Australian Government

MEA11 Aeroskills Training Package

Release: 2.0

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MEA11 Aeroskills Training Package

Modification History

The version details of this endorsed Training Package are in the table below.

Version	Release Date	Comments
Version 2	23 August 2013	**Endorsement**: • Addition of eight (8) new elective units of competency • One (1) unit of competency not carried forward • One (1) revised qualification **ISC upgrades**: • New electives included in existing qualifications • Minor editorial corrections to some existing units of competency • Licensing requirements clarified in qualifications • Twelve (12) new Skill Sets • Three (3) revised Skill Sets - One typographical error corrected; one unit code updated; and one unit replaced • Imported unit codes updated to current versions • Appendix 1: Cross reference to CASA licensing syllabus amended to align it with changes in CASA/EASA licensing examination Refer to mapping for details.
Version 1	25 January 2012	Primary release

Imprint Oct 24

MEA11v2 Mapping

Qualifications – mapping of changes

MEA11v1	MEA11v2	Title	Comment
MEA20411	MEA20411	Certificate II in Aeroskills	Release 2 – Licensing requirements clarified -

			equivalent
MEA20511	MEA20511	Certificate II in Aircraft Line Maintenance	Release 2 – Licensing requirements clarified - equivalent
MEA20611	MEA20611	Certificate II in Aircraft Surface Finishing	Release 2 – Licensing requirements clarified - equivalent
MEA30111	MEA30111	Certificate III in Aircraft Surface Finishing	Release 2 – Licensing requirements clarified. Imported units updated to current versions - equivalent
MEA30211	MEA30211	Certificate III in Aeroskills (Mechatronics)	Release 2 – Licensing requirements clarified - equivalent
MEA30311	MEA30311	Certificate III in Aircraft Life Support and Furnishing	Release 2 – Licensing requirements clarified. Imported units updated to current versions - equivalent
MEA40611	MEA40611	Certificate IV in Aeroskills (Avionics)	Release 2 – Licensing requirements clarified - equivalent
MEA40711	MEA40711	Certificate IV in Aeroskills (Mechanical)	Release 2 – Licensing requirements clarified. MEA388A replaced by elective units MEA392A, 393A, 394A, 395A, 396A and 397A (no change to qualification outcomes) - equivalent
MEA40911	MEA40911	Certificate IV in Aircraft Surface Finishing	Release 2 – Licensing requirements clarified. Imported units updated to current versions - equivalent
MEA41011	MEA41011	Certificate IV in Aeroskills (Mechatronics)	Release 2 – Licensing requirements clarified - equivalent
MEA41111	MEA41111	Certificate IV in Aircraft Life Support and Furnishing	Release 2 – Licensing requirements clarified. Imported units updated to

			current versions - equivalent
MEA41211	MEA41213	Certificate IV in Aeroskills (Armament)	Release 1 - Unit MEA262B Modify/repair single layer printed circuit boards has been deleted and the required number of units reduced to 21 (technical stream units reduced to 13) Imported unit and references to other Training Packages updated – Not equivalent
MEA41311	MEA41311	Certificate IV in Aeroskills (Structures)	Release 2 – Licensing requirements clarified. Unit MEA425A added to Elective Units Group A - equivalent
MEA50111	MEA50111	Diploma of Aeroskills (Avionics)	Release 2 – Licensing requirements clarified - equivalent
MEA50211	MEA50211	Diploma of Aeroskills (Mechanical)	Release 2 – Licensing requirements clarified - equivalent
MEA50311	MEA50311	Diploma of Aviation Maintenance Management (Avionics)	Release 2 – Licensing requirements clarified. New elective MEA147A added to Group A - equivalent
MEA50411	MEA50411	Diploma of Aviation Maintenance Management (Mechanical)	Release 2 – Licensing requirements clarified. New elective MEA147A added to Group A - equivalent
MEA50511	MEA50511	Diploma of Aeroskills (Non-Destructive Testing)	Release 2 – Licensing requirements clarified - equivalent
MEA60111	MEA60111	Advanced Diploma of Aviation Maintenance Management (Avionics)	Release 2 – Licensing requirements clarified. New elective MEA147A added to Group A - equivalent
MEA60211	MEA60211	Advanced Diploma of Aviation Maintenance Management (Mechanical)	Release 2 – Licensing requirements clarified. New elective MEA147A added to

			Group A - equivalent
MEA60311	MEA60311	Advanced Diploma of Aviation Non-Destructive Testing	Release 2 – Licensing requirements clarified - equivalent

MEA11v2 - new units of competency

MEA11v2	**Comment**
MEA147A Perform airworthiness management and maintenance program tasks	New unit
MEA392A Disassemble aircraft piston engines	New unit. Covers components of MEA388A (not equivalent).
MEA393A Repair and/or overhaul aircraft piston engine cylinder assembly components	New unit. Covers components of MEA388A (not equivalent).
MEA394A Repair and/or overhaul aircraft piston engine crankcase assembly components	New unit. Covers components of MEA388A (not equivalent).
MEA395A Reassemble aircraft piston engines	New unit. Covers components of MEA388A (not equivalent).
MEA396A Assemble aircraft piston engine quick engine change unit	New unit. Covers components of MEA388A (not equivalent).
MEA397A Test aircraft piston engines after repair or overhaul	New unit. Covers components of MEA388A (not equivalent).
MEA425A Perform bolted composite skin repairs	New unit. Added as an elective to Group A in MEA41311

Unit not carried forward

Code and title	**Comment**
MEA388A Repair and/or overhaul piston engines	Content subsumed in following units: MEA392A, MEA393A, MEA394A, MEA395A, MEA396A and MEA397A. Not equivalent

MEA11v2 - units of competency updated

Units of competency	Comment
MEA108B Complete aviation maintenance industry documentation	Release 3 – equivalent. Correction of one typo in Required Skills
MEA203C Remove and install advanced aircraft electrical system components	Release 3 – equivalent. Updates to Skills, Knowledge and Range regarding Halon fire-extinguisher regulations.
MEA286A Repair or overhaul aircraft electrical/electro-mechanical components	Release 3 – equivalent. Included specific mention of magnetos and distributor blocks in Skills, Knowledge and Range.
MEA303D Remove and install aircraft pneumatic system components	Release 2 – equivalent. Updates to S&K and variables regarding Halon fire extinguisher regulations.
MEA310C Inspect, test and troubleshoot aircraft pneumatic systems and components	Release 3– equivalent. Range and Assessment Requirements amended to allow omission where pressurisation systems are not applicable to the enterprise.
MEA313C Inspect, test and troubleshoot piston engine systems and components	Release 3 – equivalent. Descriptor and application revised to clarify that this unit covers larger engines with super/turbocharging while MEA353A covers normally aspirated engines.
MEA321C Test and troubleshoot aircraft fixed wing flight control systems	Release 2 – equivalent. Range statements clarified and a complementary change to Critical aspects for assessment and evidence required to demonstrate competency.
MEA339C Inspect, repair and maintain aircraft structures	Release 2 – equivalent. Bolted composite repairs included in Knowledge, Skills and Range Statement.

Units of competency	Comment
MEA363B Inspect, repair and maintain structures and related components	Release 2 – equivalent. Bolted composite repairs added to Knowledge, Skill and Range Statement. Corrupted numbering of Range Statement items corrected.
MEA382A Repair and/or overhaul aircraft fuel system components	Release 3 – equivalent. Unit application clarified and Range statement expanded to make clear inclusion of fuel injection systems and carburettors.
MEA601A Maintain aircraft egress systems	Release 3 – Equivalent. Imported prerequisite unit code updated to current version.
MEA602A Remove and install aircraft stores management system components	Release 3 – Equivalent. Imported prerequisite unit code updated to current version.
MEA603A Remove and install aircraft stores suspension system components	Release 3 – Equivalent. Imported prerequisite unit code updated to current version.

Imported units updated

Original code	Original title	Updated code	Update title	Comment
AURV229749A	Prepare spray painting materials and equipment	AURVTP2003	Prepare spray painting materials and equipment	Equivalent
AURV231208A	Carry out trimming of vehicle components	AURVTT2004	Trim vehicle components	Equivalent
AURV231268A	Select and apply trim/fabric materials and determine attachment methods	AURVTT2005	Select and apply trim and fabric materials	Equivalent

AURV231368A	Select and apply trim/fabric adhesives	AURVTT2006	Select and apply trim and fabric adhesives	Equivalent
AURV329603DA	Apply air dry and polyurethane enamel refinishing materials	AURVTP3012	Apply air dry and polyurethane enamel refinishing materials	Equivalent
PUADEFEO101D	Work safely with explosive ordnance	DEFEO101D	Work safely with explosive ordnance	Equivalent
PUADEFEO501D	Conduct explosive ordnance inspection	DEFEO501D	Conduct explosive ordnance inspection	Equivalent

Revised Skill sets

Title	**Comment**
MEASS00082 Aircraft egress system maintenance	Release 2 – Equivalent. Imported unit updated to current version.
MEASS00165 Electrical – B2 Licence Exclusions E1 and E4 (when competencies are being gained on basic light aircraft or helicopters)	Release 2 – Equivalent. Typographical error corrected in title.
MEASS0024 Piston engine repair_overhaul	Release 2 - MEA388A replaced by MEA392A, MEA393A, MEA394A, MEA395A, MEA396A and MEA397A

New Skill Sets

MEASS00233 A1 Licence Skill Set if Certificate IV in Aeroskills (Mechanical) is held

MEASS00234 A2 Licence Skill Set if Certificate IV in Aeroskills (Mechanical) is held

MEASS00235 A3 Licence Skill Set if Certificate IV in Aeroskills (Mechanical) is held

MEASS00236 A4 Licence Skill Set if Certificate IV in Aeroskills (Mechanical) is held

MEASS00237 A1 Licence Skill Set if Certificate IV in Aeroskills (Avionics) is held

MEASS00238 A2 Licence Skill Set if Certificate IV in Aeroskills (Avionics) is held

MEASS00239 A3 Licence Skill Set if Certificate IV in Aeroskills (Avionics) is held

MEASS00240 A4 Licence Skill Set if Certificate IV in Aeroskills (Avionics) is held

MEASS00241 A1 Licence Skill Set if a B2 Licence is held

MEASS00242 A2 Licence Skill Set if a B2 Licence is held

MEASS00243 A3 Licence Skill Set if a B2 Licence is held

MEASS00244 A4 Licence Skill Set if a B2 Licence is held

Preliminary information

Important Note to Users

Training Packages are not static documents; they are amended periodically to reflect the latest industry practices and are version controlled. It is essential that the latest version is always used.

Check the version number before commencing training or assessment

This Training Package is Version 2 – check whether this is the latest version by going to Training.gov.au (www.training.gov.au) and locating information about the Training Package. Alternatively, contact Manufacturing Skills Australia www.mskills.com.au to confirm the latest version number.

Explanation of version number conventions

The primary release Training Package is Version 1. When changes are made to a Training Package, sometimes the version number is changed and sometimes it is not, depending on the extent of the change. When a Training Package is reviewed it is considered to be a new Training Package for the purposes of version control, and is Version 1. Do not confuse the version number with the Training Package's national code (which remains the same during its period of endorsement).

Explanation of the review date

The review date (shown on the title page and in the footer of each page) indicates when the Training Package is expected to be reviewed in the light of changes such as changing technologies and circumstances. The review date is not an expiry date. Endorsed Training Packages and their components remain current until they are reviewed or replaced.

Training Package Overview

What is a Training Package?

A Training Package is an integrated set of nationally endorsed competency standards, assessment guidelines and Australian Qualifications Framework (AQF) qualifications for a specific industry, industry sector or enterprise.

Each Training Package:

- provides a consistent and reliable set of components for training, recognising and assessing peoples skills, and may also have optional support materials
- enables nationally recognised qualifications to be awarded through direct assessment of workplace competencies
- encourages the development and delivery of flexible training which suits individual and industry requirements
- encourages learning and assessment in a work-related environment which leads to verifiable workplace outcomes.

How do Training Packages fit within the National Skills Framework?

The National Skills Framework applies nationally, is endorsed by the Ministerial Council for Vocational and Technical Education, and comprises the Australian Quality Training Framework 2010 (AQTF 2010), and Training Packages endorsed by the National Skills Stanards Council (NSSC).

How are Training Packages developed?

Training Packages are developed by Industry Skills Councils (ISCs) or enterprises to meet the identified training needs of specific industries or industry sectors. To gain national endorsement of Training Packages, developers must provide evidence of extensive research, consultation and support within the industry area or enterprise.

How do Training Packages encourage flexibility?

Training Packages describe the skills and knowledge needed to perform effectively in the workplace without prescribing how people should be trained.

Training Packages acknowledge that people can achieve vocational competency in many ways by emphasising what the learner can do, not how or where they learned to do it. For example, some experienced workers might be able to demonstrate competency against the units of competency, and even gain a qualification, without completing a formal training program.

With Training Packages, assessment and training may be conducted at the workplace, off-the-job, at a training organisation, during regular work, or through work experience, work placement, work simulation or any combination of these.

Who can deliver and assess using Training Packages?

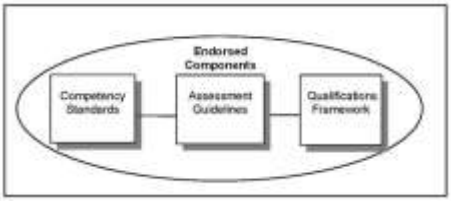
Training and assessment using Training Packages must be conducted by a Registered Training Organisation (RTO) that has the qualifications or specific units of competency on its scope of registration, or that works in partnership with another RTO, as specified in the AQTF 2010.

Training Package Components

Training Packages are made up of mandatory components endorsed by the NSSC, and optional support materials.

Training Package Endorsed Components

The nationally endorsed components include the Competency Standards, Assessment Guidelines and Qualifications Framework. These form the basis of training and assessment in the Training Package and, as such, they must be used.



Competency Standards

Each unit of competency identifies a discrete workplace requirement and includes the knowledge and skills that underpin competency as well as language, literacy and numeracy; and occupational health and safety requirements. The units of competency must be adhered to in training and assessment to ensure consistency of outcomes.

Assessment Guidelines

The Assessment Guidelines provide an industry framework to ensure all assessments meet industry needs and nationally agreed standards as expressed in the Training Package and the AQTF 2010. The Assessment Guidelines must be followed to ensure the integrity of assessment leading to nationally recognised qualifications.

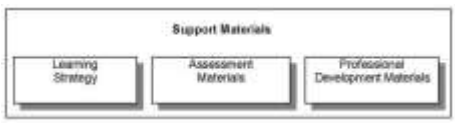
Qualifications Framework

Each Training Package provides details of those units of competency that must be achieved to award AQF qualifications. The rules around which units of competency can be combined to make up a valid AQF qualification in the Training Package are referred to as the ‘packaging rules’. The packaging rules must be followed to ensure the integrity of nationally recognised qualifications issued.

Training Package Support Materials

The endorsed components of Training Packages are complemented and supported by optional support materials that provide for choice in the design of training and assessment to meet the needs of industry and learners.

Training Package support materials can relate to single or multiple units of competency, an industry sector, a qualification or the whole Training Package. They tend to fall into one or more of the categories illustrated below.



Training Package support materials are produced by a range of stakeholders such as RTOs, individual trainers and assessors, private and commercial developers and Government agencies.

Training Package, Qualification and Unit of Competency Codes

There are agreed conventions for the national codes used for Training Packages and their components. Always use the correct codes, exactly as they appear in the Training Package, and with the code always before the title.

Training Package Codes

Each Training Package has a unique five-character national code assigned when the Training Package is endorsed, for example, *MEA11*. The first three characters are letters identifying the Training Package industry coverage and the last two characters are numbers identifying the year of endorsement.

Qualification Codes

Within each Training Package, each qualification has a unique eight-character code, for example, *MEA20411*. Qualification codes are developed as follows:

- the first three letters identify the Training Package;
- the first number identifies the qualification level (noting that, in the qualification titles themselves, arabic numbers are not used);
- the next two numbers identify the position in the sequence of the qualification at that level; and
- the last two numbers identify the year in which the qualification was endorsed. (Where qualifications are added after the initial Training Package endorsement, the last two numbers may differ from other Training Package qualifications as they identify the year in which those particular qualifications were endorsed.)

Unit of Competency Codes

Within each Training Package, each unit of competency has a unique code. Unit of competency codes are assigned when the Training Package is endorsed, or when new units of competency are added to an existing endorsed Training Package. Unit codes are developed as follows:

- a typical code is made up of up to 12 characters, normally a mixture of uppercase letters and numbers, as in *MEA101B*;
- the first three characters signify the Training Package – *MEA Aeroskills Training Package* – in the above example, and up to eight characters, relating to an industry sector, function or skill area, follow;
- the last character is always a letter and identifies the unit of competency version. An ‘A’ at the end of the code indicates that this is the original unit of competency. ‘B’, or another incremented version identifier means that minor changes have been made. Typically this would mean that wording has changed in the range statement or evidence guide, providing clearer intent; and
- where changes are made that alter the outcome, a new code is assigned and the title is changed.

Training Package, Qualification and Unit of Competency Titles

There are agreed conventions for titling Training Packages and their components. Always use the correct titles, exactly as they appear in the Training Package, and with the code always placed before the title.

Training Package Titles

The title of each endorsed Training Package is unique and relates the Training Packages broad industry coverage.

Qualification Titles

The title of each endorsed Training Package qualification is unique. Qualification titles use the following sequence:

- first, the qualification is identified as either Certificate I, Certificate II, Certificate III, Certificate IV, Diploma, Advanced Diploma, Vocational Graduate Certificate, or Vocational Graduate Diploma;
- this is followed by the words ‘in’ for Certificates I to IV, and ‘of’ for Diploma, Advanced Diploma, Vocational Graduate Certificate and Vocational Graduate Diploma;
- then, the industry descriptor, for example, Telecommunications; and
- then, if applicable, the occupational or functional stream in brackets, for example (Computer Systems).

For example:

MEA40711 Certificate IV in Aeroskills (Mechanical)

Unit of Competency Titles

Each unit of competency title is unique. Unit of competency titles describe the competency outcome concisely, and are written in sentence case.

For example:

MEA112B Plan and implement civil aircraft maintenance activities

Australian Qualifications Framework

The Australian Qualifications Framework

What is the Australian Qualifications Framework?

A brief overview of the Australian Qualifications Framework (AQF) follows. For a full explanation of the AQF, see the AQF Implementation Handbook.
http://www.aqf.edu.au/Portals/0/Documents/Handbook/AQF_Handbook_07.pdf

The AQF provides a comprehensive, nationally consistent framework for all qualifications in post-compulsory education and training in Australia. In the vocational education and training (VET) sector it assists national consistency for all trainees, learners, employers and providers by enabling national recognition of qualifications and Statements of Attainment.

Training Package qualifications in the VET sector must comply with the titles and guidelines of the AQF. Endorsed Training Packages provide a unique title for each AQF qualification which must always be reproduced accurately.

Qualifications

Training Packages can incorporate the following eight AQF qualifications.

- Certificate I in ...
- Certificate II in ...
- Certificate III in ...
- Certificate IV in ...
- Diploma of ...
- Advanced Diploma of ...
- Vocational Graduate Certificate in ...
- Vocational Graduate Diploma of ...

On completion of the requirements defined in the Training Package, a Registered Training Organisation (RTO) may issue a nationally recognised AQF qualification. Issuance of AQF qualifications must comply with the advice provided in the AQF Implementation Handbook and the AQTF 2010 Essential Standards for Initial and Continuing Registration.

Statement of Attainment

A Statement of Attainment is issued by a RTO when an individual has completed one or more units of competency from nationally recognised qualification(s)/courses(s). Issuance of Statements of Attainment must comply with the advice provided in the current AQF Implementation Handbook and the AQTF 2010 Essential Standards for Initial and Continuing Registration.

Under the AQTF 2010, RTOs must recognise the achievement of competencies as recorded on a qualification or Statement of Attainment issued by other RTOs. Given this, recognised competencies can progressively build towards a full AQF qualification.

AQF Guidelines and Learning Outcomes

The AQF Implementation Handbook provides a comprehensive guideline for each AQF qualification. A summary of the learning outcome characteristics and their distinguishing features for each VET related AQF qualification is provided below.

Certificate I

Characteristics of Learning Outcomes

Breadth, depth and complexity of knowledge and skills would prepare a person to perform a defined range of activities most of which may be routine and predictable.

Applications may include a variety of employment related skills including preparatory access and participation skills, broad-based induction skills and/or specific workplace skills. They may also include participation in a team or work group.

Distinguishing Features of Learning Outcomes

Do the competencies enable an individual with this qualification to:

- demonstrate knowledge by recall in a narrow range of areas
- demonstrate basic practical skills, such as the use of relevant tools
- perform a sequence of routine tasks given clear direction
- receive and pass on messages/information.

Certificate II

Characteristics of Learning Outcomes

Breadth, depth and complexity of knowledge and skills would prepare a person to perform in a range of varied activities or knowledge application where there is a clearly defined range of contexts in which the choice of actions required is usually clear and there is limited complexity in the range of operations to be applied.

Performance of a prescribed range of functions involving known routines and procedures and some accountability for the quality of outcomes.

Applications may include some complex or non-routine activities involving individual responsibility or autonomy and/or collaboration with others as part of a group or team.

Distinguishing Features of Learning Outcomes

Do the competencies enable an individual with this qualification to:

- demonstrate basic operational knowledge in a moderate range of areas
- apply a defined range of skills
- apply known solutions to a limited range of predictable problems
- perform a range of tasks where choice between a limited range of options is required
- assess and record information from varied sources
- take limited responsibility for own outputs in work and learning.

Certificate III

Characteristics of Learning Outcomes

Breadth, depth and complexity of knowledge and competencies would cover selecting, adapting and transferring skills and knowledge to new environments and providing technical advice and some leadership in resolution of specified problems. This would be applied across a range of roles in a variety of contexts with some complexity in the extent and choice of options available.

Performance of a defined range of skilled operations, usually within a range of broader related activities involving known routines, methods and procedures, where some discretion and judgement is required in the section of equipment, services or contingency measures and within known time constraints.

Applications may involve some responsibility for others. Participation in teams including group or team coordination may be involved.

Distinguishing Features of Learning Outcomes

Do the competencies enable an individual with this qualification to:

- demonstrate some relevant theoretical knowledge
- apply a range of well-developed skills
- apply known solutions to a variety of predictable problems
- perform processes that require a range of well-developed skills where some discretion and judgement is required
- interpret available information, using discretion and judgement
- take responsibility for own outputs in work and learning
- take limited responsibility for the output of others.

Certificate IV

Characteristics of Learning Outcomes

Breadth, depth and complexity of knowledge and competencies would cover a broad range of varied activities or application in a wider variety of contexts most of which are complex and non-routine. Leadership and guidance are involved when organising activities of self and others as well as contributing to technical solutions of a non-routine or contingency nature.

Performance of a broad range of skilled applications including the requirement to evaluate and analyse current practices, develop new criteria and procedures for performing current practices and provision of some leadership and guidance to others in the application and planning of the skills. Applications involve responsibility for, and limited organisation of, others.

Distinguishing Features of Learning Outcomes

Do the competencies enable an individual with this qualification to:

- demonstrate understanding of a broad knowledge base incorporating some theoretical concepts
- apply solutions to a defined range of unpredictable problems
- identify and apply skill and knowledge areas to a wide variety of contexts, with depth in some areas
- identify, analyse and evaluate information from a variety of sources
- take responsibility for own outputs in relation to specified quality standards
- take limited responsibility for the quantity and quality of the output of others.

Diploma

Characteristics of Learning Outcomes

Breadth, depth and complexity covering planning and initiation of alternative approaches to skills or knowledge applications across a broad range of technical and/or management requirements, evaluation and coordination.

The self directed application of knowledge and skills, with substantial depth in some areas where judgment is required in planning and selecting appropriate equipment, services and techniques for self and others.

Applications involve participation in development of strategic initiatives as well as personal responsibility and autonomy in performing complex technical operations or organising others. It may include participation in teams including teams concerned with planning and evaluation functions. Group or team coordination may be involved.

The degree of emphasis on breadth as against depth of knowledge and skills may vary between qualifications granted at this level.

Distinguishing Features of Learning Outcomes

Do the competencies or learning outcomes enable an individual with this qualification to:

- demonstrate understanding of a broad knowledge base incorporating theoretical concepts, with substantial depth in some areas
- analyse and plan approaches to technical problems or management requirements
- transfer and apply theoretical concepts and/or technical or creative skills to a range of situations
- evaluate information, using it to forecast for planning or research purposes
- take responsibility for own outputs in relation to broad quantity and quality parameters
- take some responsibility for the achievement of group outcomes.

Advanced Diploma

Characteristics of Learning Outcomes

Breadth, depth and complexity involving analysis, design, planning, execution and evaluation across a range of technical and/or management functions including development of new criteria or applications or knowledge or procedures.

The application of a significant range of fundamental principles and complex techniques across a wide and often unpredictable variety of contexts in relation to either varied or highly specific functions. Contribution to the development of a broad plan, budget or strategy is involved and accountability and responsibility for self and others in achieving the outcomes is involved.

Applications involve significant judgement in planning, design, technical or leadership/guidance functions related to products, services, operations or procedures.

The degree of emphasis on breadth as against depth of knowledge and skills may vary between qualifications granted at this level.

Distinguishing Features of Learning Outcomes

Do the competencies or learning outcomes enable an individual with this qualification to:

- demonstrate understanding of specialised knowledge with depth in some areas
- analyse, diagnose, design and execute judgements across a broad range of technical or management functions
- generate ideas through the analysis of information and concepts at an abstract level

- demonstrate a command of wide-ranging, highly specialised technical, creative or conceptual skills
- demonstrate accountability for personal outputs within broad parameters
- demonstrate accountability for personal and group outcomes within broad parameters.

Vocational Graduate Certificate

Characteristics of competencies or learning outcomes

The self-directed development and achievement of broad and specialised areas of knowledge and skills, building on prior knowledge and skills.

Substantial breadth and complexity involving the initiation, analysis, design, planning, execution and evaluation of technical and management functions in highly varied and highly specialised contexts.

Applications involve making significant, high-level, independent judgements in major broad or planning, design, operational, technical and management functions in highly varied and specialised contexts. They may include responsibility and broad-ranging accountability for the structure, management and output of the work or functions of others.

The degree of emphasis on breadth, as opposed to depth, of knowledge and skills may vary between qualifications granted at this level.

Distinguishing features of learning outcomes

Do the competencies or learning outcomes enable an individual with this qualification to:

- demonstrate the self-directed development and achievement of broad and specialised areas of knowledge and skills, building on prior knowledge and skills
- initiate, analyse, design, plan, execute and evaluate major broad or technical and management functions in highly varied and highly specialised contexts
- generate and evaluate ideas through the analysis of information and concepts at an abstract level
- demonstrate a command of wide-ranging, highly specialised technical, creative or conceptual skills in complex contexts
- demonstrate responsibility and broad-ranging accountability for the structure, management and output of the work or functions of others.

Vocational Graduate Diploma

Characteristics of competencies or learning outcomes

The self-directed development and achievement of broad and specialised areas of knowledge and skills, building on prior knowledge and skills.

Substantial breadth, depth and complexity involving the initiation, analysis, design, planning, execution and evaluation of major functions, both broad and highly specialised, in highly varied and highly specialised contexts.

Further specialisation within a systematic and coherent body of knowledge.

Applications involve making high-level, fully independent, complex judgements in broad planning, design, operational, technical and management functions in highly varied and highly specialised contexts. They may include full responsibility and accountability for all aspects of work and functions of others, including planning, budgeting and strategy development.

The degree of emphasis on breadth, as opposed to depth, of knowledge and skills may vary between qualifications granted at this level.

Distinguishing features of learning outcomes

Do the competencies or learning outcomes enable an individual with this qualification to:

- demonstrate the self-directed development and achievement of broad and highly specialised areas of knowledge and skills, building on prior knowledge and skills
- initiate, analyse, design, plan, execute and evaluate major functions, both broad and within highly varied and highly specialised contexts
- generate and evaluate complex ideas through the analysis of information and concepts at an abstract level
- demonstrate an expert command of wide-ranging, highly specialised, technical, creative or conceptual skills in complex and highly specialised or varied contexts
- demonstrate full responsibility and accountability for personal outputs
- demonstrate full responsibility and accountability for all aspects of the work or functions of others, including planning, budgeting and strategy.

Qualification Pathways

For more information about qualifications and pathways contact Manufacturing Skills Australia (MSA) www.mskills.com.au

Competency Standards

What is competency?

The broad concept of industry competency concerns the ability to perform particular tasks and duties to the standard of performance expected in the workplace. Competency requires the application of specified skills, knowledge and attitudes relevant to effective participation in an industry, industry sector or enterprise.

Competency covers all aspects of workplace performance and involves performing individual tasks; managing a range of different tasks; responding to contingencies or breakdowns; and, dealing with the responsibilities of the workplace, including working with others. Workplace competency requires the ability to apply relevant skills, knowledge and attitudes consistently over time and in the required workplace situations and environments. In line with this concept of competency Training Packages focus on what is expected of a competent individual in the workplace as an outcome of learning, rather than focussing on the learning process itself.

Competency standards in Training Packages are determined by industry to meet identified industry skill needs. Competency standards are made up of a number of units of competency each of which describes a key function or role in a particular job function or occupation. Each unit of competency within a Training Package is linked to one or more AQF qualifications.

Contextualisation of units of competency by RTOs

Registered Training Organisations (RTOs) may contextualise units of competency in this endorsed Training Package to reflect required local outcomes. Contextualisation could involve additions or amendments to the unit of competency to suit particular delivery methods, learner profiles, specific enterprise equipment requirements, or to otherwise meet local needs. However, the integrity of the overall intended outcome of the unit of competency must be maintained.

Any contextualisation of units of competency in this Training Package must be within the bounds of the following advice:

- RTOs must not remove or add to the number and content of elements and performance criteria.
- RTOs can include specific industry terminology in the range statement.
- Any amendments and additions to the range statement made by RTOs must not diminish the breadth of application of the competency, or reduce its portability.
- RTOs may add detail to the evidence guide in areas such as the critical aspects of evidence or required resources and infrastructure—but only where these expand the breadth of the competency and do not limit its use.

Components of units of competency

The components of units of competency are summarised below, in the order in which they appear in each unit of competency.

Unit Title

The unit title is a succinct statement of the outcome of the unit of competency. Each unit of competency title is unique, both within and across Training Packages.

Unit Descriptor

The unit descriptor broadly communicates the content of the unit of competency and the skill area it addresses. Where units of competency have been contextualised from units of competency from other endorsed Training Packages, summary information is provided. There may also be a brief second paragraph that describes its relationship with other units of competency, and any licensing requirements.

Employability Skills

This sub-section contains a statement that the unit contains Employability skills.

Prerequisite Units (optional)

If there are any units of competency that must be completed before the unit, these will be listed.

Application of the Unit

This sub-section fleshes out the unit of competency's scope, purpose and operation in different contexts, for example, by showing how it applies in the workplace.

Competency Field (Optional)

The competency field either reflects the way the units of competency are categorised in the Training Package or denotes the industry sector, specialisation or function. It is an optional component of the unit of competency.

Sector (optional)

The industry sector is a further categorisation of the competency field and identifies the next classification, for example an elective or supervision field.

Elements of Competency

The elements of competency are the basic building blocks of the unit of competency. They describe in terms of outcomes the significant functions and tasks that make up the competency.

Performance Criteria

The performance criteria specify the required performance in relevant tasks, roles, skills and in the applied knowledge that enables competent performance. They are usually written in passive voice. Critical terms or phrases may be written in bold italics and then defined in range statement, in the order of their appearance in the performance criteria.

Required Skills and Knowledge

The essential skills and knowledge are either identified separately or combined. Knowledge identifies what a person needs to know to perform the work in an informed and effective manner. Skills describe the application of knowledge to situations where understanding is converted into a workplace outcome.

Range Statement

The range statement provides a context for the unit of competency, describing essential operating conditions that may be present with training and assessment, depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts. As applicable, the meanings of key terms used in the performance criteria will also be explained in the range statement.

Evidence Guide

The evidence guide is critical in assessment as it provides information to the Registered Training Organisation (RTO) and assessor about how the described competency may be demonstrated. The evidence guide does this by providing a range of evidence for the assessor to make determinations, and by providing the assessment context. The evidence guide describes:

- conditions under which competency must be assessed including variables such as the assessment environment or necessary equipment;
- relationships with the assessment of any other units of competency;
- suitable methodologies for conducting assessment including the potential for workplace simulation;

- resource implications, for example access to particular equipment, infrastructure or situations;
- how consistency in performance can be assessed over time, various contexts and with a range of evidence; and
- the required underpinning knowledge and skills.

Employability Skills in Units of Competency

The detail and application of Employability Skills facets will vary according to the job role requirements of each industry. In developing Training Packages, industry stakeholders are consulted to identify appropriate facets of Employability Skills which are incorporated into the relevant units of competency and qualifications.

Employability Skills are not a discrete requirement contained in units of competency (as was the case with Key Competencies). Employability Skills are specifically expressed in the context of the work outcomes described in units of competency and will appear in elements, performance criteria, range statements and evidence guides. As a result, users of Training Packages are required to review the entire unit of competency in order to accurately determine Employability Skills requirements.

How Employability Skills relate to the Key Competencies

The eight nationally agreed Employability Skills now replace the seven Key Competencies in Training Packages. Trainers and assessors who have used Training Packages prior to the introduction of Employability Skills may find the following comparison useful.

Employability Skills	Mayer Key Competencies
Communication	Communicating ideas and information
Teamwork	Working with others and in teams
Problem solving	Solving problems Using mathematical ideas and techniques
Initiative and enterprise	
Planning and organising	Collecting, analysing and organising information Planning and organising activities
Self-management	
Learning	
Technology	Using technology

When analysing the above table it is important to consider the relationship and natural overlap of Employability Skills. For example, using technology may involve communication skills and combine the understanding of mathematical concepts.

Explicitly embedding Employability Skills in units of competency

This Training Package seeks to ensure that industry-endorsed Employability Skills are explicitly embedded in units of competency. The application of each skill and the level of detail included in each part of the unit will vary according to industry requirements and the nature of the unit of competency.

Employability Skills must be both explicit and embedded within units of competency. This means that Employability Skills will be:

- embedded in units of competency as part of the other performance requirements that make up the competency as a whole
- explicitly described within units of competency to enable Training Packages users to identify accurately the performance requirements of each unit with regards to Employability Skills.

This Training Package also seeks to ensure that Employability Skills are well-defined and written into units of competency so that they are apparent, clear and can be delivered and assessed as an essential component of unit work outcomes.

Sample unit of competency components showing Employability Skills

The following table shows the sequence of a unit of competency, and each cell contains text taken from a range of units. It provides examples of where and how various Employability Skills could be embedded in each component.

Please note that in the example, the bracketed Employability Skills are provided for clarification only and would not be present in units of competency within this Training Package.

Unit Title	Give formal presentations and take part in meetings (Communication)
Unit Descriptor	This unit covers the skills and knowledge required to promote the use and implementation of innovative work practices to effect change (*Initiative and enterprise*)
Element	Proactively resolve issues (*Problem solving*)
Performance Criteria	Information is organised in a format suitable for analysis and dissemination in accordance with organisational requirements (*Planning and organising*)
Range Statement	Software applications may include email, internet, word processing, spreadsheet, database or accounting packages (*Technology*)

Required Skills and Knowledge	Modify activities depending on differing workplace contexts, risk situations and environments (*Learning*) Work collaboratively with others during a fire emergency (*Teamwork*) Instructions, procedures and other information relevant the maintenance of vessel and port security (*Communication*)
Evidence Guide	Evidence of having worked constructively with a wide range of community groups and stakeholders to solve problems and adapt or design new solutions to meet identified needs in crime prevention. In particular, evidence must be obtained on the ability to: • assess response options to identified crime-prevention needs and determine the optimal action to be implemented • in consultation with relevant others, design an initiative to address identified issues (*Initiative and enterprise*)

Employability Skills Summaries and units of competency

An Employability Skills Summary exists for each qualification. Summaries include broad advice on industry expectations with regard to Employability Skills at the qualification level. Summaries should be used by trainers and assessors to assist in identifying the Employability Skills requirements contained within units of competency.

Assessment Guidelines

Section 1

Introduction

These Assessment Guidelines provide the endorsed framework for assessment of units of competency in this Training Package. They are designed to ensure that assessment is consistent with the *Australian Quality Training Framework (AQTF) Essential Standards for Initial and Continuing Registration*. Assessments against the units of competency in this Training Package must be carried out in accordance with these Assessment Guidelines.

Assessment System Overview

This section provides an overview of the requirements for assessment when using this Training Package, including a summary of the AQTF requirements, licensing and registration requirements, and assessment pathways.

Quality assessment underpins the credibility of the vocational education and training sector. The Assessment Guidelines of a Training Package are an important tool in supporting quality assessment.

Assessment within the National Skills Framework is the process of collecting evidence and making judgements about whether competency has been achieved to confirm whether an individual can perform to the standards expected in the workplace, as expressed in the relevant endorsed unit of competency.

Assessment must be carried out in accordance with the:

- benchmarks for assessment
- principles of assessment
- rules of evidence
- assessment requirements set out in the AQTF.

Benchmarks for Assessment

The endorsed units of competency in this Training Package are the benchmarks for assessment. As such, they provide the basis for nationally recognised Australian Qualifications Framework (AQF) qualifications and Statements of Attainment issued by Registered Training Organisations (RTOs).

Principles of Assessment

All assessments carried out by RTOs are required to demonstrate compliance with the principles of assessment:

- validity
- reliability
- flexibility
- fairness
- sufficiency.

These principles must be addressed in the:

- design, establishment and management of the assessment system for this Training Package
- development of assessment tools
- the conduct of assessment.

Validity

Assessment is valid when the process is sound and assesses what it claims to assess. Validity requires that:

a) assessment against the units of competency must cover the broad range of skills and knowledge that are essential to competent performance

b) assessment of knowledge and skills must be integrated with their practical application

c) judgement of competence must be based on sufficient evidence (that is, evidence gathered on a number of occasions and in a range of contexts using different assessment methods). The specific evidence requirements of each unit of competency provide advice on sufficiency.

Reliability

Reliability refers to the degree to which evidence presented for assessment is consistently interpreted and results in consistent assessment outcomes. Reliability requires the assessor to have the required competencies in assessment and relevant vocational competencies (or to assess in conjunction with someone who has the vocational competencies). It can only be achieved when assessors share a common interpretation of the assessment requirements of the unit(s) being assessed.

Flexibility

To be flexible, assessment should reflect the candidate's needs; provide for recognition of competencies no matter how, where or when they have been acquired; draw on a range of methods appropriate to the context, competency and the candidate; and support continuous competency development.

Fairness

Fairness in assessment requires consideration of the individual candidate's needs and characteristics, and any reasonable adjustments that need to be applied to take account of them. It requires clear communication between the assessor and the candidate to ensure that the candidate is fully informed about, understands and is able to participate in, the assessment process, and agrees that the process is appropriate. It also includes an opportunity for the person being assessed to challenge the result of the assessment and to be reassessed if necessary.

Sufficiency

Sufficiency relates to the quality and quantity of evidence assessed. It requires collection of enough appropriate evidence to ensure that all aspects of competency have been satisfied and that competency can be demonstrated repeatedly. Supplementary sources of evidence may be necessary. The specific evidence requirements of each unit of competency provide advice on sufficiency. Sufficiency is also one of the rules of evidence.

Rules of Evidence

The rules of evidence guide the collection of evidence that address the principles of validity and reliability, guiding the collection of evidence to ensure that it is valid, sufficient, current and authentic.

Valid

Valid evidence must relate directly to the requirements of the unit of competency. In ensuring evidence is valid, assessors must ensure that the evidence collected supports demonstration of the outcomes and performance requirements of the unit of competency together with the knowledge and skills necessary for competent performance. Valid evidence must encapsulate the breadth and depth of the unit of competency, which will necessitate using a number of different assessment methods.

Sufficient

Sufficiency relates to the quality and quantity of evidence assessed. It requires collection of enough appropriate evidence to ensure that all aspects of competency have been satisfied and that competency can be demonstrated repeatedly. Supplementary sources of evidence may be necessary. The specific evidence requirements of each unit of competency provide advice on sufficiency.

Current

In assessment, currency relates to the age of the evidence presented by a candidate to demonstrate that they are still competent. Competency requires demonstration of current performance, so the evidence collected must be from either the present or the very recent past.

Authentic

To accept evidence as authentic, an assessor must be assured that the evidence presented for assessment is the candidate's own work.

Section 2

Assessment Requirements of the Australian Quality Training Framework

Assessment leading to nationally recognised AQF qualifications and Statements of Attainment in the vocational education and training sector must meet the requirements of the AQTF as expressed in the AQTF 2010 Essential Standards for Registration.

The AQTF 2010 Essential Standards for Initial and Continuing Registration can be downloaded from <www.training.com.au>.

The following points summarise the assessment requirements.

Registration of Training Organisations

Assessment must be conducted by, or on behalf of, an RTO formally registered by a State or Territory Registering Body in accordance with the AQTF. The RTO must have the specific units of competency and/or AQF qualifications on its scope of registration.

Quality Training and Assessment

Each RTO must provide quality training and assessment across all its operations. See the AQTF 2010 Essential Standards for Initial and Continuing Registration, Standard 1.

Assessor Competency Requirements

Each person involved in training and assessment must be competent for the functions they perform. See the AQTF 2010 Essential Standards for Initial and Continuing Registration, Standard 1 for assessor (and trainer) competency requirements. See also the AQTF 2010 Users' Guide to the Essential Standards for Registration – Appendix 2.

Assessment Requirements

The RTOs assessments, including RPL, must meet the requirements of the relevant endorsed Training Package. See the AQTF 2010 Essential Standards for Initial and Continuing Registration.

Assessment Strategies

Each RTO must have strategies for training and assessment that meet the requirements of the relevant Training Package or accredited course and are developed in consultation with industry stakeholders. See the AQTF 2010 Essential Standards for Initial and Continuing Registration.

National Recognition

Each RTO must recognise the AQF qualifications and Statements of Attainment issued by any other RTO. See the AQTF 2010 Essential Standards for Initial and Continuing Registration.

Access and Equity and Client Outcomes

Each RTO must adhere to the principles of access and equity and maximise outcomes for its clients. See the AQTF 2010 Essential Standards for Initial and Continuing Registration.

Monitoring Assessments

Training and/or assessment provided on behalf of the RTO must be monitored to ensure that it is in accordance with all aspects of the AQTF 2010 Essential Standards for Initial and Continuing Registration.

Recording Assessment Outcomes

Each TO must manage records to ensure their accuracy and integrity. See the AQTF 2010 Essential Standards for Initial and Continuing Registration.

Issuing AQF qualifications and Statement of Attainment

Each RTO must issue AQF qualifications and Statements of Attainment that meet the requirements of the current AQF Implementation Handbook and the endorsed Training Packages within the scope of its registration. An AQF qualification is issued once the full requirements for a qualification, as specified in the nationally endorsed Training Package are met. A Statement of Attainment is issued when an individual has completed one or more units of competency from nationally recognised qualification(s)/courses(s). See the AQTF and the edition of the AQF Implementation Handbook—available on the AQF Council website <www.aqf.edu.au >

Section 3

Licensing/Registration Requirements

This section provides information on licensing/registration requirements for this Training Package, with the following important disclaimer.

Licensing and registration requirements that apply to specific industries, and VET, vary between each state and territory, and can regularly change. The developers of this Training Package consider that the licensing/registration requirements described in this section apply to RTOs, assessors or candidates with respect to this Training Package. While reasonable care has been taken in its preparation, the developers of this Training Package and the Department cannot guarantee that the list is definitive or accurate at the time of reading; the information in this section is provided in good faith on that basis.

Contact the relevant state or territory department(s) to check if the licensing/registration requirements described below still apply, and to check if there are any others with which you must comply. For further information contact the Civil Aviation Safety Authority (CASA) in accordance with the advice provided below.

Advice to contact CASA for authoritative information on licensing requirements

Selected units of competency and qualifications in this Training Package have been designed to satisfy CASA requirements for Licensed Aircraft Maintenance Engineers specified in Civil Aviation Safety Regulation Part 66.

Training programs will allow entry to optional licensing pathways leading to both trade recognition and preparation for CASA licensing. These programs will be conducted by Registered Training Organisations which will also have complementary CASA approval as maintenance training organisations under Civil Aviation Safety Regulation Part 147.

Authoritative information on licensing, current and proposed compliance requirements can be obtained from CASA on telephone 131 757 or at www.casa.gov.au.

Requirements for Assessors

In order to conduct assessment for statutory licensing or other industry registration requirements, assessors must meet the requirements outlined in the following chart, in addition to the AQTF requirements.

Licence/Registration	Jurisdiction	Requirements
A1 A2 A3 A4 B1.1 B1.2 B1.3 B1.4 B2	Commonwealth	Assessors must have been appointed by a Maintenance Training Organisation that is operating under the provisions of Civil Aviation Safety Regulation Part 147.

Requirements for RTOs

Selected units of competency and qualifications in this Training Package provide the basis for a range of statutory licensing and industry registration arrangements. To satisfy these licensing and registration arrangements, RTOs must meet the additional requirements detailed in the following chart.

Licence/Registration	Jurisdiction	Requirements
A1 A2 A3 A4 B1.1 B1.2 B1.3 B1.4 B2	Commonwealth	RTOs delivering training leading to the grant of an Aircraft Maintenance Engineer Licence must be Maintenance Training Organisations operating under the provisions of Civil Aviation Safety Regulation Part 147. Underpinning skills and knowledge must fully cover the Civil Aviation Safety Regulation Part 66 licensing topics as listed by licence and unit of competency in Appendix 1 to this Training Package.

Requirements for Candidates

Individuals being assessed under statutory licensing and industry registration systems must comply with training and experience requirements additional to the minimum requirements identified in this Training Package. These additional requirements are specified in Civil Aviation Safety Regulation Part 66 and include:

- For an A Licence, attainment of all units of competency specified in Section 2 for MEA20511 Certificate II in Aircraft Line Maintenance with elective units selected according to the licence (A1, A2, A3 or A4) sought
- For a B1 Licence, attainment of all units of competency specified in Section 2 for MEA50211 Diploma of Aeroskills (Mechanical) with elective units selected according to the licence (B1.1, B1.2, B1.3 or B1.4) sought
- For a B2 Licence, attainment of all units of competency specified in Section 2 for MEA50111 Diploma of Aeroskills (Avionics)
- In all cases, one of the requirements to demonstrate eligibility will be the presentation of a Log of Industrial Experience and Achievement in which experience and attainment of units of competency have been correctly certified.

Where units of competency have been attained other than through an RTO that is also a Maintenance Training Organisation under Civil Aviation Safety Regulation Part 147 and a licence is being sought, the individual will be required to undergo an RPL assessment conducted by a Maintenance Training Organisation.

Section 4

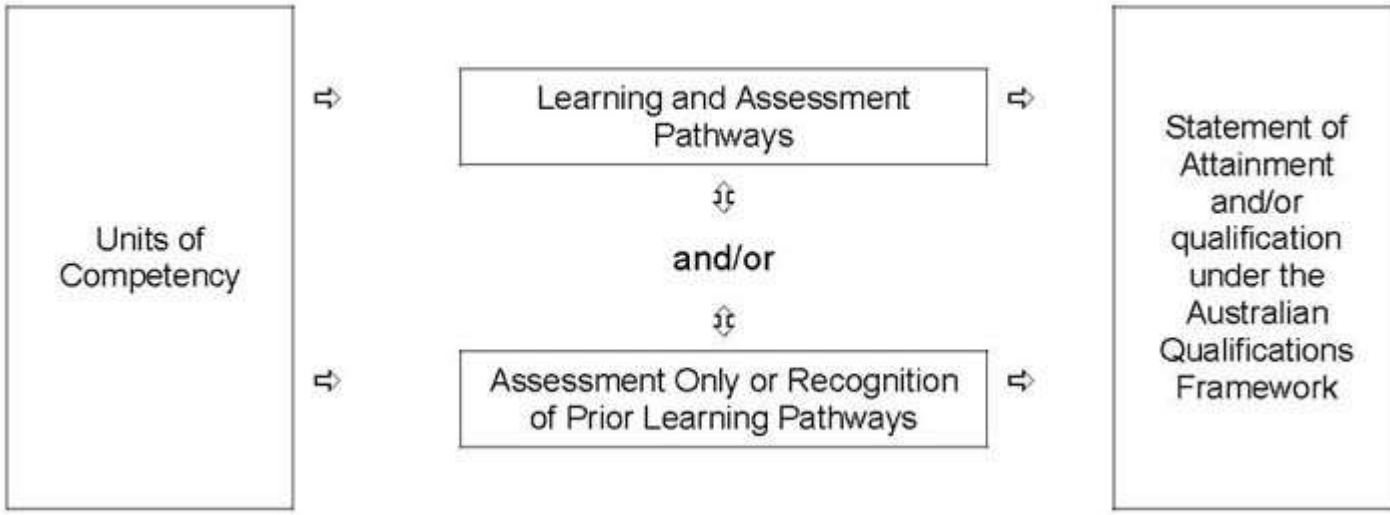
Pathways

The competencies in this Training Package may be attained in a number of ways including through:

- formal or informal education and training
- experiences in the workplace

- general life experience, and/or
- any combination of the above.

Assessment under this Training Package leading to an AQF qualification or Statement of Attainment may follow a learning and assessment pathway, or a recognition pathway, or a combination of the two as illustrated in the following diagram.



Each of these assessment pathways leads to full recognition of competencies held – the critical issue is that the candidate is competent, not how the competency was acquired.

Assessment, by any pathway, must comply with the assessment requirements set out in the Assessment Guidelines of the Training Package, the AQTF and, where relevant, the Australian Qualifications Framework.

Learning and Assessment Pathways

Usually, learning and assessment are integrated, with evidence being collected and feedback provided to the candidate at any time throughout the learning and assessment process.

Learning and assessment pathways may include structured programs in a variety of contexts using a range of strategies to meet different learner needs. Structured learning and assessment programs could be: group-based, work-based, project-based, self-paced, action learning-based; conducted by distance or e-learning; and/or involve practice and experience in the workplace.

Learning and assessment pathways to suit Australian Apprenticeships have a mix of formal structured training and structured workplace experience with formative assessment activities through which candidates can acquire and demonstrate skills and knowledge from the relevant units of competency.

Credit Pathways

Credit is the value assigned for the recognition of equivalence in content between different types of learning and/or qualifications which reduces the volume of learning required to achieve a qualification.

Credit arrangements must be offered by all RTOs that offer Training Package qualifications. Each RTO must have a systematic institutional approach with clear, accessible and transparent policies and procedures.

Competencies already held by individuals can be formally assessed against the units of competency in this Training Package, and should be recognised regardless of how, when or where they were acquired, provided that the learning is relevant to the unit of competency outcomes.

Recognition of Prior Learning

Recognition of Prior Learning (RPL) is an assessment process which determines the credit outcomes of an individual application for credit.

The availability of RPL provides all potential learners with access to credit opportunities.

The recognition of prior learning pathway is appropriate for candidates who have previously attained skills and knowledge and who, when enrolling in qualifications, seek to shorten the duration of their training and either continue or commence working. This may include the following groups of people:

- existing workers;
- individuals with overseas qualifications;
- recent migrants with established work histories;
- people returning to the workplace; and
- people with disabilities or injuries requiring a change in career.

As with all assessment, RPL assessment should be undertaken by academic or teaching staff with expertise in the subject, content of skills area, as well as knowledge of and expertise in RPL assessment policies and procedures.

Assessment methods used for RPL should provide a range of ways for individuals to demonstrate that they have met the required outcomes and can be granted credit. These might include:

- questioning (oral or written)
- consideration of a portfolio and review of contents
- consideration of third party reports and/or other documentation such as documentation such as articles, reports, project material, papers, testimonials or other products prepared by the RPL applicant that relate to the learning outcomes of the relevant qualification component
- mapping of learning outcomes from prior formal or non-formal learning to the relevant qualification components
- observation of performance, and
- participation in structured assessment activities the individual would normally be required to undertake if they were enrolled in the qualification component/s.

In a RPL pathway, the candidate provides current, quality evidence of their competency against the relevant unit of competency. This process may be directed by the candidate and verified by the assessor. Where the outcomes of this process indicate that the candidate is competent, structured training is not required. The RPL requirements of the AQTF must be met.

As with all assessment, the assessor must be confident that the evidence indicates that the candidate is currently competent against the endorsed unit of competency. This evidence may take a variety of forms and might include certification, references from past employers, testimonials from clients, work samples and/or observation of the candidate. The onus is on candidates to provide sufficient evidence to satisfy assessors that they currently hold the relevant competencies. In judging evidence, the assessor must ensure that the evidence of prior learning is:

- authentic (the candidate's own work);
- valid (directly related to the current version of the relevant endorsed unit of competency);
- reliable (shows that the candidate consistently meets the endorsed unit of competency);
- current (reflects the candidate's current capacity to perform the aspect of the work covered by the endorsed unit of competency); and
- sufficient (covers the full range of elements in the relevant unit of competency and addresses the four dimensions of competency, namely task skills, task management skills, contingency management skills, and job/role environment skills).

Credit Transfer

Credit transfer is a process which provides learners with agreed and consistent credit outcomes based on equivalences in content between matched qualifications.

This process involves education institutions:

- mapping, comparing and evaluating the extent to which the defined learning outcomes and assessment requirements of the individual components of one qualification are equivalent to the learning outcomes and assessment requirements of the individual components of another qualification
- making an educational judgment of the credit outcomes to be assigned between the matched components of the two qualifications
- setting out the agreed credit outcomes in a documented arrangement or agreement, and
- publicising the arrangement/agreement and credit available.

Combination of Pathways

Credit may be awarded on the basis of a combination of credit transfer plus an individual RPL assessment for additional learning. Once credit has been awarded on the basis of RPL, subsequent credit transfer based on these learning outcomes should not include revisiting the RPL assessment but should be based on credit transfer or articulation or other arrangements between providers.

Where candidates for assessment have gained competencies through work and life experience and gaps in their competence are identified, or where they require training in new areas, a combination of pathways may be appropriate.

In such situations, the candidate may undertake an initial assessment to determine their current competency. Once current competency is identified, a structured learning and assessment program ensures that the candidate acquires the required additional competencies identified as gaps.

Section 5

Assessor Requirements

This section identifies the specific requirements on the vocational competence and experience for assessors, to ensure that they meet the needs of industry and their obligations under AQTF, and clarifies how others may contribute to the assessment process where one person alone does not hold all the required competencies.

Assessor Competencies

The AQTF specifies mandatory competency requirements for assessors. For information, Element 1.4 from the AQTF 2010 Essential Standards for Registration follows:

1.4 Training and assessment are conducted by trainers and assessors who:

- have the necessary training and assessment competencies as determined by the National Quality Council or its successors, and
- have the relevant vocational competencies at least to the level being delivered or assessed, and
- can demonstrate current industry skills directly relevant to the training/assessment being undertaken, and
- continue to develop their Vocational Education and Training (VET) knowledge and skills as well as their industry currency and trainer/assessor competence.

* See AQTF 2010 Users' Guide to the Essential Standards for Registration – Appendix 2

Section 6

Designing Assessment Tools

This section provides an overview on the use and development of assessment tools.

Use of Assessment Tools

Assessment tools provide a means of collecting the evidence that assessors use in making judgements about whether candidates have achieved competency.

There is no set format or process for the design, production or development of assessment tools. Assessors may use prepared assessment tools, such as those specifically developed to support this Training Package, or they may develop their own.

Using Prepared Assessment Tools

If using prepared assessment tools, assessors should ensure these relate to the current version of the relevant unit of competency. The current unit of competency can be checked on the National Register <www.ntis.gov.au>.

Developing Assessment Tools

When developing their own assessment tools, assessors must ensure that the tools:

- are benchmarked against the relevant unit or units of competency;
- are reviewed as part of the validation of assessment strategies required under the AQTF; and
- meet the assessment requirements expressed in the AQTF 2010 Essential Standards for Initial and Continuing Registration.

A key reference for assessors developing assessment tools is TAE10 Training and Education Training Package.

Language, Literacy and Numeracy

The design of assessment tools must reflect the language, literacy and numeracy competencies required for the performance of a task in the workplace and not exceed these expectations.

Section 7

Conducting Assessment

This section details the mandatory assessment requirements and provides information on equity in assessment including reasonable adjustment.

Mandatory Assessment Requirements

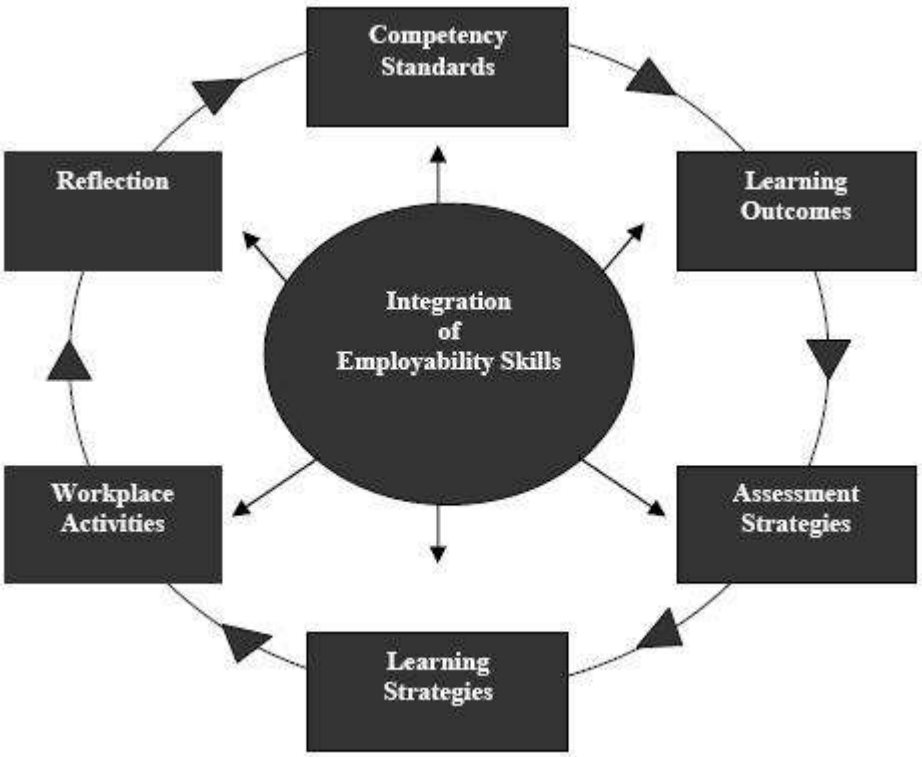
Assessments must meet the criteria set out in the AQTF 2010 Essential Standards for Initial and Continuing Registration. For information, the mandatory assessment requirements from Standard 1 from the AQTF 2010 Essential Standards for Initial and Continuing Registration are as follows:

1.5 Assessment, including Recognition of Prior Learning (RPL):

- meets the requirements of the relevant Training Package or accredited course
- is conducted in accordance with the principles of assessment and the rules of evidence
- meets workplace and, where relevant, regulatory requirements
- is systematically validated.

Assessment of Employability Skills

Employability Skills are integral to workplace competency. As such, they must be considered in the design, customisation, delivery and assessment of vocational education and training programs in an integrated and holistic way, as represented diagrammatically below.



Employability Skills are embedded within each unit of competency, and an Employability Skills Summary is available for each qualification. Training providers must use Employability Skills information in order to design valid and reliable training and assessment strategies. This analysis could include:

- reviewing units of competency to locate relevant Employability Skills and determine how they are applied within the unit
- analysing the Employability Skills Summary for the qualification in which the unit or units are packaged to help clarify relevant industry and workplace contexts and the application of Employability Skills at that qualification outcome
- designing training and assessment to address Employability Skills requirements.

The NQC has endorsed a model for assessing and reporting Employability Skills, which contains further suggestions about good practice strategies in teaching, assessing, learning and reporting Employability Skills. The model is available from <http://www.training.com.au/>.

The endorsed approach includes learners downloading qualification specific Employability Skills Summaries for Training Package qualifications from an online repository at <http://employabilityskills.training.com.au>

For more information on Employability Skills in Manufacturing Skills Australia (MSA) Training Packages go to the MSA website at www.mskills.com.au.

Employability Skills are reported on each qualification using the following statement on the qualification testamur: "A summary of the Employability Skills developed through this qualification can be downloaded from http://employabilityskills.training.com.au "

Access and Equity

An individual's access to the assessment process should not be adversely affected by restrictions placed on the location or context of assessment beyond the requirements specified in this Training Package: training and assessment must be bias-free.

Under the rules for their development, Training Packages must reflect and cater for the increasing diversity of Australia's VET clients and Australia's current and future workforce. The flexibilities offered by Training Packages should enhance opportunities and potential outcomes for all people so that we can all benefit from a wider national skills base and a shared contribution to Australia's economic development and social and cultural life.

Reasonable Adjustments

It is important that education providers take meaningful, transparent and reasonable steps to consult, consider and implement reasonable adjustments for students with disability.

Under the Disability Standards for Education 2005, education providers must make reasonable adjustments for people with disability to the maximum extent that those adjustments do not cause that provider unjustifiable hardship. While 'reasonable adjustment' and 'unjustifiable hardship' are different concepts and involve different considerations, they both seek to strike a balance between the interests of education providers and the interests of students with and without disability.

An adjustment is any measure or action that a student requires because of their disability, and which has the effect of assisting the student to access and participate in education and training on the same basis as students without a disability. An adjustment is reasonable if it achieves this purpose while taking into account factors such as the nature of the student's disability, the views of the student, the potential effect of the adjustment on the student and others who might be affected, and the costs and benefits of making the adjustment.

An education provider is also entitled to maintain the academic integrity of a course or program and to consider the requirements or components that are inherent or essential to its nature when assessing whether an adjustment is reasonable. There may be more than one adjustment that is reasonable in a given set of circumstances; education providers are required to make adjustments that are reasonable and that do not cause them unjustifiable hardship.

The Training Package Guidelines provides more information on reasonable adjustment, including examples of adjustments. Go to http://www.deewr.gov.au/tpdh/Pages/home.aspx .

Further Sources of Information

The section provides a listing of useful contacts and resources to assist assessors in planning, designing, conducting and reviewing of assessments against this Training Package.

Contacts

Manufacturing Skills Australia
Level 8, 80 Arthur Street
North Sydney NSW 2060

PO Box 289
North Sydney NSW 2059

Ph: 02 9955 5500
Fx: 02 9955 8044
Web: www.mskills.com.ai

Technical and Vocational Education and Training (TVET) Australia Limited
Level 21, 390 St Kilda Road, Melbourne VIC 3150
PO Box 12211, A'Beckett Street Post Office, Melbourne, Victoria, 8006
Ph: +61 3 9832 8100
Fax: +61 3 9832 8198
Email: sales@tvetaustralia.com.au
Web: www.tvetaustralia.com.au

For information on the TAE10 Training and Education Training Package contact:

Innovation & Business Skills Australia

Telephone: (03) 9815 7000
Facsimile: (03) 9815 7001
Email: virtual@ibsa.org.au

Web: www.ibsa.org.au

General Resources

AQF Implementation Handbook, Fourth Edition 2007. Australian Qualifications Framework Advisory Board, 2002 <www.aqf.edu.au>

Australian Quality Training Framework (AQTF) and AQTF 2010 Users' Guide to the Essential Standards for Registration – http://www.training.com.au/pages/menuitem5cbe14d51b49dd34b225261017a62dbc.aspx

For general information and resources go to http://www.training.com.au/

The National Register is an electronic database providing comprehensive information about RTOs, Training Packages and accredited courses - <www.training.gov.au>

The Training Package Development Handbook site provides NSSC policy for the development of Training Packages. The site also provides guidance material for the application of that policy, and other useful information and links. http://www.deewr.gov.au/Skills/Overview/Policy/TPDH/Pages/main.aspx

Assessment Resources

RTOs are at the forefront of vocational education and training (VET) in Australia. They translate the needs of industry into relevant, quality, client-focussed training and assessment.

RTOs should strive for innovation in VET teaching and learning practices and develop highly flexible approaches to assessment which take cognisance of specific needs of learners, in order to improve delivery and outcomes of training.

Resources can be purchased or accessed from:

- TVET Australia – provides an integrated service to enable users of the national training system to identify and acquire training materials, identify copyright requirements and enter licenses for use of that material consistent with the scope and direction of the NQC.

  http://www.productservices.tvetaustralia.com.au/

- www.mskills.com.au
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Introduction to MEA11

Introduction to MEA11 Version 2

Summary of changes – units and qualifications

- One new unit covering employment in CAMOs to be added to Diploma and Advanced Diploma qualifications as an additional elective
- One new unit covering bolted repairs to composite aircraft skin to be added to a Certificate IV qualification as an additional elective
- Six new units covering the repair and overhaul of piston engines, subsuming content in an existing unit
- One revised qualification: MEA41213 Certificate IV in Aeroskills (Armament).

Industry priorities and expectations

Industry representatives and RTOs see the new units as meeting an existing need. It is expected the units will be accessed by industry and RTOs immediately following endorsement.

Impact of newly endorsed components

STAs, RTOs and industry stakeholders have been consulted during the development process and have been kept informed of the changes. The new units will be accessed by RTOs specialising in delivery of maintenance management and trade training in the mechanical and structures fields. MSA is not aware of any issues that need addressing to ensure successful implementation.

As the new units are packaged as electives in existing pathways in MEA11 Aeroskills Training Package, no changes to scope or registration will be required for RTOs.

The unit relating to CAMO employment will be delivered to individuals enrolled in Diploma and Advanced Diplomas of Aviation Maintenance Management where the individuals are to be employed within CAMOs in positions defined in CASR Part 42.

The unit relating to bolted repairs to composite skin will be delivered to individuals enrolled in Certificate IV in Aeroskills (Structures) where the competency is required in the workplace, and is also likely to be delivered post-graduate where the introduction of new aircraft types necessitates the competency.

The six units covering piston engine repair and overhaul may be taken by those enrolled in Certificate IV in Aeroskills (Mechanical) in the workshop stream where they are employed on piston engine repair and overhaul. The units may also be used by individuals from allied trades who are converting from automotive or stationary engines to aircraft.

RTOs delivering the current MEA41211 should be able to transfer to MEA41213 without having to extend scope. The number of units required has been reduced by one to 21, however, the overall workplace outcomes have not changed. The unit (MEA261B) remains available in other qualifications in MEA11.

Introduction to the MEA11 Aeroskills Training Package Version 1

The MEA11 Aeroskills Training Package replaces the MEA07v3 Aeroskills Training Package. Changes to the Training Package include:

- introduction of the MEA50511 Diploma of Aeroskills (Non-Destructive Testing) and the MEA60311 Advanced Diploma of Aviation Non-Destructive Testing
- introduction of units of competency required for compliance with regulations relating to aircraft welding
- introduction of a MEA30211 Certificate III in Aeroskills (Mechatronics) and a MEA41011 Certificate IV in Aeroskills (Mechatronics) to cover the maintenance of small aircraft and to provide a transitional pathway over the period to 2015 from the CASA CAR 31 licensing system to a competency-based system similar to that covered in CASR Part 66 for the large aircraft B1 and B2 licences
- inclusion of additional electives in the MEA40711 Certificate IV in Aeroskills (Mechanical) to increase flexibility in the component workshop stream
- revision of a number of Structures units and the introduction of a composites cold bonding unit in line with stakeholder input
- updating and standardisation of a number of existing units
- acronyms and definition of terms have been consolidated into the new Appendix 2 Glossary of terms used in units of competency.

The draft MEA11 Aeroskills Training Package has been processed through the standard Manufacturing Skills Australia (MSA) processes involving quality and equity reviews, review by State and Territory Training Authorities (STAs) and by the Aerospace Education and Training Reference Group.

Introduction to the industry

The Australian Aerospace Industry Aviation Maintenance Sector

The MEA11 Aeroskills Training Package covers the Aviation Maintenance Sector of the Australian Aerospace Industry. This sector covers maintenance performed on aircraft and their components in support of both civil and military aviation by a workforce of about 15,000 civilian and ADF personnel.

On the civil side, the workforce ranges from airlines employing large numbers of maintenance personnel to medium and small general aviation organisations that may employ as few as two or three individuals. In both the airline and general aviation areas there are third party maintenance organisations that support aircraft operators on a contractual basis. Again, these organisations vary in size from hundreds of maintenance personnel down to organisations with fewer than 10 personnel. Some maintenance organisations maintain both aircraft and their components while others maintain either complete aircraft or a range of aircraft components.

Military aviation consists of the three Services of the ADF where maintenance work is performed by uniformed personnel, plus a large network of contractors with civilian workforces that perform the deeper maintenance of most aircraft types and contractors also perform most component maintenance. The defence contractors are typically large aerospace organisations, or subsidiaries thereof. Many have a number of contracts and operate from a number of sites that may be geographically remote from one another.

Those involved in the maintenance of civil aircraft work under an extensive range of regulations that are aimed at ensuring a high level of flight safety and rely on licensed and specifically authorised individuals for the certification of maintenance. Those involved in the maintenance of State (military) aircraft and their components operate under a range of ADF regulations and standards that are also aimed at ensuring a high level of flight safety. Under the ADF system the certification of maintenance is based on task authorisation and levels of maintenance quality inspection. In both cases, the level of regulation relates to the old adage in aviation maintenance that ‘in the air you can’t get out and fix something that has gone wrong and seemingly minor maintenance errors can have catastrophic consequences’.

The importance of safe and efficient aviation services to the national economy cannot be overstated.

Aviation is of considerable importance in the use of often complex and very expensive equipment for the rapid transportation of people and cargo, in the provision of aerial work services to agriculture and in fire fighting. Military aviation is of considerable importance to national defence, and in the provision of services to the community at times of natural disaster.

Aviation maintenance is thus a key national industry sector. It is diverse, highly technical and uses advanced technologies. It operates in a multi-billion dollar capital equipment environment and high quality and maximum safety requirements and standards are critical.

Structure of the Aerospace Industry Competency Standards

Within this Training Package the units of competency are divided into two types:

- Common units – these indicate competencies that apply across the majority of MEA11 Aeroskills Training Package qualifications at one or more levels of qualification. These units may or may not be core units, depending on the individual packaging rules.

- Technical stream units – these are either core or elective units that relate to individual technical streams and related qualifications. Units may be core in one qualification and elective in another because of regulatory and licensing requirements.

The unit numbering system is as follows:

- Common unit numbers begin with ‘1’, e.g. MEA101B
- Avionics technical stream units begin with ‘2,’ e.g. MEA201B
- Mechanical technical stream units begin with ‘3’, e.g. MEA301B
- Structures technical stream units begin with ‘4’, e.g. MEA401C
- Aircraft Life Support and Furnishing units begin with ‘5’, e.g. MEA501A
- Armament units begin with ‘6’, e.g. MEA601A.
-

MEA11 Qualification Pathways

The Aeroskills Training Package Qualifications

The MEA11 Aeroskills Training Package Version 2 includes national qualifications at Certificate II, Certificate III, Certificate IV, Diploma and Advanced Diploma levels. The Training Package provides national qualification outcomes based on recognition of competency achievement as specified under the Competency Standards section of this Training Package. These qualifications can be accessed through traineeship and apprenticeship pathways, or through other pathways that do not involve a contract of training, such as recognition of prior learning.

Packaging units of competency for a qualification

Qualifications may be achieved in a number of ways, but regardless of how they are attained, they must be based on the achievement of a package of competency standards.

Each qualification is made up of core and elective units drawn from common, technical stream and imported units:

- the mandatory core of common, technical stream and imported units for each qualification ensure the integrity of the qualification and effective alignment with CASA and ADF regulatory requirements
- the ability to select from a range of elective units that may be packaged into alternate training pathways provides flexibility and, where applicable, a means of alignment with regulatory requirements in areas such as licensing sub-sets in the CASA system and task authorisation in the ADF system.

The units of competency to be achieved for each qualification have been determined in consultation with industry and the Regulators (CASA and the ADF). Any RTO issuing a qualification will need to comply with this framework. However, RTOs are encouraged to offer flexible learning delivery formats to suit industry needs (what is taught, how, when, where delivered etc).

People with experience in related industries, such as Manufacturing, Engineering, Automotive and Electrotechnology, may be able to achieve competence in component workshop units from the Aerospace Industry Competency Standards with limited levels of 'gap' training and experience. This process is facilitated through a common 'conversion' unit of competency (MEA145A) relating to specific component workshop employment areas.

Certificate II Aeroskills qualifications

The MEA11 Aeroskills Training Package includes the following qualifications at Certificate II level:

- MEA20411 Certificate II in Aeroskills
- MEA20511 Certificate II in Aircraft Line Maintenance
- MEA20611 Certificate II in Aircraft Surface Finishing.

MEA20411 Certificate II in Aeroskills

The MEA20411 Certificate II in Aeroskills articulates with, and provides credit towards, the Aeroskills Training Package 'trade' qualifications at AQF Certificate IV level with common units given full recognition at the higher level. The elective units may provide partial credit towards related higher level units as people progress from AQF level II to the higher qualification. The relationship between the AQF level II and AQF level IV elective units is as follows:

MEA20411 units of competency	Related AQF IV units of competency
MEA238B Perform routine removal and installation of miscellaneous aircraft electrical hardware/components	MEA201B Remove and install miscellaneous aircraft electrical hardware/components
MEA239B Fabricate aircraft electrical looms and harnesses	MEA246C Fabricate and/or repair aircraft electrical hardware or parts
MEA240B Use electrical test equipment to perform basic electrical tests	MEA260B Use electrical test equipment
MEA329B Dismantle, inspect, maintain and assemble aircraft basic hydraulic and pneumatic components or parts	MEA380A Repair and/or overhaul aircraft hydraulic system components MEA381A Repair and/or overhaul aircraft pneumatic system components MEA382A Repair and/or overhaul aircraft fuel system components
MEA330B Dismantle, inspect, maintain and assemble aircraft non-primary	MEA328C Maintain and/or repair aircraft

structural removable components or parts and internal fittings	mechanical components or parts
MEA331B Dismantle, inspect, maintain and assemble aircraft gas turbine engine components or parts	MEA383A Repair and/or overhaul gas turbine engine air inlet and compressor components and/or modules MEA384A Repair and/or overhaul gas turbine engine combustion section components and/or modules MEA385A Repair and/or overhaul gas turbine engine turbine and exhaust section components MEA386A Repair and/or overhaul gas turbine engine ancillary section components
MEA332B Dismantle, inspect, maintain and assemble aircraft mechanical components or parts	MEA328C Maintain and/or repair aircraft mechanical components or parts
MEA333B Dismantle, inspect, maintain and assemble aircraft piston engine components or parts	MEA388A Repair and/or overhaul piston engines
MEA406B Repair/modify aircraft non-primary structural sheetmetal components	MEA423A Repair/modify aircraft metal structure
MEA407B Repair/modify aircraft non-primary structural non-metallic components	MEA405B Repair/modify aircraft composite material structure/components

The MEA20411 Certificate II in Aeroskills has a set of packaging rules that provide multiple pathways in three technical areas of Avionics, Mechanical and Structures. This design promotes the achievement of a multi-skilled qualification that can directly lead to the three established aircraft ‘trade’ areas and provide the maximum credit transfer.

The qualification has been designed to allow maximum flexibility to enable enterprises to choose the most appropriate pathway/s for their needs. The technical focus and application of the qualification achieved by each learner can be easily determined through reference to the Log of Industrial Experience and Achievement.

To achieve a MEA20411 Certificate II in Aeroskills, both common and elective units must be completed. The technical units are presented in ways such that the qualification will have a dominant technical area (a primary area of Avionic, Mechanical or Structures) and a complementary supporting component (the ‘minor’ component).

The ‘major’ and ‘minor’ components of the qualification must be drawn from different technical areas.

Common units	+	**technical units (major component)**	+	**technical unit (minor component)**	=	**MEA20411 Certificate II in Aeroskills**

MEA20511 Certificate II in Aircraft Line Maintenance

This qualification was developed to meet CASA requirements for the grant of an Aircraft Maintenance Engineer A Licence (A1, A2, A3 or A4) in accordance with Civil Aviation Safety Regulation (CASR) Part 66, and with transitional arrangements under CAO 100.66, in accordance with which maintenance authorities equivalent to the A licences may be granted. The qualification requirements must be met also in accordance with the requirements of CAO 100.66 pending the issue of CASR Part 66, including full coverage of CASA syllabus requirements as listed in Appendix 1. Training delivery is also required to be in accordance with CASR Part 147.

Because of the need to comply with licensing requirements there is no flexibility in the selection of units, other than for the purpose of meeting the specified requirements for the grant of an A1, A2, A3 or A4 licence.

Advice to contact CASA for authoritative information on licensing requirements

This Aeroskills Training Package publication provides advisory information based on discussions with CASA, including their anticipated future requirements. All possible care has been taken in the preparation of this material however persons should not rely solely on this publication on matters involving CASA's current or proposed licensing requirements or arrangements.

Precise information on licensing, current and proposed compliance requirements can be obtained from CASA on telephone 131 757 or at www.casa.gov.au.

The MEA20511 Certificate II in Aircraft Line Maintenance articulates with, and provides credit towards, the Aeroskills Training Package ‘trade’ qualifications at AQF Certificate IV level, with common units given full recognition at the higher level. The elective units may be credited as follows:

MEA20511 elective units	Possible credit
MEA240B Use electrical test equipment to perform basic electrical tests	Partial towards MEA260B Use electrical test equipment
MEA264A Remove and install aircraft electrical/avionic components during line maintenance	Partial towards MEA202C Remove and install basic aircraft electrical system components and MEA203C Remove and install advanced aircraft

	electrical system components
MEA265A Remove and install general aircraft electrical hardware	Partial towards MEA201B Remove and install miscellaneous aircraft electrical hardware/components
MEA344A Remove and install aircraft components	Partial towards MEA302C Remove and install aircraft hydro mechanical and landing gear system components
MEA345A Perform scheduled line maintenance activities on gas turbine engine fixed wing aircraft	Full credit for MEA301C Perform aircraft flight servicing
MEA346A Perform scheduled line maintenance activities on gas turbine engine rotary wing aircraft	
MEA347A Perform scheduled line maintenance activities on piston engine fixed wing aircraft	
MEA348A Perform scheduled line maintenance activities on piston engine rotary wing aircraft	
MEA418A Perform basic repair of aircraft internal fittings during line maintenance	Partial towards MEA339C Inspect, repair and maintain aircraft structures

MEA20611 Certificate II in Aircraft Surface Finishing

This qualification was developed to meet industry and ADF requirements for qualifications and competencies to cover the surface finishing of aircraft and aircraft components. There is a limited degree of flexibility in the selection of units to cover a range of multi-skilling activities required by industry organisations.

The MEA20611 Certificate II in Aircraft Surface Finishing articulates with, and provides credit towards, the surface finishing qualifications at AQF Certificate III and IV levels. In addition, the core common units provide credit towards other MEA11 Aeroskills Training Package qualifications at AQF Certificate III, IV and Diploma levels, and the electives that provide multi-skilling would provide significant credit towards other MEA11 Aeroskills Training Package qualifications at AQF Certificate II level. The elective units may be credited as follows:

MEA20611 elective units	**Possible credit**
MEA330B Dismantle, inspect, maintain and	Full credit towards MEA20411 Certificate II in

assemble aircraft non-primary structural removable components or parts and internal fittings	Aeroskills
MEA406B Repair/modify aircraft non-primary structural sheetmetal components	Full credit towards MEA20411 Certificate II in Aeroskills
MEA407B Repair/modify aircraft non-primary structural non-metallic components	Full credit towards MEA20411 Certificate II in Aeroskills

Certificate III Aeroskills qualifications

There are three qualifications at Certificate III in the MEA11 Aeroskills Training Package Version 1. They are:

- MEA30111 Certificate III in Aircraft Surface Finishing
- MEA30211 Certificate III in Aeroskills (Mechatronics)
- MEA30311 Certificate III in Aircraft Life Support and Furnishing.

MEA30111 Certificate III in Aircraft Surface Finishing

A number of industry organisations and the ADF train and employ aircraft surface finishers. In some cases these individuals are trained from entry level and in other cases they are recruited and converted from automotive spray painting to aircraft surface finishing. The combination of competencies in surface finishing tasks and the level of multi-skilling required by the relevant organisations resulted in MEA30111 Certificate III in Aircraft Surface Finishing.

The MEA30111 Certificate III in Aircraft Surface Finishing articulates with, and provides credit towards, the surface finishing qualification at AQF Certificate IV level. In addition, the common units and unit MEA401C Inspect aircraft structures would provide significant credit towards other MEA11 Aeroskills Training Package qualifications at AQF Certificate IV level.

MEA30211 Certificate III in Aeroskills (Mechatronics)

The MEA30211 Certificate III in Aeroskills (Mechatronics) is introduced with MEA11 Aeroskills Training Package to cover maintenance of small aircraft within the General Aviation industry sector by non-licensed individuals. It may also be of use as a first Aeroskills qualification for individuals transitioning from an allied trade to employment on small aircraft maintenance. The core common, technical stream and imported units provide credit towards other Aeroskills qualifications at AQF Certificate IV and, in some cases, at Diploma level. There is a wide choice of elective technical stream units that are intended to meet the needs of the full range of General Aviation maintenance organisations and will also provide credits towards Aeroskills qualifications at AQF Certificate IV and, in some cases, Diploma levels. With an appropriate choice of electives this qualification fully articulates with MEA41011 Certificate IV in Aeroskills (Mechatronics).

MEA30311 Certificate III in Aircraft Life Support and Furnishing

The MEA30311 Certificate III in Aircraft Life Support and Furnishing is based on the PUA31706 Certificate III in Public Safety (Aviation Life Support Maintenance) which was to be deleted from that Training Package after MEA07 Version 2 was implemented. RTOs were expected to transfer within 12 months from release date of MEA07v2.

In developing the qualification for the MEA11 Aeroskills Training Package there was extensive consultation with the ADF (for whom PUA31706 was developed), and with the civil aviation maintenance industry which resulted in the coverage of aircraft furnishing maintenance being increased. The qualification now covers the maintenance of aircrew equipment (such as helmets, oxygen masks, Anti-G suits and immersion suits), parachutes, survival vests for aircrew and passengers, life rafts, aircraft internal fittings and soft furnishings. In the case of soft furnishings, both fabrication and maintenance is covered. Multi-skilling is also provided for in the inspection and repair of non-structural metallic and non-metallic components, and for limited maintenance of electrical and electronic systems and components in passenger seats and pods.

The MEA30311 Certificate III in Aircraft Life Support and Furnishing fully articulates towards the MEA41111 Certificate IV in Aircraft Life Support and Furnishing. It also includes a number of common units of competency that are common to other qualifications at AQF Certificate III and Certificate IV levels. The relationship between the units required for this qualification and those applicable to the PUA31706 Certificate III in Public Safety (Aviation Life Support Maintenance) is as follows:

MEA30311 units	**PUA31706 units**
MEA101B Interpret occupational health and safety practices in aviation maintenance	Same (alternative of BSBCMN211A Participate in workplace safety procedures provides partial coverage)
MEA103B Plan and organise aviation maintenance work activities	Same
MEA105C Apply quality standards	MEA105B Apply quality standards applicable to

applicable to aviation maintenance processes	aviation maintenance processes
MEA107B Interpret and use aviation maintenance industry manuals and specifications	Same
MEA108B Complete aviation maintenance industry documentation	Same
MEA109B Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	Same
MEA118A Conduct self in the aviation maintenance environment	Covered in part by each of PUADEFEQ001A Work with equity and diversity, PUACOM001B Communicate in the workplace, PUATEA001A Work in a team
MEA240B Use electrical test equipment to perform basic electrical tests	
MEA304C Remove and install non-pressurised aircraft structural and non-structural components	
MEA317C Remove and install pressurised aircraft structural and non-structural components	
MEA411A Remove surface coatings from aircraft or aircraft components	
MEA412A Pre-treat aluminium alloy surfaces	
MEA414A Remove light corrosion	
MEA416A Apply aircraft identification markings, graphics and decals	
MEA419A Inspect and repair/modify aircraft cabin/cockpit non-primary structure components	
MEA501A Maintain and fit anti-G suits	Equivalent to PUADEFLS001A
MEA502A Maintain and fit helmets	Equivalent to PUADEFLS002A
MEA503A Maintain and fit immersion suits	Equivalent to PUADEFLS003A

MEA504A Maintain and fit oxygen masks	Equivalent to PUADEFLS004A
MEA505A Maintain and pack parachutes	Equivalent to PUADEFLS005A
MEA506A Maintain and pack survival inflatable life rafts and escape slides	Equivalent to PUADEFLS006A
MEA507A Maintain, pack and fit survival inflatable buoyancy vests	Equivalent to PUADEFLS007A
MEA508A Maintain, install and remove restraint systems	Equivalent to PUADEFLS008A
MEA509A Manufacture, repair and alter aircraft related fabric components	Equivalent to PUADEFLS009A
MEA510A Maintain seat and pod electrical and electronic systems	
MEA511A Operate and maintain sewing machines and overlockers	Equivalent to LMTPRTF05CA
AURV231208A Carry out trimming of vehicle components	
AURV231268A Select and apply trim/fabric materials and determine attachment methods	Equivalent to AUR31268B Select and apply trim/fabric materials
AURV231368A Select and apply trim/fabric adhesives	Part covered by LMTPRTF09BA Use adhesives - 2
LMFSF2001B Cut single layer fabrics	Same
LMFSF2002B Machine sew materials	Same
LMFUP3012B Apply marine sewing and installation techniques	Same
LMTTF2008A Use adhesives	Equivalent to LMTPRTF09BA Use adhesives - 2
MEM12001B Use comparison and basic measuring devices	Same as MEM12.1B Use comparison and basic measuring devices
PUADEFEO101D Work safely with explosive ordnance	Same
PUADEFEO501D Conduct explosive ordnance inspection	Same

Certificate IV Aeroskills qualifications

The MEA11 Aeroskills Training Package includes seven Certificate IV qualifications:

- MEA40611 Certificate IV in Aeroskills (Avionics)
- MEA40711 Certificate IV in Aeroskills (Mechanical)
- MEA40911 Certificate IV in Aircraft Surface Finishing
- MEA41011 Certificate IV in Aeroskills (Mechatronics)
- MEA41111 Certificate IV in Aircraft Life Support and Furnishing
- MEA41213 Certificate IV in Aeroskills (Armament)
- MEA41311 Certificate IV in Aeroskills (Structures).

Certificate IV qualifications outcomes

The Certificate IV qualifications in Aeroskills contained in the MEA11 Aeroskills Training Package Version 1 specify competencies required for trade-level outcomes in maintenance, repair and overhaul for the aerospace engineering industry. They have been structured to produce a competent base-level aerospace engineering technician; the level expected on completion of an aerospace apprenticeship in Avionics, Mechanical, Mechatronics, Structures or Armament streams, or following training beyond trade-level in Aircraft Surface Finishing or in Aircraft Life Support and Furnishing. Traineeship pathways are also included, enabling the greatest possible access to careers in the aerospace industry.

Credit transfer and articulation

Details of credit transfer and articulation from AQF Certificate II and III levels to Certificate IV have already been provided. Where credit cannot be allocated on a whole unit basis, the relationship with Certificate IV level units will be clearly mapped and identified in separate documentation at a later date. In addition, from MEA11 Aeroskills Training Package Version 1 there is guidance information for assessment in units of competency where experience associated with another unit may be used also as evidence for the unit being assessed. This will assist learners, enterprises and RTOs in realising the greatest possible efficiencies in terms of learning and skills acquisition.

A separate mapping exercise to document the level of credit transfer available from, and to, competencies under other related industry Training Packages, such as MEM05 Metal and Engineering, UEE07 Electrotechnology and AUR05 Automotive Industry Retail, Service and Repair, towards the Aeroskills Certificate IV qualifications has resulted in the development of a common ‘conversion’ unit.

The Certificate IV qualifications articulate with, and provide credit towards, the qualifications at AQF Diploma and Advanced Diploma levels. This provides avenues towards meeting the full CASA requirements for the grant of B1 and B2 licences, and to prepare individuals to work in maintenance management and maintenance-related integrated logistic support (ILS) activities within both the ADF and CASA regulatory environments.

The MEA41211 Certificate IV in Aeroskills (Armament) is somewhat different since, at present, training is available only to trainees who have enlisted in the RAAF and ongoing career development involves, in part, the attainment of additional qualifications from the PUA00 Public Safety Training Package that cover weapons and explosive ordnance.

Certificate IV structure and packaging rules

Each Certificate IV qualification is comprised of core and elective units. Electives may be grouped according to industry and regulatory need.

The core consists of common units, mandatory technical stream units required for regulatory compliance and mandatory imported units.

Elective units consist of common, technical stream and imported units that may be grouped to meet defined industry or specific regulatory requirements as described in each qualification. Elective units provide the greatest possible degree of flexibility to the extent permitted by regulatory compliance.

Meeting CASA regulatory requirements

Revised CASA maintenance regulations applicable to the maintenance of large aircraft, such as those operated by the airlines, came into force in the middle of 2011. The applicable regulations are CASR Parts 42, 66, 145 and 147. Maintenance of small aircraft over the period 2011 to 2015 will continue to be covered by the existing CAR 30 and 31, with an extended Part 42 and the other regulations being applied to General Aviation after that time.

Units of competency and qualification pathways required to support compliance with these regulations have been introduced into the MEA11 Aeroskills Training Package, primarily at Diploma and Advanced Diploma levels with regard to large aircraft maintenance.

As stated, new regulations will not be applied to General Aviation until after 2015 and a revised system of licensing is still to be finalised. However, beyond 2015 the pathway to licence will be via the attainment of MEA11 Aeroskills Training Package units of competency and a qualification at Certificate IV level which is expected to be attained primarily through an apprenticeship. To have individuals able to be licensed through this approach from 2015/2016 onwards requires the introduction of a qualification in MEA11 Aeroskills Training Package Version 1. Accordingly, MEA41011 Certificate IV in Aeroskills (Mechatronics) is introduced to operate in tandem with the CASA Basic Examinations and Schedule of Experience (required by CAR 31) through to 2015. If necessary, qualification pathways will be revised once the final form of small aircraft maintenance certification licensing has been determined.

Diploma level Aeroskills qualifications

The MEA11 Aeroskills Training Package includes five Diploma level qualifications:

- MEA50111 Diploma of Aeroskills (Avionics)
- MEA50211 Diploma of Aeroskills (Mechanical)

- MEA50311 Diploma of Aviation Maintenance Management (Avionics)
- MEA50411 Diploma of Aviation Maintenance Management (Mechanical)
- MEA50511 Diploma of Aeroskills (Non-Destructive Testing).

The Diplomas of Aeroskills in the avionic and mechanical fields provide competency pathways which cover a combination of Certificate IV and 'beyond trade' Diploma-level competencies that together fully meet proposed CASA licensing requirements for the B1 (MEA50211 refers) and B2 (MEA50111 refers) licences that may be granted under CASR Part 66. Individuals who obtain one of these Diplomas under the training provisions of CASR Part 147 and having met the CASR Part 66 licensing syllabus requirements, as shown in Appendix 1, will have met the specified criteria for the grant of the applicable licence.

The two Diplomas of Aviation Maintenance Management provide para-professional qualifications that meet aviation maintenance industry needs for junior maintenance managers and for employment in maintenance-related ILS activities within either the ADF or CASA regulatory systems.

The MEA50511 Diploma of Aeroskills (Non-Destructive Testing) is a qualification that provides for full qualification at AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace Level 2.

Credit transfer and articulation

The Certificate IV qualifications in Aeroskills in Avionics and Mechanical (MEA40611 and MEA40711) articulate with or provide substantial credit towards the four Diploma level qualifications MEA50111 Diploma of Aeroskills (Avionics), MEA50211 Diploma of Aeroskills (Mechanical), MEA50311 Diploma of Aviation Maintenance Management (Avionics) and MEA50411 Diploma of Aviation Maintenance Management (Mechanical). The MEA41011 Certificate IV in Aeroskills (Mechatronics) also provides significant credit towards these Diplomas.

The MEA41311 Certificate IV in Aeroskills (Structures), MEA40911 Certificate IV in Aircraft Surface Finishing and MEA41111 Certificate IV in Aircraft Life Support and Furnishing qualifications do not articulate with the Diplomas, but individuals with one of those qualifications would be entitled to credit for a number of common units of competency.

All of the Certificate IV qualifications provide a limited number of credits towards the MEA50511 Diploma of Aeroskills (Non-Destructive Testing).

Qualification structure – flexibility

In the case of the Diplomas of Aeroskills in the Avionic and Mechanical fields, flexibility is limited by the requirement to precisely meet the specified licensing criteria of CASR Part 66.

However, in the case of the Diplomas of Aviation Maintenance Management there is considerable flexibility so that organisations and individuals can tailor the qualification to employment areas, such as:

- maintenance team leaders in either the ADF or CASA regulatory environment
- employment within CASR Part 42 continuing airworthiness management organisations

- specialist employment in maintenance-related ILS areas in the ADF regulatory environment.

Training and qualifications pathways including Apprenticeships

The Diploma qualifications can be accessed through apprenticeship pathways, through a traineeship or through later post-graduate study. In the case of the Diplomas of Aviation Maintenance Management the qualifications could be also be accessed through direct entry onto a course run by an RTO. These qualifications may also be achieved through a process of recognition of prior learning.

Details of indicative training pathways (or competency profiles) will be made available for use by enterprises, RTOs, NACs etc. as part of the non-endorsed Training Package information. These pathways cover different job types including options providing licensing preparation. However, it is stressed that they are intended for illustrative purposes and should not be viewed as limiting. A diagram showing the various pathways to all qualifications in the MEA11 Aeroskills Training Package may be found at the end of this section.

Structure and packaging rules

The Diplomas of Aeroskills in the avionic and mechanical fields provide competency pathways which include specified embedded ‘trade’ competency units meeting requirements for Certificate IV plus ‘beyond trade’ licensing requirements which combine to fully meet CASA requirements for issue of particular maintenance engineer licences as specified under CASR Part 66.

Each Diploma qualification (avionics or mechanical) is comprised of core units of competency (common to all licence streams) and specified elective stream units specific to a given licence. Both core and elective streams include both Certificate IV and additional ‘beyond trade’ obligatory units supporting achievement of the particular maintenance engineer licence sought.

The structure of each qualification can be represented in a generic form as follows:

Specified Certificate IV requirements	**+**	**Specified licensing requirements**	**=**	**Diploma of Aeroskills**

The two Diplomas of Aviation Maintenance Management consist of a number of common para-professional units that apply to both qualifications, plus some that are chosen according to the intended area of employment. In addition, there are a number of imported elective para-professional engineering units. Also provided are a number of preliminary units that must be attained where the individual is not articulating from MEA40611 Certificate IV in Aeroskills (Avionics) or MEA40711 Certificate IV in Aeroskills (Mechanical).

The structure of each qualification can be represented in a generic form as follows:

Preliminary units (if required)	+	Applicable common units	+	Elective engineering units	=	Diploma of Aviation Maintenance Management

The MEA50511 Diploma of Aeroskills (Non-Destructive Testing) is structured to provide qualification to *AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace* Level 2 in the following NDT methods:

- penetrant
- magnetic particle
- eddy current
- ultrasonic
- radiographic.

Units are also included to provide competency in compliance with regulatory requirements regarding the certification and reporting of test results.

Advanced Diploma level Aeroskills qualifications

The MEA11 Aeroskills Training Package includes three Advanced Diploma level qualifications:

- MEA60111 Advanced Diploma of Aviation Maintenance Management (Avionics)
- MEA60211 Advanced Diploma of Aviation Maintenance Management (Mechanical)
- MEA60311 Advanced Diploma of Aviation Non-Destructive Testing.

The qualifications in maintenance management provide competencies required to work at the higher para-professional and maintenance manager levels in civil aviation maintenance organisations operating under both the CASA and the ADF airworthiness regulatory systems, and within the ADF. Through selection of elective units within the framework of the packaging rules for each qualification individuals and organisations can adapt the qualifications for employment as managers within aviation maintenance organisations, or as managers within engineering support organisations dealing with aspects of ILS and within continuing airworthiness management organisations.

The qualification in NDT enables individuals to meet the requirements for *AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace* Level 3.

Credit transfer and articulation

There are articulation pathways to the MEA60111 Advanced Diploma of Aviation Maintenance Management (Avionics) from the following three qualifications:

- MEA50111 Diploma of Aeroskills (Avionics)
- MEA50311 Diploma of Aviation Maintenance Management (Avionics)
- MEA40611 Certificate IV in Aeroskills (Avionics).

Similarly, there are articulation pathways to MEA60211 Advanced Diploma of Aviation Maintenance Management (Mechanical) from:

- MEA50211 Diploma of Aeroskills (Mechanical)
- MEA50411 Diploma of Aviation Maintenance Management (Mechanical)
- MEA40711 Certificate IV in Aeroskills (Mechanical).

In the case of MEA60311 Advanced Diploma of Aviation Non-Destructive Testing there is an articulation pathway from the MEA50511 Diploma of Aeroskills (Non-Destructive Testing).

Qualification structure – flexibility

Through appropriate selection of elective units the two Advanced Diplomas of Aviation Maintenance Management can be adapted to prepare individuals for employment in maintenance organisation positions, such as Accountable Manager, Senior Maintenance Manager, Maintenance Manager and designated management positions in continuing airworthiness management organisations, or as managers of a range of activities in engineering support organisations, such as spares assessing management, repairable item management and aviation maintenance publication management.

In the case of the MEA60311 Advanced Diploma of Aviation Non-Destructive Testing flexibility is limited by the need to align with the required qualifications and employment areas specified in *AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace* for Level 3 personnel.

Training and qualification pathways

The Advanced Diploma qualifications in Maintenance Management can be accessed through training provided by an RTO that articulates from either Diploma of Aviation Maintenance Management, either Diploma of Aeroskills or from an applicable Certificate IV in Aeroskills. A direct entry pathway is not available because of regulatory requirements associated with the areas of employment relevant to the qualifications. The qualifications may also be attained either wholly or in part through a process of recognition of prior learning.

The MEA60311 Advanced Diploma of Aviation Non-Destructive Testing must be accessed through a training pathway that complies with *AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace* for authorisation at Level 3.

Structure and packaging rules

The two Advanced Diplomas of Aviation Maintenance Management consist of a number of common para-professional units that apply to both qualifications, plus some that are chosen according to the intended area of employment. In addition, there are a number of imported elective para-professional engineering units that are in either aeronautical or avionic specialist streams.

The MEA60311 Advanced Diploma of Aviation Non-Destructive Testing consists of common units relating to aircraft maintenance, units required to attain competence in all NDT methods covered by *AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace* plus units required to provide competency in training development, delivery and assessment. There is also a limited range of electives that relate to the regulatory environment in which the individual is employed.

MEA11 Qualifications

List of all qualifications in MEA11

Qualification code	Title
MEA20411	Certificate II in Aeroskills
MEA20511	Certificate II in Aircraft Line Maintenance
MEA20611	Certificate II in Aircraft Surface Finishing
MEA30111	Certificate III in Aircraft Surface Finishing
MEA30211	Certificate III in Aeroskills (Mechatronics)
MEA30311	Certificate III in Aircraft Life Support and Furnishing
MEA40611	Certificate IV in Aeroskills (Avionics)
MEA40711	Certificate IV in Aeroskills (Mechanical)
MEA40911	Certificate IV in Aircraft Surface Finishing
MEA41011	Certificate IV in Aeroskills (Mechatronics)
MEA41111	Certificate IV in Aircraft Life Support and Furnishing
MEA41213	Certificate IV in Aeroskills (Armament)
MEA41311	Certificate IV in Aeroskills (Structures)
MEA50111	Diploma of Aeroskills (Avionics)

Qualification code	Title
MEA50211	Diploma of Aeroskills (Mechanical)
MEA50311	Diploma of Aviation Maintenance Management (Avionics)
MEA50411	Diploma of Aviation Maintenance Management (Mechanical)
MEA50511	Diploma of Aeroskills (Non-Destructive Testing)
MEA60111	Advanced Diploma of Aviation Maintenance Management (Avionics)
MEA60211	Advanced Diploma of Aviation Maintenance Management (Mechanical)
MEA60311	Advanced Diploma of Aviation Non-Destructive Testing

MEA11 Skill Sets Information

The MEA11v2 Skill Sets are in eight groups that relate to their purpose, as follows:

- Group 1 contains Skill Sets applicable to individuals with relevant allied trade Certificate III or Certificate IV qualifications that provide competencies required for employment in aviation component maintenance workshops operating under either the CASA or the ADF regulatory systems.
- Group 2 contains Skill Sets that specify CASA requirements for the removal of exclusions from B1 and B2 aircraft maintenance engineer licences and for the grant of A licences to holders of a B2 licence or a Certificvate IV in Aeroskills (Mechanical).
- Group 3 contains Skill Sets that specify CASA requirements for the grant of maintenance authorisations to individuals working in CASR Part 145 maintenance organisations.
- Group 4 contains Skill Sets for Aircraft welding authorisations.
- Group 5 contains Skill Sets for NDT authorisations.
- Group 6 contains Skill Sets for aircraft component electroplating authorisations.
- Group 7 contains Skill Sets for aircraft machining authorisations.
- Group 8 contains Skill Sets for Aircraft tyre retreading authorisations.

Group 1 – Skill Sets for Employment in Aviation Maintenance Workshops

The Skill Sets in this group have been developed as a means of qualifying individuals from allied trades to work in specific areas of aircraft component repair and overhaul. They could also be used to qualify individuals with Aeroskills AME qualifications to work on component repair and overhaul. Allied trades are as follows:

- Allied trades related to avionic and electrical component work are electro-technology, telecommunications and automotive. A metals and engineering background may also qualify where competencies held and work experience is in the electrical and/or electronic fields.
- Allied trades related to mechanical component work are automotive and metals and engineering where competencies held and work experience is in mechanical maintenance fields.

Many of the units of competency listed in the Skill Sets have the following common core Aeroskills units as prerequisites:

- MEA101B Interpret occupational health and safety practices in aviation maintenance
- MEA103B Plan and organise aviation maintenance work activity
- MEA105C Apply quality standards applicable to aviation maintenance processes
- MEA107B Interpret and use aviation maintenance industry manuals and specifications
- MEA109B Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance.

Much of the general content in these units is also covered by units that will be held by individuals in allied trades. To facilitate the movement of such individuals to aviation component workshop employment the parts of these units that are peculiar to Aeroskills have been identified and have been included in MEA145A Conversion from allied trades for employment in aviation maintenance workshops which is listed in each Skill Set. Through attainment of MEA145A individuals may be deemed to be competent in each of the listed common core units.

Avionics

- Electrical component repair/overhaul
- Mechanical and electro-mechanical instrument component repair/overhaul
- Aircraft display, control and distribution system component repair/overhaul
- Oxygen system component repair/overhaul
- Aircraft radio frequency communication and navigation system component repair/overhaul
- Aircraft pulse system component repair/overhaul
- Aircraft audio and visual system and reproducer repair/overhaul

Mechanical

- Hydraulic system component repair/overhaul
- Electro-hydraulic component repair/overhaul
- Pneumatic system component repair/overhaul
- Electro-pneumatic component repair/overhaul
- Fuel system component repair/overhaul
- Gas turbine engine air inlet and compressor module/component repair/overhaul
- Gas turbine engine combustion section module/component repair/overhaul
- Gas turbine engine turbine and exhaust module/component repair/overhaul

- Gas turbine engine ancillary section module/component repair/overhaul
- Piston engine repair/overhaul
- Propeller repair/overhaul
- Rotary wing dynamic component repair/overhaul
- Mechanical system component repair/overhaul
- Composite structure maintenance

Group 2 - Skill Sets for Removal of B1 and B2 Licence Exclusions

In the process of transitioning from the CAR 31 aircraft maintenance engineer licensing system to the new CASR Part 66 system many existing CAR 31 licence holders will be granted a B1 or B2 licence with a range of exclusions.

To provide a mechanism for the removal of these exclusions, the Skill Sets in this group have been developed in consultation with CASA. For the purpose of exclusion removal, they must be delivered by RTOs that also hold Maintenance Training Organisation status under CASR Part 147.

CASA has also issued Airworthiness Advisory Circular AAC 9-66 in which it has been specified that CASA regards the grant of a B1 or B2 licence as signifying that all competencies relating to the specific licence privileges granted are held by the individual.

Under these provisions, all holders of a B1 licence may be deemed to hold the following units of competency:

- MEA101B Interpret occupational health and safety practices in aviation maintenance
- MEA103B Plan and organise aviation maintenance work activity
- MEA105C Apply quality standards applicable to aviation maintenance processes
- MEA107B Interpret and use aviation maintenance industry manuals and specifications
- MEA108B Complete aviation maintenance industry documentation
- MEA109B Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
- MEA301B Perform aircraft flight servicing.

All holders of a B2 licence may be deemed to hold the following units of competency:

- MEA101B Interpret occupational health and safety practices in aviation maintenance
- MEA103B Plan and organise aviation maintenance work activity
- MEA105C Apply quality standards applicable to aviation maintenance processes
- MEA107B Interpret and use aviation maintenance industry manuals and specifications
- MEA108B Complete aviation maintenance industry documentation
- MEA109B Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
- MEA201B Remove and install miscellaneous aircraft electrical hardware/components
- MEA246C Fabricate and/or repair aircraft electrical hardware or parts
- MEA260B Use electrical test equipment.

For this reason, the above units are not listed against the Skill Sets where they are specified as prerequisites for listed units.

Where any RPL action is required with regard to any of the units of competency listed in the Skill Sets in this group, RTOs are encouraged to undertake an efficient RPL assessment (in line with CASA guidance in AAC9-66) to determine required gap training (if any) in order to provide an integrated learning program for the units in the applicable Skill Set.

- Electrical – B1.1 Licence Exclusions E1 and E4 Removal
- Electrical – B1.1 Licence Exclusions E1 and E4 Removal (when competencies are being gained on basic light aircraft with gas turbine engine)
- Electrical – B1.2, B1.3 or B1.4 Licence Exclusions E1 and E4 Removal
- Electrical – B1.2 or B1.4 Licence Exclusions E1 and E4 Removal (when competencies are being gained on basic light aircraft or helicopters)
- Electrical – B2 Licence Exclusions E1 and E4 Removal
- Electrical – B2 Licence Exclusions E1 and E4 Removal (when competencies are being gained on basic light aircraft or helicopters)
- Airframe – B1.1 Licence Exclusion E2 Removal
- Airframe – B1.1 Licence Exclusion E2 Removal (when competencies are being gained on basic light aircraft with gas turbine engine)
- Airframe – B1.2 Licence Exclusion E2 Removal
- Airframe – B1.2 Licence Exclusion E2 Removal (when competencies are being gained on basic light aircraft)
- Airframe – B1.3 and B1.4 Licence Exclusion E2 Removal
- Airframe – B1.4 Licence Exclusion E2 Removal (when competencies are being gained on basic helicopters)
- Power Plant – B1.1 Licence Exclusion E3 Removal
- Power Plant – B1.2 Licence Exclusion E3 Removal
- Power Plant – B1.2 Licence Exclusion E3 Removal (when competencies are being gained on basic light aircraft)
- Power Plant – B1.3 Licence Exclusion E3 Removal
- Power Plant – B1.4 Licence Exclusion E3 Removal
- Power Plant – B1.4 Licence Exclusion E3 Removal (when competencies are being gained on basic helicopters)
- Instrument – B1 Licence Exclusions E5 and E7 Removal
- Instrument – B1.2 and B1.4 Licence Exclusions E5 and E7 Removal (when competencies are being gained on basic light aircraft or helicopters)
- Instrument – B2 Licence Exclusions E5 and E7 Removal
- Instrument and Radio – B1 Licence Exclusion E6 Removal
- Instrument and Radio – B1.2 and B1.4 Licence Exclusion E6 Removal (when competencies are being gained on basic light aircraft or helicopters)
- Instrument and Radio – B2 Licence Exclusion E6 Removal

- Instrument and Radio – B2 Licence Exclusion E6 Removal (non-type rated aircraft and helicopters only)
- Radio – B1 Licence Exclusion E8 Removal
- Radio – B1.2 and B1.4 Licence Exclusion E8 Removal (when competencies are being gained on basic light aircraft or helicopters)
- Radio – B2 Licence Exclusion E8 Removal
- Radio – B2 Licence Exclusion E8 Removal (when competencies are being gained on non-type rated aircraft and helicopters)
- Airframe – B1 Licence Exclusion E9 and E43 Removal
- Airframe – B1 Licence Exclusion E10 Removal
- Radio – B2 Licence Exclusion E11 Removal
- Airframe/Engine – B1.1 and B1.2 Licence Exclusion E12 Removal
- Airframe – B1 Licence Exclusion E13 Removal
- Airframe – B1 Licence Exclusion E14 Removal
- Airframe – B1.1 and B1.3 Licence Exclusion E15 Removal
- Airframe – B1.1 Licence Exclusion E15 Removal
- Airframe – B1.1 Licence Exclusion E16 Removal
- Airframe – B1.2 Licence Exclusion E16 Removal
- Radio – B2 Licence Exclusion E18 Removal
- Radio – B2 Licence Exclusion E19 Removal
- Radio – B2 Licence Exclusion E20 Removal
- Radio – B2 Licence Exclusion E21 Removal
- Radio – B2 Licence Exclusion E22 Removal
- Radio – B2 Licence Exclusion E23 Removal
- Radio – B2 Licence Exclusion E24 Removal
- Radio – B2 Licence Exclusion E25 Removal
- Radio – B2 Licence Exclusion E26 Removal
- Instrument – B2 Licence Exclusion E27 Removal
- Instrument – B2 Licence Exclusion E28 Removal
- Instrument – B2 Licence Exclusion E29 Removal
- Instrument – B2 Licence Exclusion E30 Removal
- Instrument – B2 Licence Exclusion E31 Removal
- Electrical – B2 Licence Exclusion E32 Removal
- Engine – B1.2 or B1.4 Licence Exclusions E33 and E38 Removal
- Electrical/Instrument/Radio – B2 Licence Exclusion E34 Removal
- Airframe – B1.1 or B1.2 Licence Exclusion E35 Removal
- Engine – B1.2 or B1.4 Licence Exclusions E36 and E37 Removal
- Engine – B1.2 or B1.4 Licence Exclusions E36 and E37 Removal (when competencies are being gained on basic light aircraft or helicopters)
- Airframe – B1.1 or B1.3 Licence Exclusions E39 Removal
- Airframe – B1.2 or B1.4 Licence Exclusion E39 Removal (when competencies are being gained on basic light aircraft or helicopters)
- Airframe – B1 Licences Exclusions E40 Removal

- Airframe - B1 Licences Exclusions E41 Removal
- Airframe – B1 Licences Exclusions E42 Removal
- Electrical – B1 Licences Exclusion E44 Removal

Group 3 – Skill Sets for Individual Maintenance Authorisations

- Aircraft egress system maintenance
- In-flight entertainment system maintenance
- Borescope inspection approval
- Aircraft composite structure repair/modification using hot and cold bonding
- Aircraft composite structure repair/modification using cold bonding only

Group 4 - Skill Sets for Aircraft Welding Authorisations

There is a Skill Set for each of the relevant aircraft welding processes in each parent metal group. An individual can meet Regulatory requirements for approvals by meeting the requirements and being given a Statement of Attainment for the specific Skill Set that covers the welding method and the relevant parent metal group.

The Skill Sets provide for the required welding skills to be delivered through the applicable MEM code welding units (except for plasma arc welding where it has been necessary to base the skill development on the MEM Gas Tungsten Arc Welding code welding unit). The listed MEA welding units cover the test pieces that must be completed and tested for aircraft welding approval. Also included in the Skill Sets are common MEA units that relate to aircraft OHS, publications, documentation, work practices and quality processes.

- Aircraft welding using the gas welding process – aluminium alloys
- Aircraft welding using the gas welding process – magnesium alloys
- Aircraft welding using the gas welding process – carbon and low alloy steels
- Aircraft welding using the gas welding process – corrosion and heat resisting steels
- Aircraft welding using the gas welding process – nickel alloys
- Aircraft welding using the gas welding process – copper based alloys
- Aircraft welding using the gas welding process – titanium alloys
- Aircraft welding using the braze welding process - aluminium alloys
- Aircraft welding using the braze welding process - magnesium alloys
- Aircraft welding using the braze welding process - carbon and low alloy steels
- Aircraft welding using the braze welding process - corrosion and heat resisting steels
- Aircraft welding using the braze welding process - nickel alloys
- Aircraft welding using the braze welding process - copper based alloys
- Aircraft welding using the braze welding process - titanium alloys
- Aircraft welding using the gas metal arc welding process - aluminium alloys
- Aircraft welding using the gas metal arc welding process - magnesium alloys
- Aircraft welding using the gas metal arc welding process - carbon and low alloy steels

- Aircraft welding using the gas metal arc welding process - corrosion and heat resisting steels
- Aircraft welding using the gas metal arc welding process - nickel alloys
- Aircraft welding using the gas metal arc welding process - copper based alloys
- Aircraft welding using the gas metal arc welding process - titanium alloys
- Aircraft welding using the gas tungsten arc welding process - aluminium alloys
- Aircraft welding using the gas tungsten arc welding process - magnesium alloys
- Aircraft welding using the gas tungsten arc welding process - carbon and low alloy steels
- Aircraft welding using the gas tungsten arc welding process - corrosion and heat resisting steels
- Aircraft welding using the gas tungsten arc welding process - nickel alloys
- Aircraft welding using the plasma arc welding process - aluminium alloys
- Aircraft welding using the plasma arc welding process - magnesium alloys
- Aircraft welding using the plasma arc welding process - carbon and low alloy steels
- Aircraft welding using the plasma arc welding process - corrosion and heat resisting steels
- Aircraft welding using the plasma arc welding process - nickel alloys
- Aircraft welding using the plasma arc welding process - copper based alloys
- Aircraft welding using the plasma arc welding process - titanium alloys
- Aircraft welding using the manual metal arc welding process - aluminium alloys
- Aircraft welding using the manual metal arc welding process - magnesium alloys
- Aircraft welding using the manual metal arc welding process - carbon and low alloy steels
- Aircraft welding using the manual metal arc welding process - corrosion and heat resisting steels
- Aircraft welding using the manual metal arc welding process - nickel alloys
- Aircraft welding using the manual metal arc welding process - copper based alloys
- Aircraft welding using the manual metal arc welding process - titanium alloys

Group 5 - Skill Sets for NDT Authorisations

There is a Skill Set for each of the relevant NDT methods at AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace Level 2 and at a basic level. An individual can meet Regulatory requirements for approvals by meeting the requirements and being given a statement of attainment for the specific Skill Set that covers the relevant NDT method.

- Liquid penetrant inspection approval for aerospace
- Magnetic particle inspection approval for aerospace
- Eddy current inspection approval for aerospace
- Ultrasonic inspection approval for aerospace
- Radiographic inspection approval for aerospace
- Basic visual liquid dye penetrant inspection approval for aerospace
- Basic magnetic particle inspection approval for aerospace
- Basic eddy current inspection approval for aerospace

- Ultrasonic thickness testing inspection approval for aerospace
- Basic radiographic inspection approval for aerospace

Group 6 - Skill Sets for Aircraft Component Electroplating Authorisations

An individual can meet Regulatory requirements for approvals by meeting the requirements and being given a statement of attainment for the specific Skill Set that covers the applicable electroplating, anodising or metal spraying operation.

- Electroplate aeronautical product component parts
- Produce anodised film on aluminium alloy components
- Metal spray aeronautical product component parts

Group 7 - Skill Sets for Aircraft Machining Authorisations

An individual can meet Regulatory requirements for approvals by meeting the requirements and being given a statement of attainment for the specific Skill Set that covers the applicable machining operation.

- Machine aeronautical product component parts (general)
- Grind aeronautical product component parts
- Precision jig boring of aeronautical product component parts
- Complex milling of aeronautical product component parts
- Machine aeronautical product component parts using horizontal and/or vertical boring machines
- Machine aeronautical product component parts using NC/CNC machines
- Machine aeronautical product component parts using NC/CNC machining centres
- Machine plastic aeronautical product component parts
- Aeronautical product component parts – metal spinning lathe operations

Group 8 - Skill Sets for Aircraft Tyre Retreading Authorisations

An individual can meet Regulatory requirements for approvals by meeting the requirements and being given a statement of attainment for the specific Skill Set that covers the applicable aircraft tyre retreading operation.

- Aircraft tyre retreading (basic)
- Aircraft tyre retreading (advanced)
-

MEA11 Employability Skills

Industry Requirements for Employability Skills

Aviation maintenance involves dealing with a wide range of technology in a highly regulated environment and consistently working to high standards in order to ensure flight safety. There is therefore a particular emphasis on all areas of employability skills. For example, communication skills are vital to being able to operate in a highly regulated environment with extensive work involving recording and reporting, environments and problem solving across a range of technologies is vital. Also, with ongoing mandatory training associated with many types of aircraft a high level of personal commitment to learning is essential.

Examples from this Training Package of Employability Skills embedded within unit components

Unit component	Example of embedded Employability Skill
Unit Title	Test and troubleshoot aircraft electrical systems and components (*problem solving and technology*)
Unit Descriptor	It covers the competencies required to correctly interpret and apply CASA airworthiness and certification requirements during aircraft maintenance (*communication*)
Element	Identify task requirements (*planning and organising*)
Performance Criteria	Work individually or as a team member to complete maintenance tasks in a timely manner and in accordance with enterprise procedures and requirements (*communication, teamwork, initiative and enterprise and self-management*)
Range Statement	Troubleshooting involves the use of fault finding charts or similar, to line replacement level (*communication and problem solving*)
Required Skills and Knowledge	Applying logic processes, taking and interpreting electrical measurements, using test equipment and appropriate wiring diagrams and manuals to isolate electrical system malfunctions of the above components and systems (*problem solving, communication and technology*)
Evidence Guide	A person who demonstrates competency in this unit must be able to demonstrate initiative, effectively manage their own workload and contribute to the ongoing development of their skills, knowledge and competencies in the applicable field of aviation maintenance (*initiative and enterprise, self-management and learning*)

MEA11 Units of competency

List of all units within MEA11

Unit code	Unit title
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
MEA111C	Perform administrative processes to prepare for certification of civil aircraft maintenance
MEA112B	Plan and implement civil aircraft maintenance activities
MEA113C	Supervise civil aircraft maintenance activities and manage human resources in the workplace
MEA114A	Certify aeronautical product maintenance
MEA115A	Plan and implement aeronautical product maintenance activities
MEA116B	Apply occupational health and safety procedures at supervisor level in aviation maintenance
MEA117A	Apply self in the aviation maintenance environment
MEA118A	Conduct self in the aviation maintenance environment
MEA119A	Perform administrative processes to prepare for certification of civil aircraft A level line maintenance
MEA120B	Manage an aviation maintenance quality system
MEA121B	Manage aircraft/aeronautical product configuration
MEA122B	Manage aircraft/equipment system performance testing

Unit code	Unit title
MEA123B	Manage aviation maintenance work environment policy and practices
MEA124B	Coordinate change programs in the aviation maintenance environment
MEA125B	Develop aviation maintenance personnel
MEA126B	Manage aircraft maintenance activities
MEA127B	Provide technical advice in the maintenance and management of aircraft and aeronautical product
MEA128B	Provide engineering advice in the modification, maintenance and management of aircraft systems
MEA129A	Investigate technical aspects of aviation occurrences
MEA130A	Manage deployed/detached aviation maintenance activities
MEA131B	Manage the custody, transfer and disposal of aircraft, aeronautical product and support equipment
MEA132A	Manage budgetary resources in the aviation maintenance environment
MEA133B	Communicate aviation technical and maintenance management knowledge
MEA134B	Establish, maintain and evaluate the organisation’s occupational health and safety system
MEA135A	Use computers in aviation maintenance-related integrated logistic support activities
MEA136A	Assess aviation maintenance spares and manage repairable items
MEA137A	Write aviation technical publications
MEA138B	Perform aviation technical publication management activities
MEA139A	Perform aviation maintenance – related integrated logistic support management activities
MEA140A	Supervise aviation maintenance teams and perform maintenance quality inspections
MEA141B	Manage risk in aviation maintenance
MEA142B	Manage self in the aviation maintenance environment

Unit code	Unit title
MEA143B	Develop and manage maintenance error management programs
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
MEA146A	Prepare and manage aviation maintenance organisation budgets and financial plans
MEA147A	Perform airworthiness management and maintenance program tasks
MEA201B	Remove and install miscellaneous aircraft electrical hardware/components
MEA202C	Remove and install basic aircraft electrical system components
MEA203C	Remove and install advanced aircraft electrical system components
MEA204C	Remove and install basic aircraft instrument system components
MEA205C	Remove and install advanced aircraft instrument system components
MEA206C	Remove and install aircraft basic radio communication and navigation system components
MEA207C	Remove and install aircraft electronic system components
MEA208C	Remove and install aircraft pressurisation control system components
MEA209C	Remove and install aircraft oxygen system components
MEA210C	Inspect, test and troubleshoot basic aircraft electrical systems and components
MEA211C	Inspect, test and troubleshoot advanced aircraft electrical systems and components
MEA212C	Inspect, test and troubleshoot basic aircraft instrument systems and components
MEA213C	Inspect, test and troubleshoot advanced aircraft instrument systems
MEA214C	Inspect, test and troubleshoot aircraft basic communication and radio navigation systems and components
MEA215C	Inspect, test and troubleshoot advanced aircraft communications systems and components
MEA216C	Inspect, test and troubleshoot instrument landing systems and components
MEA217C	Inspect, test and troubleshoot fixed wing autopilot systems and components

Unit code	Unit title
MEA218C	Inspect, test and troubleshoot rotary wing autopilot systems and components
MEA219C	Inspect, test and troubleshoot aircraft pressurisation control systems and components
MEA220C	Inspect, test and troubleshoot aircraft primary radar systems and components
MEA221C	Inspect, test and troubleshoot aircraft secondary radar systems and components
MEA222C	Inspect, test and troubleshoot aircraft oxygen systems and components
MEA223D	Inspect aircraft electrical systems and components
MEA224C	Inspect aircraft instrument systems and components
MEA225C	Inspect fixed wing aircraft automatic flight control systems and components
MEA226D	Inspect aircraft electronic systems and components
MEA227D	Test and troubleshoot aircraft electrical systems and components
MEA228D	Test and troubleshoot aircraft instrument systems and components
MEA229D	Test and troubleshoot aircraft radio frequency navigation and communications systems and components
MEA230C	Test and troubleshoot fixed wing aircraft automatic flight control systems and components
MEA231C	Inspect, test and troubleshoot rotary wing aircraft automatic flight control systems and components
MEA232C	Test and troubleshoot aircraft pulse systems and components
MEA233C	Inspect, test and troubleshoot aircraft inertial navigation and reference systems and components
MEA234C	Inspect, test and troubleshoot aircraft global navigation systems and components
MEA235B	Perform advanced troubleshooting in aircraft avionic maintenance
MEA238B	Perform routine removal and installation of miscellaneous aircraft electrical hardware/components
MEA239B	Fabricate aircraft electrical looms and harnesses
MEA240B	Use electrical test equipment to perform basic electrical tests

Unit code	Unit title
MEA241C	Perform aircraft weight and balance calculations as a result of modifications
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts
MEA252B	Test, align and troubleshoot aircraft synchro and servo system components
MEA260B	Use electrical test equipment
MEA261C	Use electronic test equipment
MEA262B	Modify/repair aircraft component single layer printed circuit boards
MEA263B	Modify/repair aircraft component multi-layer printed circuit boards
MEA264A	Remove and install aircraft electrical/avionic components during line maintenance
MEA265A	Remove and install general aircraft electrical hardware
MEA270A	Lay out avionic systems
MEA271A	Lay out avionic flight management systems
MEA272B	Apply basic scientific principles and techniques in avionic engineering situations
MEA273A	Select and test avionic engineering materials
MEA274A	Maintain basic light aircraft electrical systems and components
MEA275A	Maintain basic light aircraft instrument systems and components
MEA276A	Maintain basic aircraft communication and radio navigation systems and components
MEA277A	Maintain twin engine aircraft electrical systems and components
MEA278A	Inspect, test and troubleshoot instrument display systems and components
MEA279A	Inspect, test and troubleshoot full authority digital engine control systems
MEA280A	Inspect, test and troubleshoot flight management systems and components
MEA281A	Maintain light aircraft AC powered instrument systems and components
MEA282A	Repair or overhaul aircraft pulse system components
MEA283A	Repair or overhaul aircraft display, control and distribution system components

Unit code	Unit title
MEA284A	Repair or overhaul aircraft instrument system components
MEA285A	Repair or overhaul aircraft radio frequency communication and navigation system components
MEA286A	Repair or overhaul aircraft electrical/electro-mechanical components
MEA287A	Repair or overhaul aircraft oxygen system components
MEA288A	Repair or overhaul aircraft audio and visual systems and reproducers
MEA289A	Maintain basic light aircraft avionic systems and components
MEA290A	Fit avionic modification sheetmetal components
MEA291A	Inspect, test and troubleshoot fixed wing single axis autopilot systems and components
MEA301C	Perform aircraft flight servicing
MEA302C	Remove and install aircraft hydro-mechanical and landing gear system components
MEA303D	Remove and install aircraft pneumatic system components
MEA304C	Remove and install non-pressurised aircraft structural and non-structural components
MEA305C	Remove and install aircraft fixed wing flight control system components
MEA306C	Remove and install engines and engine system components
MEA307C	Remove and install propeller systems and components
MEA308C	Remove and install rotary wing rotor and flight control system components
MEA309C	Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components
MEA310C	Inspect, test and troubleshoot aircraft pneumatic systems and components
MEA311D	Inspect and repair/modify aircraft structures
MEA312C	Inspect, test and troubleshoot aircraft fixed wing flight control systems and components
MEA313C	Inspect, test and troubleshoot piston engine systems and components

Unit code	Unit title
MEA314C	Inspect, test and troubleshoot gas turbine engine systems and components
MEA315C	Inspect, test and troubleshoot propeller systems and components
MEA316C	Inspect, test and troubleshoot rotary wing rotor and control systems and components
MEA317C	Remove and install pressurised aircraft structural and non-structural components
MEA318C	Inspect aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components
MEA319C	Inspect gas turbine engine systems and components
MEA320C	Test and troubleshoot aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components
MEA321C	Test and troubleshoot aircraft fixed wing flight control systems and components
MEA322C	Test and troubleshoot gas turbine engine systems and components
MEA323B	Perform advanced troubleshooting in aircraft mechanical maintenance
MEA325B	Weigh aircraft and perform aircraft weight and balance calculations as a result of modifications
MEA327B	Fabricate and/or repair aircraft mechanical components or parts
MEA328C	Maintain and/or repair aircraft mechanical components or parts
MEA329B	Dismantle, inspect, maintain and assemble aircraft basic hydraulic and pneumatic components or parts
MEA330B	Dismantle, inspect, maintain and assemble aircraft non-primary structural removable components or parts and internal fittings
MEA331B	Dismantle, inspect, maintain and assemble aircraft gas turbine engine components or parts
MEA332B	Dismantle, inspect, maintain and assemble aircraft mechanical components or parts
MEA333B	Dismantle, inspect, maintain and assemble aircraft piston engine components or parts
MEA339C	Inspect, repair and maintain aircraft structures

Unit code	Unit title
MEA340A	Lay out and set up aircraft systems
MEA341A	Apply basic aircraft design characteristics
MEA342A	Apply basic aircraft power plant design characteristics
MEA343B	Remove and install avionic system components
MEA344A	Remove and install aircraft components
MEA345A	Perform scheduled line maintenance activities on gas turbine engine fixed wing aircraft
MEA346A	Perform scheduled line maintenance activities on gas turbine engine rotary wing aircraft
MEA347A	Perform scheduled line maintenance activities on piston engine fixed wing aircraft
MEA348A	Perform scheduled line maintenance activities on piston engine rotary wing aircraft
MEA349B	Apply basic scientific principles and techniques in aeronautical engineering situations
MEA350A	Select and test aeronautical engineering materials
MEA351A	Maintain airframe systems of basic light fixed wing aircraft
MEA352A	Maintain basic rotary wing aircraft systems
MEA353A	Maintain basic light aircraft engines and propellers
MEA354A	Maintain light aircraft pneumatic systems
MEA355A	Maintain light aircraft air cycle air conditioning systems
MEA356A	Maintain light piston engine aircraft pressurisation systems
MEA357A	Inspect, test and repair aircraft fabric surfaces
MEA358A	Re-cover aircraft fabric surfaces
MEA359A	Inspect and repair aircraft wooden structures
MEA360A	Maintain aircraft diesel engines

Unit code	Unit title
MEA361A	Maintain aircraft two stroke petrol engines
MEA362A	Maintain aircraft vapour cycle air conditioning systems
MEA363B	Inspect, repair and maintain structures and related components of non-pressurised small aircraft
MEA364A	Maintain and/or repair small aircraft mechanical components or parts
MEA365A	Assess structural repair/modification requirements and evaluate structural repairs and modifications
MEA366A	Perform borescope inspections
MEA367A	Repair/modify aircraft composite structure using cold bonding
MEA368A	Shot peen aircraft components
MEA380A	Repair and/or overhaul aircraft hydraulic system components
MEA381A	Repair and/or overhaul aircraft pneumatic system components
MEA382A	Repair and/or overhaul aircraft fuel system components
MEA383A	Repair and/or overhaul gas turbine engine air inlet and compressor components and/or modules
MEA384A	Repair and/or overhaul gas turbine engine combustion section components and/or modules
MEA385A	Repair and/or overhaul gas turbine engine turbine and exhaust section components
MEA386A	Repair and/or overhaul gas turbine engine ancillary section components
MEA387A	Test gas turbine engines and engine modules after overhaul or repair
MEA389A	Repair and/or overhaul propellers
MEA390A	Repair and/or overhaul rotary wing dynamic components
MEA391A	Repair and/or overhaul aircraft mechanical system components
MEA392A	Disassemble aircraft piston engines
MEA393A	Repair and/or overhaul aircraft piston engine cylinder assembly components

Unit code	Unit title
MEA394A	Repair and/or overhaul aircraft piston engine crankcase assembly components
MEA395A	Reassemble aircraft piston engines
MEA396A	Assemble aircraft piston engine quick engine change unit
MEA397A	Test aircraft piston engines after repair or overhaul
MEA401C	Inspect aircraft structures
MEA405B	Repair/modify aircraft composite material structure/components
MEA406B	Repair/modify aircraft non-primary structural sheetmetal components
MEA407B	Repair/modify aircraft non-primary structural non-metallic components
MEA410C	Maintain aircraft structure/components
MEA411A	Remove surface coatings from aircraft or aircraft components
MEA412A	Pre-treat aluminium alloy surfaces
MEA413A	Seal aircraft and aircraft component structural seams
MEA414A	Remove light corrosion from aircraft
MEA415A	Paint aircraft surfaces
MEA416A	Apply aircraft identification markings, graphics and decals
MEA417A	Apply specialty coatings to aircraft
MEA418A	Perform basic repair of aircraft internal fittings during line maintenance
MEA419A	Inspect and repair/modify aircraft cabin/cockpit non-primary structure components
MEA420A	Fabricate basic structural components for aircraft
MEA421A	Fabricate advanced structural components for aircraft
MEA422A	Repair/modify aircraft metal structure
MEA423A	Aircraft structure major disassembly and reassembly
MEA424A	Evaluate aircraft non-destructive tests

Unit code	Unit title
MEA425A	Perform bolted composite skin repairs
MEA430A	Gas weld aircraft components
MEA431A	Braze weld aircraft components
MEA432A	Weld aircraft components using the gas tungsten arc welding process
MEA433A	Weld aircraft components using the gas metal arc welding process
MEA434A	Weld aircraft components using the plasma arc welding process
MEA435A	Weld aircraft components using the manual metal arc welding process
MEA501A	Maintain and fit anti-G suits
MEA502A	Maintain and fit helmets
MEA503A	Maintain and fit immersion suits
MEA504A	Maintain and fit oxygen masks
MEA505A	Maintain and pack parachutes
MEA506A	Maintain and pack survival inflatable life rafts and escape slides
MEA507A	Maintain, pack and fit survival inflatable buoyancy vests
MEA508A	Maintain, install and remove restraint systems
MEA509A	Manufacture, repair and alter aircraft related fabric components
MEA510A	Maintain seat and pod electrical and electronic systems
MEA511A	Operate and maintain sewing machines and overlockers
MEA601A	Maintain aircraft egress systems
MEA602A	Remove and install aircraft stores management system components
MEA603A	Remove and install aircraft stores suspension systems and components
MEA604A	Inspect, test and troubleshoot aircraft stores management systems and components
MEA605A	Inspect, test and troubleshoot aircraft stores suspension systems and components

Imported units of competency

Unit code	Unit title
AURVTP2003	Prepare spray painting materials and equipment
AURVTP3012	Apply air dry and polyurethane enamel refinishing material
AURVTT2004	Trim vehicle components
AURVTT2005	Select and apply trim and fabric materials
AURVTT2006	Select and apply trim and fabric adhesives
DEFEO101D	Work safely with explosive ordnance
DEFEO501D	Conduct explosive ordnance inspection
LMFSF2001B	Cut single layer fabrics
LMFSF2002B	Machine sew materials
LMFUP3012B	Apply marine sewing and installation techniques
LMTTF2008A	Use adhesives
MEM05004C	Perform routine oxy acetylene welding
MEM05006C	Perform brazing and/or silver soldering
MEM05007C	Perform manual heating and thermal cutting
MEM05012C	Perform routine manual metal arc welding
MEM05015D	Weld using manual metal arc welding process
MEM05016C	Perform advanced welding using manual metal arc welding process
MEM05017D	Weld using gas metal arc welding process
MEM05018C	Perform advanced welding using gas metal arc welding process
MEM05019D	Weld using gas tungsten arc welding process
MEM05020C	Perform advanced welding using gas tungsten arc welding process
MEM05022C	Perform advanced welding using oxy acetylene welding process
MEM05026C	Apply welding principles

Unit code	Unit title
MEM05043B	Perform welds to code standards using gas metal arc welding process
MEM05044B	Perform welds to code standards using gas tungsten arc welding process
MEM05046B	Perform welds to code standards using manual metal arc welding process
MEM05049B	Perform routine gas tungsten arc welding
MEM05050B	Perform routine gas metal arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM08012B	Prepare surfaces by abrasive blasting (basic)
MEM08013B	Prepare surfaces by abrasive blasting (advanced)
MEM08016B	Conduct blast coating by-products, materials and emissions
MEM09002B	Interpret technical drawing
MEM09003B	Prepare basic engineering drawing
MEM09009C	Create 2D drawings using computer aided design systems
MEM11011B	Undertake manual handling
MEM12001B	Use comparison and basic measuring devices
MEM12003B	Perform precision mechanical measurement
MEM12005B	Calibrate measuring equipment
MEM12023A	Perform engineering measurement
MEM13003B	Work safely with industrial chemicals and materials
MEM13013B	Work safely with ionising radiation
MEM15010B	Perform laboratory procedures
MEM15017B	Use and maintain reference standards
MEM16002C	Conduct formal interviews and negotiations
MEM16010A	Write reports

Unit code	Unit title
MEM17002B	Conduct workplace assessment
MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEM24001B	Perform basic penetrant testing
MEM24002B	Perform penetrant testing
MEM24003B	Perform basic magnetic particle testing
MEM24004B	Perform magnetic particle testing
MEM24005B	Perform basic eddy current testing
MEM24006B	Perform eddy current testing
MEM24007B	Perform ultrasonic thickness testing
MEM24008B	Perform ultrasonic testing
MEM24009B	Perform basic radiographic testing
MEM24010B	Perform radiographic testing
MEM24011B	Establish non-destructive tests
MEM24012C	Apply metallurgy principles
MEM30007A	Select common engineering materials
MEM30012A	Apply mathematical techniques in a manufacturing engineering or related environment
PSPMNGT610A	Manage public sector financial resources
PUADEFEO101D	Work safely with explosive ordnance
MSAENV272B	Participate in environmentally sustainable work practices
MSAENV472B	Implement and monitor environmentally sustainable work practices
MSAENV672B	Develop workplace policy and procedures for environmental sustainability
TAEDEL301A	Provide work skill instruction

Unit code	Unit title
TAEDEL402A	Plan, organise and facilitate learning in the workplace
TAEASS401B	Plan assessment activities and processes
TAEASS402B	Assess competence
TAEASS403B	Participate in assessment validation
TAEASS502B	Design and develop assessment tools
TAEDES401A	Design and develop learning programs

Additional Imported Units for MEA11v1

The units listed below are required for the additional Skill Sets added to meet CASA requirements. They have no applicability to any qualification and none of them have been contextualised.

Unit code	Unit title
MEM07001B	Perform operational maintenance of machines equipment
MEM07002B	Perform precision shaping/planning/slotting operations
MEM07005C	Perform general machining
MEM07006C	Perform lathe operations
MEM07007C	Perform milling operations
MEM07008D	Perform grinding operations
MEM07009B	Perform precision jig boring operations
MEM07010B	Perform tool and cutter grinding operations
MEM07011B	Perform complex milling operations
MEM07012B	Perform complex grinding operations
MEM07013B	Perform machining operations using horizontal and/or vertical boring machines
MEM07015B	Set computer controlled machines/processes

MEM07016C	Set and edit computer controlled machines/processes
MEM07018C	Write basic NC/CNC programs
MEM07019C	Program NC/CNC machine centre
MEM07020C	Program multiple spindle and/or multiple axis NC/CNC machining centre
MEM07021B	Perform complex lathe operations
MEM07022C	Program CNC wire cut machine
MEM07024B	Operate and monitor machine processes
MEM07028B	Operate computer controlled machine processes
MEM07030C	Perform metal spinning lathe operations (basic)
MEM07031C	Perform metal spinning lathe operations (complex)
MEM07032B	Use workshop machines for basic operations
MEM08001B	Perform wire, jig and barrel load unload work
MEM08002C	Pre-treat work for subsequent surface coating
MEM08003C	Perform electroplating operations
MEM08004B	Finish work using wet, dry and vapour deposition methods
MEM08006B	Produce clear and/or coloured and/or sealed anodised film on aluminium
MEM08018B	Electroplate engineering coatings
MEM12024A	Perform computations
MEM15004B	Perform inspection
MEM16006A	Organise and communicate information
PMBPROD262B	Operate tyre curing equipment
PMBPROD263B	Operate tyre retread curing equipment
PMBPROD264C	Check recycle wash process
PMBPROD265C	Operate portable vulcanising equipment
PMBPROD266B	Prepare tyre casing for retreading

PMBPROD324B	Inspect tyres for retreading
PMBPROD325B	Lay on tyre retreads
PMBPROD326B	Inspect tyres

Appendix 1: Cross-reference to CASA Licensing Syllabus

For the purpose of establishing parity with the licensing system of the European Aviation Safety Authority (EASA) the Civil Aviation Safety Authority (CASA) includes in CAO 100.66 and in the proposed Civil Aviation Safety Regulation Part 66 a licensing examination syllabus. Where individuals are seeking the grant of an Aircraft Maintenance Engineer Licence (or interim maintenance authority under the transitional arrangements of CAO 100.66) in Categories A, B1 or B2 it must be demonstrated that the knowledge requirements of the syllabus were fully covered in the underpinning knowledge applicable to the units of competency relevant to the licence sought.

In this Appendix there is a table for each A and B1 Licence, and for the B2 Licence (or the equivalent maintenance authorities) in which syllabus modules and topics applicable to each licence are listed, along with the units of competency that are expected to provide the required knowledge. RTOs operating as Maintenance Training Organisations under Civil Aviation Safety Regulation Part 147 (or CAO 100.66 during the transitional period) are required to ensure that the modules and topics are fully covered in the off-job training applicable to each listed unit of competency.

Refer also to Licensing/Registration Requirements in Section 3, Assessment Guidelines.

Alignment between CASA Licensing Syllabus and Aeroskills Units of Competency – A1 Licence

Syllabus Reference A1 Licence	**Units of Competency Providing Full Coverage**
Module 1 Mathematics	MEA345A
Module 2 Physics	MEA345A
Module 3 Electrical Fundamentals	
3.1 Electron Theory	MEA265A
3.2 Static Electricity and Conduction	MEA265A
3.3 Electrical Terminology	MEA265A
3.4 Generation of Electricity	MEA265A

Syllabus Reference A1 Licence	**Units of Competency Providing Full Coverage**
3.5 DC Sources of Electricity	MEA265A
3.6 DC Circuits	Not required
3.7 Resistance/Resistor	Not required
3.8 Power	Not required
3.9 Capacitance/Capacitor	Not required
3.10 Magnetism	Not required
3.11 Inductance/Inductor	Not required
3.12 DC Motor/Generator Theory	Not required
3.13 AC Theory	MEA264A
3.14 Resistive, Capacitive and Inductive Circuits	Not required
3.15 Transformers	Not required
3.16 Filters	Not required
3.17 AC Generators	Not required
3.18 AC Motors	Not required
Module 4 Electronic Fundamentals	
4.1 Semiconductors	Not required
4.2 Printed Circuit Boards	Not required
4.3 Sevomechanisms	Not required
Module 5 Digital Techniques Electronic Instrument Systems	
5.1 Electronic Instrument Systems	MEA345A
5.2 Numbering Systems	Not required
5.3 Data Conversion	Not required
5.4 Data Buses	Not required

Syllabus Reference A1 Licence	**Units of Competency Providing Full Coverage**
5.5 Logic Circuits	Not required
5.6 Basic Computer Structure	MEA345A
5.7 Microprocessors	Not required
5.8 Integrated Circuits	Not required
5.9 Multiplexing	Not required
5.10 Fibre Optics	Not required
5.11 Electronic Displays	Not required
5.12 Electrostatic Sensitive Devices	MEA264A
5.13 Software Management Control	Not required
5.14 Electromagnetic Environment	Not required
5.15 Typical Electronic/Digital Aircraft Systems	Not required
Module 6 Materials and Handling	
6.1 Aircraft Materials – Ferrous	MEA109B
6.2 Aircraft Materials – Non-Ferrous	MEA109B
6.3 Aircraft Materials – Composite and Non-Metallic	MEA418A
6.4 Corrosion	MEA345A
6.5 Fasteners	MEA109B
6.6 Pipes and Unions	MEA109B
6.7 Springs	MEA109B
6.8 Bearings	MEA344A
6.9 Transmissions	MEA344A, MEA345A
6.10 Control Cables	MEA109B
6.11 Electrical Cables and Connectors	MEA265A

Syllabus Reference A1 Licence	**Units of Competency Providing Full Coverage**
Module 7 Maintenance Practices	
7.1 Safety Precautions – Aircraft and Workshop	MEA101B
7.2 Workshop Practices	MEA107B, MEA109B
7.3 Tools	MEA109B, MEA240B
7.4 Avionic General Test Equipment	Not required
7.5 Engineering Drawings, Diagrams and Standards	MEA107B
7.6 Fits and Clearances	MEA107B, MEA109B
7.7 Electrical cables and Connectors	MEA265A
7.8 Riveting	MEA418A
7.9 Pipes and Hoses	MEA344A, MEA345A
7.10 Springs	MEA344A
7.11 Bearings	MEA344A
7.12 Transmissions	MEA344A, MEA345A
7.13 Control Cables	MEA345A
7.14 Material Handling	Not required
7.15 Welding, Brazing, Soldering and Bonding	Not required
7.16 Aircraft Weight and Balance	Not required
7.17 Aircraft Handling and Storage	MEA345A
7.18 Disassembly, Inspection, Repair and Assembly Techniques	MEA345A
7.19 Abnormal Events	MEA119A
7.20 Maintenance Procedures	MEA119A, MEA345A
Module 8 Basic Aerodynamics	

Syllabus Reference A1 Licence	**Units of Competency Providing Full Coverage**
8.1 Physics of the Atmosphere	MEA345A
8.2 Aerodynamics	MEA345A
8.3 Theory of Flight	MEA345A
8.4 Flight Stability and Dynamics	MEA345A
Module 9 Human Factors	
9.1 General	MEA103B
9.2 Human Performance and Limitations	MEA103B
9.3 Social Psychology	MEA103B
9.4 Factors Affecting Performance	MEA103B
9.5 Physical Environment	MEA103B
9.6 Tasks	MEA103B
9.7 Communication	MEA103B
9.8 Human Error	MEA103B
9.9 Hazards in the Workplace	MEA101B
Module 10 Aviation Legislation	
10.1 Regulatory framework	MEA119B
10.2 Part 66 Certifying Staff	MEA119B
10.3 Part 145 – Approved Maintenance Organisations	MEA119B
10.4 Air Operations	Not required
10.5 Certification of Aircraft, Parts and Appliances	Not required
10.6 Parts 21 and 42	Not required
10.7 Applicable National and International requirements	Not required

Syllabus Reference A1 Licence	Units of Competency Providing Full Coverage
Module 11 Aeroplane Aerodynamics, Structure and Systems	
11.1 Theory of Flight	MEA345A
11.2 Airframe Structures – General concepts	MEA345A
11.3 Airframe Structures – Aeroplanes	MEA345A
11.4 Air Conditioning and Cabin Pressurisation	MEA345A
11.5 Instruments and Avionic Systems	MEA264A
11.6 Electrical Power	MEA264A
11.7 Equipment and Furnishings	MEA264A, MEA344A, MEA345A
11.8 Fire Protection	MEA345A
11.9 Flight Controls	MEA345A
11.10 Fuel Systems	MEA345A
11.11 Hydraulic Power	MEA345A
11.12 Ice and Rain Protection	MEA345A
11.13 Landing Gear	MEA344A, MEA345A
11.14 Lights	MEA264A
11.15 Oxygen	MEA345A
11.16 Pneumatic and Vacuum	MEA345A
11.17 Water and Waste	MEA344A, MEA345A
11.18 On-Board Maintenance Systems	MEA345A
11.19 Integrated modular avionics	MEA264A
11.20 Cabin systems	MEA264A
11.21 Information systems such as air traffic and information management systems and network server systems	MEA264A

Syllabus Reference A1 Licence	**Units of Competency Providing Full Coverage**
Module 15 Gas Turbine Engine	
15.1 Fundamentals	MEA345A
15.2 Engine Performance	Not required
15.3 Inlet	MEA345A
15.4 Compressors	MEA345A
15.5 Combustion Section	MEA345A
15.6 Turbine Section	MEA345A
15.7 Exhaust	MEA345A
15.8 Bearings and Seals	Not required
15.9 Lubricants and Fuels	MEA345A
15.10 Lubrication Systems	MEA345A
15.11 Fuel Systems	MEA345A
15.12 Air Systems	MEA345A
15.13 Starting and Ignition Systems	MEA345A
15.14 Engine Indication Systems	MEA345A
15.15 Power Augmentation Systems	Not required
15.16 Turbo Prop Engines	MEA345A
15.17 Turbo-Shaft Engines	MEA345A
15.18 Auxiliary Power Units	MEA345A
15.19 Power plant Installation	MEA345A
15.20 Fire Protection Systems	MEA345A
15.21 Engine Monitoring and Ground Operation	MEA345A
15.22 Engine Storage and Preservation	Not required

Syllabus Reference A1 Licence	Units of Competency Providing Full Coverage
Module 17 Propeller	
17.1 Fundamentals	MEA345A
17.2 Propeller Construction	MEA345A
17.3 Propeller Pitch Control	MEA345A
17.4 Propeller Synchronising	Not required
17.5 Propeller Ice Protection	MEA345A
17.6 Propeller Maintenance	MEA345A
17.7 Propeller Storage and Preservation	MEA345A

Alignment between CASA Licensing Syllabus and Aeroskills Units of Competency – A2 Licence

Syllabus Reference A2 Licence	Units of Competency Providing Full Coverage
Module 1 Mathematics	MEA347A
Module 2 Physics	MEA347A
Module 3 Electrical Fundamentals	
3.1 Electron Theory	MEA265A
3.2 Static Electricity and Conduction	MEA265A
3.3 Electrical Terminology	MEA265A
3.4 Generation of Electricity	MEA265A
3.5 DC Sources of Electricity	MEA265A
3.6 DC Circuits	Not required
3.7 Resistance/Resistor	Not required
3.8 Power	Not required
3.9 Capacitance/Capacitor	Not required

Syllabus Reference A2 Licence	**Units of Competency Providing Full Coverage**
3.10 Magnetism	Not required
3.11 Inductance/Inductor	Not required
3.12 DC Motor/Generator Theory	Not required
3.13 AC Theory	MEA264A
3.14 Resistive, Capacitive and Inductive Circuits	Not required
3.15 Transformers	Not required
3.16 Filters	Not required
3.17 AC Generators	Not required
3.18 AC Motors	Not required
Module 4 Electronic Fundamentals	
4.1 Semiconductors	Not required
4.2 Printed Circuit Boards	Not required
4.3 Sevomechanisms	Not required
Module 5 Digital Techniques Electronic Instrument Systems	
5.1 Electronic Instrument Systems	MEA347A
5.2 Numbering Systems	Not required
5.3 Data Conversion	Not required
5.4 Data Buses	Not required
5.5 Logic Circuits	Not required
5.6 Basic Computer Structure	MEA347A
5.7 Microprocessors	Not required
5.8 Integrated Circuits	Not required
5.9 Multiplexing	Not required

Syllabus Reference A2 Licence	**Units of Competency Providing Full Coverage**
5.10 Fibre Optics	Not required
5.11 Electronic Displays	Not required
5.12 Electrostatic Sensitive Devices	MEA264A
5.13 Software Management Control	Not required
5.14 Electromagnetic Environment	Not required
5.15 Typical Electronic/Digital Aircraft Systems	Not required
Module 6 Materials and Handling	
6.1 Aircraft Materials – Ferrous	MEA109B
6.2 Aircraft Materials – Non-Ferrous	MEA109B
6.3 Aircraft Materials – Composite and Non-Metallic	MEA418A
6.4 Corrosion	MEA347A
6.5 Fasteners	MEA109B
6.6 Pipes and Unions	MEA109B
6.7 Springs	MEA109B
6.8 Bearings	MEA347A
6.9 Transmissions	MEA344A, MEA347A
6.10 Control Cables	MEA109B
6.11 Electrical Cables and Connectors	MEA265A
Module 7 Maintenance Practices	
7.1 Safety Precautions – Aircraft and Workshop	MEA101B
7.2 Workshop Practices	MEA107B, MEA109B
7.3 Tools	MEA109B, MEA240B
7.4 Avionic General Test Equipment	Not required

Syllabus Reference A2 Licence	**Units of Competency Providing Full Coverage**
7.5 Engineering Drawings, Diagrams and Standards	MEA107B
7.6 Fits and Clearances	MEA107B, MEA109B
7.7 Electrical cables and Connectors	MEA265A
7.8 Riveting	MEA418A
7.9 Pipes and Hoses	MEA344A, MEA347A
7.10 Springs	MEA344A
7.11 Bearings	MEA344A
7.12 Transmissions	MEA344A, MEA347A
7.13 Control Cables	MEA347A
7.14 Material Handling	Not required
7.15 Welding, Brazing, Soldering and Bonding	Not required
7.16 Aircraft Weight and Balance	Not required
7.17 Aircraft Handling and Storage	MEA347A
7.18 Disassembly, Inspection, Repair and Assembly Techniques	MEA347A
7.19 Abnormal Events	MEA119A
7.20 Maintenance Procedures	MEA119A, MEA347A
Module 8 Basic Aerodynamics	
8.1 Physics of the Atmosphere	MEA347A
8.2 Aerodynamics	MEA347A
8.3 Theory of Flight	MEA347A
8.4 Flight Stability and Dynamics	MEA347A
Module 9 Human Factors	

Syllabus Reference A2 Licence	**Units of Competency Providing Full Coverage**
9.1 General	MEA103B
9.2 Human Performance and Limitations	MEA103B
9.3 Social Psychology	MEA103B
9.4 Factors Affecting Performance	MEA103B
9.5 Physical Environment	MEA103B
9.6 Tasks	MEA103B
9.7 Communication	MEA103B
9.8 Human Error	MEA103B
9.9 Hazards in the Workplace	MEA101B
Module 10 Aviation Legislation	
10.1 Regulatory framework	MEA119B
10.2 Part 66 Certifying Staff	MEA119B
10.3 Part 145 – Approved Maintenance Organisations	MEA119B
10.4 Air Operations	Not required
10.5 Certification of Aircraft, Parts and Appliances	Not required
10.6 Parts 21 and 42	Not required
10.7 Applicable National and International requirements	Not required
Module 11 Aeroplane Aerodynamics, Structure and Systems	
11.1 Theory of Flight	MEA347A
11.2 Airframe Structures – General concepts	MEA347A
11.3 Airframe Structures – Aeroplanes	MEA347A
11.4 Air Conditioning and Cabin Pressurisation	MEA347A

Syllabus Reference A2 Licence	**Units of Competency Providing Full Coverage**
11.5 Instruments and Avionic Systems	MEA264A
11.6 Electrical Power	MEA264A
11.7 Equipment and Furnishings	MEA264A, MEA344A, MEA347A
11.8 Fire Protection	MEA347A
11.9 Flight Controls	MEA347A
11.10 Fuel Systems	MEA347A
11.11 Hydraulic Power	MEA347A
11.12 Ice and Rain Protection	MEA347A
11.13 Landing Gear	MEA344A, MEA347A
11.14 Lights	MEA264A, MEA347A
11.15 Oxygen	MEA347A
11.16 Pneumatic and Vacuum	MEA347A
11.17 Water and Waste	MEA344A, MEA347A
11.18 On Board Maintenance Systems	MEA347A
11.19 Integrated modular avionics	MEA264A
11.20 Cabin systems	MEA264A
11.21 Information systems such as air traffic and information management systems and network server systems	MEA264A
Module 16 Piston Engine	
16.1 Fundamentals	MEA347A
16.2 Engine Performance	MEA347A
16.3 Engine Construction	MEA347A
16.4 Engine Fuel Systems	MEA347A

Syllabus Reference A2 Licence	Units of Competency Providing Full Coverage
16.5 Starting and ignition system	MEA347A
16.6 Induction, Exhaust and Cooling Systems	MEA347A
16.7 Supercharging/Turbocharging	MEA347A
16.8 Lubricants and Fuels	MEA347A
16.9 Lubrication Systems	MEA347A
16.10 Engine Indication Systems	MEA347A
16.11 Power plant Installation	MEA347A
16.12 Engine Monitoring and Ground Operation	MEA347A
16.13 Engine Storage and Preservation	Not required
Module 17 Propeller	
17.1 Fundamentals	MEA347A
17.2 Propeller Construction	MEA347A
17.3 Propeller Pitch Control	MEA347A
17.4 Propeller Synchronising	Not required
17.5 Propeller Ice Protection	MEA347A
17.6 Propeller Maintenance	MEA347A
17.7 Propeller Storage and Preservation	MEA347A

Alignment between CASA Licensing Syllabus and Aeroskills Units of Competency – A3 Licence

Syllabus Reference A3 Licence	Units of Competency Providing Full Coverage
Module 1 Mathematics	MEA346A
Module 2 Physics	MEA346A
Module 3 Electrical Fundamentals	

Syllabus Reference A3 Licence	**Units of Competency Providing Full Coverage**
3.1 Electron Theory	MEA265A
3.2 Static Electricity and Conduction	MEA265A
3.3 Electrical Terminology	MEA265A
3.4 Generation of Electricity	MEA265A
3.5 DC Sources of Electricity	MEA265A
3.6 DC Circuits	Not required
3.7 Resistance/Resistor	Not required
3.8 Power	Not required
3.9 Capacitance/Capacitor	Not required
3.10 Magnetism	Not required
3.11 Inductance/Inductor	Not required
3.12 DC Motor/Generator Theory	Not required
3.13 AC Theory	MEA264A
3.14 Resistive, Capacitive and Inductive Circuits	Not required
3.15 Transformers	Not required
3.16 Filters	Not required
3.17 AC Generators	Not required
3.18 AC Motors	Not required
Module 4 Electronic Fundamentals	
4.1 Semiconductors	Not required
4.2 Printed Circuit Boards	Not required
4.3 Servomechanisms	Not required
Module 5 Digital Techniques Electronic Instrument Systems	

Syllabus Reference A3 Licence	**Units of Competency Providing Full Coverage**
5.1 Electronic Instrument Systems	MEA346A
5.2 Numbering Systems	Not required
5.3 Data Conversion	Not required
5.4 Data Buses	Not required
5.5 Logic Circuits	Not required
5.6 Basic Computer Structure	MEA346A
5.7 Microprocessors	Not required
5.8 Integrated Circuits	Not required
5.9 Multiplexing	Not required
5.10 Fibre Optics	Not required
5.11 Electronic Displays	Not required
5.12 Electrostatic Sensitive Devices	MEA264A
5.13 Software Management Control	Not required
5.14 Electromagnetic Environment	Not required
Typical Electronic/Digital Aircraft Systems	Not required
Module 6 Materials and Handling	
6.1 Aircraft Materials – Ferrous	MEA109B
6.2 Aircraft Materials – Non-Ferrous	MEA109B
6.3 Aircraft Materials – Composite and Non-Metallic	MEA418A
6.4 Corrosion	MEA346A
6.5 Fasteners	MEA109B
6.6 Pipes and Unions	MEA109B
6.7 Springs	MEA109B

Syllabus Reference A3 Licence	**Units of Competency Providing Full Coverage**
6.8 Bearings	MEA344A
6.9 Transmissions	MEA344A, MEA346A
6.10 Control Cables	MEA109B
6.11 Electrical Cables and Connectors	MEA265A
Module 7 Maintenance Practices	
7.1 Safety Precautions – Aircraft and Workshop	MEA101B
7.2 Workshop Practices	MEA107B, MEA109B
7.3 Tools	MEA109B, MEA240B
7.4 Avionic General Test Equipment	Not required
7.5 Engineering Drawings, Diagrams and Standards	MEA107B
7.6 Fits and Clearances	MEA107B, MEA109B
7.7 Electrical cables and Connectors	MEA265A
7.8 Riveting	MEA418A
7.9 Pipes and Hoses	MEA344A, MEA346A
7.10 Springs	MEA344A
7.11 Bearings	MEA344A
7.12 Transmissions	MEA344A, MEA346A
7.13 Control Cables	MEA346A
7.14 Material Handling	Not required
7.15 Welding, Brazing, Soldering and Bonding	Not required
7.16 Aircraft Weight and Balance	Not required
7.17 Aircraft Handling and Storage	MEA346A
7.18 Disassembly, Inspection, Repair and	MEA346A

Syllabus Reference A3 Licence	**Units of Competency Providing Full Coverage**
Assembly Techniques	
7.19 Abnormal Events	MEA119A
7.20 Maintenance Procedures	MEA119A, MEA346A
Module 8 Basic Aerodynamics	
8.1 Physics of the Atmosphere	MEA346A
8.2 Aerodynamics	MEA346A
8.3 Theory of Flight	MEA346A
8.4 Flight Stability and Dynamics	MEA346A
Module 9 Human Factors	
9.1 General	MEA103B
9.2 Human Performance and Limitations	MEA103B
9.3 Social Psychology	MEA103B
9.4 Factors Affecting Performance	MEA103B
9.5 Physical Environment	MEA103B
9.6 Tasks	MEA103B
9.7 Communication	MEA103B
9.8 Human Error	MEA103B
9.9 Hazards in the Workplace	MEA101B
Module 10 Aviation Legislation	
10.1 Regulatory framework	MEA119B
10.2 Part 66 Certifying Staff	MEA119B
10.3 Part 145 – Approved Maintenance Organisations	MEA119B
10.4 Air Operations	Not required

Syllabus Reference A3 Licence	**Units of Competency Providing Full Coverage**
10.5 Certification of Aircraft, Parts and Appliances	Not required
10.6 Parts 21 and 42	Not required
10.7 Applicable National and International requirements	Not required
Module 12 Helicopter Aerodynamics, Structure and Systems	
12.1 Theory of Flight – Rotary Wing Aerodynamics	MEA346A
12.2 Flight control Systems	MEA346A
12.3 Blade Tracking and Vibration Analysis	MEA346A
12.4 Transmission	MEA346A
12.5 Airframe Structures	MEA346A
12.6 Air Conditioning	MEA346A
12.7 Instruments/Avionic Systems	MEA264A
12.8 Electrical Power	MEA264A
12.9 Equipment and Furnishings	MEA264A, MEA344A, MEA346A
12.10 Fire Protection	MEA346A
12.11 Fuel Systems	MEA346A
12.12 Hydraulic Power	MEA346A
12.13 Ice and Rain Protection	MEA346A
12.14 Landing Gear	MEA344A, MEA346A
12.15 Lights	MEA264A
12.16 Pneumatic and Vacuum	MEA346A
12.17 Integrated modular avionics	MEA264A
12.18 On Board Maintenance Systems	MEA346A

Syllabus Reference A3 Licence	**Units of Competency Providing Full Coverage**
12.19 Information systems such as air traffic and information management systems and network server systems	MEA264A
Module 15 Gas Turbine Engine	
15.1 Fundamentals	MEA346A
15.2 Engine Performance	Not required
15.3 Inlet	MEA346A
15.4 Compressors	MEA346A
15.5 Combustion Section	MEA346A
15.6 Turbine Section	MEA346A
15.7 Exhaust	MEA346A
15.8 Bearings and Seals	Not required
15.9 Lubricants and Fuels	MEA346A
15.10 Lubrication Systems	MEA346A
15.11 Fuel Systems	MEA346A
15.12 Air Systems	MEA346A
15.13 Starting and Ignition Systems	MEA346A
15.14 Engine Indication Systems	MEA346A
15.15 Power Augmentation Systems	Not required
15.16 Turbo Prop Engines	MEA346A
15.17 Turbo-Shaft Engines	MEA346A
15.18 Auxiliary Power Units	MEA346A
15.19 Power plant Installation	MEA346A
15.20 Fire Protection Systems	MEA346A

Syllabus Reference A3 Licence	Units of Competency Providing Full Coverage
15.21 Engine Monitoring and Ground Operation	MEA346A
15.22 Engine Storage and Preservation	Not required

Alignment between CASA Licensing Syllabus and Aeroskills Units of Competency – A4 Licence

Syllabus Reference A4 Licence	Units of Competency Providing Full Coverage
Module 1 Mathematics	MEA348A
Module 2 Physics	MEA348A
Module 3 Electrical Fundamentals	
3.1 Electron Theory	MEA265A
3.2 Static Electricity and Conduction	MEA265A
3.3 Electrical Terminology	MEA265A
3.4 Generation of Electricity	MEA265A
3.5 DC Sources of Electricity	MEA265A
3.6 DC Circuits	Not required
3.7 Resistance/Resistor	Not required
3.8 Power	Not required
3.9 Capacitance/Capacitor	Not required
3.10 Magnetism	Not required
3.11 Inductance/Inductor	Not required
3.12 DC Motor/Generator Theory	Not required
3.13 AC Theory	MEA264A
3.14 Resistive, Capacitive and Inductive Circuits	Not required
3.15 Transformers	Not required

Syllabus Reference A4 Licence	**Units of Competency Providing Full Coverage**
3.16 Filters	Not required
3.17 AC Generators	Not required
3.18 AC Motors	Not required
Module 4 Electronic Fundamentals	
4.1 Semiconductors	Not required
4.2 Printed Circuit Boards	Not required
4.3 Servomechanisms	Not required
Module 5 Digital Techniques Electronic Instrument Systems	
5.1 Electronic Instrument Systems	MEA348A
5.2 Numbering Systems	Not required
5.3 Data Conversion	Not required
5.4 Data Buses	Not required
5.5 Logic Circuits	Not required
5.6 Basic Computer Structure	MEA348A
5.7 Microprocessors	Not required
5.8 Integrated Circuits	Not required
5.9 Multiplexing	Not required
5.10 Fibre Optics	Not required
5.11 Electronic Displays	Not required
5.12 Electrostatic Sensitive Devices	MEA264A
5.13 Software Management Control	Not required
5.14 Electromagnetic Environment	Not required
Typical Electronic/Digital Aircraft Systems	Not required

Syllabus Reference A4 Licence	Units of Competency Providing Full Coverage
Module 6 Materials and Handling	
6.1 Aircraft Materials – Ferrous	MEA109B
6.2 Aircraft Materials – Non-Ferrous	MEA109B
6.3 Aircraft Materials – Composite and Non-Metallic	MEA418A
6.4 Corrosion	MEA348A
6.5 Fasteners	MEA109B
6.6 Pipes and Unions	MEA109B
6.7 Springs	MEA109B
6.8 Bearings	MEA344A
6.9 Transmissions	MEA344A, MEA348A
6.10 Control Cables	MEA109B
6.11 Electrical Cables and Connectors	MEA265A
Module 7 Maintenance Practices	
7.1 Safety Practices – Aircraft and Workshop	MEA101B
7.2 Workshop Practices	MEA107B, MEA109B
7.3 Tools	MEA109B, MEA240B
7.4 Avionic General Test Equipment	Not required
7.5 Engineering Drawings, Diagrams and Standards	MEA107B
7.6 Fits and Clearances	MEA107B, MEA109B
7.7 Electrical cables and Connectors	MEA265A
7.8 Riveting	MEA418A
7.9 Pipes and Hoses	MEA344A, MEA348A

Syllabus Reference A4 Licence	**Units of Competency Providing Full Coverage**
7.10 Springs	MEA344A
7.11 Bearings	MEA344A
7.12 Transmissions	MEA344A, MEA348A
7.13 Control Cables	MEA348A
7.14 Material Handling	Not required
7.15 Welding, Brazing, Soldering and Bonding	Not required
7.16 Aircraft Weight and Balance	Not required
7.17 Aircraft Handling and Storage	MEA348A
7.18 Disassembly, Inspection, Repair and Assembly Techniques	MEA348A
7.19 Abnormal Events	MEA119A
7.20 Maintenance Procedures	MEA119A, MEA348A
Module 8 Basic Aerodynamics	
8.1 Physics of the Atmosphere	MEA348A
8.2 Aerodynamics	MEA348A
8.3 Theory of Flight	MEA348A
8.4 Flight Stability and Dynamics	MEA348A
Module 9 Human Factors	
9.1 General	MEA103B
9.2 Human Performance and Limitations	MEA103B
9.3 Social Psychology	MEA103B
9.4 Factors Affecting Performance	MEA103B
9.5 Physical Environment	MEA103B
9.6 Tasks	MEA103B

Syllabus Reference A4 Licence	**Units of Competency Providing Full Coverage**
9.7 Communication	MEA103B
9.8 Human Error	MEA103B
9.9 Hazards in the Workplace	MEA101B
Module 10 Aviation Legislation	
10.1 Regulatory framework	MEA119B
10.2 Part 66 Certifying Staff	MEA119B
10.3 Part 145 – Approved Maintenance Organisations	MEA119B
10.4 Air Operations	Not required
10.5 Certification of Aircraft, Parts and Appliances	Not required
10.6 Parts 21 and 42	Not required
10.7 Applicable National and International requirements	Not required
Module 12 Helicopter Aerodynamics, Structure and Systems	
12.1 Theory of Flight – Rotary Wing Aerodynamics	MEA348A
12.2 Flight control Systems	MEA348A
12.3 Blade Tracking and Vibration Analysis	MEA348A
12.4 Transmission	MEA348A
12.5 Airframe Structures	MEA348A
12.6 Air Conditioning	MEA348A
12.7 Instruments/Avionic Systems	MEA348A
12.8 Electrical Power	MEA264A
12.9 Equipment and Furnishings	MEA264A, MEA344A, MEA348A

Syllabus Reference A4 Licence	**Units of Competency Providing Full Coverage**
12.10 Fire Protection	MEA348A
12.11 Fuel Systems	MEA348A
12.12 Hydraulic Power	MEA348A
12.13 Ice and Rain Protection	MEA348A
12.14 Landing Gear	MEA344A, MEA348A
12.15 Lights	MEA264A, MEA348A
12.16 Pneumatic and Vacuum	MEA348A
12.17 Integrated modular avionics	MEA264A
12.18 On Board Maintenance Systems	MEA348A
12.19 Information systems such as air traffic and information management systems and network server systems	MEA264A
Module 16 Piston Engine	
16.1 Fundamentals	MEA348A
16.2 Engine Performance	MEA348A
16.3 Engine Construction	MEA348A
16.4 Engine Fuel System	MEA348A
16.5 Starting and Ignition Systems	MEA348A
16.6 Induction, Exhaust and Cooling Systems	MEA348A
16.7 Supercharging/Turbocharging	MEA348A
16.8 Lubricants and Fuels	MEA348A
16.9 Lubrication Systems	MEA348A
16.10 Engine Indication Systems	MEA348A
16.11 Power plant Installation	MEA348A

Syllabus Reference A4 Licence	Units of Competency Providing Full Coverage
16.12 Engine Monitoring and Ground Operation	MEA348A
16.13 Engine Storage and Preservation	Not required

Alignment between CASA Licensing Syllabus and Aeroskills Units of Competency – B1.1 Licence

Syllabus Reference B1.1 Licence	Units of Competency Providing Full Coverage
Module 1 Mathematics	MEA201B
Module 2 Physics	MEA201B
Module 3 Electrical Fundamentals	
3.1 Electron Theory	MEA201B
3.2 Static Electricity and Conduction	MEA201B
3.3 Electrical Terminology	MEA201B
3.4 Generation of Electricity	MEA201B
3.5 DC Sources of Electricity	MEA201B
3.6 DC Circuits	MEA201B
3.7 Resistance/Resistor	MEA201B
3.8 Power	MEA201B
3.9 Capacitance/Capacitor	MEA201B
3.10 Magnetism	MEA201B
3.11 Inductance/Inductor	MEA201B
3.12 DC Motor/Generator Theory	MEA203C
3.13 AC Theory	MEA203C
3.14 Resistive, Capacitive and Inductive Circuits	MEA203C
3.15 Transformers	MEA203C

Syllabus Reference B1.1 Licence	**Units of Competency Providing Full Coverage**
3.16 Filters	MEA203C
3.17 AC Generators	MEA203C
3.18 AC Motors	MEA203C
Module 4 Electronic Fundamentals	
4.1 Semiconductors	MEA343B
4.2 Printed Circuit Boards	MEA343B
4.3 Servomechanisms	MEA343B
Module 5 Digital Techniques Electronic Instrument Systems	
5.1 Electronic Instrument Systems	MEA343B
5.2 Numbering Systems	MEA343B
5.3 Data Conversion	MEA343B
5.4 Data Buses	MEA343B
5.5 Logic Circuits	MEA343B
5.6 Basic Computer Structure	MEA343B
5.7 Microprocessors	Not required
5.8 Integrated Circuits	Not required
5.9 Multiplexing	Not required
5.10 Fibre Optics	MEA343B
5.11 Electronic Displays	MEA343B
5.12 Electrostatic Sensitive Devices	MEA343B
5.13 Software Management Control	MEA343B
5.14 Electromagnetic Environment	MEA343B
5.15 Typical Electronic/Digital Aircraft Systems	MEA343B

Syllabus Reference B1.1 Licence	Units of Competency Providing Full Coverage
Module 6 Materials and Handling	
6.1 Aircraft Materials – Ferrous	MEA109B
6.2 Aircraft Materials – Non-Ferrous	MEA109B
6.3 Aircraft Materials – Composite and Non-Metallic	MEA339C
6.4 Corrosion	MEA339C
6.5 Fasteners	MEA109B
6.6 Pipes and Unions	MEA109B
6.7 Springs	MEA109B
6.8 Bearings	MEA302C
6.9 Transmissions	MEA306C
6.10 Control Cables	MEA109B
6.11 Electrical Cables and Connectors	MEA201B, MEA246C
Module 7 Maintenance Practices	
7.1 Safety Precautions – Aircraft and Workshop	MEA101B
7.2 Workshop Practices	MEA107B, MEA109B
7.3 Tools	MEA109B, MEA260B
7.4 Avionic General Test Equipment	MEA260B
7.5 Engineering Drawings, Diagrams and Standards	MEA107B
7.6 Fits and Clearances	MEA107B, MEA109B
7.7 Electrical cables and Connectors	MEA246C
7.8 Riveting	MEA339C
7.9 Pipes and Hoses	MEA302C, MEA303D, MEA328C

Syllabus Reference B1.1 Licence	**Units of Competency Providing Full Coverage**
7.10 Springs	MEA318C, MEA328C
7.11 Bearings	MEA318C, MEA319C
7.12 Transmissions	MEA318C, MEA319C
7.13 Control Cables	MEA318C, MEA328C
7.14 Material Handling	MEA339C
7.15 Welding, Brazing, Soldering and Bonding	MEA201B, MEA339C, MEA365A
7.16 Aircraft Weight and Balance	MEA325B
7.17 Aircraft Handling and Storage	MEA301C
7.18 Disassembly, Inspection, Repair and Assembly Techniques	MEA227D, MEA320C, MEA321C, MEA322C, MEA328C, MEA339C, MEA365A
7.19 Abnormal Events	MEA112B
7.20 Maintenance Procedures	MEA112B
Module 8 Basic Aerodynamics	
8.1 Physics of the Atmosphere	MEA321C, MEA322C
8.2 Aerodynamics	MEA321C
8.3 Theory of Flight	MEA321C
8.4 Flight Stability and Dynamics	MEA321C
Module 9 Human Factors	
9.1 General	MEA103B, MEA113C
9.2 Human Performance and Limitations	MEA103B, MEA113C
9.3 Social Psychology	MEA103B, MEA113C
9.4 Factors Affecting Performance	MEA103B, MEA113C
9.5 Physical Environment	MEA103B, MEA113C

Syllabus Reference B1.1 Licence	**Units of Competency Providing Full Coverage**
9.6 Tasks	MEA103B, MEA113C
9.7 Communication	MEA103B, MEA113C
9.8 Human Error	MEA103B, MEA113C
9.9 Hazards in the Workplace	MEA101B, MEA116B
Module 10 Aviation Legislation	
10.1 Regulatory framework	MEA111C
10.2 Part 66 Certifying Staff	MEA111C
10.3 Part 145 – Approved Maintenance Organisations	MEA111C
10.4 Air Operations	MEA111C
10.5 Certification of Aircraft, Parts and Appliances	MEA111C
10.6 Parts 21 and 42	MEA111C
10.7 Applicable National and International requirements	MEA111C
Module 11 Aeroplane Aerodynamics, Structure and Systems	
11.1 Theory of Flight	MEA321C
11.2 Airframe Structures – General concepts	MEA339C
11.3 Airframe Structures – Aeroplanes	MEA339C
11.4 Air Conditioning and Cabin Pressurisation	MEA219C, MEA223D, MEA318C
11.5 Instruments and Avionic Systems	MEA343B
11.6 Electrical Power	MEA203C, MEA301C
11.7 Equipment and Furnishings	MEA317C
11.8 Fire Protection	MEA223D, MEA318C
11.9 Flight Controls	MEA223D, MEA318C, MEA320C

Syllabus Reference B1.1 Licence	**Units of Competency Providing Full Coverage**
11.10 Fuel Systems	MEA223D, MEA301C, MEA318C
11.11 Hydraulic Power	MEA223D, MEA301C, MEA318C
11.12 Ice and Rain Protection	MEA223D, MEA301C, MEA318C
11.13 Landing Gear	MEA223D, MEA318C
11.14 Lights	MEA223D
11.15 Oxygen	MEA222B
11.16 Pneumatic and Vacuum	MEA223D, MEA318C
11.17 Water and Waste	MEA223D, MEA318C
11.18 On-Board Maintenance Systems	MEA343B
11.19 Integrated modular avionics	MEA343B
11.20 Cabin systems	MEA343B
11.21 Information systems such as air traffic and information management systems and network server systems	MEA343B
Module 15 Gas Turbine Engine	
15.1 Fundamentals	MEA322C
15.2 Engine Performance	MEA322C
15.3 Inlet	MEA223D, MEA322C
15.4 Compressors	MEA322C
15.5 Combustion Section	MEA322C
15.6 Turbine Section	MEA322C
15.7 Exhaust	MEA322C
15.8 Bearings and Seals	MEA322C
15.9 Lubricants and Fuels	MEA301C

Syllabus Reference B1.1 Licence	Units of Competency Providing Full Coverage
15.10 Lubrication Systems	MEA322C
15.11 Fuel Systems	MEA223D, MEA322C
15.12 Air Systems	MEA223D, MEA322C
15.13 Starting and Ignition Systems	MEA223D, MEA322C
15.14 Engine Indication Systems	MEA223D, MEA322C, MEA343B
15.15 Power Augmentation Systems	MEA322C
15.16 Turbo Prop Engines	MEA223D, MEA322C
15.17 Turbo-Shaft Engines	MEA223D, MEA322C
15.18 Auxiliary Power Units	MEA223D, MEA322C
15.19 Power plant Installation	MEA203C, MEA306C
15.20 Fire Protection Systems	MEA223D, MEA318C
15.21 Engine Monitoring and Ground Operation	MEA322C, MEA323B
15.22 Engine Storage and Preservation	MEA306C
Module 17 Propeller	
17.1 Fundamentals	MEA315C
17.2 Propeller Construction	MEA315C
17.3 Propeller Pitch Control	MEA223D, MEA315C
17.4 Propeller Synchronising	MEA223D, MEA315C
17.5 Propeller Ice Protection	MEA223D, MEA315C
17.6 Propeller Maintenance	MEA315C
17.7 Propeller Storage and Preservation	MEA307C

Alignment between CASA Licensing Syllabus and Aeroskills Units of Competency – B1.2 Licence

Syllabus Reference B1.2 Licence	**Units of Competency Providing Full Coverage**
Module 1 Mathematics	MEA201B
Module 2 Physics	MEA201B
Module 3 Electrical Fundamentals	
3.1 Electron Theory	MEA201B
3.2 Static Electricity and Conduction	MEA201B
3.3 Electrical Terminology	MEA201B
3.4 Generation of Electricity	MEA201B
3.5 DC Sources of Electricity	MEA201B
3.6 DC Circuits	MEA201B
3.7 Resistance/Resistor	MEA201B
3.8 Power	MEA201B
3.9 Capacitance/Capacitor	MEA201B
3.10 Magnetism	MEA201B
3.11 Inductance/Inductor	MEA201B
3.12 DC Motor/Generator Theory	MEA203C
3.13 AC Theory	MEA203C
3.14 Resistive, Capacitive and Inductive Circuits	MEA203C
3.15 Transformers	MEA203C
3.16 Filters	MEA203C
3.17 AC Generators	MEA203C
3.18 AC Motors	MEA203C
Module 4 Electronic Fundamentals	
4.1 Semiconductors	MEA343B

Syllabus Reference B1.2 Licence	**Units of Competency Providing Full Coverage**
4.2 Printed Circuit Boards	MEA343B
4.3 Servomechanisms	MEA343B
Module 5 Digital Techniques Electronic Instrument Systems	
5.1 Electronic Instrument Systems	MEA343B
5.2 Numbering Systems	MEA343B
5.3 Data Conversion	MEA343B
5.4 Data Buses	MEA343B
5.5 Logic Circuits	MEA343B
5.6 Basic Computer Structure	MEA343B
5.7 Microprocessors	Not required
5.8 Integrated Circuits	Not required
5.9 Multiplexing	Not required
5.10 Fibre Optics	MEA343B
5.11 Electronic Displays	MEA343B
5.12 Electrostatic Sensitive Devices	MEA343B
5.13 Software Management Control	MEA343B
5.14 Electromagnetic Environment	MEA343B
5.15 Typical Electronic/Digital Aircraft Systems	MEA343B
Module 6 Materials and Handling	
6.1 Aircraft Materials – Ferrous	MEA109B
6.2 Aircraft Materials – Non-Ferrous	MEA109B
6.3 Aircraft Materials – Composite and Non-Metallic	MEA339C

Syllabus Reference B1.2 Licence	**Units of Competency Providing Full Coverage**
6.4 Corrosion	MEA339C
6.5 Fasteners	MEA109B
6.6 Pipes and Unions	MEA109B
6.7 Springs	MEA109B
6.8 Bearings	MEA302C
6.9 Transmissions	MEA306C
6.10 Control Cables	MEA109B
6.11 Electrical Cables and Connectors	MEA201B, MEA246C
Module 7 Maintenance Practices	
7.1 Safety Precautions – Aircraft and Workshop	MEA101B
7.2 Workshop Practices	MEA107B, MEA109B
7.3 Tools	MEA109B, MEA260B
7.4 Avionic General Test Equipment	MEA260B
7.5 Engineering Drawings, Diagrams and Standards	MEA107B
7.6 Fits and Clearances	MEA107B, 109B
7.7 Electrical cables and Connectors	MEA246C
7.8 Riveting	MEA339C
7.9 Pipes and Hoses	MEA302C, MEA303D, MEA328C
7.10 Springs	MEA309C, MEA328C
7.11 Bearings	MEA309C, MEA313C
7.12 Transmissions	MEA309C, MEA313C
7.13 Control Cables	MEA309C, MEA328C
7.14 Material Handling	MEA339C

Syllabus Reference B1.2 Licence	**Units of Competency Providing Full Coverage**
7.15 Welding, Brazing, Soldering and Bonding	MEA201B, MEA339C, MEA365A
7.16 Aircraft Weight and Balance	MEA325B
7.17 Aircraft Handling and Storage	MEA301C
7.18 Disassembly, Inspection, Repair and Assembly Techniques	MEA211B, MEA309C, MEA313C, MEA323B, MEA328C, MEA339C, MEA365A
7.19 Abnormal Events	MEA112B
7.20 Maintenance Procedures	MEA112B
Module 8 Basic Aerodynamics	
8.1 Physics of the Atmosphere	MEA312C
8.2 Aerodynamics	MEA312C
8.3 Theory of Flight	MEA312C
8.4 Flight Stability and Dynamics	MEA312C
Module 9 Human Factors	
9.1 General	MEA103B, MEA113C
9.2 Human Performance and Limitations	MEA103B, MEA113C
9.3 Social Psychology	MEA103B, MEA113C
9.4 Factors Affecting Performance	MEA103B, MEA113C
9.5 Physical Environment	MEA103B, MEA113C
9.6 Tasks	MEA103B, MEA113C
9.7 Communication	MEA103B, MEA113C
9.8 Human Error	MEA103B, MEA113C
9.9 Hazards in the Workplace	MEA101B, MEA116B
Module 10 Aviation Legislation	

Syllabus Reference B1.2 Licence	**Units of Competency Providing Full Coverage**
10.1 Regulatory framework	MEA111C
10.2 Part 66 Certifying Staff	MEA111C
10.3 Part 145 – Approved Maintenance Organisations	MEA111C
10.4 Air Operations	MEA111C
10.5 Certification of Aircraft, Parts and Appliances	MEA111C
10.6 Parts 21 and 42	MEA111C
10.7 Applicable National and International requirements	MEA111C
Module 11 Aeroplane Aerodynamics, Structure and Systems	
11.1 Theory of Flight	MEA312C
11.2 Airframe Structures – General concepts	MEA339C
11.3 Airframe Structures – Aeroplanes	MEA339C
11.4 Air Conditioning and Cabin Pressurisation	MEA211C, MEA219C, MEA309C
11.5 Instruments and Avionic Systems	MEA343B
11.6 Electrical Power	MEA211C, MEA301C
11.7 Equipment and Furnishings	MEA304C or MEA317C
11.8 Fire Protection	MEA211C, MEA309C
11.9 Flight Controls	MEA211C, MEA312C
11.10 Fuel Systems	MEA211C, MEA301C, MEA309C
11.11 Hydraulic Power	MEA211C, MEA301C, MEA309C
11.12 Ice and Rain Protection	MEA211C, MEA301C, MEA309C
11.13 Landing Gear	MEA211C, MEA309C
11.14 Lights	MEA211C

Syllabus Reference B1.2 Licence	**Units of Competency Providing Full Coverage**
11.15 Oxygen	MEA222C
11.16 Pneumatic and Vacuum	MEA211C, MEA310C
11.17 Water and Waste	MEA211C, MEA309C
11.18 On Board Maintenance Systems	MEA343B
11.19 Integrated modular avionics	MEA343B
11.20 Cabin systems	MEA343B
11.21 Information systems such as air traffic and information management systems and network server systems	MEA343B
Module 16 Piston Engine	
16.1 Fundamentals	MEA313C
16.2 Engine Performance	MEA313C
16.3 Engine Construction	MEA313C
16.4 Engine Fuel Systems	MEA211C, MEA313C, MEA343B
16.5 Starting and Ignition Systems	MEA211C, MEA313C
16.6 Induction, Exhaust and Cooling Systems	MEA313C
16.7 Supercharging/Turbocharging	MEA313C
16.8 Lubricants and Fuels	MEA301C, MEA313C
16.9 Lubrication Systems	MEA313C
16.10 Engine Indication Systems	MEA211C, MEA313C, MEA343B
16.11 Power plant Installation	MEA203C, MEA306C
16.12 Engine Monitoring and Ground Operation	MEA313C
16.13 Engine Storage and Preservation	MEA306C
Module 17 Propeller	

Syllabus Reference B1.2 Licence	Units of Competency Providing Full Coverage
17.1 Fundamentals	MEA315C
17.2 Propeller Construction	MEA315C
17.3 Propeller Pitch Control	MEA211C, MEA315C
17.4 Propeller Synchronising	MEA211C, MEA315C
17.5 Propeller Ice Protection	MEA211C, MEA315C
17.6 Propeller Maintenance	MEA315C
17.7 Propeller Storage and Preservation	MEA307C

Alignment between CASA Licensing Syllabus and Aeroskills Units of Competency – B1.3 Licence

Syllabus Reference B1.3 Licence	Units of Competency Providing Full Coverage
Module 1 Mathematics	MEA201B
Module 2 Physics	MEA201B
Module 3 Electrical Fundamentals	
3.1 Electron Theory	MEA201B
3.2 Static Electricity and Conduction	MEA201B
3.3 Electrical Terminology	MEA201B
3.4 Generation of Electricity	MEA201B
3.5 DC Sources of Electricity	MEA201B
3.6 DC Circuits	MEA201B
3.7 Resistance/Resistor	MEA201B
3.8 Power	MEA201B
3.9 Capacitance/Capacitor	MEA201B
3.10 Magnetism	MEA201B

Syllabus Reference B1.3 Licence	**Units of Competency Providing Full Coverage**
3.11 Inductance/Inductor	MEA201B
3.12 DC Motor/Generator Theory	MEA203C
3.13 AC Theory	MEA203C
3.14 Resistive, Capacitive and Inductive Circuits	MEA203C
3.15 Transformers	MEA203C
3.16 Filters	MEA203C
3.17 AC Generators	MEA203C
3.18 AC Motors	MEA203C
Module 4 Electronic Fundamentals	
4.1 Semiconductors	MEA343B
4.2 Printed Circuit Boards	MEA343B
4.3 Servomechanisms	MEA343B
Module 5 Digital Techniques Electronic Instrument Systems	
5.1 Electronic Instrument Systems	MEA343B
5.2 Numbering Systems	MEA343B
5.3 Data Conversion	MEA343B
5.4 Data Buses	MEA343B
5.5 Logic Circuits	MEA343B
5.6 Basic Computer Structure	MEA343B
5.7 Microprocessors	Not required
5.8 Integrated Circuits	Not required
5.9 Multiplexing	Not required
5.10 Fibre Optics	MEA343B

Syllabus Reference B1.3 Licence	**Units of Competency Providing Full Coverage**
5.11 Electronic Displays	MEA343B
5.12 Electrostatic Sensitive Devices	MEA343B
5.13 Software Management Control	MEA343B
5.14 Electromagnetic Environment	MEA343B
Typical Electronic/Digital Aircraft Systems	MEA343B
Module 6 Materials and Handling	
6.1 Aircraft Materials – Ferrous	MEA109B
6.2 Aircraft Materials – Non-Ferrous	MEA109B
6.3 Aircraft Materials – Composite and Non-Metallic	MEA339C
6.4 Corrosion	MEA339C
6.5 Fasteners	MEA109B
6.6 Pipes and Unions	MEA109B
6.7 Springs	MEA109B
6.8 Bearings	MEA302C
6.9 Transmissions	MEA306C
6.10 Control Cables	MEA109B
6.11 Electrical Cables and Connectors	MEA201B, MEA246C
Module 7 Maintenance Practices	
7.1 Safety Precautions – Aircraft and Workshop	MEA101B
7.2 Workshop Practices	MEA107B, MEA109B
7.3 Tools	MEA109B, MEA260B
7.4 Avionic General Test Equipment	MEA260B
7.5 Engineering Drawings, Diagrams and	MEA107B

Syllabus Reference B1.3 Licence	**Units of Competency Providing Full Coverage**
Standards	
7.6 Fits and Clearances	MEA107B, MEA109B
7.7 Electrical cables and Connectors	MEA246C
7.8 Riveting	MEA339C
7.9 Pipes and Hoses	MEA302C, MEA303D, MEA328C
7.10 Springs	MEA309C, MEA328C
7.11 Bearings	MEA309C, MEA319C
7.12 Transmissions	MEA309C, MEA316C
7.13 Control Cables	MEA316C, MEA328C
7.14 Material Handling	MEA339C
7.15 Welding, Brazing, Soldering and Bonding	MEA201B, MEA339C, MEA365A
7.16 Aircraft Weight and Balance	MEA325B
7.17 Aircraft Handling and Storage	MEA301C
7.18 Disassembly, Inspection, Repair and Assembly Techniques	MEA309C, MEA322C, MEA323B, MEA328C, MEA339C, MEA365A
7.19 Abnormal Events	MEA112B
7.20 Maintenance Procedures	MEA112B
Module 8 Basic Aerodynamics	
8.1 Physics of the Atmosphere	MEA316C, MEA322C
8.2 Aerodynamics	MEA316C
8.3 Theory of Flight	MEA316C
8.4 Flight Stability and Dynamics	MEA316C
Module 9 Human Factors	
9.1 General	MEA103B, MEA113C

Syllabus Reference B1.3 Licence	**Units of Competency Providing Full Coverage**
9.2 Human Performance and Limitations	MEA103B, MEA113C
9.3 Social Psychology	MEA103B, MEA113C
9.4 Factors Affecting Performance	MEA103B, MEA113C
9.5 Physical Environment	MEA103B, MEA113C
9.6 Tasks	MEA103B, MEA113C
9.7 Communication	MEA103B, MEA113C
9.8 Human Error	MEA103B, MEA113C
9.9 Hazards in the Workplace	MEA101B, MEA116B
Module 10 Aviation Legislation	
10.1 Regulatory framework	MEA111C
10.2 Part 66 Certifying Staff	MEA111C
10.3 Part 145 – Approved Maintenance Organisations	MEA111C
10.4 Air Operations	MEA111C
10.5 Certification of Aircraft, Parts and Appliances	MEA111C
10.6 Parts 21 and 42	MEA111C
10.7 Applicable National and International requirements	MEA111C
Module 12 Helicopter Aerodynamics, Structures and Systems	
12.1 Theory of Flight – Rotary Wing Aerodynamics	MEA316C
12.2 Flight Control Systems	MEA316C
12.3 Blade Tracking and Vibration Analysis	MEA316C
12.4 Transmissions	MEA316C

Syllabus Reference B1.3 Licence	**Units of Competency Providing Full Coverage**
12.5 Airframe Structures	MEA304C, MEA339C
12.6 Air Conditioning	MEA310C
12.7 Instruments and Avionic Systems	MEA343B
12.8 Electrical Power	MEA223D, MEA301C
12.9 Equipment and Furnishings	MEA304C
12.10 Fire Protection	MEA223D, MEA318C
12.11 Fuel Systems	MEA223D, MEA301C, MEA309C
12.12 Hydraulic Power	MEA223D, MEA309C
12.13 Ice and Rain Protection	MEA223D, MEA310C
12.14 Landing Gear	MEA223D, MEA309C
12.15 Lights	MEA223D
12.16 Pneumatic and Vacuum	MEA223D, MEA310C
12.17 Integrated modular avionics	MEA343B
12.18 On Board Maintenance Systems	MEA343B
12.19 Information systems such as air traffic and information management systems and network server systems	MEA343B
Module 15 Gas Turbine Engine	
15.1 Fundamentals	MEA322C
15.2 Engine Performance	MEA322C
15.3 Inlet	MEA223D, MEA322C
15.4 Compressors	MEA322C
15.5 Combustion Section	MEA322C
15.6 Turbine Section	MEA322C

Syllabus Reference B1.3 Licence	Units of Competency Providing Full Coverage
15.7 Exhaust	MEA322C
15.8 Bearings and Seals	MEA322C
15.9 Lubricants and Fuels	MEA301C
15.10 Lubrication Systems	MEA322C
15.11 Fuel Systems	MEA223D, MEA322C
15.12 Air Systems	MEA223D, MEA322C
15.13 Starting and Ignition Systems	MEA223D, MEA322C
15.14 Engine Indication Systems	MEA322C, MEA343B
15.15 Power Augmentation Systems	MEA322C
15.16 Turbo Prop Engines	MEA223D, MEA322C
15.17 Turbo-Shaft Engines	MEA223D, MEA322C
15.18 Auxiliary Power Units	MEA223D, MEA322C
15.19 Power plant Installation	MEA203C, MEA306C
15.20 Fire Protection Systems	MEA223D, MEA310C
15.21 Engine Monitoring and Ground Operation	MEA322C, MEA323B
15.22 Engine Storage and Preservation	MEA306C

Alignment between CASA Licensing Syllabus and Aeroskills Units of Competency – B1.4 Licence

Syllabus Reference B1.4 Licence	Units of Competency Providing Full Coverage
Module 1 Mathematics	MEA201B
Module 2 Physics	MEA201B
Module 3 Electrical Fundamentals	
3.1 Electron Theory	MEA201B

Syllabus Reference B1.4 Licence	**Units of Competency Providing Full Coverage**
3.2 Static Electricity and Conduction	MEA201B
3.3 Electrical Terminology	MEA201B
3.4 Generation of Electricity	MEA201B
3.5 DC Sources of Electricity	MEA201B
3.6 DC Circuits	MEA201B
3.7 Resistance/Resistor	MEA201B
3.8 Power	MEA201B
3.9 Capacitance/Capacitor	MEA201B
3.10 Magnetism	MEA201B
3.11 Inductance/Inductor	MEA201B
3.12 DC Motor/Generator Theory	MEA203C
3.13 AC Theory	MEA203C
3.14 Resistive, Capacitive and Inductive Circuits	MEA203C
3.15 Transformers	MEA203C
3.16 Filters	MEA203C
3.17 AC Generators	MEA203C
3.18 AC Motors	MEA203C
Module 4 Electronic Fundamentals	
4.1 Semiconductors	MEA343B
4.2 Printed Circuit Boards	MEA343B
4.3 Servomechanisms	MEA343B
Module 5 Digital Techniques Electronic Instrument Systems	
5.1 Electronic Instrument Systems	MEA343B

Syllabus Reference B1.4 Licence	**Units of Competency Providing Full Coverage**
5.2 Numbering Systems	MEA343B
5.3 Data Conversion	MEA343B
5.4 Data Buses	MEA343B
5.5 Logic Circuits	MEA343B
5.6 Basic Computer Structure	MEA343B
5.7 Microprocessors	Not required
5.8 Integrated Circuits	Not required
5.9 Multiplexing	Not required
5.10 Fibre Optics	MEA343B
5.11 Electronic Displays	MEA343B
5.12 Electrostatic Sensitive Devices	MEA343B
5.13 Software Management Control	MEA343B
5.14 Electromagnetic Environment	MEA343B
5.15 Typical Electronic/Digital Aircraft Systems	MEA343B
Module 6 Materials and Handling	
6.1 Aircraft Materials – Ferrous	MEA109B
6.2 Aircraft Materials – Non-Ferrous	MEA109B
6.3 Aircraft Materials – Composite and Non-Metallic	MEA339C
6.4 Corrosion	MEA339C
6.5 Fasteners	MEA109B
6.6 Pipes and Unions	MEA109B
6.7 Springs	MEA109B
6.8 Bearings	MEA302B

Syllabus Reference B1.4 Licence	**Units of Competency Providing Full Coverage**
6.9 Transmissions	MEA306B
6.10 Control Cables	MEA109B
6.11 Electrical Cables and Connectors	MEA201B, MEA246C
Module 7 Maintenance Practices	
7.1 Safety Precautions – Aircraft and Workshop	MEA101B
7.2 Workshop Practices	MEA107B, MEA109B
7.3 Tools	MEA109B, MEA260B
7.4 Avionic General Test Equipment	MEA260B
7.5 Engineering Drawings, Diagrams and Standards	MEA107B
7.6 Fits and Clearances	MEA107B, MEA109B
7.7 Electrical cables and Connectors	MEA246C
7.8 Riveting	MEA339C
7.9 Pipes and Hoses	MEA302C, MEA303D, MEA328C
7.10 Springs	MEA309C, MEA328C
7.11 Bearings	MEA309C, MEA313C, MEA316C
7.12 Transmissions	MEA309C, MEA316C
7.13 Control Cables	MEA309C, MEA328C
7.14 Material Handling	MEA339C
7.15 Welding, Brazing, Soldering and Bonding	MEA201B, MEA339C, MEA365A
7.16 Aircraft Weight and Balance	MEA325B
7.17 Aircraft Handling and Storage	MEA301C
7.18 Disassembly, Inspection, Repair and Assembly Techniques	MEA211C, MEA309C, MEA313C, MEA316C, MEA323B, MEA328C, MEA339C, MEA365A

Syllabus Reference B1.4 Licence	**Units of Competency Providing Full Coverage**
7.19 Abnormal Events	MEA112B
7.20 Maintenance Procedures	MEA112B
Module 8 Basic Aerodynamics	
8.1 Physics of the Atmosphere	MEA316C
8.2 Aerodynamics	MEA316C
8.3 Theory of Flight	MEA316C
8.4 Flight Stability and Dynamics	MEA316C
Module 9 Human Factors	
9.1 General	MEA103B, MEA113C
9.2 Human Performance and Limitations	MEA103B, MEA113C
9.3 Social Psychology	MEA103B, MEA113C
9.4 Factors Affecting Performance	MEA103B, MEA113C
9.5 Physical Environment	MEA103B, MEA113C
9.6 Tasks	MEA103B, MEA113C
9.7 Communication	MEA103B, MEA113C
9.8 Human Error	MEA103B, MEA113C
9.9 Hazards in the Workplace	MEA101B, MEA116B
Module 10 Aviation Legislation	
10.1 Regulatory framework	MEA111C
10.2 Part 66 Certifying Staff	MEA111C
10.3 Part 145 – Approved Maintenance Organisations	MEA111C
10.4 Air Operations	MEA111C
10.5 Certification of Aircraft, Parts and Appliances	MEA111C

Syllabus Reference B1.4 Licence	**Units of Competency Providing Full Coverage**
10.6 Parts 21 and 42	MEA111C
10.7 Applicable National and International requirements	MEA111C
Module 12 Helicopter Aerodynamics, Structures and Systems	
12.1 Theory of Flight – Rotary Wing Aerodynamics	MEA316C
12.2 Flight Control Systems	MEA316C
12.3 Blade Tracking and Vibration Analysis	MEA316C
12.4 Transmissions	MEA316C
12.5 Airframe Structures	MEA304C, MEA339C
12.6 Air Conditioning	MEA310C
12.7 Instruments and Avionic Systems	MEA343B
12.8 Electrical Power	MEA223D, MEA301C
12.9 Equipment and Furnishings	MEA304C
12.10 Fire Protection	MEA223D, 310C
12.11 Fuel Systems	MEA223D, MEA301C, MEA309C
12.12 Hydraulic Power	MEA223D, MEA309C
12.13 Ice and Rain Protection	MEA223D, MEA310C
12.14 Landing Gear	MEA223D, MEA309C
12.15 Lights	MEA223D
12.16 Pneumatic/Vacuum	MEA223D, MEA310C
12.17 Integrated modular avionics	MEA343B
12.18 On Board Maintenance Systems	MEA343B
12.19 Information systems such as air traffic and information management systems and network	MEA343B

Syllabus Reference B1.4 Licence	Units of Competency Providing Full Coverage
server systems	
Module 16 Piston Engine	
16.1 Fundamentals	MEA313C
16.2 Engine Performance	MEA313C
16.3 Engine Construction	MEA313C
16.4 Engine Fuel Systems	MEA211C, MEA313C, MEA343B
16.5 Starting and Ignition Systems	MEA211C, MEA313C
16.6 Induction, Exhaust and Cooling Systems	MEA313C
16.7 Supercharging/Turbocharging	MEA313C
16.8 Lubricants and Fuels	MEA301C, MEA313C
16.9 Lubrication Systems	MEA313C
16.10 Engine Indication Systems	MEA211C, MEA313C, MEA340A
16.11 Power plant Installation	MEA203C, MEA306C
16.12 Engine Monitoring and Ground Operation	MEA313C
16.13 Engine Storage and Preservation	MEA306C

Alignment between CASA Licensing Syllabus and Aeroskills Units of Competency – B2 Licence

Syllabus Reference B2 Licence	Units of Competency Providing Full Coverage
Module 1 Mathematics	MEA201B
Module 2 Physics	MEA201B
Module 3 Electrical Fundamentals	
3.1 Electron Theory	MEA201B
3.2 Static Electricity and Conduction	MEA201B

Syllabus Reference B2 Licence	**Units of Competency Providing Full Coverage**
3.3 Electrical Terminology	MEA201B
3.4 Generation of Electricity	MEA201B
3.5 DC Sources of Electricity	MEA201B
3.6 DC Circuits	MEA201B
3.7 Resistance/Resistor	MEA201B
3.8 Power	MEA201B
3.9 Capacitance/Capacitor	MEA201B
3.10 Magnetism	MEA201B
3.11 Inductance/Inductor	MEA201B
3.12 DC Motor/Generator Theory	MEA203C
3.13 AC Theory	MEA203C
3.14 Resistive, Capacitive and Inductive Circuits	MEA203C
3.15 Transformers	MEA203C
3.16 Filters	MEA203C
3.17 AC Generators	MEA203C
3.18 AC Motors	MEA203C
Module 4 Electronic Fundamentals	
4.1 Semiconductors	MEA228D
4.2 Printed Circuit Boards	MEA207C
4.3 Servomechanisms	MEA228D, MEA230C
Module 5 Digital Techniques Electronic Instrument Systems	
5.1 Electronic Instrument Systems	MEA228D
5.2 Numbering Systems	MEA228D

Syllabus Reference B2 Licence	**Units of Competency Providing Full Coverage**
5.3 Data Conversion	MEA228D
5.4 Data Buses	MEA228D
5.5 Logic Circuits	MEA228D
5.6 Basic Computer Structure	MEA228D
5.7 Microprocessors	MEA228D
5.8 Integrated Circuits	MEA228D
5.9 Multiplexing	MEA228D
5.10 Fibre Optics	MEA228D
5.11 Electronic Displays	MEA228D
5.12 Electrostatic Sensitive Devices	MEA207C
5.13 Software Management Control	MEA228D
5.14 Electromagnetic Environment	MEA207C
5.15 Typical Electronic/Digital Aircraft Systems	MEA228D, MEA230C, MEA232C
Module 6 Materials and Handling	
6.1 Aircraft Materials – Ferrous	MEA109B
6.2 Aircraft Materials – Non-Ferrous	MEA109B
6.3 Aircraft Materials – Composite and Non-Metallic	MEA109B
6.4 Corrosion	MEA223D
6.5 Fasteners	MEA109B
6.6 Pipes and Unions	MEA109B
6.7 Springs	MEA109B
6.8 Bearings	MEA203C
6.9 Transmissions	MEA203C

Syllabus Reference B2 Licence	**Units of Competency Providing Full Coverage**
6.10 Control Cables	MEA109B
6.11 Electrical Cables and Connectors	MEA201B, MEA246C
Module 7 Maintenance Practices	
7.1 Safety Precautions – Aircraft and Workshop	MEA101B
7.2 Workshop Practices	MEA107B, MEA109B
7.3 Tools	MEA109B, MEA260B
7.4 Avionic General Test Equipment	MEA260B
7.5 Engineering Drawings, Diagrams and Standards	MEA107B
7.6 Fits and Clearances	MEA107B, MEA109B
7.7 Electrical cables and Connectors	MEA246B
7.8 Riveting	Not required
7.9 Pipes and Hoses	Not required
7.10 Springs	Not required
7.11 Bearings	Not required
7.12 Transmissions	Not required
7.13 Control Cables	Not required
7.14 Material Handling	Not required
7.15 Welding, Brazing, Soldering and Bonding (a) only	MEA201B
7.16 Aircraft Weight and Balance (a) only	MEA241C
7.17 Aircraft Handling and Storage	MEA301C
7.18 Disassembly, Inspection, Repair and Assembly Techniques	MEA227D, MEA228D, MEA229D, MEA230C, MEA232C, MEA235B
7.19 Abnormal Events	MEA112B

Syllabus Reference B2 Licence	**Units of Competency Providing Full Coverage**
7.20 Maintenance Procedures	MEA112B
Module 8 Basic Aerodynamics	
8.1 Physics of the Atmosphere	MEA228D, MEA230C
8.2 Aerodynamics	MEA230C
8.3 Theory of Flight	MEA230C
8.4 Flight Stability and Dynamics	MEA230C
Module 9 Human Factors	
9.1 General	MEA103B, MEA113C
9.2 Human Performance and Limitations	MEA103B, MEA113C
9.3 Social Psychology	MEA103B, MEA113C
9.4 Factors Affecting Performance	MEA103B, MEA113C
9.5 Physical Environment	MEA103B, MEA113C
9.6 Tasks	MEA103B, MEA113C
9.7 Communication	MEA103B, MEA113C
9.8 Human Error	MEA103B, MEA113C
9.9 Hazards in the Workplace	MEA101B, MEA116B
Module 10 Aviation Legislation	
10.1 Regulatory framework	MEA111C
10.2 Part 66 Certifying Staff	MEA111C
10.3 Part 145 – Approved Maintenance Organisations	MEA111C
10.4 Air Operations	MEA111C
10.5 Certification of Aircraft, Parts and Appliances	MEA111C
10.6 Parts 21 and 42	MEA111C

Syllabus Reference B2 Licence	**Units of Competency Providing Full Coverage**
10.7 Applicable National and International requirements	MEA111C
Module 13 Aircraft Aerodynamics, Structures and Systems	
13.1 Theory of Flight	MEA230C or MEA218B
13.2 Structures – General Concepts	MEA103B, MEA203C, MEA223D
13.3 Autoflight	MEA230C or MEA231C
13.4 Communication/Navigation	MEA228D, MEA229D, MEA232C
13.5 Electrical Power	MEA223D
13.6 Equipment and Furnishings	MEA226D
13.7 Flight Controls	MEA223D, MEA230C, MEA227D or MEA211C, MEA231C, MEA235B
13.8 Instrument Systems	MEA227D, MEA228D
13.9 Lights	MEA223D
13.10 On Board Maintenance Systems	MEA228D
13.11 Air conditioning and cabin pressurisation	MEA223D, MEA224C, MEA227D, MEA228D
13.12 Fire protection	MEA223D, MEA227D, MEA301C
13.13 Fuel systems	MEA223D, MEA224C, MEA227D, MEA228D, MEA301C
13.14 Hydraulic power	MEA223D, MEA224C, MEA227D, MEA228D, MEA301C
13.15 Ice and rain protection	MEA223D, MEA227D, MEA301C
13.16 Landing gear	MEA223D, MEA227D, MEA301C
13.17 Oxygen	MEA209C, MEA223D, MEA224C, MEA227D, MEA228D
13.18 Pneumatic and vacuum	MEA223D, MEA224C, MEA227D,

Syllabus Reference B2 Licence	Units of Competency Providing Full Coverage
	MEA228D, MEA301C
13.19 Water and waste	MEA223D, MEA227D
13.20 Integrated modular avionics	MEA226D, MEA228D
13.21 Cabin systems	MEA226D, MEA229D
13.22 Information systems such as air traffic and information management systems and network server systems	MEA226D, MEA229D
Module 14 Propulsion	
14.1 Turbine Engines	MEA227D, MEA224C
14.2 Engine Indicating Systems	MEA224C

Appendix 2: Glossary of Terms and Definitions

Acronyms

A	
AC	Advisory Circular or Alternating current
ACAS	Aircraft collision avoidance system
ACARS	Aircraft communications addressing and reporting system
AD	Airworthiness Directive
ADF	Australian Defence Force or Automatic direction finder
AFCS	Automatic flight control system
AH	Artificial horizon
AHRS	Attitude and heading reference system
AM	Amplitude modulated
AMO	Approved Maintenance Organisation (CASA) or Authorised Maintenance

	Organisation (ADF)
APU	Auxiliary power unit
AQF	Australian Qualification Framework
ARINC	Aeronautical Radio Incorporated (avionic data bus)
ASI	Airspeed indicator
ATA	Air Transport Association
ATC	Air traffic control
ATSB	Australian Transport Safety Bureau
B	
BCF	Bromochlorodifluoromethane (fire extinguisher)
C	
CAMO	Continuing airworthiness management organisation
CASA	Civil Aviation Safety Authority
CASR	Civil Aviation Safety Regulation
CAIR	Confidential aviation incident report
CAR	Civil Aviation Regulation
CG	Centre of gravity
CRO	Cathode ray oscilloscope
CRT	Cathode ray tube
CVR	Cockpit voice recorder
D	
DC	Direct current

DG	Directional gyro
DME	Distance measuring equipment
DRABC	Danger, Respond, Airway, Breathing, Circulation
DTP	Desk top publishing
E	
ECAM	Electronic central aircraft monitor system
EFIS	Electronic flight instrument system
EICAS	Engine indicating and crew alerting system
ELT	Emergency location transmitter
EPA	Environmental Protection Agency
EROPS	Extended Range Operations
F	
FADEC	Full authority digital engine control
FDR	Flight data recorder
FLIR	Forward-looking infra-red
FM	Frequency modulated
FMS	Flight management system
FMCS	Flight management computer system
FOD	Foreign Object Damage
FRP	Fibre reinforced plastic
G	
GPS	Global positioning system

GPWS	Ground proximity warning system
GNS	Global navigation system
H	
HEIU	High energy ignition unit
HF	High frequency
HUD	Head-up display
I	
IAS	Indicated airspeed
ILS	Integrated logistic support or instrument landing system
INS	Inertial navigation system
J	

K	

L	
LCR	Inductance, capacitance and resistance (type of electrical circuit)
LDBO	Liquid dry breathing oxygen
LRU	Line replaceable unit
LSA	Logistic support analysis

M	
MCS	Maintenance control section
MDR	Major defect report
MEL	Minimum equipment list
MRB	Maintenance Review Board
MTO	Maintenance Training Organisation (CASR Part 147)
MQI	Maintenance Quality Inspector (ADF airworthiness system)
MSDS	Material safety data sheet
MSG	Maintenance Standards Group
N	
NDT	Non-destructive testing
O	
OAT	Outside air temperature
P	
PCB	Printed circuit board
PCT	Practical consolidation of training
PCU	Passenger control unit
PPE	Personal protective equipment
Q	

R	
RADALT	Radio altimeter
RAM	Reliability, availability and maintainability
RF	Radio frequency
RTO	Registered Training Organisation
S	
SATCOM	Satellite communications
SDR	Service difficulty report
SMS	Stores management system
SSS	Stores suspension system
T	
TACAN	Tactical Aerial Navigation
TAMM	Technical Airworthiness Maintenance Manual (AAP 7001.053)
TAS	True airspeed
TRU	Transformer rectifier unit
U	
UHF	Ultra high frequency
V	
VCR	Video cassette recorder
VHF	Very high frequency
VOR	Very high frequency omni-directional range

VSI	Vertical speed indicator
W	

X	

Y	

Z	

Definitions

Term	**Definition**
Aeroskills Education and Training Reference Group (part of MSA)	The Aerospace industry body providing advice on training and skill needs for aircraft engineering maintenance and manufacture. The Reference Group is part of the Manufacturing Skills Council which operates as MSA.
Analyse	The ability to break down material into component parts, explain relationships between parts and to recognise the organisational principles involved.
Application	The ability to use learned material in new and concrete situations, the application of rules, methods, concepts, principles, laws, theories and skills.
Apprentice/trainee	Any person who is undertaking off-job training courses and/or completing on-job competency standards.

Approved aerospace assessor	A person who is authorised by the particular RTO to assess whether an individual has achieved all of the specified competency requirements for attainment of Aeroskills Training Package units of competency.
Assessment by simulation	Where system or component reliability on some types of aircraft or equipment has resulted in few opportunities to develop competency on-job assessment may be carried out through task simulation, with the circumstances defined as follows: • In an off-job training situation, competency assessment under simulated conditions may be carried out where simulated aircraft maintenance trainers are available, or where training aid aircraft or components are adequate for the development and demonstration of competency. • In a maintenance workplace, competency assessment under simulated conditions may be carried out where a candidate has attained competency in the majority of units relevant to the qualification being sought; sufficient to demonstrate a broad application of basic trade skills and theory. Under such circumstances the candidate could be required to assemble required manuals and documentation and then describe in detail to the assessor how the task would be performed so as to satisfy the prescribed conditions of assessment for the unit of competency.
Classify	To be able to sort and place into groups having common characteristics.
Comprehension	The ability to grasp the meaning of material: translating material from one form to another: by interpreting material (explaining or summarising); predicting consequences or effects.
Component	Any self-contained part, combination of parts, sub-assemblies or units, which perform a distinctive function necessary to the operation of a system.
Construct	To draw, make, design, assemble, prepare or build.
Defect	Any confirmed abnormal condition of an item whether or not this could ultimately result in a failure.
Demonstrate	To perform a set of procedures with or without verbal explanation.
Describe	To supply a verbal account (orally or in writing) that gives the essential categories, properties or relationships.
Equipment	Equipment (including test equipment) required to support the maintenance or manufacture of aircraft or aircraft components.

	Specific application may be further defined by reference to relevant illustrated tool and equipment manuals. Ground support equipment would refer to items, such as trestles, ladders, docking stands, slings and lifting booms, and so on, and a range of high access mobile equipment.
Fabricate/assemble	To take raw stock and make detailed parts by a variety of methods, such as cutting, bending, attaching, and so on. It may be applied to metal and composite structures, electrical parts, and so on.
Generic skill	The fundamental, non-trade specific, skills which are transferable to enable a person to perform a wide variety of similar or related tasks. For example, the 'generic skill' of using a screwdriver implies that the apprentice/trainee can use a range of screwdrivers to perform a variety of tasks.
Industry practice(s)	Procedures and specifications which are generally applicable in aircraft maintenance activities, as specified by standard practice manuals and accepted industry requirements.
Industry standard	Specification or pre-determined procedure or outcome defined by aircraft, component or equipment manufacturers, or regulatory authorities. It may be in the form of manuals, service bulletins, special instruction, civil aviation orders or regulations.
Inspect	To examine or check a system assembly, component or part by visual or physical means, for the purpose of identifying defects or limits.
Licensed Aircraft Maintenance Engineer	The LAME holds a licence issued by CASA allowing him/her to certify or sign for aircraft maintenance as covered by the licence. The LAME certifies (within the limits of the licence) that maintenance, testing or inspection has been carried out to approved data and that the aircraft is airworthy and still meets its type design standard. CASA's new licensing requirements mean that (from a notified date and allowing for transition steps as specified in CAO 100.66) persons will have to complete specified vocational competency pathways prior to applying to CASA for issue of the particular licence sought.
Line replaceable unit	A unit (component) that can be readily changed on an aircraft during line maintenance operations.
Maintenance (scheduled)	That maintenance performed at defined intervals to retain a system, component or part in a serviceable condition by systematic inspection, detection, replacement of worn-out items, adjustment, calibration, cleaning, and so on.

Maintenance (unscheduled)	That maintenance performed to restore a system, component or part to a satisfactory condition by providing correction of a known or suspected malfunction and/or defect.
Manual	A document or publication that provides data relative to a special subject or equipment. Information covered by manuals may include aircraft maintenance, component maintenance, fault isolation, structural repair, system schematics, wiring, weight and balance, illustrated parts catalogues, tools and equipment.
Modify	Change or alter through re-work and/or through the installation or removal of an assembly, component or part.
Overhaul	The work necessary to return an aircraft component back to a zero time condition. In this context, overhaul generally refers to 'off-aircraft' workshop activities.
Part	One piece, or two or more pieces joined together which are not normally subject to disassembly without destruction of designed use.
Procedure	A step-by-step sequence of events or actions, which may also include a process.
Process	To make, alter or finish aircraft parts by bonding, metal spraying, brush cadmium plating, brush alodine, anodising, (flap, rotor and shot) peening, grit blasting, cold hole working, perma and cable swaging, electroplating, heat treatment, photo-etching, welding/machining, and so on.
Regulatory authority	Any organisation or department which has a responsibility for establishing and monitoring adherence to procedures, specifications or standards within the aerospace industry, either nationally or internationally, where applicable.
Remove/install	To take off or attach a sub-assembly, component or part from, or to a larger assembly. It may include assemblies, sub-assemblies, components or equipment.
Repair	To make a failed, damaged or worn component or part serviceable by dismantling assessing serviceability, modifying, rectifying, replacing piece parts and reassembling.
Rig	Adjust to a specified position or condition.
Supervision (of an apprentice/trainee)	Direct: working under direct supervision means an apprentice/trainee receives detailed instruction on the tasks to be performed, is subject to progress checks as to those tasks, and has

	those tasks reviewed on completion. Routine: the task was performed with the apprentice/trainee working independently and only standard inspection requirements or guidance was performed during the task. With this level of supervision, the apprentice/trainee may have been under constant observation during the performance of the task. However, he/she did not require a level of interaction above that of a tradesperson undertaking the same task. Additionally, all associated sub-tasks (paperwork, tool control, and so on) were completed.
System	A combination of interrelated assemblies, components or parts arranged to perform a specific function.
Test	To test and/or function (operate) an assembly, component or part to make sure that it agrees with the applicable specifications. In this definition, testing provides a way in which adjustment and/or troubleshooting/diagnosis can occur.
Troubleshoot/fault diagnosis	To locate and determine the reason for a fault in a system, component or part by means of a systematic checking or analysis.
Tune/adjust/calibrate	Correct or alter a system, circuit, components or indicator to provide a specified outcome or condition.

MEA20411 Certificate II in Aeroskills

Modification History

Release 2 - Licensing requirements clarified - equivalent

Release 1 - Unit codes updated as required - equivalent

Description

This qualification may be of use to employees of aviation maintenance workshops who are required to perform repair and overhaul tasks on a limited range of aircraft electrical, hydraulic, pneumatic, electro-hydraulic and electro-pneumatic components, or who perform simple repairs on a limited range of structural components.

Units of competency that comprise this qualification are a mix of common units that apply to all technical employment streams covered by the MEA11 Aeroskills Training Package (core units) and technical stream units that are specific to a technical employment stream (elective units).

Pathways Information

The qualification provides significant credits towards higher level Aeroskills Certificates.

Licensing/Regulatory Information

This qualification complies with airworthiness regulatory requirements of CASA and the ADF.

Entry Requirements

Not applicable.

Employability Skills Summary

Employability Skill	Industry/enterprise requirements for this qualification include:
Communication	• Understanding work and organisational instructions • Seeking guidance and describing clearly faults, problems and spares requirements • Negotiating with team members regarding timing and progress of work activities • Understanding and interpreting procedures, instructions and maintenance publications

	• Completing maintenance documentation and component tags • Reading drawings relating to maintenance activities • Using computers to obtain maintenance data and complete documentation • Networking with other team members regarding work planning and execution
Teamwork	• Performing tasks as an individual while being responsive to supervisors and allowing for relevant human factors • Working effectively with supervisors, qualified persons providing guidance and other team members who may be of different ages, gender, race, religion and political persuasion • Working effectively as a member of a team and gaining the trust and support of other team members
Problem solving	• With qualified person guidance identifying problems and developing practical solutions to maintenance problems not fully covered by maintenance data • Proposing solutions to problems as modifications or a amendments to specified maintenance processes • Responding to emergencies or accidents in accordance with regulatory and organisational requirements • Using mathematical techniques to obtain and apply dimensional and tolerance data and to convert values between systems of measurement
Initiative and enterprise	• Adapting to new situations that arise as a consequence of revised maintenance data, practices and procedures • Varying work practices and behaviour as a result of performance feedback during competency development and job performance • Evaluating under guidance ideas that may result in modifications or changes to work processes • Applying human factors to avoid maintenance errors and maintain quality standards and adapting competencies to the performance of a range of maintenance tasks • Contributing to a process of continuous improvement and a willingness to support and participate in the effective introduction of new work practices
Planning and organising	• Clarifying task objectives and required outcomes with supervisors and with qualified persons providing guidance
Self-management	• Accepting responsibility for managing individual workload to meet target completion times or fit in with team milestones • Actively seeking opportunities to develop competencies and to apply them across a range of tasks and monitoring performance using indicators such as the extent of guidance required and the level of supervision exercised by supervisors • Identifying career paths beyond Certificate II, especially with

	regard to on-aircraft as an aircraft maintenance engineer or component repair and overhaul in workshops
Learning	• Taking advantage of learning opportunities that arise through expansion of the range of tasks and through organisational continuation training • Adapting competencies to accommodate new ideas and techniques • Using feedback from qualified persons and supervisors to identify ways in which competence can be improved
Technology	• Maintaining components and component parts that are within the scope of competencies and selecting applicable tools and equipment • Storing and caring for components, component parts, tools and support equipment • Using test equipment that is within the scope of competencies held • Amending print-based maintenance publications • Using computers and microfiche to obtain maintenance data and using computers to complete documentation

Packaging Rules

To be awarded the MEA20411 Certificate II in Aeroskills, competency must be demonstrated in one of:

- Avionic: **twelve (12)** units consisting of **eight (8**) Core units plus **three (3)** units from Elective Group A and **one (1)** unit from either Group B or Group C
- Mechanical: **twelve (12)** units consisting of **eight (8)** Core units plus **three (3)** units from Elective Group B and **one (1)** unit from either of Groups A and C
- Structures: **eleven (11)** units consisting of **eight (8)** Core units plus **two (2)** units from Elective Group C and **one (1)** unit from either of Groups A and B.

Core units of competency

Unit code	Unit title	Prerequisites
MEA101B	Interpret occupational health and safety practices in aviation maintenance	Nil
MEA103B	Plan and organise aviation maintenance work activities	MEA101B, MEA105C, MEA107B, MEA108B

Unit code	Unit title	Prerequisites
MEA105C	Apply quality standards applicable to aviation maintenance processes	MEA101B, MEA107B
MEA107B	Interpret and use aviation maintenance industry manuals and specifications	Nil
MEA108B	Complete aviation maintenance industry documentation	MEA105C
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105C, MEA108B
MEA117A	Apply self in the aviation maintenance environment	Nil
MSAENV272B	Participate in environmentally sustainable work practices	Nil

Elective units of competency

Group A

Unit code	Unit title	Prerequisites
MEA238B	Perform routine removal and installation of miscellaneous aircraft electrical hardware/components	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA239B	Fabricate aircraft electrical looms and harnesses	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA240B	Use electrical test equipment to perform basic electrical tests	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B

Group B

Unit code	Unit title	Prerequisites
MEA329B	Dismantle, inspect, maintain and assemble aircraft basic hydraulic and pneumatic components or parts	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA330B	Dismantle, inspect, maintain and assemble aircraft non-primary structural removable components or	MEA101B, MEA103B, MEA105C, MEA107B,

	parts and internal fittings	MEA108B, MEA109B
MEA331B	Dismantle, inspect, maintain and assemble aircraft gas turbine engine components or parts	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA332B	Dismantle, inspect, maintain and assemble aircraft mechanical components or parts	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA333B	Dismantle, inspect, maintain and assemble aircraft piston engine components or parts	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B

Group C

Unit code	Unit title	Prerequisites
MEA406B	Repair/modify aircraft non-primary structural sheetmetal components	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA407B	Repair/modify aircraft non-primary structural non-metallic components	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B

Custom Content Section

Not applicable.

MEA20511 Certificate II in Aircraft Line Maintenance

Modification History

Release 2 - Licensing requirements clarified - equivalent

Release 1 - Unit codes updated as required - equivalent

Description

This qualification is applicable to employees of airlines and other operators of piston, jet and turbo-propeller aircraft and helicopters who are required to hold a CASA A Licence to perform and certify a range of specified maintenance tasks that can be performed with the aircraft on a flight line or at the departure gate. On completion of the required maintenance tasks the individual is authorised to release the aircraft to service.

The qualification satisfies CASA requirements for the grant, under CASR Part 66, of an Aircraft Maintenance Engineer A Licence when:

- the skills and knowledge requirements align with CASA syllabus requirements described under 'Licensing' in the Assessment Guidelines and in Appendix 1
- training has been delivered in accordance with the requirements of CASR Part 147.

The units of competency that comprise this qualification consist of a mix of:

- common units that are applicable to all of the employment streams covered by the MEA11 Aeroskills Training Package or are of an administrative nature relating to the CASA A Licence
- a combination of Avionic, Mechanical and Structures Technical Stream units that apply to the range of tasks performed by the holders of CASA A Licences.
-

Pathways Information

This qualification provides a number of credits towards higher level Aeroskills Certificates and towards the Diploma of Aeroskills (Mechanical) which is required for the grant of a CASA B1 licence.

Licensing/Regulatory Information

This qualification meets the requirements of CASA for the grant of an Aircraft Maintenance Engineer A Licence.

Entry Requirements

Not applicable.

Employability Skills Summary

Employability Skill	Industry/enterprise requirements for this qualification include:
Communication	• Understanding work and organisational instructions • Seeking guidance and describing clearly faults, problems and spares requirements • Negotiating with maintenance controllers or supervisors regarding timing and progress of work activities • Understanding and interpreting regulations, procedures, instructions and maintenance publications • Completing maintenance releases, other documentation and component tags • Reading drawings relating to maintenance activities • Using computers to obtain maintenance data and complete documentation • Networking with other team members regarding work planning and execution
Teamwork	• Performing tasks as an individual while being responsive to maintenance controllers or supervisors and allowing for relevant human factors • Working effectively with others who may be of different ages, gender, race, religion and political persuasion • Working effectively as a member of a maintenance organisation and gaining the trust and support of other members of the organisation
Problem solving	• Identifying problems and developing practical solutions to maintenance problems not fully covered by maintenance data that are within the scope of the CASA A Licence • Proposing solutions to problems as modifications or a amendments to specified maintenance processes • Responding to emergencies or accidents in accordance with regulatory and organisational requirements • Using mathematical techniques to obtain and apply dimensional and tolerance data and to convert values between systems of measurement
Initiative and enterprise	• Adapting to new situations that arise as a consequence of revised maintenance data, practices and procedures • Varying work practices and behaviour as a result of performance feedback during competency development and job performance • Evaluating ideas that may result in modifications or changes to work processes within the scope of the CASA A Licence • Applying human factors to avoid maintenance errors and maintain quality standards and adapting competencies to the

	performance of the range of maintenance tasks that are within the scope of the CASA A Licence • Contributing to a process of continuous improvement and a willingness to support and participate in the effective introduction of new work practices
Planning and organising	• Clarifying task objectives and required outcomes with maintenance controllers or supervisors
Self-management	• Accepting responsibility for managing individual workload to meet target completion times or fit in with team milestones • Actively seeking opportunities to develop competencies and to apply them across a range of tasks and monitoring performance using indicators such as the extent of oversight exercised by supervisors • Identifying career paths beyond Certificate II, especially with regard to progression to an applicable B1 Licence
Learning	• Taking advantage of learning opportunities that arise through type training and organisational continuation training • Adapting competencies to accommodate new ideas and techniques • Using feedback from supervisors to identify ways in which competence can be improved
Technology	• Maintaining aircraft within the scope of the CASA A Licence and selecting applicable tools and support equipment • Storing and caring for components, tools and support equipment • Using test equipment that is within the scope of the CASA A Licence • Amending print-based maintenance publications • Using on-board maintenance systems to identify maintenance requirements • Using computers and microfiche to obtain maintenance data and using computers to complete documentation

Packaging Rules

To be awarded the MEA20511 Certificate II in Aircraft Line Maintenance, competency must be demonstrated in **fifteen (15)** units of competency, as follows:

- **fourteen (14)** Core units made up of common, imported and technical stream units
- **one (1)** unit from Elective Group A, chosen according to the CASA A licence that is being sought.

Core units of competency

Unit code	Unit title	Prerequisites
MEA101B	Interpret occupational health and safety practices in aviation maintenance	Nil
MEA103B	Plan and organise aviation maintenance work activities	MEA101B, MEA105C, MEA107B, MEA108B
MEA105C	Apply quality standards applicable to aviation maintenance processes	MEA101B, MEA107B
MEA107B	Interpret and use aviation maintenance industry manuals and specifications	Nil
MEA108B	Complete aviation maintenance industry documentation	MEA105C
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105C, MEA108B
MEA117A	Apply self in the aviation maintenance environment	Nil
MEA119B	Perform administrative processes to prepare for certification of civil aircraft A level line maintenance	All Certificate II units relevant to the applicable A Licence
MEA240B	Use electrical test equipment to perform basic electrical tests	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA264A	Remove and install aircraft electrical/avionic components during line maintenance	MEA265A
MEA265A	Remove and install general aircraft electrical hardware	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA344A	Remove and install aircraft components	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B

Unit code	Unit title	Prerequisites
MEA418A	Perform basic repair of aircraft internal fittings during line maintenance	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MSAENV272B	Participate in environmentally sustainable work practices	Nil

Elective units Group A

Unit code	Unit title	Prerequisites	Unit applicability
MEA345A	Perform scheduled line maintenance activities on gas turbine engine fixed wing aircraft	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Mandatory where A1 Licence is sought
MEA346A	Perform scheduled line maintenance activities on gas turbine engine rotary wing aircraft	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Mandatory where A3 Licence is sought
MEA347A	Perform scheduled line maintenance activities on piston engine fixed wing aircraft	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Mandatory where A2 Licence is sought
MEA348A	Perform scheduled line maintenance activities on piston engine rotary wing aircraft	MEA101B MEA103B	Mandatory where A4 Licence is sought

Unit code	Unit title	Prerequisites	Unit applicability
		MEA105C MEA107B MEA108B MEA109B	

Custom Content Section

Not applicable.

MEA20611 Certificate II in Aircraft Surface Finishing

Modification History

Release 2 - Licensing requirements clarified - equivalent

Release 1 - Unit codes updated as required - equivalent

Description

This qualification would be applicable to employees of aircraft maintenance organisations or specialist aircraft surface finishing organisations who are involved in the stripping of old finishes and in the preparation of aircraft and aircraft component surfaces for the application of paint and other specialist surface finishes. A limited range of component removal and installation tasks related to surface finishing tasks may also be performed.

Units of competency that comprise this qualification are a mix of common units that are applicable to all employment streams at the Certificate II level plus a number of structures technical stream units that relate to aircraft surface finishing and minor repairs, plus a mechanical technical stream unit that provides optional multi-skilling.

Pathways Information

The qualification provides a significant number of credits towards Surface Finishing qualifications at Certificate III and IV levels. The common units also provide credit towards other Aeroskills qualifications and the elective units would count towards a MEA20411 Certificate II in Aeroskills.

Licensing/Regulatory Information

This qualification complies with airworthiness regulatory requirements of CASA and the ADF.

Entry Requirements

Not applicable.

Employability Skills Summary

Employability Skill	Industry/enterprise requirements for this qualification include:
Communication	• Understanding work and organisational instructions • Seeking guidance and describing clearly faults, problems and

	material requirements • Negotiating with team members regarding timing and progress of work activities • Understanding and interpreting procedures, instructions and maintenance publications • Completing maintenance documentation and component tags • Reading drawings relating to maintenance activities • Using computers to obtain maintenance data and complete documentation • Networking with other team members regarding work planning and execution
Teamwork	• Performing tasks as an individual while being responsive to supervisors and allowing for relevant human factors • Working effectively with supervisors and other team members who may be of different ages, gender, race, religion and political persuasion • Working effectively as a member of a team and gaining the trust and support of other team members
Problem solving	• Identifying problems and developing practical solutions to problems not fully covered by maintenance data • Proposing solutions to problems as modifications or a amendments to specified maintenance processes • Responding to emergencies or accidents in accordance with regulatory and organisational requirements • Using mathematical techniques to obtain and apply dimensional and tolerance data and to convert values between systems of measurement
Initiative and enterprise	• Adapting to new situations that arise as a consequence of revised maintenance data, practices and procedures • Varying work practices and behaviour as a result of performance feedback during competency development and job performance • Evaluating under guidance ideas that may result in modifications or changes to work processes • Applying human factors to avoid maintenance errors and maintain quality standards and adapting competencies to the performance of a range of surface finishing tasks • Contributing to a process of continuous improvement and a willingness to support and participate in the effective introduction of new work practices
Planning and organising	• Clarifying task objectives and required outcomes with supervisors
Self-management	• Accepting responsibility for managing individual workload to meet target completion times or fit in with team milestones • Actively seeking opportunities to develop competencies and to

	apply them across a range of tasks and monitoring performance using indicators such as the extent of guidance required and the level of supervision exercised by supervisors • Identifying career paths beyond Certificate II
Learning	• Taking advantage of learning opportunities that arise through expansion of the range of tasks and through organisational continuation training • Adapting competencies to accommodate new ideas and techniques • Using feedback from peers and supervisors to identify ways in which competence can be improved
Technology	• Maintaining components and component parts that are within the scope of competencies and selecting applicable tools and equipment • Storing and caring for components, component parts, tools and support equipment • Amending print-based maintenance publications • Using computers and microfiche to obtain maintenance data and using computers to complete documentation

Packaging Rules

To be awarded the MEA20611 Certificate II in Aircraft Surface Finishing, competency must be demonstrated in **twelve (12)** or **thirteen (13)** units of competency, depending on the choice of specialist units. These units include:

- **eleven (11)** Core units consisting of common, imported and technical stream units, plus either Elective Group A (one unit) or Group B (two units).

Core units of competency

Unit code	Unit title	Prerequisites
MEA101B	Interpret occupational health and safety practices in aviation maintenance	Nil
MEA103B	Plan and organise aviation maintenance work activities	MEA101B, MEA105C, MEA107B, MEA108B
MEA105C	Apply quality standards applicable to aviation maintenance processes	MEA101B, 107B
MEA107B	Interpret and use aviation maintenance industry	Nil

Unit code	Unit title	Prerequisites
	manuals and specifications	
MEA108B	Complete aviation maintenance industry documentation	MEA105C
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105C, MEA108B
MEA117A	Apply self in the aviation maintenance environment	Nil
MEA411A	Remove surface coatings from aircraft or aircraft components	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA412A	Pre-treat aluminium alloy surfaces	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA413A	Seal aircraft and aircraft component structural seams	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MSAENV272B	Participate in environmentally sustainable work practices	Nil

Elective units

Group A

Unit code	Unit title	Prerequisites
MEA330B	Dismantle, inspect, maintain and assemble aircraft non-primary structural removable components or parts and internal fittings	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B

Group B

Unit code	Unit title	Prerequisites
MEA406B	Repair/modify aircraft non-primary structural sheetmetal components	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B

MEA407B	Repair/modify aircraft non-primary structural non-metallic components	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B

Custom Content Section

Not applicable.

MEA30111 Certificate III in Aircraft Surface Finishing

Modification History

Release 2 - Licensing requirements clarified. Imported units updated to current version - equivalent

Release 1 - Unit codes updated as required - equivalent

Description

This qualification may apply to employees of aircraft maintenance organisations, or of specialist aircraft surface finishing organisations who are required to prepare the surfaces of aircraft and aircraft components for the application of surface finishes, apply paint, specialist finishes and decals or stencils. Also required is the application of aircraft registration markings, national markings and organisational logos.

The units of competency that comprise this qualification are a mix of:

- common units that apply to all Aeroskills specialist streams at Certificate III and IV levels
- structures technical stream units relating to aircraft surface finishing
- imported automotive units relating to the application of paint finishes.
-

Pathways Information

This qualification fully articulates with MEA40911 Certificate IV in Aircraft Surface Finishing and the Common units provide a number of credits towards other Aeroskills qualifications at Certificate III and IV levels.

Licensing/Regulatory Information

This qualification complies with airworthiness regulatory requirements of CASA and the ADF.

Entry Requirements

Not applicable.

Employability Skills Summary

Employability Skill	Industry/enterprise requirements for this qualification include:
Communication	• Understanding work and organisational instructions • Understanding input from specialist personnel and technical representatives

	• Negotiating with other team members or supervisors regarding timing and progress of work activities and access to sections of the aircraft, or to equipment • Understanding and interpreting regulations, procedures, instructions and maintenance publications • Completing maintenance documentation • Reading drawings relating to surface finishing schemes and maintenance activities • Using computers to obtain maintenance data and complete documentation • Networking with other team members regarding work planning and execution
Teamwork	• Performing tasks as an individual while being responsive to supervisors and allowing for relevant human factors • Working effectively with others who may be of different ages, gender, race, religion and political persuasion • Assisting other team members with tasks and providing advice on work processes
Problem solving	• Identifying problems in a timely manner and developing practical solutions to problems not fully covered by maintenance data • Proposing solutions to problems as modifications or a amendments to specified maintenance processes • Constantly reviewing problem solving skills and ability to effectively apply competencies to solve problems within the limits permitted by regulatory and organisational guidelines • Responding to emergencies or accidents in accordance with regulatory and organisational requirements • Using mathematical techniques to apply finishing schemes and to convert values between systems of measurement
Initiative and enterprise	• Adapting to new situations that arise as a consequence of regulatory changes, revised maintenance data, practices and procedures • Varying work practices and behaviour as a result of performance feedback from peers and supervisors • Evaluating ideas to ensure that technical and regulatory aspects have been fully covered before proposing action that may result in modifications or changes to work processes • Applying human factors to avoid maintenance errors and maintain quality standards • Adapting competencies to the performance of a wide range of maintenance tasks • Contributing to a process of continuous improvement and a willingness to support and participate in the effective introduction of new work practices

Planning and organising	• Clarifying task objectives and required outcomes through discussion with supervisors and other team members • Monitoring the time taken to complete tasks against team requirements or targets provided by supervisors • Collecting, analysing and organising information relating to assigned tasks and confirming the purpose and required work outcomes • Identifying the extent of impact on assigned work of changes in procedures, work instructions or regulatory requirements
Self-management	• Accepting responsibility for managing individual workload to meet target completion times or fit in with team milestones • Assessing personal knowledge and skills with the aid of the self-assessment work sheets in the Log of Industrial Experience and Achievement and preparing for competency assessments • Actively seeking opportunities to develop competencies and to apply them across a range of tasks and monitoring performance using indicators such as the extent of oversight exercised by supervisors • Identifying career paths and training opportunities that will assist in attaining career goals
Learning	• Taking advantage of learning opportunities that arise through training courses provided by the organisation or external providers and through mentoring and on-job training • Adapting competencies to accommodate new ideas and techniques • Using feedback from supervisors and peers to identify ways in which competence can be improved • Mentoring new or more junior personnel • Interpreting units of competency and applying them to attainment of identified career goals
Technology	• Operating PPE and surface finishing equipment and ground support equipment and troubleshooting equipment faults • Testing the performance and calibration of surface finishing equipment • Storing and caring for surface finishing equipment, PPE and support equipment • Amending various forms of maintenance data • Using computers and microfiche to obtain maintenance data and using computers to complete documentation

Packaging Rules

To be awarded the MEA30111 Certificate III in Aircraft Surface Finishing, competency must be demonstrated in **seventeen (17)** Core units of competency. Units must be chosen as specified under the conditions set out below.

There are no elective units for this qualification.

Core units – Common and imported

Take all **eight (8)** of the common and imported core units listed below.

Unit code	Unit title	Prerequisites
MEA101B	Interpret occupational health and safety practices in aviation maintenance	Nil
MEA103B	Plan and organise aviation maintenance work activities	MEA101B, MEA105C, MEA107B, MEA108B
MEA105C	Apply quality standards applicable to aviation maintenance processes	MEA101B, MEA107B
MEA107B	Interpret and use aviation maintenance industry manuals and specifications	Nil
MEA108B	Complete aviation maintenance industry documentation	MEA105C
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105C, MEA108B
MEA118A	Conduct self in the aviation maintenance environment	Nil
MSAENV272B	Participate in environmentally sustainable work practices	Nil

Core units – Technical and imported

Plus, the **nine (9)** core technical stream and imported units listed below.

Unit Code	Unit Title	Prerequisites
MEA411A	Remove surface coatings from aircraft or aircraft components	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA412A	Pre-treat aluminium alloy surfaces	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA413A	Seal aircraft and aircraft component structural seams	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA414A	Remove light corrosion from aircraft	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA415A	Paint aircraft surfaces	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA416A	Apply aircraft identification markings, graphics and decals	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA417A	Apply specialty coatings to aircraft	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
AURVTP2003	Prepare spray painting materials and equipment	Nil
AURVTP3012	Apply air dry and polyurethane enamel refinishing materials	Nil

Custom Content Section

Not applicable.

MEA30211 Certificate III in Aeroskills (Mechatronics)

Modification History

Release 2 - Licensing requirements clarified - equivalent

Release 1 - New qualification

Description

This qualification may apply to individuals employed within the General Aviation industry sector on the maintenance of small aircraft who are not seeking direct progression to a CASA B1.2 Aircraft Maintenance Engineer licence limited to basic small aircraft maintenance. It may also be of use as a first Aeroskills qualification for individuals transitioning from an allied trade to employment on small aircraft maintenance.

Individuals who intend to seek the grant of a licence in the future should consider the requirements for MEA41011 Certificate IV in Aeroskills (Mechatronics) when selecting elective units of competency for this qualification.

Pathways Information

Depending on the choice of elective units, this qualification articulates with MEA41011 Certificate IV in Aeroskills (Mechatronics) and a number of units also provide credits towards other qualifications at AQF Certificate IV and Diploma levels.

Licensing/Regulatory Information

This qualification complies with airworthiness regulatory requirements of CASA for the maintenance of small aircraft.

Entry Requirements

Not applicable.

Employability Skills Summary

Employability Skill	Industry/enterprise requirements for this qualification include:
Communication	• Understanding work and organisational instructions • Understanding input from specialist personnel and technical representatives • Negotiating with other team members or supervisors regarding timing and progress of work activities and access to sections of

	the aircraft, or to equipment • Understanding and interpreting regulations, procedures, instructions and maintenance publications • Completing maintenance documentation • Reading drawings relating to modifications and maintenance activities • Using computers to obtain maintenance data and complete documentation • Networking with other team members regarding work planning and execution
Teamwork	• Performing tasks as an individual while being responsive to supervisors and allowing for relevant human factors • Working effectively with others who may be of different ages, gender, race, religion and political persuasion • Assisting other team members with tasks and providing advice on work processes
Problem solving	• Identifying problems in a timely manner and developing practical solutions to problems not fully covered by maintenance data • Proposing solutions to problems as modifications or amendments to specified maintenance processes • Constantly reviewing problem solving skills and ability to effectively apply competencies to solve problems within the limits permitted by regulatory and organisational guidelines • Responding to emergencies or accidents in accordance with regulatory and organisational requirements • Using mathematical techniques to apply tolerances and limits, and to convert values between systems of measurement
Initiative and enterprise	• Adapting to new situations that arise as a consequence of regulatory changes, revised maintenance data, practices and procedures • Varying work practices and behaviour as a result of performance feedback from peers and supervisors • Evaluating ideas to ensure that technical and regulatory aspects have been fully covered before proposing action that may result in modifications or changes to work processes • Applying human factors to avoid maintenance errors and maintain quality standards • Adapting competencies to the performance of a wide range of maintenance tasks • Contributing to a process of continuous improvement and a willingness to support and participate in the effective introduction of new work practices
Planning and organising	• Clarifying task objectives and required outcomes through

	discussion with supervisors and other team members • Monitoring the time taken to complete tasks against team requirements or targets provided by supervisors • Collecting, analysing and organising information relating to assigned tasks and confirming the purpose and required work outcomes • Identifying the extent of impact on assigned work of changes in procedures, work instructions or regulatory requirements
Self-management	• Accepting responsibility for managing individual workload to meet target completion times or fit in with team milestones • Assessing personal knowledge and skills with the aid of the self-assessment work sheets in the Log of Industrial Experience and Achievement and preparing for competency assessments • Actively seeking opportunities to develop competencies and to apply them across a range of tasks and monitoring performance using indicators such as the extent of oversight exercised by supervisors • Identifying career paths and training opportunities that will assist in attaining career goals
Learning	• Taking advantage of learning opportunities that arise through training courses provided by the organisation or external providers and through mentoring and on-job training • Adapting competencies to accommodate new ideas and techniques • Using feedback from supervisors and peers to identify ways in which competence can be improved • Mentoring new or more junior personnel • Interpreting units of competency and applying them to attainment of identified career goals
Technology	• Operating aircraft and avionic systems, test equipment and ground support equipment, ground running engines and troubleshooting faults • Maintaining aircraft systems, components and test stands • Performance testing of aircraft systems and engines • Storing and caring for components, parts, tools, test equipment and support equipment • Amending various forms of maintenance data • Using computers and microfiche to obtain maintenance data and using computers to complete documentation

Packaging Rules

To be awarded the MEA30211 Certificate III in Aeroskills (Mechatronics), competency must be demonstrated in **nineteen (19)** units of competency, as follows:

- **fourteen (14)** Core units consisting of common, technical stream and imported units
- **five (5)** Elective units drawn from the technical stream units listed in Group A while observing the unit selection guidelines.

Core units of competency

Unit code	Unit title	Prerequisites
MEA101B	Interpret occupational health and safety practices in aviation maintenance	Nil
MEA103B	Plan and organise aviation maintenance work activities	MEA101B, MEA105C, MEA107B, MEA108B
MEA105C	Apply quality standards applicable to aviation maintenance processes	MEA101B, MEA107B
MEA107B	Interpret and use aviation maintenance industry manuals and specifications	Nil
MEA108B	Complete aviation maintenance industry documentation	MEA105C
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105C, MEA108B
MEA118A	Conduct self in the aviation maintenance environment	Nil
MEA201B	Remove and install miscellaneous aircraft electrical hardware/components	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts	MEA201B, MEA260B
MEA260B	Use electrical test equipment	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA301C	Perform aircraft flight servicing	MEA101B, MEA103B, MEA105C, MEA107B,

		MEA108B, MEA109B
MEA363B	Inspect, repair and maintain structures and related components of non-pressurised small aircraft	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA364A	Maintain and/or repair small aircraft mechanical components or parts	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MSAENV272B	Participate in environmentally sustainable work practices	Nil

Elective units Group A

Select **five (5)** units while observing the unit selection guidelines in column four.

Unit code	**Unit title**	**Prerequisites**	**Unit selection guidelines**
MEA202C	Remove and install basic aircraft electrical system components	MEA201B	Required for electrical retractable undercarriage maintenance – do not take with MEA274A
MEA210C	Inspect, test and troubleshoot basic aircraft electrical systems and components	MEA202C MEA246C	Required for electrical retractable undercarriage maintenance – do not take with MEA274A
MEA274A	Maintain basic light aircraft electrical systems and components	MEA246C	Required for 100 hourly inspection on basic light aircraft or helicopters
MEA275A	Maintain basic light aircraft instrument systems and components	MEA246C	Required for 100 hourly inspection on basic light aircraft or helicopters
MEA276A	Maintain basic light aircraft communication and radio navigation systems	MEA246C	Required for 100 hourly inspection on basic light aircraft or helicopters
MEA302C	Remove and install aircraft hydro-mechanical and landing	MEA101B MEA103B	Required for hydraulic retractable undercarriage

Unit code	Unit title	Prerequisites	Unit selection guidelines
	gear system components	MEA105C MEA107B MEA108B MEA109B	maintenance
MEA304C	Remove and install non-pressurised aircraft structural and non-structural components	MEA302C	Do not take with MEA317C – MEA363B provides credits towards this unit
MEA306C	Remove and install engines and engine system components	MEA302C	Applicable to piston and gas turbine engines
MEA307C	Remove and install propeller systems and components	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Required for variable pitch propellers
MEA308C	Remove and install rotary wing rotor and flight control system components	MEA302C	Required for helicopters with powered flight controls – count as 2 units - do not take with MEA352A
MEA309C	Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components	MEA302C	Required for hydraulic retractable undercarriage maintenance
MEA311D	Inspect and repair/modify aircraft structures	MEA304C or MEA317C	MEA363B provides credit towards this unit – count as 2 units
MEA313C	Inspect, test and troubleshoot piston engine systems and components	MEA306C	Required for supercharged and turbocharged engines
MEA314C	Inspect, test and troubleshoot gas turbine engine systems and components	MEA306C	Required for gas turbine engines

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA315C	Inspect, test and troubleshoot propeller systems and components	MEA307C	Required for variable pitch propellers
MEA316C	Inspect, test and troubleshoot rotary wing rotor and control systems and components	MEA308C	Required for helicopters with powered flight controls – count as 2 units – do not take with MEA352A
MEA351A	Maintain airframe systems of basic light fixed wing aircraft	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Required for 100 hourly inspection on basic light aircraft
MEA352A	Maintain basic rotary wing aircraft systems	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Required for 100 hourly inspection on basic helicopters
MEA353A	Maintain basic light aircraft engines and propellers	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Required for 100 hourly inspection on basic light aircraft or helicopters
MEA354A	Maintain light aircraft pneumatic systems	MEA101B MEA103B MEA105C MEA107B MEA108B	

Unit code	Unit title	Prerequisites	Unit selection guidelines
		MEA109B	
MEA355A	Maintain light aircraft air cycle air conditioning systems	MEA201B MEA246C	
MEA356A	Maintain light piston engine aircraft pressurisation systems	MEA201B MEA246C	
MEA357A	Inspect, test and repair aircraft fabric surfaces	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	
MEA359A	Inspect and repair aircraft wooden structures	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	
MEA360A	Maintain aircraft diesel engines	MEA353A	
MEA361A	Maintain aircraft two stroke petrol engines	MEA353A	
MEA362A	Maintain aircraft vapour cycle air conditioning systems	MEA201B MEA246C	
MEA367A	Repair/modify aircraft composite structure using cold bonding	MEA401C or MEA339C or MEA363B	Do not take with MEA405B
MEA405B	Repair/modify aircraft composite material structure/components	MEA401C Note that MEA363B is equivalent to this unit	Required for repairs to composite primary and secondary structure

Custom Content Section

Not applicable.

MEA30311 Certificate III in Aircraft Life Support and Furnishing

Modification History

Release 2 - Licensing requirements clarified. Imported units updated to current version - equivalent

Release 1 - Unit codes updated as required - equivalent

Description

This qualification may be applicable to members of the ADF and to employees of aircraft maintenance organisations who are maintaining aircraft and personal life support equipment and aircraft furnishings.

The qualification consists of a number of common units plus mandatory and elective technical stream units including a number of imported units dealing with explosive ordnance (pyrotechnics) safety and inspection, and with sewing, trimming and use of fabric adhesives.

Pathways Information

The qualification articulates with MEA41111 Certificate IV in Aircraft Life Support and Furnishing and the common units and the elective Avionic, Mechanical and Structures Technical Stream units provide a number of credits towards other Aeroskills Certificates at Certificate II, III and IV levels.

Licensing/Regulatory Information

This qualification complies with airworthiness regulatory requirements of CASA and the ADF.

Entry Requirements

Not applicable.

Employability Skills Summary

Employability Skill	Industry/enterprise requirements for this qualification include:
Communication	• Understanding work and organisational instructions • Understanding input from specialist personnel and technical representatives • Negotiating with other team members or supervisors regarding

	timing and progress of work activities and access to sections of the aircraft, or to equipment • Understanding and interpreting regulations, procedures, instructions and maintenance publications • Completing maintenance documentation • Reading drawings relating to life support and furnishing and maintenance activities • Using computers to obtain maintenance data and complete documentation • Networking with other team members regarding work planning and execution • Delivering briefings on the use of items of life support equipment and communicating with individuals being fitted with personal items of life support equipment
Teamwork	• Performing tasks as an individual while being responsive to supervisors and allowing for relevant human factors • Working effectively with others who may be of different ages, gender, race, religion and political persuasion • Assisting other team members with tasks and providing advice on work processes
Problem solving	• Identifying problems in a timely manner and developing practical solutions to problems not fully covered by maintenance data • Proposing solutions to problems as modifications or a amendments to specified maintenance processes • Constantly reviewing problem solving skills and ability to effectively apply competencies to solve problems within the limits permitted by regulatory and organisational guidelines • Responding to emergencies or accidents in accordance with regulatory and organisational requirements • Using mathematical techniques to manufacture fabric items and to convert values between systems of measurement
Initiative and enterprise	• Adapting to new situations that arise as a consequence of regulatory changes, revised maintenance data, practices and procedures • Varying work practices and behaviour as a result of performance feedback from peers and supervisors • Evaluating ideas to ensure that technical and regulatory aspects have been fully covered before proposing action that may result in modifications or changes to work processes • Applying human factors to avoid maintenance errors and maintain quality standards • Adapting competencies to the performance of a wide range of maintenance and life support equipment fitting tasks • Contributing to a process of continuous improvement and a

	willingness to support and participate in the effective introduction of new work practices
Planning and organising	• Clarifying task objectives and required outcomes through discussion with supervisors and other team members • Monitoring the time taken to complete tasks against team requirements or targets provided by supervisors • Collecting, analysing and organising information relating to assigned tasks and confirming the purpose and required work outcomes • Identifying the extent of impact on assigned work of changes in procedures, work instructions or regulatory requirements
Self-management	• Accepting responsibility for managing individual workload to meet target completion times or fit in with team milestones • Assessing personal knowledge and skills with the aid of the self-assessment work sheets in the Log of Industrial Experience and Achievement and preparing for competency assessments • Actively seeking opportunities to develop competencies and to apply them across a range of tasks and monitoring performance using indicators such as the extent of oversight exercised by supervisors • Identifying career paths and training opportunities that will assist in attaining career goals
Learning	• Taking advantage of learning opportunities that arise through training courses provided by the organisation or external providers and through mentoring and on-job training • Adapting competencies to accommodate new ideas and techniques • Using feedback from supervisors and peers to identify ways in which competence can be improved • Mentoring new or more junior personnel • Interpreting units of competency and applying them to attainment of identified career goals
Technology	• Operating PPE and life support/furnishing maintenance equipment and ground support equipment and troubleshooting equipment faults • Testing the performance and calibration of life support and furnishing equipment • Storing and caring for life support and furnishing equipment, PPE and support equipment • Amending various forms of maintenance data • Using computers and microfiche to obtain life support equipment and maintenance data and using computers to complete documentation

Packaging Rules

To be awarded the MEA30311 Certificate III in Aircraft Life Support and Furnishing, competency must be demonstrated in **twenty one (21)** units of competency, as follows:

- **nine (9)** Core units consisting of common and imported units
- **twelve (12)** Elective units (chosen in accordance with the unit selection guidelines in Column four) from the technical stream and imported units in Group A.

Core units

Unit code	Unit title	Prerequisites
MEA101B	Interpret occupational health and safety practices in aviation maintenance	Nil
MEA103B	Plan and organise aviation maintenance work activities	MEA101B, MEA105C, MEA107B, MEA108B
MEA105C	Apply quality standards applicable to aviation maintenance processes	MEA101B, MEA107B
MEA107B	Interpret and use aviation maintenance industry manuals and specifications	Nil
MEA108B	Complete aviation maintenance industry documentation	MEA105C
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105C, MEA108B
MEA118A	Conduct self in the aviation maintenance environment	Nil
MEM12001B	Use comparison and basic measuring devices	Nil
MSAENV272B	Participate in environmentally sustainable work practices	Nil

Elective units Group A

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA240B	Use electrical test equipment to perform basic electrical tests	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	
MEA304C	Remove and install non-pressurised aircraft structural and non-structural components	MEA302C	do not take with MEA317C
MEA317C	Remove and install pressurised aircraft structural and non-structural components	MEA302C MEA303D	do not take with MEA304C
MEA411A	Remove surface coatings from aircraft or aircraft components	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	
MEA412A	Pre-treat aluminium alloy surfaces	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	
MEA414A	Remove light corrosion from aircraft	MEA101B MEA103B MEA105C MEA107B MEA108B	do not take with MEA419A

Unit code	Unit title	Prerequisites	Unit selection guidelines
		MEA109B	
MEA416A	Apply aircraft identification markings, graphics and decals	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	
MEA419A	Inspect and repair/modify aircraft cabin/cockpit non-primary structure components	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	do not take with MEA414A
MEA501A	Maintain and fit anti-G suits	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B MEA118A MEA511A LMFSF2002B	
MEA502A	Maintain and fit helmets	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B MEA118A MEA240B	

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA503A	Maintain and fit immersion suits	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B MEA118A LMTTF2008A	
MEA504A	Maintain and fit oxygen masks	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B MEA118A MEA240B	
MEA505A	Maintain and pack parachutes	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B MEA118A MEA511A LMFSF2002B	
MEA506A	Maintain and pack survival inflatable life rafts and escape slides	MEA101B MEA103B MEA105C MEA107B MEA108B	

Unit code	Unit title	Prerequisites	Unit selection guidelines
		MEA109B MEA118A	
MEA507A	Maintain, pack and fit survival inflatable buoyancy vests	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B MEA118A	
MEA508A	Maintain, install and remove restraint systems	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B MEA118A MEA511A LMFSF2002B	Elective
MEA509A	Manufacture, repair and alter aircraft related fabric components	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B MEA118A MEA511A LMFSF2002B	
MEA510A	Maintain seat and pod electrical and electronic systems	MEA240B	
MEA511A	Operate and maintain sewing	Nil	

Unit code	Unit title	Prerequisites	Unit selection guidelines
	machines and overlockers		
AURVTT2004	Trim vehicle components	Nil	do not take with LMFUP3012B
AURVTT2005	Select and apply trim and fabric materials	Nil	
AURVTT2006	Select and apply trim and fabric adhesives	Nil	do not take with LMTTF2008A
LMFSF2001B	Cut single layer fabrics	Nil	
LMFSF2002B	Machine sew materials	Nil	
LMFUP3012B	Apply marine sewing and installation techniques	Nil	do not take with AURVTT2004
LMTTF2008A	Use adhesives	Nil	do not take with AURVTT2005
DEFEO101D	Work safely with explosive ordnance	Nil	
DEFEO501D	Conduct explosive ordnance inspection	Nil	

Custom Content Section

Not applicable.

MEA40611 Certificate IV in Aeroskills (Avionics)

Modification History

Release 2 - Licensing requirements clarified - equivalent

Release 1 - Unit codes updated as required - equivalent

Description

This qualification may apply to employees of civil aviation maintenance organisations or to members of the ADF who perform scheduled inspections, fault diagnosis and repair, and modification of aircraft electrical, instrument and radio systems and system components.

The qualification defines the exit from an apprenticeship and may apply to either aircraft maintenance performed on flight lines/ramps and in hangars, or to avionic component repair and overhaul performed in workshops. These outcomes are defined in two streams:

- aircraft maintenance stream
- component maintenance workshop stream.

The qualification consists of:

- common units that apply to all Aeroskills specialist streams at Certificate III and IV levels
- avionic technical stream units relating to either aircraft avionic system and component maintenance or to component repair and overhaul
- one mechanical technical stream unit that is applicable to the aircraft maintenance stream.

Because of the wide application of this qualification there is considerable flexibility in the selection of technical stream units and individuals should be mindful of their future career aspirations when selecting units for, in particular, the aircraft maintenance stream. Provided that the correct elective units are selected, the qualification articulates with the MEA50111 Diploma of Aeroskills (Avionics) which qualifies individuals for the grant by CASA of a B2 Aircraft Maintenance Engineer Licence.

The qualification also provides credits towards the MEA50311 Diploma of Aviation Maintenance Management (Avionics) and the MEA60111 Advanced Diploma of Aviation Maintenance Management (Avionics).

Pathways Information

Not applicable.

Licensing/Regulatory Information

This qualification complies with airworthiness regulatory requirements of CASA and the ADF.

Entry Requirements

Not applicable.

Employability Skills Summary

Employability Skill	Industry/enterprise requirements for this qualification include:
Communication	• Understanding work and organisational instructions • Understanding input from specialist personnel and technical representatives • Providing guidance to others and clearly describing faults, problems and spares requirements • Negotiating with other team members or supervisors regarding timing and progress of work activities and access to sections of the aircraft, or to equipment • Understanding and interpreting regulations, procedures, instructions and maintenance publications • Completing maintenance documentation and component tags • Interpreting wiring diagrams and system schematics, and reading drawings relating to maintenance activities • Using computers to obtain maintenance data and complete documentation • Networking with other team members regarding work planning and execution
Teamwork	• Performing tasks as an individual while being responsive to supervisors and allowing for relevant human factors • Working effectively with others who may be of different ages, gender, race, religion and political persuasion • Assisting other team members with tasks and providing advice on work processes and troubleshooting
Problem solving	• Identifying problems in a timely manner and developing practical solutions to maintenance problems not fully covered by maintenance data • Proposing solutions to problems as modifications or amendments to specified maintenance processes • Constantly reviewing problem solving skills and ability to effectively apply competencies to solve problems within the limits permitted by regulatory and organisational guidelines • Responding to emergencies or accidents in accordance with

	regulatory and organisational requirements • Using mathematical techniques to relate test results to system or component performance and to convert values between systems of measurement
Initiative and enterprise	• Adapting to new situations that arise as a consequence of regulatory changes, revised maintenance data, practices and procedures • Varying work practices and behaviour as a result of performance feedback from peers and supervisors • Evaluating ideas to ensure that technical and regulatory aspects have been fully covered before proposing action that may result in modifications or changes to work processes • Applying human factors to avoid maintenance errors and maintain quality standards • Adapting competencies to the performance of a wide range of maintenance tasks • Contributing to a process of continuous improvement and a willingness to support and participate in the effective introduction of new work practices
Planning and organising	• Clarifying task objectives and required outcomes through discussion with supervisors and other team members • Monitoring the time taken to complete tasks against team requirements or targets provided by supervisors • Collecting, analysing and organising information relating to assigned maintenance tasks and confirming the purpose and required work outcomes • Identifying the extent of impact on assigned work of changes in procedures, work instructions or regulatory requirements
Self-management	• Accepting responsibility for managing individual workload to meet target completion times or fit in with team milestones • Assessing personal knowledge and skills with the aid of the self-assessment work sheets in the Log of Industrial Experience and Achievement and preparing for competency assessments • Actively seeking opportunities to develop competencies and to apply them across a range of tasks and monitoring performance using indicators, such as the extent of oversight exercised by supervisors • Identifying career paths and training opportunities that will assist in attaining career goals
Learning	• Taking advantage of learning opportunities that arise through training courses provided by the organisation or external providers and through mentoring and on-the-job training • Adapting competencies to accommodate new ideas and techniques • Using feedback from supervisors and peers to identify ways in

	which competence can be improved • Mentoring new or more junior personnel • Interpreting units of competency and applying them to attainment of identified career goals
Technology	• Operating aircraft and avionic systems, test equipment and ground support equipment and troubleshooting faults • Using on-board maintenance systems and using maintenance-related software • Operating automatic test stations • Testing the performance and calibration of components and test stations • Storing and caring for components, parts, tools, test equipment and support equipment • Amending various forms of maintenance data • Using computers and microfiche to obtain maintenance data and using computers to complete documentation

Packaging Rules

To be awarded the MEA40611 Certificate IV in Aeroskills (Avionics) competency must be demonstrated in:

- **Aircraft Maintenance Stream**
  - **eleven (11)** Core units consisting of common, imported and some avionic technical stream units
  - **thirteen (13)** Elective technical stream units chosen from Group A
  - Total: **twenty four (24)** units.

OR

- **Component Maintenance Workshop Stream**
  - **twelve (12)** Core units consisting of common, imported and avionic technical stream units
  - **three (3)** Elective technical stream units chosen from Group B
  - Total: **fifteen (15**) units.

Core units (Aircraft Maintenance Stream)

Complete all **eleven (11)** mandatory common, technical stream and imported units listed below.

Unit code	Unit title	Prerequisites
MEA101B	Interpret occupational health and safety practices in aviation maintenance	Nil
MEA103B	Plan and organise aviation maintenance work activities	MEA101B, MEA105C, MEA107B, MEA108B
MEA105C	Apply quality standards applicable to aviation maintenance processes	MEA101B, MEA107B
MEA107B	Interpret and use aviation maintenance industry manuals and specifications	Nil
MEA108B	Complete aviation maintenance industry documentation	MEA105C
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105C, MEA108B
MEA118A	Conduct self in the aviation maintenance environment	Nil
MEA201B	Remove and install miscellaneous aircraft electrical hardware/components	MEA101B, MEA103B MEA105C, MEA107B MEA108B, MEA109B
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts	MEA201B, MEA260B
MEA260B	Use electrical test equipment	MEA101B, MEA103B MEA105C, MEA107B MEA108B, MEA109B
MSAENV272B	Participate in environmentally sustainable work practices	Nil

Core units (Component Maintenance Workshop Stream)

Complete all **twelve (12)** mandatory common, technical stream and imported units listed below.

Unit code	Unit title	Prerequisites
	Interpret occupational health and safety practices	Nil

Unit code	Unit title	Prerequisites
MEA101B	in aviation maintenance	
MEA103B	Plan and organise aviation maintenance work activities	MEA101B, MEA105C, MEA107B, MEA108B
MEA105C	Apply quality standards applicable to aviation maintenance processes	MEA101B, MEA107B
MEA107B	Interpret and use aviation maintenance industry manuals and specifications	Nil
MEA108B	Complete aviation maintenance industry documentation	MEA105C
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105C, MEA108B
MEA118A	Conduct self in the aviation maintenance environment	Nil
MEA201B	Remove and install miscellaneous aircraft electrical hardware/components	MEA101B, MEA103B MEA105C, MEA107B MEA108B, MEA109B
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts	MEA201B, MEA260B
MEA260B	Use electrical test equipment	MEA101B, MEA103B MEA105C, MEA107B MEA108B, MEA109B
MEA261C	Use electronic test equipment	MEA101B, MEA103B MEA105C, MEA107B MEA108B, MEA109B
MSAENV272B	Participate in environmentally sustainable work practices	Nil

Elective units

Group A (Aircraft Maintenance Stream)

Choose **thirteen (13)** of the technical stream units listed below while observing the unit selection guidelines in column four.

Unit code	Unit title	Prerequisite or co-requisite	Unit selection guidelines
MEA202C	Remove and install basic aircraft electrical system components	MEA201B	Do not take with MEA203C
MEA203C	Remove and install advanced aircraft electrical system components	MEA201B	Do not take with MEA202C
MEA204C	Remove and install basic aircraft instrument system components	MEA201B	Do not take with MEA205C
MEA205C	Remove and install advanced aircraft instrument system components	MEA201B	Do not take with MEA204C
MEA206C	Remove and install aircraft basic radio communication and navigation system components	MEA201B	Elective
MEA207C	Remove and install aircraft electronic system components	MEA201B	Elective
MEA208C	Remove and install aircraft pressurisation control system components	MEA201B	Elective
MEA209C	Remove and install aircraft oxygen system components	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Elective
MEA210C	Inspect, test and troubleshoot basic aircraft electrical systems and components	MEA202C MEA246C	Do not take with MEA211C or with MEA223C and MEA227D
MEA211C	Inspect, test and troubleshoot advanced aircraft electrical systems and components	MEA203C MEA246C	Do not take with MEA210C or with MEA223D and MEA227D
MEA212C	Inspect, test and troubleshoot basic aircraft instrument systems	MEA204C MEA246C	Do not take with MEA213C or with MEA224C and

Unit code	Unit title	Prerequisite or co-requisite	Unit selection guidelines
	and components		MEA228D
MEA213C	Inspect, test and troubleshoot advanced aircraft instrument systems	MEA205C MEA246C	Do not take with MEA212C or with MEA224C and MEA228D
MEA214C	Inspect, test and troubleshoot aircraft basic communication and radio navigation systems and components	MEA206C MEA246C	Do not take with MEA226D and MEA229D
MEA215C	Inspect, test and troubleshoot advanced aircraft communications systems and components	MEA206C MEA246C	Do not take with MEA226D and MEA229D
MEA216C	Inspect, test and troubleshoot instrument landing systems and components	MEA206C MEA207C MEA246C	Do not take with MEA226D and MEA229D
MEA217C	Inspect, test and troubleshoot fixed wing autopilot systems and components	MEA207C MEA246C	Take instead of MEA225B and MEA230C if only maintaining 3 axis autopilot system
MEA218C	Inspect, test and troubleshoot rotary wing autopilot systems and components	MEA207C MEA246C	Take instead of MEA231C if only maintaining an autopilot system
MEA219C	Inspect, test and troubleshoot aircraft pressurisation control systems and components	MEA208C MEA246C	Do not take with MEA224C and MEA228D
MEA220C	Inspect, test and troubleshoot aircraft primary radar systems and components	MEA207C MEA246C	Do not take with MEA226D and MEA232C
MEA221C	Inspect, test and troubleshoot aircraft secondary radar systems and components	MEA207C MEA246C	Do not take with MEA226D and MEA232C
MEA222C	Inspect, test and troubleshoot aircraft oxygen systems and components	MEA209C	Elective

Unit code	Unit title	Prerequisite or co-requisite	Unit selection guidelines
MEA223D	Inspect aircraft electrical systems and components	MEA203C MEA246C	Do not take with MEA210C or MEA211C
MEA224C	Inspect aircraft instrument systems and components	MEA205C MEA246C	Do not take with MEA212C or MEA213C
MEA225C	Inspect fixed wing aircraft automatic flight control systems and components	MEA207C MEA246C	Do not take with MEA217C
MEA226D	Inspect aircraft electronic systems and components	MEA207C MEA246C	Do not take with MEA213C, MEA214C or MEA15C
MEA227D	Test and troubleshoot aircraft electrical systems and components	MEA223D	Do not take with MEA211C
MEA228D	Test and troubleshoot aircraft instrument systems and components	MEA224C MEA226D	Do not take with MEA212C or MEA213C
MEA229D	Test and troubleshoot aircraft radio frequency navigation and communications systems and components	MEA226D	Do not take with MEA214C, MEA215C or MEA216C
MEA230C	Test and troubleshoot fixed wing aircraft automatic flight control systems and components	MEA225C MEA246C	Do not take with MEA217C
MEA231C	Inspect, test and troubleshoot rotary wing aircraft automatic flight control systems and components	MEA207C MEA246C	Do not take with MEA218C
MEA232C	Test and troubleshoot aircraft pulse systems and components	MEA226D MEA246C	Do not take with MEA220C or MEA221C
MEA233C	Inspect, test and troubleshoot aircraft inertial navigation and reference systems and components	MEA207C MEA246C	Do not take with MEA226D and MEA228D
MEA234C	Inspect, test and troubleshoot	MEA206C	Do not take with MEA226D

Unit code	Unit title	Prerequisite or co-requisite	Unit selection guidelines
	aircraft global navigation systems and components	MEA207C MEA246C	and MEA229D
MEA261C	Use electronic test equipment	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Elective
MEA262B	Modify/repair single layer printed circuit boards	MEA260B MEA261C	Do not take with MEA263B
MEA263B	Modify/repair multi-layer printed circuit boards	MEA260B MEA261C	Do not take with MEA262B
MEA274A	Maintain basic light aircraft electrical systems and components	MEA246C	Do not take with MEA202C, MEA203C, MEA210C, MEA211C – applicable only to basic light aircraft
MEA275A	Maintain basic light aircraft instrument systems and components	MEA246C	Do not take with MEA204C, MEA205C, MEA212C or MEA213C – applicable only to basic light aircraft
MEA276A	Maintain basic aircraft communication and radio navigation systems and components	MEA246C	Do not take with MEA206C, MEA214C, MEA289A – applicable only to basic light aircraft
MEA277A	Maintain twin engine aircraft electrical systems and components	MEA210C	Do not take with MEA211C
MEA278A	Inspect, test and troubleshoot instrument display systems and components	MEA207C, MEA246C	Do not take with MEA226D, MEA228D
MEA279A	Inspect, test and troubleshoot full authority digital engine control systems	MEA207C, MEA246C	Do not take with MEA230C
MEA280A	Inspect, test and troubleshoot flight management systems and	MEA207C, MEA246C	Elective

Unit code	Unit title	Prerequisite or co-requisite	Unit selection guidelines
	components		
MEA281A	Maintain light aircraft AC powered instrument systems and components	MEA246C	Do not take with MEA213C
MEA289A	Maintain basic light aircraft avionic systems and components	MEA246C	Do not take with MEA206C, MEA214C or MEA276A – applicable only to basic light aircraft
MEA290A	Fit avionic modification sheetmetal components	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Elective - applicable only to small aircraft maintenance
MEA291A	Inspect, test and troubleshoot fixed wing single axis autopilot systems and components	MEA207C, MEA246C	Do not take with MEA217C
MEA301C	Perform aircraft flight servicing	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Elective

Group B (Component Maintenance Workshop Stream)

Choose at least **three (3)** of the Avionic technical stream units listed below while observing the unit selection guidelines in column four.

Unit code	Unit title	Prerequisite or co-requisite	Unit selection guidelines
MEA252B	Test, align and troubleshoot synchro and servo system	MEA201B MEA260B	Elective

	components	MEA261C	
MEA262B	Modify/repair single layer printed circuit boards	MEA260B MEA261C	Do not take with MEA263B
MEA263B	Modify/repair multi-layer printed circuit boards	MEA260B MEA261C	Do not take with MEA262B
MEA282A	Repair or overhaul aircraft pulse system components	MEA260B MEA261C	Elective
MEA283A	Repair or overhaul aircraft display, control and distribution system components	MEA260B MEA261C	Elective
MEA284A	Repair or overhaul aircraft instrument system components	MEA260B MEA261C	Elective
MEA285A	Repair or overhaul aircraft radio frequency communication and navigation system components	MEA260B MEA261C	Elective
MEA286A	Repair or overhaul aircraft electrical/electro-mechanical components	MEA201B MEA260B	Elective
MEA287A	Repair or overhaul aircraft oxygen system components	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Elective
MEA288A	Repair or overhaul aircraft audio and visual systems and reproducers	MEA260B MEA261C	Elective

Custom Content Section

Not applicable.

MEA40711 Certificate IV in Aeroskills (Mechanical)

Modification History

Release 2 - Licensing requirements clarified. Additional electives for component workshop training pathway. Elective unit MEA388A not carried forward (subsumed by elective units MEA392A, MEA393A, MEA394A, MEA395A, MEA396A and MEA397A) - equivalent

Release 1 - Additional electives for component workshop training pathway. Unit codes updated as required - equivalent

Description

This qualification may apply to employees of civil aviation maintenance organisations or to members of the ADF who perform scheduled inspections, fault diagnosis and repair, and modification of airframes and airframe mechanical, hydraulic and pneumatic systems and components, and of aircraft engines and (where applicable) propellers.

The qualification defines the exit from an apprenticeship and may apply to either aircraft maintenance performed on flight lines/ramps and in hangars, or to airframe and engine component repair and overhaul performed in workshops. These outcomes are defined in two streams:

- aircraft maintenance stream
- component maintenance workshop stream.

The qualification consists of:

- common units that apply to all Aeroskills specialist streams at AQF Certificate III and IV levels
- mechanical and structures technical stream units relating to airframe and engine system and component maintenance
- mechanical technical stream units and a small number of avionic stream units that are applicable to the aircraft component maintenance workshop stream.
-

Pathways Information

Because of the wide application of this qualification there is considerable flexibility in the selection of technical stream units and individuals should be mindful of their future career aspirations when selecting units for, in particular, the aircraft maintenance stream. Provided that the correct elective units are selected, the qualification articulates with the MEA50211 Diploma of Aeroskills (Mechanical) which qualifies individuals for the grant by CASA of a B1 Aircraft Maintenance Engineer Licence.

The qualification also provides credits towards the MEA50411 Diploma of Aviation Maintenance Management (Mechanical) and the MEA60211 Advanced Diploma of Aviation Maintenance Management (Mechanical).

Licensing/Regulatory Information

This qualification complies with airworthiness regulatory requirements of CASA and the ADF.

Entry Requirements

Not applicable.

Employability Skills Summary

Employability Skill	Industry/enterprise requirements for this qualification include:
Communication	• Understanding work and organisational instructions • Understanding input from specialist personnel and technical representatives • Providing guidance to others and clearly describing faults, problems and spares requirements • Negotiating with other team members or supervisors regarding timing and progress of work activities and access to sections of the aircraft, or to equipment • Understanding and interpreting regulations, procedures, instructions and maintenance publications • Completing maintenance documentation and component tags • Interpreting wiring diagrams and system schematics, and reading drawings relating to maintenance activities • Using computers to obtain maintenance data and complete documentation • Networking with other team members regarding work planning and execution
Teamwork	• Performing tasks as an individual while being responsive to supervisors and allowing for relevant human factors • Working effectively with others who may be of different ages, gender, race, religion and political persuasion • Assisting other team members with tasks and providing advice on work processes and troubleshooting
Problem solving	• Identifying problems in a timely manner and developing practical solutions to maintenance problems not fully covered by maintenance data • Proposing solutions to problems as modifications or amendments to specified maintenance processes • Constantly reviewing problem solving skills and ability to effectively apply competencies to solve problems within the limits permitted by regulatory and organisational guidelines • Responding to emergencies or accidents in accordance with

	regulatory and organisational requirements • Using mathematical techniques to relate test results to system or component performance and to convert values between systems of measurement
Initiative and enterprise	• Adapting to new situations that arise as a consequence of regulatory changes, revised maintenance data, practices and procedures • Varying work practices and behaviour as a result of performance feedback from peers and supervisors • Evaluating ideas to ensure that technical and regulatory aspects have been fully covered before proposing action that may result in modifications or changes to work processes • Applying human factors to avoid maintenance errors and maintain quality standards • Adapting competencies to the performance of a wide range of maintenance tasks • Contributing to a process of continuous improvement and a willingness to support and participate in the effective introduction of new work practices
Planning and organising	• Clarifying task objectives and required outcomes through discussion with supervisors and other team members • Monitoring the time taken to complete tasks against team requirements or targets provided by supervisors • Collecting, analysing and organising information relating to assigned maintenance tasks and confirming the purpose and required work outcomes • Identifying the extent of impact on assigned work of changes in procedures, work instructions or regulatory requirements
Self-management	• Accepting responsibility for managing individual workload to meet target completion times or fit in with team milestones • Assessing personal knowledge and skills with the aid of the self-assessment work sheets in the Log of Industrial Experience and Achievement and preparing for competency assessments • Actively seeking opportunities to develop competencies and to apply them across a range of tasks and monitoring performance using indicators, such as the extent of oversight exercised by supervisors • Identifying career paths and training opportunities that will assist in attaining career goals
Learning	• Taking advantage of learning opportunities that arise through training courses provided by the organisation or external providers and through mentoring and on-the-job training • Adapting competencies to accommodate new ideas and techniques • Using feedback from supervisors and peers to identify ways in

	which competence can be improved • Mentoring new or more junior personnel • Interpreting units of competency and applying them to attainment of identified career goals
Technology	• Operating aircraft and avionic systems, test equipment and ground support equipment, ground running engines and troubleshooting faults • Using on-board maintenance systems and using maintenance-related software • Maintaining aircraft systems, components and test stands • Performance testing of aircraft systems and engines • Storing and caring for components, parts, tools, test equipment and support equipment • Amending various forms of maintenance data • Using computers and microfiche to obtain maintenance data and using computers to complete documentation

Packaging Rules

To be awarded the MEA40711 Certificate IV in Aeroskills (Mechanical), competency must be demonstrated in:

- **Aircraft Maintenance Stream**
  - Core common and imported units: **eight (8)** units
  - Elective technical stream units from Group A: **thirteen (13)** units
  - Total: **twenty one (21)** units.

OR

- **Component Maintenance Workshop Stream**
  - Core common and imported units: **eight (8)** units
  - Elective technical stream units from Groups B and C: **six (6)** units
  - Total: **fourteen (14)** units.

Core units of competency (common to both streams)

Unit code	Unit title	Prerequisites
MEA101B	Interpret occupational health and safety practices in aviation maintenance	Nil

Unit code	Unit title	Prerequisites
MEA103B	Plan and organise aviation maintenance work activities	MEA101B, MEA105C, MEA107B, MEA108B
MEA105C	Apply quality standards applicable to aviation maintenance processes	MEA101B, MEA107B
MEA107B	Interpret and use aviation maintenance industry manuals and specifications	Nil
MEA108B	Complete aviation maintenance industry documentation	MEA105C
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105C, MEA108B
MEA118A	Conduct self in the aviation maintenance environment	Nil
MSAENV272B	Participate in environmentally sustainable work practices	Nil

Elective units

Group A (Aircraft Maintenance Stream)

Choose **thirteen (13)** of the elective mechanical and structures technical stream units listed below while observing the unit selection guidelines in column four.

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA201B	Remove and install miscellaneous aircraft electrical hardware/components	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts	MEA201B MEA260B	

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA260B	Use electrical test equipment	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	
MEA301C	Perform aircraft flight servicing	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	
MEA302C	Remove and install aircraft hydro-mechanical and landing gear system components	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	
MEA303D	Remove and install aircraft pneumatic system components	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	
MEA304C	Remove and install non-pressurised aircraft structural and non-structural components	MEA302C	Do not take with MEA317C
MEA305C	Remove and install aircraft fixed wing flight control system components	MEA302C	
MEA306C	Remove and install engines and engine system components	MEA302C	

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA307C	Remove and install propeller systems and components	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	
MEA308C	Remove and install rotary wing rotor and flight control system components	MEA302C	Alternate to both MEA305C and MEA307C – count as two units
MEA309C	Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components	MEA302C	Do not take with MEA318C and MEA320C
MEA310C	Inspect, test and troubleshoot aircraft pneumatic systems and components	MEA303D	Do not take with MEA318C and MEA320C
MEA311D	Inspect and repair/modify aircraft structures	MEA304C or MEA317C	Do not take with MEA339C or both MEA401C and MEA410C – count as 3 units
MEA312C	Inspect, test and troubleshoot aircraft fixed wing flight control systems and components	MEA305C	Do not take with MEA318C and MEA321C
MEA313C	Inspect, test and troubleshoot piston engine systems and components	MEA306C	
MEA314C	Inspect, test and troubleshoot gas turbine engine systems and components	MEA306C	Do not take with MEA319C and MEA322C
MEA315C	Inspect, test and troubleshoot propeller systems and components	MEA307C	

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA316C	Inspect, test and troubleshoot rotary wing rotor and control systems and components	MEA308C	Alternative to both of MEA312C and MEA315C – count as two units
MEA317C	Remove and install pressurised aircraft structural and non-structural components	MEA302C MEA303D	Do not take with MEA304C
MEA318C	Inspect aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components	MEA302C MEA303D MEM305C	Do not take with MEA309C or MEA310C
MEA319C	Inspect gas turbine engine systems and components	MEA306C	Do not take with MEA314C
MEA320C	Test and troubleshoot aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components	MEA318C	Do not take with MEA309C or MEA310C
MEA321C	Test and troubleshoot aircraft fixed wing flight control systems and components	MEA318C	Do not take with MEA312C
MEA322C	Test and troubleshoot gas turbine engine systems and components	MEA319C	Do not take with MEA314C
MEA327B	Fabricate and/or repair aircraft mechanical components or parts	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Do not take with MEA328C
MEA328C	Maintain and/or repair aircraft mechanical components or parts	MEA302C MEA303D	Do not take with MEA327B
MEA339C	Inspect, repair and maintain aircraft structures	MEA304C or MEA317C	Do not take with MEA311D or

Unit code	Unit title	Prerequisites	Unit selection guidelines
			MEA401C and MEA410C – count as 2 units
MEA351A	Maintain airframe systems of basic light fixed wing aircraft	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Applicable only to basic light aircraft maintenance
MEA352A	Maintain basic rotary wing aircraft systems	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Applicable only to basic helicopter maintenance
MEA353A	Maintain basic light aircraft engines and propellers	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Applicable only to basic light aircraft and basic helicopter maintenance
MEA354A	Maintain light aircraft pneumatic systems	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Applicable only to small aircraft maintenance
MEA355A	Maintain light aircraft air cycle air conditioning systems	MEA201B MEA246C	Applicable only to small aircraft maintenance
MEA356A	Maintain light piston engine aircraft pressurisation systems	MEA201B MEA246C	Applicable only to small aircraft maintenance

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA357A	Inspect, test and repair aircraft fabric surfaces	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	
MEA358A	Re-cover aircraft fabric surfaces	MEA357A	
MEA359A	Inspect and repair aircraft wooden structures	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	
MEA360A	Maintain aircraft diesel engines	MEA353A	
MEA361A	Maintain aircraft two stroke petrol engines	MEA353A	
MEA362A	Maintain aircraft vapour cycle air conditioning systems	MEA201B MEA246C	
MEA363B	Inspect, repair and maintain structures and related components of non-pressurised small aircraft	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Do not take with MEA304C, 311C or 339B – applicable only to small aircraft – count as two units
MEA364A	Maintain and/or repair small aircraft mechanical components or parts	MEA101B MEA103B MEA105C MEA107B MEA108B	Do not take with MEA328C – applicable only to small aircraft

Unit code	Unit title	Prerequisites	Unit selection guidelines
		MEA109B	
MEA366A	Perform borescope inspections	MEA313C or MEA314C or MEA322C or MEA387A or MEA388A	Additional unit where CASA borescope inspection authority required
MEA401C	Inspect aircraft structures	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Do not take with MEA311D or MEA339C
MEA410C	Maintain aircraft structure/components	MEA401C	Do not take with MEA311D or MEA339C

Groups B and C (Component Workshop Stream)

Choose at least **three (3)** of the elective technical stream units listed in Group B and make up to a total of **six (6)** units with units from Group C.

Group B

Unit code	Unit title	Prerequisites
MEA380A	Repair and/or overhaul aircraft hydraulic system components	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B
MEA381A	Repair and/or overhaul aircraft pneumatic system	MEA101B

	components	MEA103B MEA105C MEA107B MEA108B MEA109B
MEA382A	Repair and/or overhaul aircraft fuel system components	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B
MEA383A	Repair and/or overhaul gas turbine engine air inlet and compressor components and/or modules	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B
MEA384A	Repair and/or overhaul gas turbine engine combustion section components and/or modules	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B
MEA385A	Repair and/or overhaul gas turbine engine turbine and exhaust section components	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B
MEA386A	Repair and/or overhaul gas turbine engine ancillary section components	MEA101B MEA103B MEA105C

		MEA107B MEA108B MEA109B
MEA387A	Test gas turbine engines and engine modules after overhaul or repair	MEA383A MEA384A MEA385A MEA386A
MEA389A	Repair and/or overhaul propellers	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B
MEA390A	Repair and/or overhaul rotary wing dynamic components	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B
MEA391A	Repair and/or overhaul aircraft mechanical system components	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B
MEA392A	Disassemble aircraft piston engines	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B

MEA393A	Repair and/or overhaul aircraft piston engine cylinder assembly components	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B
MEA394A	Repair and/or overhaul aircraft piston engine crankcase assembly components	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B
MEA395A	Reassemble aircraft piston engines	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B
MEA396A	Assemble aircraft piston engine quick engine change unit	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B
MEA397A	Test aircraft piston engines after repair or overhaul	MEA392A MEA393A MEA394A MEA395A MEA396A

Group C

Unit code	Unit title	Prerequisites
MEA201B	Remove and install miscellaneous aircraft electrical hardware/components	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts	MEA201B MEA260B
MEA260B	Use electrical test equipment	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B
MEA368A	Shot peen aircraft components	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B
MEM24002B	Perform penetrant testing	MEM18001C MEM24012C
MEM24004B	Perform magnetic particle testing	MEM18001C MEM24012C
MEM24012C	Apply metallurgy principles	Nil

Custom Content Section

Not applicable.

MEA40911 Certificate IV in Aircraft Surface Finishing

Modification History

Release 2 - Licensing requirements clarified. Imported units updated to current version - equivalent

Release 1 - Unit codes updated as required - equivalent

Description

The qualification may apply to employees of aircraft repair and overhaul organisations or members of the ADF engaged in either the supervision of aircraft surface finishing activities or working in an environment where a significant degree of multi-skilling is required in component removal and installation and/or the performance of a specified range of repair tasks.

The qualification consists of:

- common and imported units that apply to all Aeroskills specialist streams at Certificate III and IV levels
- mandatory surface finishing technical stream and imported units that also apply at Certificate III level
- elective units to be selected according to employment need from listed common units, mechanical and structures technical stream units and an imported unit.
-

Pathways Information

The qualification also provides credits towards the MEA50411 Diploma of Aviation Maintenance Management (Mechanical) and the MEA60111 Advanced Diploma of Aviation Maintenance Management (Mechanical). A limited number of credits are also provided towards the MEA50211 Diploma of Aeroskills (Mechanical).

Licensing/Regulatory Information

This qualification complies with airworthiness regulatory requirements of CASA and the ADF.

Entry Requirements

Not applicable.

Employability Skills Summary

Employability Skill	Industry/enterprise requirements for this qualification include:
Communication	• Understanding work and organisational instructions • Understanding input from specialist personnel and technical representatives • Negotiating with other team members or supervisors regarding timing and progress of work activities and access to sections of the aircraft, or to equipment • Understanding and interpreting regulations, procedures, instructions and maintenance publications • Completing maintenance documentation • Reading drawings relating to surface finishing schemes and maintenance activities • Using computers to obtain maintenance data and complete documentation • Networking with other team members regarding work planning and execution
Teamwork	• Performing tasks as an individual while being responsive to supervisors and allowing for relevant human factors • Working effectively with others who may be of different ages, gender, race, religion and political persuasion • Assisting team members with task definition and providing advice on work processes and troubleshooting • Providing leadership and development of team commitment and dynamics • Monitoring and assessing team performance and providing mentoring and performance feedback • Gaining the trust and confidence of team members and resolving conflict within the team • Providing team members with the opportunity for ongoing competency development
Problem solving	• Identifying problems in a timely manner and applying a range of strategies to develop practical solutions to problems not fully covered by maintenance data • Proposing solutions to problems as modifications or a amendments to specified maintenance processes • Constantly reviewing problem solving skills and ability to effectively apply competencies to solve individual and team-related problems within the limits permitted by regulatory and organisational guidelines • Responding to emergencies or accidents in accordance with regulatory and organisational requirements • Using mathematical techniques to apply finishing schemes and

	to convert values between systems of measurement
Initiative and enterprise	• Adapting to new situations that arise as a consequence of regulatory changes, revised maintenance data, practices and procedures • Varying work practices and behaviour as a result of performance feedback from peers and supervisors • Evaluating ideas to ensure that technical and regulatory aspects have been fully covered before proposing action that may result in modifications or changes to work processes • Applying human factors to avoid maintenance errors and maintain quality standards • Identifying and analysing alternative approaches to managing workplace issues and problems • Adapting competencies to the performance of a wide range of maintenance tasks • Contributing to a process of continuous improvement and a willingness to support and participate in the effective introduction of new work practices
Planning and organising	• Clarifying task objectives and required outcomes through discussion with supervisors and other team members • Monitoring the time taken to complete tasks against team requirements or targets provided by supervisors • Collecting, analysing and organising information relating to assigned tasks and confirming the purpose and required work outcomes • Identifying the extent of impact on assigned work of changes in procedures, work instructions or regulatory requirements • Allocating personnel and resources to tasks
Self-management	• Accepting responsibility for managing individual workload to meet target completion times or fit in with team milestones • Assessing personal knowledge and skills with the aid of the self-assessment work sheets in the Log of Industrial Experience and Achievement and preparing for competency assessments • Actively seeking opportunities to develop competencies and to apply them across a range of tasks and monitoring performance using indicators such as the extent of oversight exercised by supervisors • Identifying career paths and training opportunities that will assist in attaining career goals
Learning	• Taking advantage of learning opportunities that arise through training courses provided by the organisation or external providers and through mentoring and on-job training • Adapting competencies to accommodate new ideas and techniques • Using feedback from supervisors and peers to identify ways in

	which competence can be improved • Mentoring new or more junior personnel • Interpreting units of competency and applying them to attainment of identified career goals
Technology	• Operating PPE and surface finishing equipment and ground support equipment and troubleshooting equipment faults • Testing the performance and calibration of surface finishing equipment • Storing and caring for surface finishing equipment, PPE and support equipment • Amending various forms of maintenance data • Using computers and microfiche to obtain maintenance data and using computers to complete documentation

Packaging Rules

To be awarded the MEA40911 Certificate IV in Aircraft Surface Finishing, competency must be demonstrated in **twenty one (21)** units of competency. These units must be chosen as specified under the following conditions:

- **seventeen (17)** Core units consisting of common, technical stream and imported units
- **four (4)** Elective units chosen from the technical stream and imported units in Group A.

Core units

Unit code	Unit title	Prerequisites
MEA101B	Interpret occupational health and safety practices in aviation maintenance	Nil
MEA103B	Plan and organise aviation maintenance work activities	MEA101B, MEA105C, MEA107B, MEA108B
MEA105C	Apply quality standards applicable to aviation maintenance processes	MEA101B, MEA107B
MEA107B	Interpret and use aviation maintenance industry manuals and specifications	Nil
MEA108B	Complete aviation maintenance industry documentation	MEA105C
MEA109B	Perform basic hand skills, standard trade	MEA105C, MEA108B

Unit code	Unit title	Prerequisites
	practices and fundamentals in aviation maintenance	
MEA118A	Conduct self in the aviation maintenance environment	Nil
MEA411A	Remove surface coatings from aircraft or aircraft components	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA412A	Pre-treat aluminium alloy surfaces	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA413A	Seal aircraft and aircraft component structural seams	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA414A	Remove light corrosion from aircraft	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA415A	Paint aircraft surfaces	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B AURV229749A AURV329603DA
MEA416A	Apply aircraft identification markings, graphics and decals	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA417A	Apply specialty coatings to aircraft	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
AURVTP2003	Prepare spray painting materials and equipment	Nil
AURVTP3012	Apply air dry and polyurethane enamel refinishing materials	Nil
MSAENV472B	Implement and monitor environmentally sustainable work practices	Nil

Elective units Group A

At least **four (4)** of the following units selected in accordance with the unit selection guidelines in column four.

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA113C	Supervise civil aircraft maintenance activities and manage human resources in the workplace	Completion of applicable Certificate IV units	
MEA116B	Apply occupational health and safety procedures at supervisor level in aviation maintenance		Must be taken if MEA113C or MEA140A selected
MEA140A	Supervise maintenance teams and perform maintenance quality inspections (this unit applicable to the ADF regulatory environment)	Appointment as an Independent Inspector or Maintenance Quality Inspector	
MEA240B	Use electrical test equipment to perform basic electrical tests	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	
MEA302C	Remove and install aircraft hydro-mechanical and landing gear system components	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Take with MEA305C
MEA305C	Remove and install aircraft fixed wing flight control system components	MEA302C	
MEA401C	Inspect aircraft structures	MEA101B MEA103B	

Unit code	Unit title	Prerequisites	Unit selection guidelines
		MEA105C MEA107B MEA108B MEA109B	
MEA405B	Repair/modify aircraft composite material structure/components	MEA401C	
MEM08012B	Prepare surfaces by abrasive blasting (basic)	MEM08016B MEM13003B	
MEM08013B	Prepare surfaces by abrasive blasting (advanced)	MEM08012B MEM08016B MEM13003B	
MEM08016B	Control blast coating by-products, materials and emissions	MEM13003B	
MEM13003B	Work safely with industrial chemicals and materials		

Custom Content Section

Not applicable.

MEA41011 Certificate IV in Aeroskills (Mechatronics)

Modification History

Release 2 - Licensing requirements clarified - equivalent

Release 1 - New qualification

Description

This is a competency-based training means of complying with small aircraft maintenance certification licensing requirements during the four year period 2011 to 2015 while the CAR 31 Basic Examination/Schedule of Experience avenue to licensing for small aircraft maintenance certification remains in operation. It should be noted that this qualification alone will not qualify individuals for the grant of a licence and successful completion of the Basic Examinations will still be required. However, it provides a sound foundation that would complement the examination requirements and would facilitate their completion during an apprenticeship.

Changes may be made to the qualification once a final decision is taken on the form of small aircraft maintenance certification licensing to ensure that it is able to become the pathway to licence after 2015.

Pathways Information

The qualification applies to individuals involved in the maintenance of small aircraft within the General Aviation industry sector and should not be regarded as a pathway to the grant of a B1 or B2 licence for regular public transport aircraft maintained by a CASR Part 145 MTO. The pathways to these licences are the MEA50211 Diploma of Aeroskills (Mechanical) for the B1 or the MEA50111 Diploma of Aeroskills (Avionics) for the B2. A number of units in this qualification would provide credits towards those qualifications and towards other qualifications at AQF Certificate IV, Diploma and Advanced Diploma levels.

Licensing/Regulatory Information

This qualification meets the requirements of CASA for the grant of an Aircraft Maintenance B1 or B2 Licence limited to the maintenance of small aircraft.

Entry Requirements

Not applicable.

Employability Skills Summary

Employability Skill	Industry/enterprise requirements for this qualification include:
Communication	• Understanding work and organisational instructions • Understanding input from professional engineers, specialist personnel and technical representatives • Liaising with maintenance personnel, aircrew and specialists regarding maintenance problems • Talking to senior managers and aircraft owners/operators about maintenance needs and problems • Providing guidance to others and describing clearly faults, problems and spares requirements • Negotiating with team members, senior managers and aircraft owners/operators regarding timing and progress of work activities • Understanding and interpreting regulations, procedures, instructions and maintenance publications • Giving written instructions and completing maintenance documentation and component tags • Interpreting wiring diagrams and system schematics, and reading drawings relating to maintenance activities • Using computers to obtain maintenance data, complete documentation and correspond using email • Networking with other maintenance managers and with maintenance controllers
Teamwork	• Performing tasks as an individual while being responsive to supervisors and allowing for relevant human factors • Working effectively with others who may be of different ages, gender, race, religion and political persuasion • Assisting other team members with tasks and providing advice on work processes and troubleshooting • Providing leadership and development of team commitment and dynamics • Providing mentoring and performance feedback • Providing team members with the opportunity for ongoing competency development
Problem solving	• Identifying problems in a timely manner and developing practical solutions to maintenance problems not fully covered by maintenance data • Proposing solutions to problems as modifications or amendments to specified maintenance processes • Assisting with the resolution of complex problems • Constantly reviewing problem solving skills and ability to effectively apply competencies to solve problems within the

	limits permitted by regulatory and organisational guidelines • Responding to emergencies or accidents in accordance with regulatory and organisational requirements • Using mathematical techniques to relate test results to system or component performance and to convert values between systems of measurement
Initiative and enterprise	• Adapting to new situations that arise as a consequence of regulatory changes, technology, contractual requirements, operational circumstances, revised maintenance data, practices and procedures • Varying work practices and behaviour as a result of performance feedback from subordinates, peers and managers • Evaluating ideas to ensure that technical and regulatory aspects have been fully covered before proposing action that may result in modifications or changes to work processes • Applying human factors to avoid maintenance errors and maintain quality standards • Adapting competencies to the performance of a wide range of maintenance tasks • Contributing to a process of continuous improvement and a willingness to support and participate in the effective introduction of new work practices
Planning and organising	• Clarifying task objectives and required outcomes through discussion with managers and team members • Planning the use of resources and allocating personnel and resources to tasks • Monitoring the time taken to complete tasks against team requirements or targets provided by management • Assessing work requirements for quotations • Collecting, analysing and organising information relating to assigned maintenance tasks and confirming the purpose and required work outcomes • Identifying contingency situations and taking action to resolve problems • Identifying the extent of impact on assigned work of changes in procedures, work instructions or regulatory requirements
Self-management	• Accepting responsibility for managing individual workload to meet target completion times or fit in with team milestones • Assessing personal knowledge and skills with the aid of the self-assessment work sheets in the Log of Industrial Experience and Achievement and preparing for competency assessments • Actively seeking opportunities to develop competencies and to apply them across a range of tasks and monitoring performance using indicators such as the extent of oversight exercised by supervisors

	• Identifying career paths and training opportunities that will assist in attaining career goals
Learning	• Taking advantage of learning opportunities that arise through training courses provided by the organisation or external providers and through mentoring and on-job training • Adapting competencies to accommodate new ideas and techniques • Using feedback from managers and peers to identify ways in which competence can be improved • Mentoring and providing on-job training and induction training to team members • Interpreting units of competency and applying them to attainment of identified career goals
Technology	• Operating aircraft and avionic systems, test equipment and ground support equipment, ground running engines and troubleshooting faults • Using on-board maintenance systems and using maintenance-related software • Testing the performance of aircraft systems and engines • Maintaining aircraft systems and components • Storing and caring for components, parts, tools, test equipment and support equipment • Amending various forms of maintenance data • Using computers and microfiche to obtain maintenance data and using computers to complete documentation

Packaging Rules

To be awarded the MEA41011 Certificate IV in Aeroskills (Mechatronics) competency must be demonstrated in **twenty seven (27)** units of competency, as follows:

- **Sixteen (16)** Core common, technical stream and imported units that are applicable to all B1 and B2 licences that are limited by exclusions to release to service of basic small aircraft
- **Eleven (11)** Elective Group A technical stream units where a limited B1.1 licence is sought
- **Eight (8)** Elective Group B technical stream units where a limited B1.2 licence is sought
- **Nine (9)** Elective Group C technical stream units where a limited B1.3 licence is sought
- **Eight (8)** Elective Group D technical stream units where a limited B1.4 licence is sought
- **Nine (9)** Elective Group E technical stream units where a limited B2 licence is sought
- Elective Group F technical stream units chosen according to the requirements of the aircraft types being maintained to bring the total unit count to twenty seven (27).

Core units of competency

All **sixteen (16)** units must be taken if a B1 or B2 licence applicable to basic small aircraft maintenance is being sought.

Unit code	Unit title	Prerequisites
MEA101B	Interpret occupational health and safety practices in aviation maintenance	Nil
MEA103B	Plan and organise aviation maintenance work activities	MEA101B, MEA105C, MEA107B, MEA108B
MEA105C	Apply quality standards applicable to aviation maintenance processes	MEA101B, MEA107B
MEA107B	Interpret and use aviation maintenance industry manuals and specifications	Nil
MEA108B	Complete aviation maintenance industry documentation	MEA105C
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105C, MEA108B
MEA111C	Perform administrative processes to prepare for certification of civil aircraft maintenance	All applicable Certificate IV units
MEA112B	Plan and implement civil aircraft maintenance activities	All applicable Certificate IV units
MEA113C	Supervise civil aircraft maintenance activities and manage human resources in the workplace	All applicable Certificate IV units
MEA116B	Apply occupational health and safety procedures at supervisor level in aviation maintenance	Nil
MEA118A	Conduct self in the aviation maintenance environment	Nil
MEA201B	Remove and install miscellaneous aircraft electrical hardware/components	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts	MEA201B, MEA260B

MEA260B	Use electrical test equipment	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA301C	Perform aircraft flight servicing	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MSAENV472B	Implement and monitor environmentally sustainable work practices	Nil

Elective units Group A

All **eleven (11)** units must be taken if a B1.1 licence applicable to basic small aircraft maintenance is being sought.

Unit code	**Unit title**	**Prerequisites**
MEA274A	Maintain basic light aircraft electrical systems and components	MEA246C
MEA275A	Maintain basic light aircraft instrument systems and components	MEA246C
MEA276A	Maintain basic light aircraft communication and radio navigation systems and components	MEA246C
MEA306C	Remove and install engines and engine system components	MEA302C
MEA307C	Remove and install propeller systems and components	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA314C	Inspect, test and troubleshoot gas turbine engine systems and components	MEA306C
MEA315C	Inspect, test and troubleshoot propeller systems and components	MEA307C
MEA351A	Maintain airframe systems of basic light fixed wing aircraft	MEA101B, MEA 03B, MEA105C, MEA107B, MEA108B, MEA109B
MEA363B	Inspect, repair and maintain structures and	MEA101B, MEA103B,

	related components of non-pressurised small aircraft	MEA105C, MEA107B, MEA108B, MEA109B
MEA364A	Maintain and/or repair small aircraft mechanical components or parts	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA365A	Assess structural repair/modification requirements and evaluate structural repairs and modifications	All Certificate IV units listed for applicable licence

Elective units Group B

All **eight (8)** units must be taken if a B1.2 licence applicable to basic small aircraft maintenance is being sought.

Unit code	**Unit title**	**Prerequisites**
MEA274A	Maintain basic light aircraft electrical systems and components	MEA246C
MEA275A	Maintain basic light aircraft instrument systems and components	MEA246C
MEA276A	Maintain basic light aircraft communication and radio navigation systems and components	MEA246C
MEA351A	Maintain airframe systems of basic light fixed wing aircraft	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA353A	Maintain basic light aircraft engines and propellers	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA363B	Inspect, repair and maintain structures and related components of non-pressurised small aircraft	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA364A	Maintain and/or repair small aircraft mechanical components or parts	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA365A	Assess structural repair/modification requirements and evaluate structural repairs	All Certificate IV units listed for applicable licence

	and modifications	

Elective units Group C

All **nine (9)** units must be taken if a B1.3 licence applicable to basic small aircraft maintenance is being sought.

Unit code	Unit title	Prerequisites
MEA274A	Maintain basic light aircraft electrical systems and components	MEA246C
MEA275A	Maintain basic light aircraft instrument systems and components	MEA246C
MEA276A	Maintain basic light aircraft communication and radio navigation systems and components	MEA246C
MEA306C	Remove and install engines and engine system components	MEA302C
MEA314C	Inspect, test and troubleshoot gas turbine engine systems and components	MEA306C
MEA352A	Maintain basic rotary wing aircraft systems	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA363B	Inspect, repair and maintain structures and related components of non-pressurised small aircraft	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA364A	Maintain and/or repair small aircraft mechanical components or parts	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA365A	Assess structural repair/modification requirements and evaluate structural repairs and modifications	All Certificate IV units listed below for applicable licence

Elective units Group D

All **eight (8)** units must be taken if a B1.4 licence applicable to basic small aircraft maintenance is being sought.

Unit code	Unit title	Prerequisites
MEA274A	Maintain basic light aircraft electrical systems and components	MEA246C
MEA275A	Maintain basic light aircraft instrument systems and components	MEA246C
MEA276A	Maintain basic light aircraft communication and radio navigation systems and components	MEA246C
MEA352A	Maintain basic rotary wing aircraft systems	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA353A	Maintain basic light aircraft engines and propellers	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA363B	Inspect, repair and maintain structures and related components of non-pressurised small aircraft	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA364A	Maintain and/or repair small aircraft mechanical components or parts	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA365A	Assess structural repair/modification requirements and evaluate structural repairs and modifications	All Certificate IV units listed for applicable licence

Elective units Group E

All **nine (9)** units must be taken if a B2 licence applicable to basic small aircraft maintenance is being sought.

Unit code	Unit title	Prerequisites
MEA202C	Remove and install basic aircraft electrical system components	MEA201B

MEA204C	Remove and install basic aircraft instrument system components	MEA201B
MEA207C	Remove and install aircraft electronic system components	MEA201B
MEA210C	Inspect, test and troubleshoot basic aircraft electrical systems and components	MEA202C, MEA246C
MEA212C	Inspect, test and troubleshoot basic aircraft instrument systems and components	MEA204C, MEA246C
MEA289A	Maintain basic light aircraft avionic systems and components	MEA246C
MEA290A	Fit avionic modification sheetmetal components	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA291A	Inspect, test and troubleshoot fixed wing single axis autopilot systems and components (Refer to Group F – MEA217B may be taken instead of this unit)	MEA207C, MEA246C
MEA302C	Remove and install aircraft hydro-mechanical and landing gear system components	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B

Elective units Group F

Except for the B1.1 licence, take two (2) or three (3) of the listed units as required by the aircraft types being maintained and the unit selection guidelines in column four to bring the total unit count to twenty seven (27).

Unit code	**Unit title**	**Prerequisites**	**Unit selection guidelines**
MEA202C	Remove and install basic aircraft electrical system components	MEA201B	Applicable to electrical retractable undercarriage
MEA206C	Remove and install aircraft basic radio communication and navigation system components	MEA201B	Includes HF radio
MEA210C	Inspect, test and troubleshoot	MEA202C	Applicable to electrical

Unit code	Unit title	Prerequisites	Unit selection guidelines
	basic aircraft electrical systems and components	MEA246C	retractable undercarriage
MEA214C	Inspect, test and troubleshoot aircraft basic communication and radio navigation systems and components	MEA206C MEA246C	Includes HF radio
MEA216C	Inspect, test and troubleshoot instrument landing systems and components	MEA206C MEA207C MEA246C	Required for ILS
MEA217C	Inspect, test and troubleshoot fixed wing autopilot systems and components	MEA207C MEA246C	Required for 3 axis autopilot system – may be taken instead of Group E unit MEA291A
MEA218C	Inspect, test and troubleshoot rotary wing autopilot systems and components	MEA207C MEA246C	Required for helicopter autopilot system
MEA220C	Inspect, test and troubleshoot aircraft primary radar systems and components	MEA207C MEA246C	Applicable to weather radar
MEA221C	Inspect, test and troubleshoot aircraft secondary radar systems and components	MEA207C MEA246C	Covers RADALT, DME, Doppler and ACAS
MEA277A	Maintain twin engine aircraft electrical systems and components	MEA210C	Mandatory for maintenance of light twin piston engine aircraft
MEA278A	Inspect, test and troubleshoot instrument display systems and components	MEA207C MEA246C	Applicable to electronic display systems
MEA279A	Inspect, test and troubleshoot piston engine full authority digital engine control systems	MEA207C MEA246C	Required for FADEC system maintenance
MEA302C	Remove and install aircraft hydro-mechanical and landing gear system components	MEA101B MEA103B MEA105C	Applicable to hydraulic retractable undercarriage and systems with engine driven pump

Unit code	Unit title	Prerequisites	Unit selection guidelines
		MEA107B MEA108B MEA109B	
MEA306C	Remove and install engines and engine system components	MEA302C	Applicable to piston and gas turbine engines
MEA307C	Remove and install propeller systems and components	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Covers variable pitch and constant speed propellers
MEA308C	Remove and install rotary wing rotor and flight control system components	MEA302C	Applicable if helicopter has powered flight controls
MEA309C	Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components	MEA302C	Applicable to hydraulic retractable undercarriage and systems with engine driven pump
MEA313C	Inspect, test and troubleshoot piston engine systems and components	MEA306C (may be deemed to be covered if MEA353A is held)	Covers turbo and supercharged engines
MEA314C	Inspect, test and troubleshoot gas turbine engine systems and components	MEA306C	For gas turbine engine maintenance
MEA315C	Inspect, test and troubleshoot propeller systems and components	MEA307C	Covers variable pitch and constant speed propellers
MEA316C	Inspect, test and troubleshoot rotary wing rotor and control systems and components	MEA308C	Applicable if helicopter has powered flight controls
MEA325B	Weigh aircraft and perform aircraft weight and balance	All applicable Certificate IV	Elective

Unit code	Unit title	Prerequisites	Unit selection guidelines
	calculations as a result of modifications	units	
MEA351A	Maintain airframe systems of basic light fixed wing aircraft	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Elective if not required by choice of Group A to E
MEA352A	Maintain basic rotary wing aircraft systems	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Elective if not required by choice of Group A to E
MEA353A	Maintain basic light aircraft engines and propellers	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Elective if not required by choice of Group A to E
MEA354A	Maintain light aircraft pneumatic systems	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Elective
MEA355A	Maintain light aircraft air cycle air conditioning systems	MEA201B MEA246C	Elective
MEA356A	Maintain light piston engine aircraft pressurisation systems	MEA201B MEA246C	Elective

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA357A	Inspect, test and repair aircraft fabric surfaces	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Required for aircraft with fabric surfaces
MEA358A	Re-cover aircraft fabric surfaces	MEA357A	Elective
MEA359A	Inspect and repair aircraft wooden structures	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Required for aircraft with wooden structure
MEA360A	Maintain aircraft diesel engines	MEA353A	Required for aircraft types with two or four stroke diesel engines
MEA361A	Maintain aircraft two stroke petrol engines	MEA353A	Required for aircraft types with two stroke petrol engines
MEA362A	Maintain aircraft vapour cycle air conditioning systems	MEA201B MEA246C	Elective
MEA367A	Repair/modify aircraft composite structure using cold bonding	MEA401C or MEA339C or MEA363B	Required for repairs to composite primary or secondary structure using cold bonding only
MEA405B	Repair/modify aircraft composite material structure/components	MEA401C (may be deemed to be covered if MEA363B is held)	Required for repairs to composite primary or secondary structure using hot or cold bonding

Custom Content Section

Not applicable.

MEA41111 Certificate IV in Aircraft Life Support and Furnishing

Modification History

Release 2 - Licensing requirements clarified. Imported units updated to current version - equivalent

Release 1 - Unit codes updated as required - equivalent

Description

This qualification may apply to members of the ADF and to employees of civil aviation maintenance organisations who work at supervisor or team leader levels on the maintenance of aircraft and personal life support equipment and on the fabrication and maintenance of aircraft furnishings.

The qualification consists of:

- mandatory common units that apply to all Aeroskills qualifications at Certificate III and IV levels and elective common units that relate to the regulatory system within which individuals are employed
- elective technical stream units and imported units.
-

Pathways Information

The qualification provides a number of credits towards other Aeroskills qualifications at Certificate III and IV levels and a limited number of credits towards a Diploma or Advanced Diploma of Aviation Maintenance Management.

Licensing/Regulatory Information

This qualification complies with airworthiness regulatory requirements of CASA and the ADF.

Entry Requirements

Not applicable.

Employability Skills Summary

Employability Skill	**Industry/enterprise requirements for this qualification include:**

Communication	• Understanding work and organisational instructions • Understanding input from specialist personnel and technical representatives • Negotiating with other team members or supervisors regarding timing and progress of work activities and access to sections of the aircraft, or to equipment • Understanding and interpreting regulations, procedures, instructions and maintenance publications • Completing maintenance documentation • Reading drawings relating to aircraft life support and furnishing and maintenance activities • Using computers to obtain maintenance data and complete documentation • Networking with other team members regarding work planning and execution
Teamwork	• Performing tasks as an individual while being responsive to supervisors and allowing for relevant human factors • Working effectively with others who may be of different ages, gender, race, religion and political persuasion • Assisting team members with task definition and providing advice on work processes and troubleshooting • Providing leadership and development of team commitment and dynamics • Monitoring and assessing team performance and providing mentoring and performance feedback • Gaining the trust and confidence of team members and resolving conflict within the team • Providing team members with the opportunity for ongoing competency development
Problem solving	• Identifying problems in a timely manner and applying a range of strategies to develop practical solutions to problems not fully covered by maintenance data • Proposing solutions to problems as modifications or a amendments to specified maintenance processes • Constantly reviewing problem solving skills and ability to effectively apply competencies to solve individual and team-related problems within the limits permitted by regulatory and organisational guidelines • Responding to emergencies or accidents in accordance with regulatory and organisational requirements • Using mathematical techniques to apply finishing schemes and to convert values between systems of measurement
Initiative and enterprise	• Adapting to new situations that arise as a consequence of regulatory changes, revised maintenance data, practices and

	procedures • Varying work practices and behaviour as a result of performance feedback from peers and supervisors • Evaluating ideas to ensure that technical and regulatory aspects have been fully covered before proposing action that may result in modifications or changes to work processes • Applying human factors to avoid maintenance errors and maintain quality standards • Identifying and analysing alternative approaches to managing workplace issues and problems • Adapting competencies to the performance of a wide range of maintenance tasks • Contributing to a process of continuous improvement and a willingness to support and participate in the effective introduction of new work practices
Planning and organising	• Clarifying task objectives and required outcomes through discussion with supervisors and other team members • Monitoring the time taken to complete tasks against team requirements or targets provided by supervisors • Collecting, analysing and organising information relating to assigned tasks and confirming the purpose and required work outcomes • Identifying the extent of impact on assigned work of changes in procedures, work instructions or regulatory requirements • Allocating personnel and resources to tasks
Self-management	• Accepting responsibility for managing individual workload to meet target completion times or fit in with team milestones • Assessing personal knowledge and skills with the aid of the self-assessment work sheets in the Log of Industrial Experience and Achievement and preparing for competency assessments • Actively seeking opportunities to develop competencies and to apply them across a range of tasks and monitoring performance using indicators such as the extent of oversight exercised by supervisors • Identifying career paths and training opportunities that will assist in attaining career goals
Learning	• Taking advantage of learning opportunities that arise through training courses provided by the organisation or external providers and through mentoring and on-job training • Adapting competencies to accommodate new ideas and techniques • Using feedback from supervisors and peers to identify ways in which competence can be improved • Mentoring new or more junior personnel • Interpreting units of competency and applying them to

	attainment of identified career goals
Technology	• Operating PPE and life support and furnishing equipment and ground support equipment and troubleshooting equipment faults • Testing the performance and calibration of life support and furnishing equipment • Storing and caring for life support and furnishing equipment, PPE and support equipment • Amending various forms of maintenance data • Using computers and microfiche to obtain maintenance data and using computers to complete documentation

Packaging Rules

To be awarded the MEA41111 Certificate IV in Aircraft Life Support and Furnishing, competency must be demonstrated in **twenty six (26)** units of competency, as follows:

- **ten (10)** Core common and imported units
- **one (1)** Elective unit from the common units listed in Group A
- **fifteen (15)** Elective units from the technical stream and imported units listed in Group B.

Core units of competency

Unit code	Unit title	Prerequisites
MEA101B	Interpret occupational health and safety practices in aviation maintenance	Nil
MEA103B	Plan and organise aviation maintenance work activities	MEA101B, MEA105C, MEA107B, MEA108B
MEA105C	Apply quality standards applicable to aviation maintenance processes	MEA101B, MEA107B
MEA107B	Interpret and use aviation maintenance industry manuals and specifications	Nil
MEA108B	Complete aviation maintenance industry documentation	MEA105C
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105C, MEA108B

Unit code	Unit title	Prerequisites
MEA115A	Plan and implement aeronautical product maintenance activities	Nil
MEA116B	Apply occupational health and safety procedures at supervisor level	Nil
MEA118A	Conduct self in the aviation maintenance environment	Nil
MSAENV472B	Implement and monitor environmentally sustainable work practices	Nil

Elective units

Group A

At least **one (1)** of the following two units chosen in accordance with the unit selection guidelines in column four.

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA114A	Certify aeronautical product maintenance		Applicable to those working under CASA Airworthiness Regulations
MEA140A	Supervise aviation maintenance teams and perform maintenance quality inspections		Applicable to those working under ADF Airworthiness Regulations

Group B

Complete **fifteen (15)** of the technical stream and imported units listed below, selected in accordance with the prerequisites in column three and the unit selection guidelines in column four.

Unit code	Unit title	Prerequisites	Unit selection guidelines

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA240B	Use electrical test equipment to perform basic electrical tests	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Elective
MEA304C	Remove and install non-pressurised aircraft structural and non-structural components	MEA302C	Elective – do not take with MEA317C
MEA317C	Remove and install pressurised aircraft structural and non-structural components	MEA302C MEA303D	Elective – do not take with MEA304C
MEA411A	Remove surface coatings from aircraft or aircraft components	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Elective
MEA412A	Pre-treat aluminium alloy surfaces	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Elective
MEA414A	Remove light corrosion from aircraft	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Elective – do not take with MEA419A

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA416A	Apply aircraft identification markings, graphics and decals	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Elective
MEA419A	Repair/modify aircraft cabin/cockpit non-primary structure components	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Elective – do not take with MEA414A
MEA501A	Maintain and fit anti-G suits	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B MEA118A MEA511A LMFSF2002B	Elective
MEA502A	Maintain and fit helmets	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B MEA118A MEA240B	Elective
MEA503A	Maintain and fit immersion suits	MEA101B MEA103B	Elective

Unit code	Unit title	Prerequisites	Unit selection guidelines
		MEA105C MEA107B MEA108B MEA109B MEA118A LMTTF2008A	
MEA504A	Maintain and fit oxygen masks	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B MEA118A MEA240B	Elective
MEA505A	Maintain and pack parachutes	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B MEA118A MEA511A LMFSF2002B	Elective
MEA506A	Maintain and pack survival inflatable life rafts and escape slides	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B MEA118A	Elective
MEA507A	Maintain, pack and fit survival inflatable buoyancy vests	MEA101B	Elective

Unit code	Unit title	Prerequisites	Unit selection guidelines
		MEA103B MEA105C MEA107B MEA108B MEA109B MEA118A	
MEA508A	Maintain, install and remove restraint systems	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B MEA511A LMFSF2002B	Elective
MEA509A	Manufacture, repair and alter aircraft related fabric components	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B MEA118A MEA511A LMFSF2002B	Elective
MEA510A	Maintain seat and pod electrical and electronic systems	MEA240B	Elective
MEA511A	Operate and maintain sewing machines and overlockers	Nil	Elective
AURVTT2004	Trim vehicle components	Nil	Elective – do not take with LMFUP3012B
AURVTT2005	Select and apply trim and fabric materials	Nil	Elective

Unit code	Unit title	Prerequisites	Unit selection guidelines
AURVTT2006	Select and apply trim and fabric adhesives	Nil	Elective - do not take with LMTTF2008A
LMFSF2001B	Cut single layer fabrics	Nil	Elective
LMFSF2002B	Machine sew materials	Nil	Elective
LMFUP3012B	Apply marine sewing and installation techniques	Nil	Elective – do not take with AURVTT2004
LMTTF2008A	Use adhesives	Nil	Elective – do not take with AURVTT2006
MEM12001B	Use comparison and basic measuring devices	Nil	Mandatory
DEFEO101D	Work safely with explosive ordnance	Nil	Elective
DEFEO501D	Conduct explosive ordnance inspection	Nil	Elective

Custom Content Section

Not applicable.

MEA41213 Certificate IV in Aeroskills (Armament)

Modification History

Release 1: Supersedes MEA41211 – not equivalent.

Unit MEA262B Modify/repair single layer printed circuit boards has been deleted and the required number of units reduced to 21 (technical stream units reduced to 13)

Imported unit and reference to other Training Packages updated.

Description

This qualification may apply to members of the Australian Defence Force (ADF) who perform scheduled inspections, fault diagnosis and repair, and modification of aircraft egress, stores management and stores suspension systems and system components. It should be noted that employment in this field also involves the attainment of a range of competencies in the explosive ordnance field. The explosive ordnance units of competency are in the DEF12 Defence Training Package and the TLI10 Transport and Logistics Training Package and are not included in this qualification other than one unit dealing with safe handling of explosive ordnance that is required for the maintenance of egress systems.

The qualification defines the exit from training and may apply to aircraft maintenance performed on flight lines and in hangars.

The qualification consists of:

- common units that apply to all Aeroskills specialist streams at Certificate III and IV levels
- avionic technical stream units relating to aircraft system and component maintenance
- one mechanical technical stream unit
- armament technical stream units.
-

Pathways Information

The qualification provides a number of credits towards other Aeroskills Certificate IV qualifications and towards the MEA50311 Diploma of Aviation Maintenance Management (Avionics) and the MEA60111 Advanced Diploma of Aviation Maintenance Management (Avionics).

Licensing/Regulatory Information

ADF regulatory requirements apply to this qualification. It is applicable only to individuals working under the ADF airworthiness regulatory system who are required to maintain aircraft weapons delivery systems.

Entry Requirements

Not applicable.

Employability Skills Summary

Employability Skill	Industry/enterprise requirements for this qualification include:
Communication	• Understanding work and organisational instructions • Understanding input from specialist personnel and technical representatives • Providing guidance to others and describing clearly faults, problems and spares requirements • Negotiating with other team members or supervisors regarding timing and progress of work activities and access to sections of the aircraft or to equipment • Understanding and interpreting regulations, procedures, instructions and maintenance publications • Completing maintenance documentation and component tags • Interpreting wiring diagrams and system schematics, and reading drawings relating to maintenance activities • Using computers to obtain maintenance data and complete documentation • Networking with other team members regarding work planning and execution
Teamwork	• Performing tasks as an individual while being responsive to supervisors and allowing for relevant human factors • Working effectively with others who may be of different ages, gender, race, religion and political persuasion • Assisting other team members with tasks and providing advice on work processes and troubleshooting
Problem solving	• Identifying problems in a timely manner and developing practical solutions to maintenance problems not fully covered by maintenance data • Proposing solutions to problems as modifications or amendments to specified maintenance processes • Constantly reviewing problem solving skills and ability to effectively apply competencies to solve problems within the limits permitted by regulatory and organisational guidelines • Responding to emergencies or accidents in accordance with regulatory and organisational requirements • Using mathematical techniques to relate test results to system or component performance and to convert values between systems of measurement

Initiative and enterprise	• Adapting to new situations that arise as a consequence of regulatory changes, revised maintenance data, practices and procedures • Varying work practices and behaviour as a result of performance feedback from peers and supervisors • Evaluating ideas to ensure that technical and regulatory aspects have been fully covered before proposing action that may result in modifications or changes to work processes • Applying human factors to avoid maintenance errors and maintain quality standards • Adapting competencies to the performance of a wide range of maintenance tasks • Contributing to a process of continuous improvement and a willingness to support and participate in the effective introduction of new work practices
Planning and organising	• Clarifying task objectives and required outcomes through discussion with supervisors and other team members • Monitoring the time taken to complete tasks against team requirements or targets provided by supervisors • Collecting, analysing and organising information relating to assigned maintenance tasks and confirming the purpose and required work outcomes • Identifying the extent of impact on assigned work of changes in procedures, work instructions or regulatory requirements
Self-management	• Accepting responsibility for managing individual workload to meet target completion times or fit in with team milestones • Assessing personal knowledge and skills with the aid of the self-assessment work sheets in the Log of Industrial Experience and Achievement and preparing for competency assessments • Actively seeking opportunities to develop competencies and to apply them across a range of tasks and monitoring performance using indicators such as the extent of oversight exercised by supervisors • Identifying career paths and training opportunities that will assist in attaining career goals
Learning	• Taking advantage of learning opportunities that arise through training courses provided by the organisation or external providers and through mentoring and on-the-job training • Adapting competencies to accommodate new ideas and techniques • Using feedback from supervisors and peers to identify ways in which competence can be improved • Mentoring new or more junior personnel • Interpreting units of competency and applying them to attainment of identified career goals

Technology	• Operating aircraft stores management and suspension systems, test equipment and ground support equipment and troubleshooting faults • Maintaining and changing configuration of aircraft stores management and suspension systems including the safe handling of components containing explosive ordnance • Maintaining aircraft egress systems and components, including arming and disarming of egress systems • Using on-board maintenance systems and using maintenance-related software • Testing the performance and calibration of components • Storing and caring for components, parts, tools, test equipment and support equipment • Amending various forms of maintenance data • Using computers and microfiche to obtain maintenance data and using computers to complete documentation

Packaging Rules

To be awarded the MEA41213 Certificate IV in Aeroskills (Armament), competency must be demonstrated in **twenty one (21) c**ore units of competency, consisting of:

- **eight (8)** common and imported units
- **thirteen (13)** technical stream units.

There are no elective units of competency for this qualification.

Core units of competency

Unit code	Unit title	Prerequisites
MEA101B	Interpret occupational health and safety practices in aviation maintenance	Nil
MEA103B	Plan and organise aviation maintenance work activities	MEA101B, MEA105C, MEA107B, MEA108B
MEA105C	Apply quality standards applicable to aviation maintenance processes	MEA101B, MEA107B
MEA107B	Interpret and use aviation maintenance industry manuals and specifications	Nil
MEA108B	Complete aviation maintenance industry	MEA105C

Unit code	Unit title	Prerequisites
	documentation	
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105C, MEA108B
MEA118A	Conduct self in the aviation maintenance environment	Nil
MEA201B	Remove and install miscellaneous aircraft electrical hardware/components	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA203C	Remove and install advanced aircraft electrical system components	MEA201B
MEA211C	Inspect, test and troubleshoot advanced aircraft electrical systems and components	MEA203C, MEA246C
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts	MEA201B, MEA260B
MEA260B	Use electrical test equipment	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA261C	Use electronic test equipment	MEA101B, MEA 103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA301C	Perform aircraft flight servicing	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA601A	Maintain aircraft egress systems	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B, DEFEO101D
MEA602A	Remove and install aircraft stores management system components	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B, DEFEO101D
MEA603A	Remove and install aircraft stores suspension systems and components	MEA101B, MEA103B, MEA105C, MEA107B, MEA108A, MEA109B,

Unit code	Unit title	Prerequisites
		DEFEO101D
MEA604A	Inspect, test and troubleshoot aircraft stores management systems and components	MEA602A
MEA605A	Inspect, test and troubleshoot aircraft stores suspension systems and components	MEA603A
MSAENV272B	Participate in environmentally sustainable work practices	Nil
DEFEO101D	Work safely with explosive ordnance	Nil

Custom Content Section

Not applicable.

MEA41311 Certificate IV in Aeroskills (Structures)

Modification History

Release 2 - Licensing requirements clarified. Unit MEA425A added to Elective Units Group A - equivalent

Release 1 - A number of mandatory units restructured and an elective cold bonding unit added. Replaces MEA40810 - not equivalent

Description

This qualification may apply to employees of civil aviation maintenance organisations or to members of the ADF who are engaged in the repair and modification of aircraft structures. The qualification defines the exit from apprenticeship and may apply to work performed in hangars on the structure of complete aircraft and to work performed in workshops on structural components. It replaces MEA40810 Certificate IV in Aeroskills (Structures).

The qualification consists of:

- Common and imported units that apply to all Aeroskills specialist streams at AQF Certificate III and IV levels
- Mandatory and elective mechanical technical stream units that provide a required degree of multi-skilling
- Mandatory structures technical stream units.
-

Pathways Information

The training pathways provide for work on both metal and composite structures. In some cases, primarily in the General Aviation sector, individuals may be also required to work on aircraft with wooden structures and/or fabric coverings. The applicable competencies are covered in the units MEA357A Inspect, test and repair aircraft fabric surfaces, MEA358A Re-cover aircraft fabric surfaces and MEA359A Inspect and repair aircraft wooden structures.

The qualification also provides credits towards the MEA50411 Diploma of Aviation Maintenance Management (Mechanical) and the MEA60111 Advanced Diploma of Aviation Maintenance Management (Mechanical). A limited number of credits are also provided towards the MEA50211 Diploma of Aeroskills (Mechanical).

Licensing/Regulatory Information

This qualification complies with airworthiness regulatory requirements of CASA and the ADF.

Entry Requirements

Not applicable.

Employability Skills Summary

Employability Skill	Industry/enterprise requirements for this qualification include:
Communication	• Understanding work and organisational instructions • Understanding input from specialist personnel and technical representatives • Providing guidance to others and describing clearly faults, problems and spares requirements • Negotiating with other team members or supervisors regarding timing and progress of work activities and access to sections of the aircraft, or to equipment • Understanding and interpreting regulations, procedures, instructions and maintenance publications • Completing maintenance documentation and component tags • Interpreting wiring diagrams and system schematics, and reading drawings relating to maintenance activities • Using computers to obtain maintenance data and complete documentation • Networking with other team members regarding work planning and execution
Teamwork	• Performing tasks as an individual while being responsive to supervisors and allowing for relevant human factors • Working effectively with others who may be of different ages, gender, race, religion and political persuasion • Assisting other team members with tasks and providing advice on work processes and troubleshooting
Problem solving	• Identifying problems in a timely manner and developing practical solutions to maintenance problems not fully covered by maintenance data • Proposing solutions to problems as modifications or amendments to specified maintenance processes • Constantly reviewing problem solving skills and ability to effectively apply competencies to solve problems within the limits permitted by regulatory and organisational guidelines • Responding to emergencies or accidents in accordance with regulatory and organisational requirements • Using mathematical techniques to relate test results to system or component performance and to convert values between systems of measurement

Initiative and enterprise	• Adapting to new situations that arise as a consequence of regulatory changes, revised maintenance data, practices and procedures • Varying work practices and behaviour as a result of performance feedback from peers and supervisors • Evaluating ideas to ensure that technical and regulatory aspects have been fully covered before proposing action that may result in modifications or changes to work processes • Applying human factors to avoid maintenance errors and maintain quality standards • Adapting competencies to the performance of a wide range of maintenance tasks • Contributing to a process of continuous improvement and a willingness to support and participate in the effective introduction of new work practices
Planning and organising	• Clarifying task objectives and required outcomes through discussion with supervisors and other team members • Monitoring the time taken to complete tasks against team requirements or targets provided by supervisors • Collecting, analysing and organising information relating to assigned maintenance tasks and confirming the purpose and required work outcomes • Identifying the extent of impact on assigned work of changes in procedures, work instructions or regulatory requirements
Self-management	• Accepting responsibility for managing individual workload to meet target completion times or fit in with team milestones • Assessing personal knowledge and skills with the aid of the self-assessment work sheets in the Log of Industrial Experience and Achievement and preparing for competency assessments • Actively seeking opportunities to develop competencies and to apply them across a range of tasks and monitoring performance using indicators such as the extent of oversight exercised by supervisors • Identifying career paths and training opportunities that will assist in attaining career goals
Learning	• Taking advantage of learning opportunities that arise through training courses provided by the organisation or external providers and through mentoring and on-job training • Adapting competencies to accommodate new ideas and techniques • Using feedback from supervisors and peers to identify ways in which competence can be improved • Mentoring new or more junior personnel • Interpreting units of competency and applying them to attainment of identified career goals

Technology	• Repairing aircraft metal structure, selecting and using tools and support equipment • Repairing aircraft composite structure, selecting and using tools and support equipment • Determining the causes of aircraft structural damage • Removing and installing aircraft system components • Storing and caring for components, parts, tools, test equipment and support equipment • Amending various forms of maintenance data • Using computers and microfiche to obtain maintenance data and using computers to complete documentation

Packaging Rules

To be awarded the MEA41311 Certificate IV in Aeroskills (Structures), competency must be demonstrated in **nineteen (19)** units of competency. These units must be chosen as follows:

- **sixteen (16)** Core units consisting of common, imported and technical stream units
- **three (3)** Elective technical stream units from Group A.

Core units of competency

Unit code	Unit title	Prerequisites
MEA101B	Interpret occupational health and safety practices in aviation maintenance	Nil
MEA103B	Plan and organise aviation maintenance work activities	MEA101B, MEA105C, MEA107B, MEA108B
MEA105C	Apply quality standards applicable to aviation maintenance processes	MEA101B, MEA107B
MEA107B	Interpret and use aviation maintenance industry manuals and specifications	Nil
MEA108B	Complete aviation maintenance industry documentation	MEA105C
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105C, MEA108B
MEA118A	Conduct self in the aviation maintenance	Nil

Unit code	Unit title	Prerequisites
	environment	
MEA302C	Remove and install aircraft hydro-mechanical and landing gear system components	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA303D	Remove and install aircraft pneumatic system components	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA327B	Fabricate and/or repair aircraft mechanical components or parts	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA401C	Inspect aircraft structures	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA420A	Fabricate basic structural components for aircraft	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA421A	Fabricate advanced structural components for aircraft	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA422A	Repair/modify aircraft metal structure	MEA401C
MEA423A	Aircraft structure major disassembly and reassembly	MEA401C
MSAENV272B	Participate in environmentally sustainable work practices	Nil

Elective units Group A

Select **three (3)** units while observing the unit selection guidelines in Column four.

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA304C	Remove and install non-pressurised aircraft structural and non-structural	MEA302C	Take this unit or MEA317C

Unit code	Unit title	Prerequisites	Unit selection guidelines
	components		
MEA305C	Remove and install aircraft fixed wing flight control system components	MEA302C	Take this unit or MEA308C
MEA308C	Remove and install rotary wing rotor and flight control system components	MEA302C	Alternate to MEA305C
MEA317C	Remove and install pressurised aircraft structural and non-structural components	MEA302C MEA303D	Alternate to MEA304C
MEA367A	Repair/modify aircraft composite structure using cold bonding	MEA401C or MEA339C or MEA363B	Take this unit or MEA405B
MEA405B	Repair/modify aircraft composite material structure/components	MEA401C	Alternate to MEA367A
MEA425A	Perform bolted composite skin repairs	MEA401C or MEA339D or MEA363C	

Custom Content Section

Not applicable.

MEA50111 Diploma of Aeroskills (Avionics)

Modification History

Release 2 - Licensing requirements clarified - equivalent

Release 1- Unit codes updated as required - equivalent

Description

This qualification applies to individuals seeking the grant of a CASA B2 Aircraft Maintenance Engineer Licence covering the supervision, performance and certification of avionic maintenance on aircraft that are type-rated by CASA for maintenance purposes.

The qualification satisfies CASA requirements for the grant, under CASR Part 66, of Aircraft Maintenance Engineer Licence B2 when the skills and knowledge requirements align with CASA syllabus requirements under 'Licensing' in the Assessment Guidelines and in Appendix 1, and training has been delivered in accordance with the requirements of CASR Part 147. It consists of:

- common and technical stream units required at Certificate IV level in the aircraft maintenance stream
- additional diploma level common and imported units that cover supervisor level OHS competency plus competencies required by CASA for the exercise of licence privileges
- Diploma level avionic technical stream units covering advanced fault diagnosis and aircraft weight and balance calculation.
-

Pathways Information

Credits are also provided towards the MEA50311 Diploma of Aviation Maintenance Management (Avionics) and the MEA60111 Advanced Diploma of Aviation Maintenance Management (Avionics).

Licensing/Regulatory Information

This qualification meets the requirements of CASA for the grant of an Aircraft Maintenance Engineer B2 Licence.

Entry Requirements

Not applicable.

Employability Skills Summary

Employability Skill	Industry/enterprise requirements for this qualification include:
Communication	• Understanding complex directions from senior managers • Understanding input from professional engineers, specialist personnel and technical representatives • Liaising with maintenance personnel, aircrew and specialists regarding maintenance problems • Talking to senior mangers about maintenance and maintenance management problems and making presentations • Providing guidance to others and describing clearly faults, problems and spares requirements • Negotiating with team members, senior managers and aircraft owners/operators regarding timing and progress of work activities • Understanding and interpreting regulations, procedures, instructions and maintenance publications • Giving written instructions and completing maintenance documentation and component tags • Writing reports and proposals as required by regulations and organisational procedures • Interpreting organisational charts, wiring diagrams and system schematics, reading drawings relating to maintenance activities and interpreting fault diagnosis guides and logic charts • Using computers to obtain maintenance data and complete documentation and correspond using email • Networking with other maintenance managers and with maintenance controllers
Teamwork	• Performing tasks as an individual while being responsive to supervisors and allowing for relevant human factors • Working effectively with others who may be of different ages, gender, race, religion and political persuasion • Assisting team members with task definition and providing advice on work processes and troubleshooting • Providing leadership and development of team commitment and dynamics • Monitoring and assessing team performance and providing mentoring and performance feedback • Gaining the trust and confidence of team members and resolving conflict within the team • Providing team members with the opportunity for ongoing competency development
Problem solving	• Identifying problems in a timely manner and developing practical solutions to maintenance problems not fully covered by

	maintenance data and to maintenance management problems • Proposing solutions to problems as repair schemes, modifications or as amendments to specified maintenance processes • Assisting with the resolution of complex problems as a team effort • Constantly reviewing problem solving skills and ability to effectively apply competencies to solve problems within the limits permitted by regulatory and organisational guidelines • Responding to emergencies or accidents in accordance with legislative, regulatory and organisational requirements • Using mathematical techniques to relate test results to system or component performance, to convert values between systems of measurement, to calculate weight and balance and to develop management solutions to problems
Initiative and enterprise	• Adapting to new situations that arise as a consequence of regulatory changes, technology, contractual requirements, personnel management changes, operational circumstances, revised maintenance data, practices and procedures • Varying work practices and behaviour as a result of performance feedback from subordinates, peers and managers • Evaluating ideas to ensure that technical and regulatory aspects have been fully covered before proposing action that may result in modifications or changes to work processes • Applying human factors to avoid maintenance errors and maintain quality standards • Adapting competencies to the performance of a wide range of maintenance tasks • Contributing to a process of continuous improvement and a willingness to initiate, support and participate in the effective introduction of new work practices
Planning and organising	• Clarifying task objectives and required outcomes through discussion with managers and team members • Planning the use of resources and allocating personnel and resources to tasks • Monitoring the time taken to complete tasks against team requirements or targets provided by management • Assessing work requirements for quotations • Collecting, analysing and organising information relating to assigned maintenance tasks and confirming the purpose and required work outcomes • Identifying contingency situations and taking action to resolve problems • Identifying the extent of impact on assigned work of changes in procedures, work instructions or regulatory requirements

Self-management	• Accepting responsibility for managing individual workload to meet target completion times or fit in with team milestones • Assessing personal knowledge and skills when assisting team members with complex tasks and when proposing modifications, repair schemes or changes to maintenance practices • Actively seeking opportunities to develop competencies and to apply them across a range of tasks and application of legislation, regulations, policy and procedures to achieve required outcomes and build confidence in own ideas and vision • Effectively manage personal work priorities and professional development • Identifying career paths and training opportunities that will assist in attaining career goals
Learning	• Taking advantage of learning opportunities that arise through training courses provided by the organisation or external providers and through mentoring and on-job training • Adapting competencies to accommodate new ideas and techniques • Using feedback from subordinates, peers and managers to identify ways in which competence can be improved • Mentoring and providing on-job training and induction training to team members • Interpreting units of competency and applying them to attainment of identified career goals
Technology	• Operating aircraft and avionic systems, test equipment and ground support equipment, ground running engines and troubleshooting faults • Using on-board maintenance systems and using maintenance-related software • Maintaining aircraft systems, components and test stands • Performance testing of aircraft systems and engines • Storing and caring for components, parts, tools, test equipment and support equipment • Complying with requirements to complete maintenance records, develop and revise maintenance data and propose amendments to technical publications • Amending various forms of maintenance data • Using computers and microfiche to obtain maintenance data and using computers to complete records, reports and documentation

Packaging Rules

To be awarded the MEA50111 Diploma of Aeroskills (Avionics), competency must be demonstrated in **thirty one (31) or thirty two (32)** units of competency, depending on the choice of elective specialist units. These units consist of:

- **eight (8)** Core Diploma level (CASA licensing) units
- **twenty two (22)** Core common and technical stream units from Certificate IV that are mandatory for a CASA B2 licence
- either Elective Group A (two units) or Group B (one unit)

Core units of competency

Complete all **eight (8)** of the Diploma level common, imported and avionic technical stream units listed below.

Unit code	Unit title	Prerequisites
MEA111C	Perform administrative processes to prepare for the certification of civil aircraft maintenance	All Cert IV units listed below
MEA112B	Plan and implement civil aircraft maintenance activities	All Cert IV units listed below
MEA113C	Supervise civil aircraft maintenance activities and manage human resources in the workplace	All Cert IV units listed below
MEA116B	Apply occupational health and safety procedures at supervisor level in aviation maintenance	Nil
MEA142B	Manage self in the aviation maintenance environment	Nil
MEA235B	Perform advanced troubleshooting in aircraft avionic maintenance	All Cert IV units listed below
MEA241C	Perform aircraft weight and balance calculations as a result of modifications	All Cert IV units listed below
MSAENV472B	Implement and monitor environmentally sustainable work practices	Nil

Plus the **twenty two (22)** Certificate IV common and avionic/mechanical technical stream units listed below.

Unit code	Unit title	Prerequisites
MEA101B	Interpret occupational health and safety practices in aviation maintenance	Nil
MEA103B	Plan and organise aviation maintenance work activities	MEA101B, MEA105C, MEA107B, MEA108B
MEA105C	Apply quality standards applicable to aviation maintenance processes	MEA101B, MEA107B
MEA107B	Interpret and use aviation maintenance industry manuals and specifications	Nil
MEA108B	Complete aviation maintenance industry documentation	MEA105C
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105C, MEA108B
MEA118A	Conduct self in the aviation maintenance environment	Nil
MEA201B	Remove and install miscellaneous aircraft electrical hardware/components	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA203C	Remove and install advanced aircraft electrical system components	MEA201B
MEA205C	Remove and install advanced aircraft instrument system components	MEA201B
MEA206C	Remove and install aircraft basic radio communication and navigation system components	MEA201B
MEA207C	Remove and install aircraft electronic system components	MEA201B
MEA223D	Inspect aircraft electrical systems and components	MEA203C, MEA246C
MEA224C	Inspect aircraft instrument systems and	MEA205C, MEA246C

Unit code	Unit title	Prerequisites
	components	
MEA226D	Inspect aircraft electronic systems and components	MEA207C, MEA246C
MEA227D	Test and troubleshoot aircraft electrical systems and components	MEA223D
MEA228D	Test and troubleshoot aircraft instrument systems and components	MEA224C, MEA226D
MEA229D	Test and troubleshoot aircraft radio frequency navigation and communications systems and components	MEA226D
MEA232C	Test and troubleshoot aircraft pulse systems and components	MEA226D, MEA246C
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts	MEA201B, MEA260B
MEA260B	Use electrical test equipment	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA301C	Perform aircraft flight servicing	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B

Elective units

Plus specialist elective units from Group A or Group B as defined below.

Group A

Unit code	Unit title	Prerequisites
MEA225C	Inspect fixed wing aircraft automatic flight control systems and components	MEA207C, MEA246C
MEA230C	Test and troubleshoot fixed wing aircraft automatic flight control systems and components	MEA225C, MEA246C

Group B

Unit code	Unit title	Prerequisites
MEA231C	Inspect, test and troubleshoot rotary wing aircraft automatic flight control systems and components	MEA207C, MEA246C

Custom Content Section

Not applicable.

MEA50211 Diploma of Aeroskills (Mechanical)

Modification History

Release 2 - Licensing requirements clarified - equivalent

Release 1 - Unit codes updated as required - equivalent

Description

This qualification applies to individuals seeking the grant of a CASA B1 Aircraft Maintenance Engineer Licence covering the supervision, performance and certification of airframe, engine, electrical and structural maintenance on aircraft that are type-rated by CASA for maintenance purposes.

The requirement for the awarding of MEA50211 Diploma of Aeroskills (Mechanical) is demonstrated competency in listed competency units under the conditions set out below. The listed units also satisfy CASA requirements for the grant, under CASR Part 66, of Aircraft Maintenance Engineer B1 Licences in sub-categories B1.1, 1.2, 1.3 and 1.4 when the skills and knowledge requirements align with CASA syllabus requirements in under 'Licensing' in the Assessment Guidelines and in Appendix 1, and training has been delivered in accordance with the requirements of CASR Part 147.

It consists of:

- common and technical stream units required at Certificate IV level in the aircraft maintenance stream with electives determined by the desired licence sub-category
- additional Diploma level common units that cover supervisor level OHS competency plus competencies required by CASA for the exercise of licence privileges
- Diploma level mechanical technical stream units covering advanced fault diagnosis and aircraft weighing and weight and balance calculation.
-

Pathways Information

The qualification also provides credits towards the MEA50411 Diploma of Aviation Maintenance Management (Mechanical) and the MEA60211 Advanced Diploma of Aviation Maintenance Management (Mechanical).

Licensing/Regulatory Information

This qualification meets the requirements of CASA for the grant of an Aircraft Maintenance Engineer B1 Licence in sub-categories B1.1, B1.2, B1.3 and B1.4.

Entry Requirements

Not applicable.

Employability Skills Summary

Employability Skill	Industry/enterprise requirements for this qualification include:
Communication	• Understanding complex directions from senior managers • Understanding input from professional engineers, specialist personnel and technical representatives • Liaising with maintenance personnel, aircrew and specialists regarding maintenance problems • Talking to senior mangers about maintenance and maintenance management problems and making presentations • Providing guidance to others and describing clearly faults, problems and spares requirements • Negotiating with team members, senior managers and aircraft owners/operators regarding timing and progress of work activities • Understanding and interpreting regulations, procedures, instructions and maintenance publications • Giving written instructions and completing maintenance documentation and component tags • Writing reports and proposals as required by regulations and organisational procedures • Interpreting organisational charts, wiring diagrams and system schematics, reading drawings relating to maintenance activities and interpreting fault diagnosis guides and logic charts • Using computers to obtain maintenance data and complete documentation and correspond using email • Networking with other maintenance managers and with maintenance controllers
Teamwork	• Performing tasks as an individual while being responsive to supervisors and allowing for relevant human factors • Working effectively with others who may be of different ages, gender, race, religion and political persuasion • Assisting team members with task definition and providing advice on work processes and troubleshooting • Providing leadership and development of team commitment and dynamics • Monitoring and assessing team performance and providing mentoring and performance feedback • Gaining the trust and confidence of team members and resolving conflict within the team

	• Providing team members with the opportunity for ongoing competency development
Problem solving	• Identifying problems in a timely manner and developing practical solutions to maintenance problems not fully covered by maintenance data and to maintenance management problems • Proposing solutions to problems as repair schemes, modifications or as amendments to specified maintenance processes • Assisting with the resolution of complex problems as a team effort • Constantly reviewing problem solving skills and ability to effectively apply competencies to solve problems within the limits permitted by regulatory and organisational guidelines • Responding to emergencies or accidents in accordance with legislative, regulatory and organisational requirements • Using mathematical techniques to relate test results to system or component performance, to convert values between systems of measurement, to calculate weight and balance and to develop management solutions to problems
Initiative and enterprise	• Adapting to new situations that arise as a consequence of regulatory changes, technology, contractual requirements, personnel management changes, operational circumstances, revised maintenance data, practices and procedures • Varying work practices and behaviour as a result of performance feedback from subordinates, peers and managers • Evaluating ideas to ensure that technical and regulatory aspects have been fully covered before proposing action that may result in modifications or changes to work processes • Applying human factors to avoid maintenance errors and maintain quality standards • Adapting competencies to the performance of a wide range of maintenance tasks • Contributing to a process of continuous improvement and a willingness to initiate, support and participate in the effective introduction of new work practices
Planning and organising	• Clarifying task objectives and required outcomes through discussion with managers and team members • Planning the use of resources and allocating personnel and resources to tasks • Monitoring the time taken to complete tasks against team requirements or targets provided by management • Assessing work requirements for quotations • Collecting, analysing and organising information relating to assigned maintenance tasks and confirming the purpose and required work outcomes

	• Identifying contingency situations and taking action to resolve problems • Identifying the extent of impact on assigned work of changes in procedures, work instructions or regulatory requirements
Self-management	• Accepting responsibility for managing individual workload to meet target completion times or fit in with team milestones • Assessing personal knowledge and skills when assisting team members with complex tasks and when proposing modifications, repair schemes or changes to maintenance practices • Actively seeking opportunities to develop competencies and to apply them across a range of tasks and application of legislation, regulations, policy and procedures to achieve required outcomes and build confidence in own ideas and vision • Effectively manage personal work priorities and professional development • Identifying career paths and training opportunities that will assist in attaining career goals
Learning	• Taking advantage of learning opportunities that arise through training courses provided by the organisation or external providers and through mentoring and on-job training • Adapting competencies to accommodate new ideas and techniques • Using feedback from subordinates, peers and managers to identify ways in which competence can be improved • Mentoring and providing on-job training and induction training to team members • Interpreting units of competency and applying them to attainment of identified career goals
Technology	• Operating aircraft and avionic systems, test equipment and ground support equipment, ground running engines and troubleshooting faults • Using on-board maintenance systems and using maintenance-related software • Maintaining aircraft systems, components and test stands • Performance testing of aircraft systems and engines • Storing and caring for components, parts, tools, test equipment and support equipment • Complying with requirements to complete maintenance records, develop and revise maintenance data and propose amendments to technical publications • Amending various forms of maintenance data • Using computers and microfiche to obtain maintenance data and using computers to complete records, reports and documentation

Packaging Rules

To be awarded the MEA50211 Diploma of Aeroskills (Mechanical), competency must be demonstrated in **thirty six (36) to forty two (42)** units, chosen as described below.

All B1 licence sub-categories require the following **twenty eight (28) or twenty nine (29)** units:

- **ten (10)** Core Diploma level (CASA licensing) common, technical stream and imported units
- **seventeen (17)** Core Certificate IV common and technical stream units
- elective technical stream units in either Group A (one unit) or Group B (two units).

Depending on the CASA B1 licence sub-category being sought, **an additional eight (8) to thirteen (13)** units are required, up to a **maximum of forty two (42)** units for the qualification. All units must be chosen as specified under the conditions set out below:

Group C Elective technical stream units required by CASA for a B1.1 licence – **11 or 13 units**

Group D Elective technical stream units required by CASA for a B1.2 licence – **12 units**

Group E Elective technical stream units required by CASA for a B1.3 licence – **9 units**

Group F Elective technical stream units required by CASA for a B1.4 licence – **8 units**

Core units of competency

Complete the **ten (10)** Diploma level common and mechanical technical stream units listed below.

Unit code	Unit title	Prerequisites
MEA111C	Perform administrative processes to prepare for the certification of civil aircraft maintenance	All Cert IV units listed below for applicable licence
MEA112B	Plan and implement civil aircraft maintenance activities	All Cert IV units listed below for applicable licence
MEA113C	Supervise civil aircraft maintenance activities and manage human resources in the workplace	All Cert IV units listed below for applicable licence
MEA116B	Apply occupational health and safety procedures	Nil

Unit code	Unit title	Prerequisites
	at supervisor level in aviation maintenance	
MEA142B	Manage self in the aviation maintenance environment	Nil
MEA323B	Perform advanced troubleshooting in aircraft mechanical maintenance	All Cert IV units listed below for applicable licence
MEA325B	Weigh aircraft and perform aircraft weight and balance calculations as a result of modifications	All Cert IV units listed below for applicable licence
MEA343B	Remove and install avionic system components	MEA211C or MEA227D
MEA365A	Assess structural repair/modification requirements and evaluate structural repairs and modifications	All Cert IV units listed below for applicable licence
MSAENV472B	Implement and monitor environmentally sustainable work practices	Nil

Plus the following **seventeen (17)** Core Certificate IV common and avionic/mechanical technical stream units listed below which are mandatory for all B1 licence sub-categories.

Unit code	Unit title	Prerequisites
MEA101B	Interpret occupational health and safety practices in aviation maintenance	Nil
MEA103B	Plan and organise aviation maintenance work activities	MEA101B, MEA105C, MEA107B, MEA108B
MEA105C	Apply quality standards applicable to aviation maintenance processes	MEA101B, MEA107B
MEA107B	Interpret and use aviation maintenance industry manuals and specifications	Nil
MEA108B	Complete aviation maintenance industry documentation	MEA105C
MEA109B	Perform basic hand skills, standard trade practices	MEA105C, MEA108B

Unit code	Unit title	Prerequisites
	and fundamentals in aviation maintenance	
MEA118A	Conduct self in the aviation maintenance environment	Nil
MEA201B	Remove and install miscellaneous aircraft electrical hardware/components	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA203C	Remove and install advanced aircraft electrical system components	MEA201B
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts	MEA201B, MEA260B
MEA260B	Use electrical test equipment	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA301C	Perform aircraft flight servicing	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B,MEA 109B
MEA302C	Remove and install aircraft hydro-mechanical and landing gear system components	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA303D	Remove and install aircraft pneumatic system components	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA306C	Remove and install engines and engine system components	MEA302C
MEA328C	Maintain and/or repair aircraft mechanical components or parts	MEA302C, MEA303D
MEA339C	Inspect, repair and maintain aircraft structures	MEA304C or MEA317C

Elective units

Plus either Group A or Group B for all B1 licence sub-categories.

Group A

Unit code	Unit title	Prerequisite or co-requisite units
MEA211C	Inspect, test and troubleshoot advanced aircraft electrical systems and components	MEA203C, MEA246C

Group B

Unit code	Unit title	Prerequisite or co-requisite units
MEA223D	Inspect aircraft electrical systems and components	MEA203C, MEA246C
MEA227D	Test and troubleshoot aircraft electrical systems and components	MEA223D

Plus units that are mandatory CASA requirements for individual licence sub-categories B1.1, B1.2, B1.3 and B1.4.

Group C

To meet the criteria for the grant of a B1.1 Licence complete **eleven (11) or thirteen (13)** units listed below as specified in the unit selection guidelines in column four.

Unit code	Unit title	Prerequisite or co-requisite units	Unit selection guidance
MEA208C	Remove and install pressurisation control system components	MEA201B	
MEA209C	Remove and install aircraft oxygen system components	MEA101B MEA103B MEA105C MEA107B MEA108B	

Unit code	Unit title	Prerequisite or co-requisite units	Unit selection guidance
		MEA109B	
MEA219C	Inspect, test and troubleshoot pressurisation control systems and components	MEA208C MEA246C	
MEA222C	Inspect, test and troubleshoot aircraft oxygen systems and components	MEA209C	
MEA305C	Remove and install aircraft fixed wing flight control system components	MEA302C	
MEA307C	Remove and install propeller systems and components	MEA101B MEA103B MEA105C MEA107B MEA108B MEA109B	Mandatory for B1.1 where the rating sought includes propellers
MEA315C	Inspect, test and troubleshoot propeller systems and components	MEA307C	Mandatory unit for B1.1 where the rating sought includes propellers
MEA317C	Remove and install pressurised aircraft structural and non-structural components	MEA302C MEA303D	
MEA318C	Inspect aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components	MEA302C MEA303D and MEA305C	
MEA319C	Inspect gas turbine engine systems and components	MEA306C	
MEA320C	Test and troubleshoot aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components	MEA318C	
MEA321C	Test and troubleshoot aircraft fixed wing flight control systems and	MEA318C	

Unit code	Unit title	Prerequisite or co-requisite units	Unit selection guidance
	components		
MEA322C	Test and troubleshoot gas turbine engine systems and components	MEA319C	

Group D

To meet the criteria for the grant of a B1.2 Licence complete **twelve (12)** units listed below.

Unit code	Unit title	Prerequisite or co-requisite units
MEA208C	Remove and install pressurisation control system components	MEA201B
MEA209C	Remove and install aircraft oxygen system components	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA219C	Inspect, test and troubleshoot pressurisation control systems and components	MEA208C, 246C
MEA222C	Inspect, test and troubleshoot aircraft oxygen systems and components	MEA209C
MEA305C	Remove and install aircraft fixed wing flight control system components	MEA302C
MEA307C	Remove and install propeller systems and components	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA309C	Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components	MEA302C
MEA310C	Inspect, test and troubleshoot aircraft pneumatic systems and components	MEA303D
MEA312C	Inspect, test and troubleshoot aircraft fixed wing flight control systems and components	MEA305C

Unit code	Unit title	Prerequisite or co-requisite units
MEA313C	Inspect, test and troubleshoot piston engine systems and components	MEA306C
MEA315C	Inspect, test and troubleshoot propeller systems and components	MEA307C
MEA317C	Remove and install pressurised aircraft structural and non-structural components	MEA302C, MEA303D

Group E

To meet the criteria for the grant of a B1.3 Licence complete **nine (9)** units listed below (noting that MEA308C and MEA316C each count as two units).

Unit code	Unit title	Prerequisite or co-requisite units
MEA304C	Remove and install non-pressurised aircraft structural and non-structural components	MEA302C
MEA308C	Remove and install rotary wing rotor and flight control system components	MEA302C
MEA309C	Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components	MEA302C
MEA310C	Inspect, test and troubleshoot aircraft pneumatic systems and components	MEA303D
MEA316C	Inspect, test and troubleshoot rotary wing rotor and control systems and components	MEA308C
MEA319C	Inspect gas turbine engine systems and components	MEA306C
MEA322C	Test and troubleshoot gas turbine engine systems and components	MEA319C

Group F

To meet the criteria for the grant of a B1.4 Licence complete **eight (8)** units listed below (noting that MEA308C and 316C each count as two units).

Unit code	**Unit title**	**Prerequisite or co-requisite units**
MEA304C	Remove and install non-pressurised aircraft structural and non-structural components	MEA302C
MEA308C	Remove and install rotary wing rotor and flight control system components	MEA302C
MEA309C	Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components	MEA302C
MEA310C	Inspect, test and troubleshoot aircraft pneumatic systems and components	MEA303D
MEA313C	Inspect, test and troubleshoot piston engine systems and components	MEA306C
MEA316C	Inspect, test and troubleshoot rotary wing rotor and control systems and components	MEA308C

Custom Content Section

Not applicable.

MEA50311 Diploma of Aviation Maintenance Management (Avionics)

Modification History

Release 2 - Entry requirements corrected from 'mechanical' to 'avionics'. Licensing requirements clarified. New elective MEA147A added to Group A and electives choice clarified - equivalent

Release 1 - Unit codes updated as required. Entry requirements clarified - equivalent

Description

This qualification may be of use to individuals employed in aviation maintenance management fields in both the civil and ADF regulatory environments in jobs such as avionic maintenance team leaders, maintenance planners, spares assessors, repairable item managers and technical authors. It must be emphasised that many of the maintenance management positions applicable to the qualification have additional experience requirements specified in airworthiness regulations and only a limited range of employment opportunities may be available to those who do not have extensive prior aviation maintenance experience. For this reason the qualification has entry requirements.

The qualification consists of:

- ten (10) core units that provide competencies applicable to aviation maintenance managers
- one (1) or two (2) elective units chosen according to employment need.
-

Pathways Information

Credit is provided towards the MEA60111 Advanced Diploma of Aviation Maintenance Management (Avionics).

Licensing/Regulatory Information

This qualification complies with airworthiness regulatory requirements of CASA and the ADF.

Entry Requirements

Individuals seeking this qualification must meet at least one of the following entry criteria:

- at least five years current aviation avionic maintenance experience
- Maintenance Engineer Licence (Avionics) issued by CASA
- Certificate IV in Aeroskills (Avionics).

Employability Skills Summary

Employability Skill	Industry/enterprise requirements for this qualification include:
Communication	• Understanding complex directions from senior managers • Understanding input from professional engineers, specialist personnel and technical representatives • Liaising with maintenance personnel, aircrew and specialists regarding maintenance problems • Talking to senior mangers about maintenance and maintenance management problems and making presentations • Providing guidance to others and clearly describing faults, problems and spares requirements • Negotiating with team members, senior managers and aircraft owners/operators regarding timing and progress of work activities • Negotiating with potential suppliers of items of aeronautical product, piece parts and consumables • Negotiating with clients regarding the drafting of technical publications and maintenance data • Understanding and interpreting regulations, procedures, instructions and maintenance publications • Giving written instructions and completing maintenance documentation and component tags • Writing reports and proposals as required by regulations and organisational procedures • Interpreting organisational charts, wiring diagrams and system schematics, reading drawings relating to maintenance activities and interpreting fault diagnosis guides and logic charts • Using computers to obtain maintenance and maintenance management data, complete documentation and correspond using email • Networking with other maintenance managers and with others involved in maintenance-related integrated logistic support activities
Teamwork	• Performing tasks as an individual while being responsive to team members or colleagues and senior managers and allowing for relevant human factors • Working effectively with others who may be of different ages, gender, race, religion and political persuasion • Assisting team members with task definition and providing advice on work processes and troubleshooting • Providing leadership and development of team commitment and dynamics • Monitoring and assessing team performance and providing mentoring and performance feedback

	• Gaining the trust and confidence of team members and resolving conflict within the team • Providing team members with the opportunity for ongoing competency development
Problem solving	• Identifying problems in a timely manner and developing practical solutions to maintenance problems not fully covered by maintenance data and to maintenance management problems • Proposing solutions to problems as repair schemes, modifications or as amendments to specified maintenance processes • Assisting with the resolution of complex problems as a team effort • Constantly reviewing problem solving skills and ability to effectively apply competencies to solve problems within the limits permitted by regulatory and organisational guidelines • Responding to emergencies or accidents in accordance with legislative, regulatory and organisational requirements • Using mathematical techniques to relate test results to system or component performance, to convert values between systems of measurement, to calculate weight and balance, to develop management solutions to problems, and in performing integrated logistic support procedures
Initiative and enterprise	• Adapting to new situations that arise as a consequence of regulatory changes, technology, contractual requirements, personnel management changes, operational circumstances, revised maintenance data, practices and procedures • Varying work practices and behaviour as a result of performance feedback from subordinates, peers and managers • Evaluating ideas to ensure that technical and regulatory aspects have been fully covered before proposing action that may result in modifications or changes to work processes • Applying human factors to avoid maintenance errors and maintain quality standards • Adapting competencies to the performance of a wide range of maintenance tasks • Contributing to a process of continuous improvement and a willingness to initiate, support and participate in the effective introduction of new work practices
Planning and organising	• Clarifying task objectives and required outcomes through discussion with managers and team members • Planning the use of resources and allocating personnel and resources to tasks • Monitoring the time taken to complete tasks against team requirements or targets provided by management • Assessing work requirements for quotations

	• Collecting, analysing and organising information relating to assigned maintenance tasks and confirming the purpose and required work outcomes • Identifying contingency situations and taking action to resolve problems • Identifying the extent of impact on assigned work of changes in procedures, work instructions or regulatory requirements
Self-management	• Accepting responsibility for managing individual workload to meet target completion times or fit in with team milestones • Assessing personal knowledge and skills when assisting team members with complex tasks and when proposing modifications, repair schemes or changes to maintenance practices • Actively seeking opportunities to develop competencies and to apply them across a range of tasks and application of legislation, regulations, policy and procedures to achieve required outcomes and build confidence in own ideas and vision • Effectively manage personal work priorities and professional development • Identifying career paths and training opportunities that will assist in attaining career goals
Learning	• Taking advantage of learning opportunities that arise through training courses provided by the organisation or external providers and through mentoring and on-the-job training • Adapting competencies to accommodate new ideas and techniques • Using feedback from subordinates, peers and managers to identify ways in which competence can be improved • Mentoring and providing on-the-job training and induction training to team members • Interpreting units of competency and applying them to attainment of identified career goals
Technology	• Operating aircraft and avionic systems, test equipment and ground support equipment, ground running engines and troubleshooting faults • Using on-board maintenance systems and using maintenance-related software • Maintaining aircraft systems, components and test stands • Performance testing of aircraft systems and engines • Storing and caring for components, parts, tools, test equipment and support equipment • Complying with requirements to complete maintenance records, develop and revise maintenance data and propose amendments to technical publications • Amending various forms of maintenance data • Using computers and microfiche to obtain maintenance data and

	using computers to complete records, reports and documentation

Packaging Rules

To be awarded the MEA50311 Diploma of Aviation Maintenance Management (Avionics), competency must be demonstrated in a total of **eleven (11)** units of competency.

All units must be chosen as specified under the conditions set out below:

- **ten (10)** Core Diploma level common, engineering and imported units
- **one (1) or tow (2)** Elective Diploma level common units from Group A.

Core units of competency

Complete the following **five (5)** common Diploma units, **four (4)** para-professional engineering units and **one (1)** imported sustainability unit listed below.

Unit code	Unit title	Prerequisites
MEA116B	Apply occupational health and safety procedures at supervisor level in aviation maintenance	Nil
MEA121B	Manage aircraft/aeronautical product configuration	Nil
MEA133B	Communicate aviation technical and maintenance knowledge	Nil
MEA135A	Use computers in aviation maintenance-related integrated logistic support activities	Nil
MEA142B	Manage self in the aviation maintenance environment	Nil
MEA272B	Apply basic scientific principles and techniques in avionic engineering situations	Nil
MEA273A	Select and test avionic engineering materials	Nil
MEM30007A	Select common engineering materials	Nil
MEM30012A	Apply mathematical techniques in a manufacturing engineering or related environment	Nil
MSAENV472B	Implement and monitor environmentally sustainable work practices	Nil

Elective units Group A

Plus **one (1)** of the following elective common units selected in accordance with the guidance provided in column four.

If MEA147A is required two (2) units must be taken.

Unit code	Unit title	Prerequisites	Unit selection guidance
MEA136A	Assess aviation maintenance spares and manage repairable items	MEA135A	Elective – for spares assessors and repairable item managers
MEA137A	Write aviation technical publications	MEA135A	Elective – for aviation technical authors
MEA140A	Supervise aviation maintenance teams and perform maintenance quality inspections	Nil	Elective – for supervisors within the ADF regulatory system
MEA147A	Perform airworthiness management and maintenance program tasks	MEA137A	Elective - applicable to CAMO employment

Custom Content Section

Not applicable.

MEA50411 Diploma of Aviation Maintenance Management (Mechanical)

Modification History

Release 2 - Licensing requirements clarified. New elective MEA147A added to Group A - equivalent

Release 1 - Unit codes updated as required. Entry requirements clarified - equivalent

Description

This qualification may be of use to individuals employed in aviation maintenance management fields in both the civil and ADF regulatory environments in jobs such as mechanical maintenance team leaders, maintenance planners, spares assessors, repairable item managers and technical authors. It must be emphasised that many of the maintenance management positions applicable to the qualification have additional experience requirements specified in airworthiness regulations and only a limited range of employment opportunities may be available to those who do not have extensive prior aviation maintenance experience. For this reason the qualification has entry requirements.

The qualification consists of:

- ten (10) core units that provide competencies applicable to aviation maintenance managers
- one (1) or two (2) elective units chosen according to employment need.
-

Pathways Information

Credit is provided towards the MEA60211 Advanced Diploma of Aviation Maintenance Management (Mechanical).

Licensing/Regulatory Information

This qualification complies with airworthiness regulatory requirements of CASA and the ADF.

Entry Requirements

Individuals seeking this qualification must meet at least one of the following entry criteria:

- at least five years current aviation mechanical maintenance experience
- Maintenance Engineer Licence (Mechanical) issued by CASA
- Certificate IV in Aeroskills (Mechanical).

Employability Skills Summary

Employability Skill	Industry/enterprise requirements for this qualification include:
Communication	• Understanding complex directions from senior managers • Understanding input from professional engineers, specialist personnel and technical representatives • Liaising with maintenance personnel, aircrew and specialists regarding maintenance problems • Talking to senior mangers about maintenance and maintenance management problems and making presentations • Providing guidance to others and describing clearly faults, problems and spares requirements • Negotiating with team members, senior managers and aircraft owners/operators regarding timing and progress of work activities • Negotiating with potential suppliers of items of aeronautical product, piece parts and consumables • Negotiating with clients regarding the drafting of technical publications and maintenance data • Understanding and interpreting regulations, procedures, instructions and maintenance publications • Giving written instructions and completing maintenance documentation and component tags • Writing reports and proposals as required by regulations and organisational procedures • Interpreting organisational charts, wiring diagrams and system schematics, reading drawings relating to maintenance activities and interpreting fault diagnosis guides and logic charts • Using computers to obtain maintenance and maintenance management data, complete documentation and correspond using email • Networking with other maintenance managers and with others involved in maintenance-related integrated logistic support activities
Teamwork	• Performing tasks as an individual while being responsive to team members or colleagues and senior managers and allowing for relevant human factors • Working effectively with others who may be of different ages, gender, race, religion and political persuasion • Assisting team members with task definition and providing advice on work processes and troubleshooting • Providing leadership and development of team commitment and dynamics • Monitoring and assessing team performance and providing mentoring and performance feedback

	• Gaining the trust and confidence of team members and resolving conflict within the team • Providing team members with the opportunity for ongoing competency development
Problem solving	• Identifying problems in a timely manner and developing practical solutions to maintenance problems not fully covered by maintenance data and to maintenance management problems • Proposing solutions to problems as repair schemes, modifications or as amendments to specified maintenance processes • Assisting with the resolution of complex problems as a team effort • Constantly reviewing problem solving skills and ability to effectively apply competencies to solve problems within the limits permitted by regulatory and organisational guidelines • Responding to emergencies or accidents in accordance with legislative, regulatory and organisational requirements • Using mathematical techniques to relate test results to system or component performance, to convert values between systems of measurement, to calculate weight and balance, to develop management solutions to problems, and in performing integrated logistic support procedures
Initiative and enterprise	• Adapting to new situations that arise as a consequence of regulatory changes, technology, contractual requirements, personnel management changes, operational circumstances, revised maintenance data, practices and procedures • Varying work practices and behaviour as a result of performance feedback from subordinates, peers and managers • Evaluating ideas to ensure that technical and regulatory aspects have been fully covered before proposing action that may result in modifications or changes to work processes • Applying human factors to avoid maintenance errors and maintain quality standards • Adapting competencies to the performance of a wide range of maintenance tasks • Contributing to a process of continuous improvement and a willingness to initiate, support and participate in the effective introduction of new work practices
Planning and organising	• Clarifying task objectives and required outcomes through discussion with managers and team members • Planning the use of resources and allocating personnel and resources to tasks • Monitoring the time taken to complete tasks against team requirements or targets provided by management • Assessing work requirements for quotations

	• Collecting, analysing and organising information relating to assigned maintenance tasks and confirming the purpose and required work outcomes • Identifying contingency situations and taking action to resolve problems • Identifying the extent of impact on assigned work of changes in procedures, work instructions or regulatory requirements
Self-management	• Accepting responsibility for managing individual workload to meet target completion times or fit in with team milestones • Assessing personal knowledge and skills when assisting team members with complex tasks and when proposing modifications, repair schemes or changes to maintenance practices • Actively seeking opportunities to develop competencies and to apply them across a range of tasks and application of legislation, regulations, policy and procedures to achieve required outcomes and build confidence in own ideas and vision • Effectively manage personal work priorities and professional development • Identifying career paths and training opportunities that will assist in attaining career goals
Learning	• Taking advantage of learning opportunities that arise through training courses provided by the organisation or external providers and through mentoring and on-the-job training • Adapting competencies to accommodate new ideas and techniques • Using feedback from subordinates, peers and managers to identify ways in which competence can be improved • Mentoring and providing on-the-job training and induction training to team members • Interpreting units of competency and applying them to attainment of identified career goals
Technology	• Operating aircraft and avionic systems, test equipment and ground support equipment, ground running engines and troubleshooting faults • Using on-board maintenance systems and using maintenance-related software • Maintaining aircraft systems, components and test stands • Performance testing of aircraft systems and engines • Storing and caring for components, parts, tools, test equipment and support equipment • Complying with requirements to complete maintenance records, develop and revise maintenance data and propose amendments to technical publications • Amending various forms of maintenance data • Using computers and microfiche to obtain maintenance data and

	using computers to complete records, reports and documentation

Packaging Rules

To be awarded the MEA50411 Diploma of Aviation Maintenance Management (Mechanical), competency must be demonstrated in a total of **eleven (11)** units of competency.

All units must be chosen as specified under the conditions set out below:

- **ten (10)** Core Diploma level common, engineering and imported units
- **one (1) or two (2)** Elective Diploma level common units from Group A.

Core units of competency

Complete the following **five (5)** common Diploma units, **four (4)** para-professional engineering units and **one (1)** imported sustainability unit listed below.

Unit code	Unit title	Prerequisites
MEA116B	Apply occupational health and safety procedures at supervisor level in aviation maintenance	Nil
MEA121B	Manage aircraft/aeronautical product configuration	Nil
MEA133B	Communicate aviation technical and maintenance knowledge	Nil
MEA135A	Use computers in aviation maintenance-related integrated logistic support activities	Nil
MEA142B	Manage self in the aviation maintenance environment	Nil
MEA349B	Apply basic scientific principles and techniques in aeronautical engineering situations	Nil
MEA350A	Select and test aeronautical engineering materials	Nil
MEM30007A	Select common engineering materials	Nil
MEM30012A	Apply mathematical techniques in a manufacturing engineering or related environment	Nil
MSAENV472B	Implement and monitor environmentally sustainable work practices	Nil

Elective units Group A

Plus **one (1)** of the following elective common units selected in accordance with the guidance in column four.

If MEA147A is required two (2) units must be taken.

Unit code	Unit title	Prerequisites	Unit selection guidance
MEA136A	Assess aviation maintenance spares and manage repairable items	MEA135A	Elective – for spares assessors and repairable item managers
MEA137A	Write aviation technical publications	MEA135A	Elective – for aviation technical authors
MEA140A	Supervise aviation maintenance teams and perform maintenance quality inspections	Nil	Elective – for supervisors within the ADF regulatory system
MEA147A	Perform airworthiness management and maintenance program tasks	MEA137A	Applicable to CAMO employment

Custom Content Section

Not applicable.

MEA50511 Diploma of Aeroskills (Non-Destructive Testing)

Modification History

Release 2 - Licensing requirements clarified - equivalent

Release 1 - Unit codes updated as required. Imported financial management elective unit replaced by MEA146A - equivalent

Description

This qualification applies to individuals who perform non-destructive testing (NDT) on aircraft and aircraft components in accordance with *AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace* at Level 2 and in compliance with the regulatory requirements of CASA and the ADF.

The requirement for the awarding of MEA50511 Diploma of Aeroskills (Non-Destructive Testing) is demonstrated competency in listed units of competency under the conditions set out below. It consists of Core units plus applicable units from Electives Group A.

Core units are as follows:

- Preliminary common and technical stream units for individuals who do not have a Certificate IV in Aeroskills
- Mandatory units consisting of:
- common and technical stream units that relate to the aviation maintenance environment
- technical stream and imported units relating to the NDT work environment
- imported units that specifically cover the competencies required to perform each relevant NDT technique to the standard specified in *AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace* for Level 2 personnel.

Elective Group A units consist of:

- Common units specific to either CASA or ADF regulatory requirements
- Technical stream and imported units that are applicable to various areas of employment in the NDT field.
-

Pathways Information

The qualification also provides credits towards the MEA50411 Diploma of Aviation Maintenance Management (Mechanical), the MEA60211 Advanced Diploma of Aviation Maintenance Management (Mechanical) and the MEA60311 Advanced Diploma of Aviation Non-Destructive Testing.

Licensing/Regulatory Information

This qualification complies with the requirements of *AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace* at Level 2 and with the airworthiness regulatory requirements of CASA and the ADF.

Entry Requirements

Individuals seeking this qualification must meet one of the following entry criteria:

- Certificate IV in Aeroskills
- Aircraft Maintenance Engineer Licence issued by CASA
- Attainment of the following **nine (9)** Aeroskills units of competency:

Unit code	Unit title	Prerequisites
MEA101B	Interpret occupational health and safety practices in aviation maintenance	Nil
MEA103B	Plan and organise aviation maintenance work activities	MEA101B, MEA105C, MEA107B, MEA108B
MEA105C	Apply quality standards applicable to aviation maintenance processes	MEA101B, MEA107B
MEA107B	Interpret and use aviation maintenance industry manuals and specifications	Nil
MEA108B	Complete aviation maintenance industry documentation	MEA105C
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105C, MEA108B
MEA340A	Lay out and set up aircraft systems	MEA101B, MEA107B, MEA109B
MEA341A	Apply basic aircraft design characteristics	MEA101B, MEA107B, MEA109B
MEA342A	Apply basic aircraft power plant design characteristics	MEA101B, MEA107B, MEA109B

Employability Skills Summary

Employability Skill	Industry/enterprise requirements for this qualification include:
Communication	• Understanding complex directions from senior managers • Understanding input from professional engineers, specialist personnel and technical representatives • Liaising with maintenance personnel and specialists regarding NDT requirements • Talking to senior mangers about NDT tasks and requirements and making presentations • Providing guidance to others and describing clearly faults found during NDT • Negotiating with team members, senior managers and aircraft owners/operators regarding timing and progress of work activities • Understanding and interpreting regulations, procedures, instructions and maintenance publications • Giving written instructions and completing maintenance documentation and component tags • Writing reports and proposals as required by regulations and organisational procedures • Interpreting organisational charts, wiring diagrams and system schematics, reading drawings relating to NDT activities and interpreting specific NDT procedures • Using computers to obtain maintenance data and complete documentation and correspond using email • Networking with other maintenance managers and with maintenance controllers
Teamwork	• Performing tasks as an individual while being responsive to supervisors and allowing for relevant human factors • Working effectively with others who may be of different ages, gender, race, religion and political persuasion • Assisting team members with task definition and providing advice on work processes and troubleshooting • Providing leadership and development of team commitment and dynamics • Monitoring and assessing team performance and providing mentoring and performance feedback • Gaining the trust and confidence of team members and resolving conflict within the team • Providing team members with the opportunity for ongoing competency development
Problem solving	• Identifying problems in a timely manner and developing practical solutions to maintenance problems requiring NDT

	• Proposing solutions to problems associated with the development and application of NDT processes • Assisting with the resolution of complex problems as a team effort • Constantly reviewing problem solving skills and ability to effectively apply competencies to solve problems within the limits permitted by regulatory and organisational guidelines • Responding to emergencies or accidents in accordance with legislative, regulatory and organisational requirements • Using mathematical techniques to relate test results to system or component performance, to convert values between systems of measurement, to calculate weight and balance and to develop management solutions to problems
Initiative and enterprise	• Adapting to new situations that arise as a consequence of regulatory changes, technology, contractual requirements, personnel management changes, operational circumstances, revised NDT data, practices and procedures • Varying work practices and behaviour as a result of performance feedback from subordinates, peers and managers • Evaluating ideas to ensure that technical and regulatory aspects have been fully covered before proposing action that may result in modifications or changes to work processes • Applying human factors to avoid maintenance errors and maintain quality standards • Adapting competencies to the performance of a wide range of maintenance tasks • Contributing to a process of continuous improvement and a willingness to initiate, support and participate in the effective introduction of new work practices
Planning and organising	• Clarifying task objectives and required outcomes through discussion with managers and team members • Planning the use of resources and allocating personnel and resources to tasks • Monitoring the time taken to complete tasks against team requirements or targets provided by management • Assessing work requirements for quotations • Collecting, analysing and organising information relating to assigned NDT tasks and confirming the purpose and required work outcomes • Identifying contingency situations and taking action to resolve problems • Identifying the extent of impact on assigned work of changes in procedures, work instructions or regulatory requirements
Self-management	• Accepting responsibility for managing individual workload to meet target completion times or fit in with team milestones

	• Assessing personal knowledge and skills when assisting team members with NDT tasks and when proposing new or modified NDT procedures • Actively seeking opportunities to develop competencies and to apply them across a range of tasks and application of legislation, regulations, policy and procedures to achieve required outcomes and build confidence in own ideas and vision • Effectively manage personal work priorities and professional development • Identifying career paths and training opportunities that will assist in attaining career goals
Learning	• Taking advantage of learning opportunities that arise through training courses provided by the organisation or external providers and through mentoring and on-job training • Adapting competencies to accommodate new ideas and techniques • Using feedback from subordinates, peers and managers to identify ways in which competence can be improved • Mentoring and providing on-job training and induction training to team members • Interpreting units of competency and applying them to attainment of identified career goals
Technology	• Operating and maintaining NDT equipment and reference standards • Performing NDT procedures on aircraft and aircraft components • Storing and caring for components, parts, tools, test equipment and support equipment • Complying with requirements to complete maintenance records, develop and revise maintenance data and propose amendments to technical publications • Amending various forms of maintenance data • Using computers and microfiche to obtain maintenance data and using computers to complete records, reports and documentation

Packaging Rules

To be awarded the MEA50511 Diploma of Aeroskills (Non-Destructive Testing) competency must be demonstrated in **twenty seven (27)** units, chosen as described below.

Core units of competency

Complete the following **twenty four (24)** core units.

Unit code	Unit title	Prerequisites
MEA116B	Apply occupational health and safety procedures at supervisor level in aviation maintenance	Nil
MEA133B	Communicate aviation technical and maintenance management knowledge	Nil
MEA135A	Use computers in aviation maintenance-related integrated logistic support activities	Nil
MEA142B	Manage self in the aviation maintenance environment	Nil
MEA260B	Use electrical test equipment	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA261C	Use electronic test equipment	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA424A	Evaluate aircraft non-destructive tests	MEA109B, MEA133B, MEM13013B, MEM16010A, MEM24002B, MEM24004B, MEM24006B, MEM24008B MEM24010B, MEM24012C
MEM09002B	Interpret technical drawing	Nil
MEM09003B	Prepare basic engineering drawing	MEM09002B
MEM11011B	Undertake manual handling	Nil
MEM12003B	Perform precision mechanical measurement	MEM12023A (see Note 1)
MEM12005B	Calibrate measuring equipment	MEM12002B (see Note 2) MEM12023A (see Note 1)
MEM13013B	Work safely with ionising radiation	Nil

MEM15017B	Use and maintain reference standards	MEM11011B MEM12003B MEM12004B (see Note 2) MEM12005B MEM12023A (see Note 1) MEM18001C (see Note 1) MEM18002B (see Note 1)
MEM16010A	Write reports	MEM14005A (see Note 3)
MEM24002B	Perform penetrant testing	MEM18001C (see Note 1) MEM24012C
MEM24004B	Perform magnetic particle testing	MEM18001C (see Note 1) MEM24012C
MEM24006B	Perform eddy current testing	MEM18001C (see Note 1) MEM24012C
MEM24008B	Perform ultrasonic testing	MEM18001C (see Note 1) MEM24012C
MEM24010B	Perform radiographic testing	MEM13013B MEM18001C (see Note 1) MEM24012C
MEM24012C	Apply metallurgy principles	Nil

MEM30007A	Select common engineering materials	Nil
MEM30012A	Apply mathematical techniques in a manufacturing, engineering or related environment	Nil
MSAENV472B	Implement and monitor environmentally sustainable work practices	Nil

Notes

- MEA109B is equivalent to MEM12023A, MEM18001C and MEM18002B
- MEA260B and MEA261C are together equivalent to MEM12002B and MEM12004B
- MEA103B is equivalent to MEM14005A

Elective units Group A

Complete **three (3)** units chosen in accordance with the unit selection guidelines in column four.

Unit code	**Unit title**	**Prerequisites**	**Unit selection guidelines**
MEA112B	Plan and implement civil aircraft maintenance activities	All relevant technical units	mandatory for CASA regulatory system
MEA113C	Supervise civil aircraft maintenance activities and manage human resources in the workplace	All relevant technical units	mandatory for CASA regulatory system
MEA140A	Supervise aviation maintenance teams and perform maintenance quality inspections	Nil	mandatory for ADF regulatory system
MEM15010B	Perform laboratory procedures	Nil	
MEM17002B	Conduct workplace assessment	Nil	
TAEDEL301A	Provide work skill instruction	Nil	

Custom Content Section

Not applicable.

MEA60111 Advanced Diploma of Aviation Maintenance Management (Avionics)

Modification History

Release 2 - Licensing requirements clarified. New elective MEA147A added to Elective Units Group A - equivalent

Release 1 - Unit codes updated as required. Imported financial management elective unit replaced by MEA146A - equivalent

Description

This qualification may be of use to individuals employed in managerial positions in both the civil and ADF regulatory environments in the fields of avionic maintenance management and Integrated Logistic Support (ILS). It should also be noted that most of the maintenance management positions applicable to this qualification have airworthiness regulatory requirements regarding aviation maintenance experience. There is therefore no direct entry pathway to the qualification.

The qualification consists of:

- twenty five (25) common units and two (2) imported units, seventeen (17) of which are elective, that provide general competencies applicable to aviation maintenance managers
- four (4) para-professional avionic engineering units.

With regard to the employability skills, due to the high proportion of electives required by this qualification, the industry/enterprise requirements described for each employability skill are representative of the aviation maintenance industry in general and may not reflect specific job roles. Learning and assessment strategies for this qualification should be based on the requirements of the units of competency for this qualification.

Pathways Information

Not applicable.

Licensing/Regulatory Information

This qualification complies with airworthiness regulatory requirements of CASA and the ADF.

Entry Requirements

Individuals seeking this qualification must meet at least one of the following criteria:

- at least five years current avionic maintenance experience
- Maintenance Engineer Licence (Avionics) issued by CASA
- Certificate IV in Aeroskills (Avionics)
- Diploma of Aviation Maintenance Management (Avionics).

Employability Skills Summary

Employability Skill	**Industry/enterprise requirements for this qualification include:**
Communication	• Understanding complex directions from senior managers • Understanding input from professional engineers, specialist personnel and technical representatives • Liaising with maintenance personnel, aircrew and specialists regarding maintenance problems • Talking to senior mangers about maintenance and maintenance management problems and making presentations • Providing guidance to others and clearly describing faults, problems and spares requirements • Negotiating with team members, senior managers and aircraft owners/operators regarding timing and progress of work activities • Negotiating with potential suppliers of items of aeronautical product, piece parts and consumables • Negotiating with clients regarding the drafting of technical publications and maintenance data • Negotiating with senior managers regarding issues, such as activity timelines and budgetary matters • Understanding and interpreting regulations, procedures, instructions and maintenance publications • Giving written instructions, such as maintenance orders and compilation of maintenance documentation • Writing reports and proposals as required by regulations and organisational procedures • Interpreting organisational charts, wiring diagrams and system schematics, reading drawings relating to maintenance activities and interpreting fault diagnosis guides and logic charts • Using computers to obtain maintenance and maintenance management data, complete documentation and correspond using email • Networking with other maintenance managers and with others involved in maintenance-related integrated logistic support activities

Teamwork	• Performing tasks as an individual while being responsive to team members or colleagues and senior managers and allowing for relevant human factors • Working effectively with others who may be of different ages, gender, race, religion and political persuasion • Assisting team members with task definition and providing advice on work processes and troubleshooting • Matching team member skills and authorisations to the task and adapting to contingencies • Providing leadership and development of team commitment and dynamics • Monitoring and assessing team performance and providing mentoring and performance feedback • Gaining the trust and confidence of team members and resolving conflict within the team • Providing team members with the opportunity for ongoing competency development
Problem solving	• Identifying problems in a timely manner and developing practical solutions to maintenance problems not fully covered by maintenance data and to maintenance management problems • Proposing solutions to problems as repair schemes, modifications or as amendments to specified maintenance processes • Assisting with the resolution of complex problems as a team effort • Constantly reviewing problem solving skills and ability to effectively apply competencies to solve problems within the limits permitted by regulatory and organisational guidelines • Responding to emergencies or accidents in accordance with legislative, regulatory and organisational requirements • Using mathematical techniques to relate test results to system or component performance, to convert values between systems of measurement, to calculate weight and balance, to develop management solutions to problems, and in performing integrated logistic support procedures
Initiative and enterprise	• Adapting to new situations that arise as a consequence of regulatory changes, technology, contractual requirements, personnel management changes, operational circumstances, revised maintenance data, practices and procedures • Varying work practices and behaviour as a result of performance feedback from subordinates, peers and managers • Evaluating ideas to ensure that technical and regulatory aspects have been fully covered before proposing action that may result in modifications or changes to work processes • Applying human factors to avoid maintenance errors and

	maintain quality standards • Adapting competencies to the performance of a wide range of maintenance tasks • Managing a process of innovation and continuous improvement and a willingness to initiate, support and participate in the effective introduction of new work practices • Assessing risks and taking action to achieve a recognised benefit or advantage to the organisation as a consequence of revised processes and procedures • Evaluating software requirements and hardware enhancements
Planning and organising	• Clarifying task objectives and required outcomes through discussion with managers and team members • Planning the use of resources and allocating personnel and resources to tasks • Monitoring the time taken to complete tasks against team requirements or targets provided by management • Assessing work requirements for quotations • Collecting, analysing and organising information relating to assigned maintenance tasks and confirming the purpose and required work outcomes • Identifying contingency situations and taking action to resolve problems • Identifying the extent of impact on assigned work of changes in procedures, work instructions or regulatory requirements • Analysing customer requirements and organisational work capacity • Developing, managing and evaluating aircraft and component maintenance strategies and plans • Establishing clear task goals and deliverables • Reviewing or developing budgets and managing financial resources • Surveying and assessing organisational and customer needs
Self-management	• Accepting responsibility for managing individual workload to meet target completion times or fit in with team milestones • Assessing personal knowledge and skills when assisting team members with complex tasks and when proposing modifications, repair schemes, changes to maintenance practices or in managing integrated logistic support activities • Actively seeking opportunities to develop competencies and to apply them across a range of tasks and application of legislation, regulations, policy and procedures to achieve required outcomes and build confidence in own ideas and vision • Effectively manage personal work priorities and professional development • Identifying career paths and training opportunities that will assist

	in attaining career goals
Learning	• Taking advantage of learning opportunities that arise through training courses provided by the organisation or external providers and through mentoring and on-the-job training • Adapting competencies to accommodate new ideas and techniques • Using feedback from subordinates, peers and managers to identify ways in which competence can be improved • Mentoring and providing on-the-job training and induction training to team members • Interpreting units of competency and applying them to attainment of identified career goals
Technology	• Operating aircraft and avionic systems, test equipment and ground support equipment, ground running engines and troubleshooting faults • Using on-board maintenance systems and using maintenance-related software • Maintaining aircraft systems, components and test stands • Performance testing of aircraft systems and engines • Storing and caring for components, parts, tools, test equipment and support equipment • Complying with requirements to complete maintenance records, develop and revise maintenance data and propose amendments to technical publications • Amending various forms of maintenance data • Using computers and microfiche to obtain maintenance data and using computers to complete records, reports and documentation

Packaging Rules

To be awarded the MEA60111 Advanced Diploma of Aviation Maintenance Management (Avionics), competency must be demonstrated in a total of **nineteen (19)** units of competency, as described below.

- If a Diploma of Aviation Maintenance Management (Avionics) has been attained, **nine (9)** of the required units will be already held and the number of additional units required is **ten (10)**.
- In all other cases the number of units required is **nineteen (19)**.

All units must be chosen as specified under the conditions set out below:

- **fifteen (15)** Core units consisting of engineering, common and imported units

- **four (4)** Elective units chosen from the common and imported units in Group A.

Core units of competency

The **four (4)** para-professional engineering units listed below are mandatory for those who do not have a Diploma of Aviation Maintenance Management (Avionics).

Unit code	Unit title	Prerequisites
MEA272B	Apply basic scientific principles and techniques in avionic engineering situations	Nil
MEA273A	Select and test avionic engineering materials	Nil
MEM30007A	Select common engineering materials	Nil
MEM30012A	Apply mathematical techniques in a manufacturing engineering or related environment	Nil

Complete the **eleven (11)** Advanced Diploma/Diploma common and imported units listed below (those with a Diploma of Aviation Maintenance Management (Avionics) will already have MEA121B, MEA133B, MEA135A and MEA142B).

Unit code	Unit title	Prerequisites
MEA120B	Manage an aviation maintenance quality system	Nil
MEA121B	Manage aircraft/aeronautical product configuration	Nil
MEA123B	Manage aviation maintenance work environment policy and practices	Nil
MEA124B	Coordinate change programs in the aviation maintenance environment	Nil
MEA125B	Develop aviation maintenance personnel	Nil
MEA133B	Communicate aviation technical and maintenance knowledge	Nil
MEA134B	Establish, maintain and evaluate the	Nil

Unit code	Unit title	Prerequisites
	organisation's occupational health and safety system	
MEA135A	Use computers in aviation maintenance-related integrated logistic support activities	Nil
MEA141B	Manage risk in aviation maintenance	Nil
MEA142B	Manage self in the aviation maintenance environment	Nil
MSAENV672B	Develop workplace policy and procedures for environmental sustainability	Nil

Elective units Group A

Plus **four (4)** of the elective Advanced Diploma/Diploma common and imported units listed below (those with a Diploma of Aviation Maintenance Management (Avionics) will already have one (1) of MEA136A, MEA137B and MEA140A). Units should be selected using the guidance in column four.

Unit code	Unit title	Prerequisites	Unit selection guidance
MEA115A	Plan and implement aeronautical product maintenance activities	Nil	
MEA122B	Manage aircraft/equipment system performance testing	MEA126B	
MEA126B	Manage aircraft maintenance activities	Nil	
MEA127B	Provide technical advice in the maintenance and management of aircraft and aeronautical product	MEA272B MEA273A	Applicable to the CASA regulatory environment
MEA128B	Provide engineering advice in the modification, maintenance and management of aircraft systems	MEA272B MEA273A	Applicable to the ADF regulatory environment

Unit code	Unit title	Prerequisites	Unit selection guidance
MEA129A	Investigate technical aspects of aviation occurrences	Nil	Applicable to the ADF regulatory environment
MEA130A	Manage deployed/detached aviation maintenance activities	Nil	Applicable to the ADF regulatory environment
MEA131B	Manage the custody, transfer and disposal of aircraft, aeronautical product and support equipment	Nil	
MEA132A	Manage budgetary resources in the aviation maintenance environment	Nil	MEA146A or PSPMNGT610A may be taken instead of this unit
MEA136A	Assess aviation maintenance spares and manage repairable items	MEA135A	
MEA137A	Write aviation technical publications	MEA135A	
MEA138B	Perform aviation technical publication management activities	MEA137A	
MEA139A	Perform aviation maintenance-related integrated logistic support activities	Nil	
MEA140A	Supervise aviation maintenance teams and perform maintenance quality inspections	Nil	For supervisors within the ADF regulatory system
MEA143B	Develop and manage maintenance error management programs	Nil	Applicable to the CASA regulatory environment
MEA146A	Prepare and manage aviation maintenance organisation budgets and financial plans	Nil	Alternative to MEA132A and to PSPMNGT610A
MEA147A	Perform airworthiness management and maintenance program tasks	MEA137A	Applicable to CAMO employment

Unit code	Unit title	Prerequisites	Unit selection guidance
PSPMNGT610A	Manage public sector financial resources	Nil	Alternative to MEA132A and to MEA146A

Custom Content Section

Not applicable.

MEA60211 Advanced Diploma of Aviation Maintenance Management (Mechanical)

Modification History

Release 2 - Licensing requirements clarified. New elective MEA147A added to Group A - equivalent

Release 1 - Unit codes updated as required. Imported financial management elective unit replaced by MEA146A - equivalent

Description

This qualification may be of use to individuals employed in managerial positions in both the civil and ADF regulatory environments in the fields of mechanical maintenance management and Integrated Logistic Support (ILS). It should also be noted that most of the maintenance management positions applicable to this qualification also have airworthiness regulatory requirements regarding aviation maintenance experience. There is therefore no direct entry pathway to the qualification.

The qualification consists of:

- Twenty five (25) common units and two (2) imported units, seventeen (17) of which are elective, that provide general competencies applicable to aviation maintenance managers
- four (4) para-professional aeronautical engineering units.

With regard to the employability skills, due to the high proportion of electives required by this qualification, the industry/enterprise requirements described for each employability skill are representative of the aviation maintenance industry in general and may not reflect specific job roles. Learning and assessment strategies for this qualification should be based on the requirements of the units of competency for this qualification.

Pathways Information

Not applicable.

Licensing/Regulatory Information

This qualification complies with airworthiness regulatory requirements of CASA and the ADF.

Entry Requirements

Individuals seeking this qualification must meet at least one of the following entry criteria:

- at least five years current aviation mechanical maintenance experience
- Maintenance Engineer Licence (Mechanical) issued by CASA
- Certificate IV in Aeroskills (Mechanical)
- Diploma of Aviation Maintenance Management (Mechanical).

Employability Skills Summary

Employability Skill	Industry/enterprise requirements for this qualification include:
Communication	• Understanding complex directions from senior managers • Understanding input from professional engineers, specialist personnel and technical representatives • Liaising with maintenance personnel, aircrew and specialists regarding maintenance problems • Talking to senior mangers about maintenance and maintenance management problems and making presentations • Providing guidance to others and describing clearly faults, problems and spares requirements • Negotiating with team members, senior managers and aircraft owners/operators regarding timing and progress of work activities • Negotiating with potential suppliers of items of aeronautical product, piece parts and consumables • Negotiating with clients regarding the drafting of technical publications and maintenance data • Negotiating with senior managers regarding issues, such as activity timelines and budgetary matters • Understanding and interpreting regulations, procedures, instructions and maintenance publications • Giving written instructions, such as maintenance orders and compilation of maintenance documentation • Writing reports and proposals as required by regulations and organisational procedures • Interpreting organisational charts, wiring diagrams and system schematics, reading drawings relating to maintenance activities and interpreting fault diagnosis guides and logic charts • Using computers to obtain maintenance and maintenance management data, complete documentation and correspond using email • Networking with other maintenance managers and with others involved in maintenance-related integrated logistic support activities

Teamwork	• Performing tasks as an individual while being responsive to team members or colleagues and senior managers and allowing for relevant human factors • Working effectively with others who may be of different ages, gender, race, religion and political persuasion • Assisting team members with task definition and providing advice on work processes and troubleshooting • Matching team member skills and authorisations to the task and adapting to contingencies • Providing leadership and development of team commitment and dynamics • Monitoring and assessing team performance and providing mentoring and performance feedback • Gaining the trust and confidence of team members and resolving conflict within the team • Providing team members with the opportunity for ongoing competency development
Problem solving	• Identifying problems in a timely manner and developing practical solutions to maintenance problems not fully covered by maintenance data and to maintenance management problems • Proposing solutions to problems as repair schemes, modifications or as amendments to specified maintenance processes • Assisting with the resolution of complex problems as a team effort • Constantly reviewing problem solving skills and ability to effectively apply competencies to solve problems within the limits permitted by regulatory and organisational guidelines • Responding to emergencies or accidents in accordance with legislative, regulatory and organisational requirements • Using mathematical techniques to relate test results to system or component performance, to convert values between systems of measurement, to calculate weight and balance, to develop management solutions to problems, and in performing integrated logistic support procedures
Initiative and enterprise	• Adapting to new situations that arise as a consequence of regulatory changes, technology, contractual requirements, personnel management changes, operational circumstances, revised maintenance data, practices and procedures • Varying work practices and behaviour as a result of performance feedback from subordinates, peers and managers • Evaluating ideas to ensure that technical and regulatory aspects have been fully covered before proposing action that may result in modifications or changes to work processes • Applying human factors to avoid maintenance errors and

	maintain quality standards • Adapting competencies to the performance of a wide range of maintenance tasks • Managing a process of innovation and continuous improvement and a willingness to initiate, support and participate in the effective introduction of new work practices • Assessing risks and taking action to achieve a recognised benefit or advantage to the organisation as a consequence of revised processes and procedures • Evaluating software requirements and hardware enhancements
Planning and organising	• Clarifying task objectives and required outcomes through discussion with managers and team members • Planning the use of resources and allocating personnel and resources to tasks • Monitoring the time taken to complete tasks against team requirements or targets provided by management • Assessing work requirements for quotations • Collecting, analysing and organising information relating to assigned maintenance tasks and confirming the purpose and required work outcomes • Identifying contingency situations and taking action to resolve problems • Identifying the extent of impact on assigned work of changes in procedures, work instructions or regulatory requirements • Analysing customer requirements and organisational work capacity • Developing, managing and evaluating aircraft and component maintenance strategies and plans • Establishing clear task goals and deliverables • Reviewing or developing budgets and managing financial resources • Surveying and assessing organisational and customer needs
Self-management	• Accepting responsibility for managing individual workload to meet target completion times or fit in with team milestones • Assessing personal knowledge and skills when assisting team members with complex tasks and when proposing modifications, repair schemes, changes to maintenance practices or in managing integrated logistic support activities • Actively seeking opportunities to develop competencies and to apply them across a range of tasks and application of legislation, regulations, policy and procedures to achieve required outcomes and build confidence in own ideas and vision • Effectively manage personal work priorities and professional development • Identifying career paths and training opportunities that will assist

	in attaining career goals
Learning	• Taking advantage of learning opportunities that arise through training courses provided by the organisation or external providers and through mentoring and on-the-job training • Adapting competencies to accommodate new ideas and techniques • Using feedback from subordinates, peers and managers to identify ways in which competence can be improved • Mentoring and providing on-the-job training and induction training to team members • Interpreting units of competency and applying them to attainment of identified career goals
Technology	• Operating aircraft and avionic systems, test equipment and ground support equipment, ground running engines and troubleshooting faults • Using on-board maintenance systems and using maintenance-related software • Maintaining aircraft systems, components and test stands • Performance testing of aircraft systems and engines • Storing and caring for components, parts, tools, test equipment and support equipment • Complying with requirements to complete maintenance records, develop and revise maintenance data and propose amendments to technical publications • Amending various forms of maintenance data • Using computers and microfiche to obtain maintenance data and using computers to complete records, reports and documentation

Packaging Rules

To be awarded the MEA60211 Advanced Diploma of Aviation Maintenance Management (Mechanical), competency must be demonstrated in a total of **nineteen (19)** units of competency, as described below.

- If the Diploma of Aviation Maintenance Management (Mechanical) has been achieved, the number of units required is **ten (10)**.
- In all other cases, the number of units required is **nineteen (19)**.

All units must be chosen as specified under the conditions set out below:

- **fifteen (15)** Core units consisting of engineering, common and imported units
- **four (4)** Elective units chosen from the common and imported units in Group A.

Core units of competency

The **four (4)** para-professional engineering units listed below are mandatory for those who do not have Diploma of Aviation Maintenance Management (Mechanical).

Unit code	Unit title	Prerequisites
MEA349B	Apply basic scientific principles and techniques in aeronautical engineering situations	Nil
MEA350A	Select and test aeronautical engineering materials	Nil
MEM30007A	Select common engineering materials	Nil
MEM30012A	Apply mathematical techniques in a manufacturing engineering or related environment	Nil

Complete the **eleven (11)** Advanced Diploma/Diploma common units listed below (those with Diploma of Aviation Maintenance Management (Mechanical) will already have MEA121B, MEA133B, MEA135B and MEA142B).

Unit code	Unit title	Prerequisites
MEA120B	Manage an aviation maintenance quality system	Nil
MEA121B	Manage aircraft/aeronautical product configuration	Nil
MEA123B	Manage aviation maintenance work environment policy and practices	Nil
MEA124B	Coordinate change programs in the aviation maintenance environment	Nil
MEA125B	Develop aviation maintenance personnel	Nil
MEA133B	Communicate aviation technical and maintenance knowledge	Nil
MEA134B	Establish, maintain and evaluate the organisation’s occupational health and safety system	Nil
MEA135A	Use computers in aviation maintenance-related	Nil

Unit code	Unit title	Prerequisites
	integrated logistic support activities	
MEA141B	Manage risk in aviation maintenance	Nil
MEA142B	Manage self in the aviation maintenance environment	Nil
MSAENV672B	Develop workplace policy and procedures for environmental sustainability	Nil

Elective units Group A

Take **four (4)** of the elective Advanced Diploma/Diploma common units listed below (those with Diploma of Aviation Maintenance Management (Mechanical) will already have **one (1)** of MEA136B, MEA137A and MEA140A). Units should be selected using the guidance in column four.

Unit code	Unit title	Prerequisites	Unit selection guidance
MEA115A	Plan and implement aeronautical product maintenance activities	Nil	
MEA122B	Manage aircraft/equipment system performance testing	MEA126B	
MEA126B	Manage aircraft maintenance activities	Nil	
MEA127B	Provide technical advice in the maintenance and management of aircraft and aeronautical product	MEA349A MEA350A	Applicable to the CASA regulatory environment
MEA128B	Provide engineering advice in the modification, maintenance and management of aircraft systems	MEA349A, MEA350A	Applicable to the ADF regulatory environment
MEA129A	Investigate technical aspects of aviation occurrences	Nil	Applicable to the ADF regulatory environment
MEA130A	Manage deployed/detached aviation maintenance activities	Nil	Applicable to the ADF regulatory environment

Unit code	Unit title	Prerequisites	Unit selection guidance
MEA131B	Manage the custody, transfer and disposal of aircraft, aeronautical product and support equipment	Nil	
MEA132A	Manage budgetary resources in the aviation maintenance environment	Nil	MEA146A or PSPMNGT610A may be taken instead of this unit
MEA136A	Assess aviation maintenance spares and manage repairable items	MEA135A	
MEA137A	Write aviation maintenance technical publications	MEA135A	
MEA138B	Perform aviation technical publication management activities	MEA137A	
MEA139A	Perform aviation maintenance-related integrated logistic support management activities	Nil	
MEA140A	Supervise aviation maintenance teams and perform maintenance quality inspections	Nil	For supervisors within the ADF regulatory system
MEA143B	Develop and manage maintenance error management programs	Nil	Applicable to the CASA regulatory environment
MEA146A	Prepare and manage aviation maintenance organisation budgets and financial plans	Nil	Alternative to MEA132A and to PSPMNGT610A
MEA147A	Perform airworthiness management and maintenance program tasks	MEA137A	Applicable to CAMO employment
PSPMNGT610A	Manage public sector financial resources	Nil	Alternative to MEA132A and BSBMGT504A

Custom Content Section

Not applicable.

MEA60311 Advanced Diploma of Aviation Non-Destructive Testing

Modification History

Release 2 - Licensing requirements clarified - equivalenet

Release 1 - New qualification

Description

This qualification applies to individuals who perform aircraft and aircraft component non-destructive testing (NDT), develop NDT techniques and provide training in NDT in accordance with *AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace* at Level 3. The qualification also meets the regulatory requirements of CASA and the ADF.

The requirement for the awarding of MEA60311 Advanced Diploma of Aviation Non-Destructive Testing is demonstrated competency in listed units of competency under the conditions set out below. It consists of core units and electives chosen from Electives Group A.

Core units include:

- common and technical stream units that relate to the aviation maintenance environment
- technical stream and imported units relating to the NDT work environment
- imported units that specifically cover the competencies required to perform each relevant NDT technique to the standard specified in *AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace* for Level 2 and 3 personnel
- imported units that cover competencies in the development, delivery and assessment of training.

Electives Group A units consisting of:

- Common units specific to either CASA or ADF regulatory requirements
- Technical stream and imported units that are applicable to various areas of employment in the NDT field at *AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace* Level 3.
-

Pathways Information

Individuals who have a Certificate IV in Aeroskills and/or the MEA50511 Diploma of Aeroskills (Non-Destructive Testing) will already have a significant number of credits towards this qualification.

The qualification also provides credits towards the MEA60211 Advanced Diploma of Aviation Maintenance Management (Mechanical).

Licensing/Regulatory Information

This qualification complies with the requirements of *AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace* at Level 3 and with the airworthiness regulatory requirements of CASA and the ADF.

Entry Requirements

Individuals seeking this qualification must meet one of the following entry criteria:

- MEA50511 Diploma of Aeroskills (Non-Destructive Testing)
- Certificate IV in Aeroskills
- Aircraft Maintenance Engineer Licence issued by CASA
- Attainment of the following nine (9) Aeroskills units of competency:

Unit code	**Unit title**	**Prerequisites**
MEA101B	Interpret occupational health and safety practices in aviation maintenance	Nil
MEA103B	Plan and organise aviation maintenance work activities	MEA101B, MEA105C, MEA107B, MEA108B
MEA105C	Apply quality standards applicable to aviation maintenance processes	MEA101B, MEA107B
MEA107B	Interpret and use aviation maintenance industry manuals and specifications	Nil
MEA108B	Complete aviation maintenance industry documentation	MEA105C
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105C, MEA108B
MEA340A	Lay out and set up aircraft systems	MEA101B, MEA107B, MEA109B
MEA341A	Apply basic aircraft design characteristics	MEA101B, MEA107B, MEA109B
MEA342A	Apply basic aircraft power plant design characteristics	MEA101B, MEA107B, MEA109B

Employability Skills Summary

Employability Skill	Industry/enterprise requirements for this qualification include:
Communication	• Understanding complex directions from senior managers • Understanding input from professional engineers, specialist personnel and technical representatives • Liaising with maintenance personnel and specialists regarding NDT problems and applications • Talking to senior mangers about NDT tasks and requirements and making presentations • Providing guidance to others and describing clearly faults found during NDT and the application of NDT procedures • Negotiating with team members, senior managers and aircraft owners/operators regarding timing and progress of work activities • Negotiating with potential suppliers of NDT equipment, piece parts and consumables • Negotiating with clients regarding the drafting of technical publications and NDT data • Negotiating with senior managers regarding issues such as activity timelines and budgetary matters • Understanding and interpreting regulations, procedures, instructions and maintenance publications • Giving written instructions such as NDT procedures, maintenance orders and compilation of maintenance documentation • Writing reports and proposals as required by regulations and organisational procedures • Interpreting organisational charts, wiring diagrams and system schematics, reading drawings relating to NDT activities and interpreting specific NDT procedures • Using computers to obtain maintenance and maintenance management data, complete documentation and correspond using email • Networking with other maintenance managers and with others involved in maintenance-related integrated logistic support activities
Teamwork	• Performing tasks as an individual while being responsive to team members or colleagues and senior managers and allowing for relevant human factors • Working effectively with others who may be of different ages, gender, race, religion and political persuasion • Assisting team members with task definition and providing advice on work processes and troubleshooting • Matching team member skills and authorisations to the task and

	adapting to contingencies • Providing leadership and development of team commitment and dynamics • Monitoring and assessing team performance and providing mentoring and performance feedback • Gaining the trust and confidence of team members and resolving conflict within the team • Providing team members with the opportunity for ongoing competency development
Problem solving	• Identifying problems in a timely manner and developing practical solutions to maintenance problems requiring NDT • Proposing solutions to problems associated with the development and application of NDT processes • Assisting with the resolution of complex problems as a team effort • Constantly reviewing problem solving skills and ability to effectively apply competencies to solve problems within the limits permitted by regulatory and organisational guidelines • Responding to emergencies or accidents in accordance with legislative, regulatory and organisational requirements • Using mathematical techniques to relate test results to system or component performance, to convert values between systems of measurement, to calculate weight and balance, to develop management solutions to problems, and in performing integrated logistic support procedures
Initiative and enterprise	• Adapting to new situations that arise as a consequence of regulatory changes, technology, contractual requirements, personnel management changes, operational circumstances, revised NDT data, practices and procedures • Varying work practices and behaviour as a result of performance feedback from subordinates, peers and managers • Evaluating ideas to ensure that technical and regulatory aspects have been fully covered before proposing action that may result in new or revised NDT procedures or changes to work processes • Applying human factors to avoid maintenance errors and maintain quality standards • Adapting competencies to the performance of a wide range of NDT tasks • Managing a process of innovation and continuous improvement and a willingness to initiate, support and participate in the effective introduction of new work practices • Assessing risks and taking action to achieve a recognised benefit or advantage to the organisation as a consequence of revised processes and procedures • Evaluating software requirements and hardware enhancements

Planning and organising	• Clarifying task objectives and required outcomes through discussion with managers and team members • Planning the use of resources and allocating personnel and resources to tasks • Monitoring the time taken to complete tasks against team requirements or targets provided by management • Assessing work requirements for quotations • Collecting, analysing and organising information relating to assigned NDT tasks and confirming the purpose and required work outcomes • Identifying contingency situations and taking action to resolve problems • Identifying the extent of impact on assigned work of changes in procedures, work instructions or regulatory requirements • Analysing customer requirements and organisational work capacity • Developing, managing and evaluating aircraft and component NDT strategies and plans • Establishing clear task goals and deliverables • Reviewing or developing budgets and managing financial resources • Surveying and assessing organisational and customer needs
Self-management	• Accepting responsibility for managing individual workload to meet target completion times or fit in with team milestones • Assessing personal knowledge and skills when assisting team members with NDT tasks and when developing new or modified NDT procedures • Actively seeking opportunities to develop competencies and to apply them across a range of tasks and application of legislation, regulations, policy and procedures to achieve required outcomes and build confidence in own ideas and vision • Effectively manage personal work priorities and professional development • Identifying career paths and training opportunities that will assist in attaining career goals
Learning	• Taking advantage of learning opportunities that arise through training courses provided by the organisation or external providers and through mentoring and on-job training • Adapting competencies to accommodate new ideas and techniques • Using feedback from subordinates, peers and managers to identify ways in which competence can be improved • Mentoring and providing on-job training and induction training to team members • Interpreting units of competency and applying them to

	attainment of identified career goals
Technology	• Operating and maintaining NDT equipment and reference standards • Performing NDT procedures on aircraft and aircraft components • Developing and documenting NDT techniques • Storing and caring for components, parts, tools, test equipment and support equipment • Complying with requirements to complete maintenance records, develop and revise maintenance data and propose amendments to technical publications • Amending various forms of maintenance data • Using computers and microfiche to obtain maintenance data and using computers to complete records, reports and documentation

Packaging Rules

To be awarded the MEA60311 Advanced Diploma of Aviation Non-Destructive Testing, competency must be demonstrated in **thirty eight (38)** units.

Core units of competency

Complete the following **thirty four (34)** core units.

Unit code	Unit title	Prerequisites
MEA116B	Apply occupational health and safety procedures at supervisor level in aviation maintenance	Nil
MEA120B	Manage an aviation maintenance quality system	Nil
MEA133B	Communicate aviation technical and maintenance management knowledge	Nil
MEA134B	Establish, maintain and evaluate the organisation’s occupational health and safety system	Nil
MEA135A	Use computers in aviation maintenance-related integrated logistic support activities	Nil

MEA137A	Write aviation technical publications	MEA135A
MEA138B	Perform aviation technical publication management activities	MEA137A
MEA142B	Manage self in the aviation maintenance environment	Nil
MEA260B	Use electrical test equipment	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA261C	Use electronic test equipment	MEA101B, MEA103B, MEA105C, MEA107B, MEA108B, MEA109B
MEA349B	Apply basic scientific principles and techniques in aeronautical engineering situations	Nil
MEA350A	Select and test aeronautical engineering materials	Nil
MEA424A	Evaluate aircraft non-destructive tests	MEA109B, MEA133B, MEM13013B, MEM16010A, MEM24002B, MEM24004B, MEM24006B, MEM24008B MEM24010B, MEM24012C
MEM09002B	Interpret technical drawing	Nil
MEM09003B	Prepare basic engineering drawing	MEM09002B
MEM12003B	Perform precision mechanical measurement	MEM12023A (see Note 1)
MEM13013B	Work safely with ionising radiation	
MEM15017B	Use and maintain reference standards	MEM11011B MEM12003B MEM12004B (see Note 2) MEM12005B MEM12023A

		(see Note 1) MEM18001C (see Note 1) MEM18002B (see Note 1)
MEM16010A	Write reports	MEM14005A (see Note 4)
MEM24002B	Perform penetrant testing	MEM18001C (see Note 1) MEM24012C
MEM24004B	Perform magnetic particle testing	MEM18001C (see Note 1) MEM24012C
MEM24006B	Perform eddy current testing	MEM18001C (see Note 1) MEM24012C
MEM24008B	Perform ultrasonic testing	MEM18001C (see Note 1) MEM24012C
MEM24010B	Perform radiographic testing	MEM13013B MEM18001C (see Note 1) MEM24012C
MEM24011B	Establish non-destructive tests	MEM13013B MEM16010A (see Note 3) MEM18001C MEM24002B MEM24004B MEM24006B MEM24008B

		MEM24010B MEM24012C
MEM24012C	Apply metallurgy principles	Nil
MEM30007A	Select common engineering materials	Nil
MEM30012A	Apply mathematical techniques in a manufacturing, engineering or related environment	Nil
MSAENV672B	Develop workplace policy and procedures for environmental sustainability	Nil
TAEDEL402A	Plan, organise and facilitate learning in the workplace	Nil
TAEASS401B	Plan assessment activities and processes	Nil
TAEASS402B	Assess competence	Nil
TAEASS403B	Participate in assessment validation	Nil
TAEASS502B	Design and develop assessment tools	Nil

Notes

- MEA109B is equivalent to MEM12023A, 18001C and 18002B
- MEA260B and MEA261C are together equivalent to MEM12004B
- MEA137A is equivalent to MEM16010A
- MEA103B is equivalent to MEM14005A

Elective units Group A

Complete **four (4)** units chosen in accordance with the unit selection guidelines in column four.

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA112B	Plan and implement civil aircraft maintenance activities	All relevant technical units	mandatory for CASA regulatory system

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA113C	Supervise civil aircraft maintenance activities and manage human resources in the workplace	All relevant technical units	mandatory for CASA regulatory system
MEA123B	Manage aviation maintenance work environment policy and practices	Nil	
MEA140A	Supervise aviation maintenance teams and perform maintenance quality inspections	Nil	Mandatory for ADF regulatory system
MEM09009C	Create 2D drawings using computer aided design systems	MEM09002B MEM16008A	
MEM15010B	Perform laboratory procedures	Nil	
MEM16002C	Conduct formal interviews and negotiations	Nil	
TAEDES401A	Design and develop learning programs	Nil	

Custom Content Section

Not applicable.

MEASS00166 Electrical component repair/overhaul

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B	Complete aviation maintenance industry documentation
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
MEA201B	Remove and install miscellaneous aircraft electrical hardware/components
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts
MEA260B	Use electrical test equipment
MEA261C	Use electronic test equipment
MEA262B	Modify/repair single layer printed circuit boards
MEA286A	Repair or overhaul aircraft electrical/electro-mechanical components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on electrical component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on electrical component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00200 Mechanical and electro-mechanical instrument component repair/overhaul

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B	Complete aviation maintenance industry documentation
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
MEA201B	Remove and install miscellaneous aircraft electrical hardware/components
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts
MEA252B	Test, align and troubleshoot synchro and servo system components
MEA260B	Use electrical test equipment
MEA261C	Use electronic test equipment
MEA262B	Modify/repair single layer printed circuit boards
MEA284A	Repair or overhaul aircraft instrument system components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on mechanical and electro-mechanical instruments repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on mechanical and electro-mechanical instruments repair and overhaul.

Custom Content Section

Not applicable.

MEASS00081 Aircraft display, control and distribution system component repair/overhaul

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B	Complete aviation maintenance industry documentation
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
MEA201B	Remove and install miscellaneous aircraft electrical hardware/components
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts
MEA252B	Test, align and troubleshoot synchro and servo system components
MEA260B	Use electrical test equipment
MEA261C	Use electronic test equipment
MEA262B	Modify/repair single layer printed circuit boards
MEA283A	Repair or overhaul aircraft display, control and distribution system components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on aircraft display, control and distribution system component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on display, control and distribution system component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00203 Oxygen system component repair/overhaul

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B	Complete aviation maintenance industry documentation
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
MEA287A	Repair or overhaul aircraft oxygen system components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on oxygen system component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on display, control and distribution system component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00084 Aircraft radio frequency communication and navigation system comonent repair/overhaul

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B	Complete aviation maintenance industry documentation
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
MEA201B	Remove and install miscellaneous aircraft electrical hardware/components
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts
MEA260B	Use electrical test equipment
MEA261C	Use electronic test equipment
MEA262B	Modify/repair single layer printed circuit boards
MEA285A	Repair or overhaul aircraft radio frequency communication and navigation system components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on aircraft radio frequency communication and navigation system component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on radio frequency communication and navigation system component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00083 Aircraft pulse system component repair/overhaul

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B	Complete aviation maintenance industry documentation
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
MEA201B	Remove and install miscellaneous aircraft electrical hardware/components
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts
MEA260B	Use electrical test equipment
MEA261C	Use electronic test equipment
MEA262B	Modify/repair single layer printed circuit boards
MEA282A	Repair or overhaul aircraft pulse system components

Target Group

Not applicable.

Suggested words for Statement of Attainment

Not applicable.

Custom Content Section

Not applicable.

MEASS00078 Aircraft audio and visual system and reproducer repair/overhaul

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B	Complete aviation maintenance industry documentation
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
MEA201B	Remove and install miscellaneous aircraft electrical hardware/components
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts
MEA260B	Use electrical test equipment
MEA261C	Use electronic test equipment
MEA262B	Modify/repair single layer printed circuit boards
MEA288A	Repair or overhaul aircraft audio and visual systems and reproducers

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on audio and visual system and reproducer repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on audio and visual system and reproducer repair and overhaul.

Custom Content Section

Not applicable.

MEASS00179 Hydraulic system component repair/overhaul

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B	Complete aviation maintenance industry documentation
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
MEA380A	Repair and/or overhaul aircraft hydraulic system components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on hydraulic component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on hydraulic system component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00167 Electro-hydraulic component repair/overhaul

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B	Complete aviation maintenance industry documentation
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
MEA201B	Remove and install miscellaneous aircraft electrical hardware/components
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts
MEA260B	Use electrical test equipment
MEA380A	Repair and/or overhaul aircraft hydraulic system components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on electro-hydraulic component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on electro-hydraulic component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00205 Pneumatic system component repair/overhaul

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B	Complete aviation maintenance industry documentation
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
MEA381A	Repair and/or overhaul aircraft pneumatic system components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on pneumatic component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on pneumatic system component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00169 Electro-pneumatic component repair/overhaul

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B	Complete aviation maintenance industry documentation
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
MEA201B	Remove and install miscellaneous aircraft electrical hardware/components
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts
MEA260B	Use electrical test equipment
MEA381A	Repair and/or overhaul aircraft pneumatic system components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on electro-pneumatic component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on electro-pneumatic component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00173 Fuel system component repair/overhaul

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B	Complete aviation maintenance industry documentation
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
MEA382A	Repair and/or overhaul aircraft fuel system components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on fuel system component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment in aircraft component maintenance workshops on fuel system component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00174 Gas turbine engine air inlet and compressor module/comonent repair/overhaul

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B	Complete aviation maintenance industry documentation
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
MEA383A	Repair and/or overhaul gas turbine engine air inlet and compressor components and/or modules

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on gas turbine engine air inlet and compressor module/component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on gas turbine engine air inlet and compressor module/component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00176 Gas turbine engine combustion section module/component repair/overhaul

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B	Complete aviation maintenance industry documentation
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
MEA384A	Repair and/or overhaul gas turbine engine combustion section components and/or modules

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on gas turbine engine combustion section module/component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on gas turbine engine combustion section module/component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00177 Gas turbine engine turbine and exhaust module/component repair/overhaul

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B	Complete aviation maintenance industry documentation
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
MEA385A	Repair and/or overhaul gas turbine engine turbine and exhaust section components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on gas turbine engine turbine and exhaust module/component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on gas turbine engine turbine and exhaust module/component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00175 Gas turbine engine ancillary section module/component repair/overhaul

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B	Complete aviation maintenance industry documentation
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
MEA386A	Repair and/or overhaul gas turbine engine ancillary section components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on gas turbine engine ancillary section module/component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on gas turbine engine ancillary section module/component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00204 Piston engine repair/overhaul

Modification History

Release 2 - MEA388A Repair and/or overhaul piston engines replaced by the following units:

MEA392A Disassemble aircraft piston engines

MEA393A Repair and/or overhaul aircraft piston engine cylinder assembly components

MEA394A Repair and/or overhaul aircraft piston engine crankcase assembly components

MEA395A Reassemble aircraft piston engines

MEA396A Assemble aircraft piston engine quick engine change unit

MEA397A Test aircraft piston engines after repair or overhaul

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B Complete aviation maintenance industry documentation

MEA145A Conversion from allied trades for employment in aviation maintenance workshops

MEA388A Repair and/or overhaul piston engines

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on aircraft piston engine repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on piston engine repair and overhaul.

Custom Content Section

Not applicable.

MEASS00214 Propeller repair/overhaul

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B	Complete aviation maintenance industry documentation
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
MEA389A	Repair and/or overhaul propellers

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on propeller repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on propeller repair and overhaul.

Custom Content Section

Not applicable.

MEASS00230 Rotary wing dynamic component repair/overhaul

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B	Complete aviation maintenance industry documentation
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
MEA390A	Repair and/or overhaul rotary wing dynamic components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on rotary wing dynamic component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on rotary wing dynamic component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00201 Mechanical system component repair/overhaul

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B	Complete aviation maintenance industry documentation
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
MEA391A	Repair and/or overhaul aircraft mechanical system components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on mechanical system component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on mechanical system component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00155 Composite structure maintenance

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Certificate IV in Aeroskills (Structures).

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
MEA401C	Inspect aircraft structures
MEA405B	Repair/modify aircraft composite material structure/components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on composite structural component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the grant of an approval to perform maintenance on aircraft composite structures.

Custom Content Section

Not applicable.

MEASS00159 Electrical - B1.1 Licence Exclusions E1 and E4 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201B	Remove and install miscellaneous aircraft electrical hardware/components
MEA203C	Remove and install advanced aircraft electrical systems and components
MEA223D	Inspect aircraft electrical systems and components
MEA227D	Test and troubleshoot aircraft electrical systems and components
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts
MEA260B	Use electrical test equipment

Target Group

Holders of CASA B1.1 licences endorsed with electrical systems E1 and/or E4 exclusions who wish to have the exclusions removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before undergoing specific type training in electrical systems.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of electrical systems exclusions E1 and/or E4 from a CASR Part 66 B1.1 licence.

Custom Content Section

Not applicable.

MEASS00160 Electrical - B1.1 Licence Exclusions E1 and E4 Removal (when competencies are being gained on basic light aircraft with gas turbine engine

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201B	Remove and install miscellaneous aircraft electrical hardware/components
MEA274A	Maintain basic light aircraft electrical systems and components
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts
MEA260B	Use electrical test equipment

Target Group

Holders of CASA B1.1 licences endorsed with electrical systems E1 and/or E4 exclusions who wish to have the exclusions removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before being able to certify maintenance on basic light aircraft (with gas turbine engine) electrical systems.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of electrical systems exclusions E1 and/or E4 from a CASR Part 66 B1.1 licence for basic light aircraft (with gas turbine engine) maintenance.

Custom Content Section

Not applicable.

MEASS00162 Electrical - B1.2, B1.3 or B1.4 Licence Exclusions E1 and E4 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201B	Remove and install miscellaneous aircraft electrical hardware/components
MEA203C	Remove and install advanced aircraft electrical systems and components
MEA211C	Inspect, test and troubleshoot advanced aircraft electrical systems and components
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts
MEA260B	Use electrical test equipment

Target Group

Holders of CASA B1.2, 1.3 or B1.4 licences endorsed with electrical systems E1 and/or E4 exclusions who wish to have the exclusions removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify electrical system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of electrical systems exclusions E1 and/or E4 from a CASR Part 66 B1.2, B1.3 or B1.4 licence.

Custom Content Section

Not applicable.

MEASS00161 Electrical - B1.2 or B1.4 Licence Exclusions E1 and E4 Removal (when competencies are being gained on basic light aircraft or helicopters)

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201B	Remove and install miscellaneous aircraft electrical hardware/components
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts
MEA260B	Use electrical test equipment
MEA274A	Maintain basic light aircraft electrical systems and components

Target Group

Holders of CASA B1.2 or B1.4 licences endorsed with electrical systems E1 and/or E4 exclusions who wish to have the exclusions removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before being able to certify maintenance on basic light aircraft and basic helicopter electrical systems.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of electrical systems exclusions E1 and/or E4 from a CASR Part 66 B1.2 or B1.4 licence for basic light aircraft and basic helicopter maintenance.

Custom Content Section

Not applicable.

MEASS00164 Electrical - B2 Licence Exclusions E1 and E4 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA203C	Remove and install advanced aircraft electrical systems and components
MEA223D	Inspect aircraft electrical systems and components
MEA227D	Test and troubleshoot aircraft electrical systems and components

Target Group

Holders of CASA B2 licences endorsed with electrical systems E1 and/or E4 exclusions who wish to have the exclusions removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before undergoing specific type training in electrical systems.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of electrical systems exclusions E1 and/or E4 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00165 Electrical - B2 Lincence Exclusions E1 and E4 Removal (when competencies are being gained on basic light aircraft or helicopters)

Modification History

Release 2 - Typo in title corrected - no change in outcomes

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA202C	Remove and install basic aircraft electrical systems and components
MEA210C	Inspect, test and troubleshoot basic aircraft electrical systems and components

Target Group

Holders of CASA B2 licences endorsed with electrical systems E1 and/or E4 exclusions who wish to have the exclusions removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before being able to certify maintenance on basic light aircraft and basic helicopter electrical systems.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of electrical systems exclusions E1 and/or E4 from a CASR Part 66 B2 licence for basic light aircraft and basic helicopter maintenance.

Custom Content Section

Not applicable.

MEASS00137 Airframe - B1.1 Licence Exclusion E2 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA302C	Remove and install aircraft hydro-mechanical and landing gear system components
MEA303D	Remove and install aircraft pneumatic system components
MEA305C	Remove and install aircraft fixed wing flight control system components
MEA317C	Remove and install pressurised aircraft structural and non-structural components
MEA318C	Inspect aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components
MEA320C	Test and troubleshoot aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components
MEA321C	Test and troubleshoot aircraft fixed wing flight control systems and components
MEA323B	Perform advanced troubleshooting in aircraft mechanical maintenance
MEA325B	Weigh aircraft and perform aircraft weight and balance calculations as a result of modifications

MEA328C	Maintain and/or repair aircraft mechanical components or parts
MEA339C	Inspect, repair and maintain aircraft structures
MEA365A	Assess structural repair/modification requirements and evaluate structural repairs and modifications

Target Group

Holders of CASA B1.1 licences endorsed with an airframe exclusion E2 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before undergoing specific type training in airframe systems/structure.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E2 from a CASR Part 66 B1.1 licence.

Custom Content Section

Not applicable.

MEASS00138 Airframe - B1.1 Licence Exclusion E2 Removal (when competencies are being gained on light aircraft with gas turbine engine)

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA351A	Maintain airframe systems of basic light fixed wing aircraft
MEA363B	Inspect, repair and maintain structure and related components of non-pressurised small aircraft
MEA364A	Maintain and/or repair small aircraft mechanical components or parts
MEA365A	Assess structural repair/modification requirements and evaluate structural repairs and modifications

Target Group

Holders of CASA B1.1 licences endorsed with an airframe exclusion E2 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before being able to certify maintenance on basic light aircraft airframe systems and structure.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E2 from a CASR Part 66 B1.1 licence for maintenance of basic light aircraft with gas turbine engines.

Custom Content Section

Not applicable.

MEASS00143 Airframe - B1.2 Licence Exclusion E2 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA302C	Remove and install aircraft hydro-mechanical and landing gear system components
MEA304C	Remove and install non-pressurised aircraft structural and non-structural components
MEA305C	Remove and install aircraft fixed wing flight control system components
MEA309C	Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components
MEA312C	Inspect, test and troubleshoot aircraft fixed wing flight control systems and components
MEA325B	Weigh aircraft and perform aircraft weight and balance calculations as a result of modifications
MEA328C	Maintain and/or repair aircraft mechanical components or parts
MEA339C	Inspect, repair and maintain aircraft structures
MEA354A	Maintain light aircraft pneumatic systems
MEA365A	Assess structural repair/modification requirements and evaluate structural

repairs and modifications

Target Group

Holders of CASA B1.2 licences endorsed with an airframe exclusion E2 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before being able to certify maintenance on airframe systems/structure.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E2 from a CASR Part 66 B1.2 licence.

Custom Content Section

Not applicable.

MEASS00144 Airframe - B1.2 Licence Exclusion E2 Removal (when competencies are being gained on basic light aircraft)

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA351A	Maintain airframe systems of basic light fixed wing aircraft
MEA363B	Inspect, repair and maintain structure and related components of non-pressurised small aircraft
MEA364A	Maintain and/or repair small aircraft mechanical components or parts
MEA365A	Assess structural repair/modification requirements and evaluate structural repairs and modifications

Target Group

Holders of CASA B1.2 licences endorsed with an airframe exclusion E2 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before being able to certify maintenance on basic light aircraft airframe systems and structure.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E2 from a CASR Part 66 B1.2 licence for basic light aircraft maintenance.

Custom Content Section

Not applicable.

MEASS00146 Airframe - B1.3 and B1.4 Licence Exclusion E2 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA302C	Remove and install aircraft hydro-mechanical and landing gear system components
MEA303D	Remove and install aircraft pneumatic system components
MEA304C	Remove and install non-pressurised aircraft structural and non-structural components
MEA308C	Remove and install rotary wing rotor and flight control system components
MEA309C	Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components
MEA310C	Inspect, test and troubleshoot aircraft pneumatic systems and components
MEA316C	Inspect, test and troubleshoot rotary wing rotor and control systems and components
MEA323B	Perform advanced troubleshooting in aircraft mechanical maintenance
MEA325B	Weigh aircraft and perform aircraft weight and balance calculations as a result of modifications

MEA328C	Maintain and/or repair aircraft mechanical components or parts
MEA339C	Inspect, repair and maintain aircraft structures
MEA365A	Assess structural repair/modification requirements and evaluate structural repairs and modifications

Target Group

Holders of CASA B1.3 and B1.4 licences endorsed with an airframe exclusion E2 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before undergoing specific type training in airframe systems/structure or being able to certify maintenance on airframe systems/structure.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E2 from CASR Part 66 B1.3 and B1.4 licences.

Custom Content Section

Not applicable.

MEASS00147 Airframe - B1.4 Licence Exclusion E2 Removal (when competencies are being gained on basic helicopters)

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA352A	Maintain basic rotary wing aircraft systems
MEA363B	Inspect, repair and maintain structure and related components of non-pressurised small aircraft
MEA364A	Maintain and/or repair small aircraft mechanical components or parts
MEA365A	Assess structural repair/modification requirements and evaluate structural repairs and modifications

Target Group

Holders of CASA B1.4 licences endorsed with an airframe exclusion E2 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before being able to certify maintenance on basic helicopter airframe systems/structure.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E2 from CASR Part 66 B1.4 licences for basic helicopter maintenance.

Custom Content Section

Not applicable.

MEASS00206 Power Plant - B1.1 Licence Exclusion E3 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA306C	Remove and install engines and engine system components
MEA307C	Remove and install propeller systems and components (applicable only where licence type ratings sought include propeller driven aircraft)
MEA315C	Inspect, test and troubleshoot propeller systems and components (applicable only where licence ratings sought include propeller driven aircraft)
MEA319C	Inspect gas turbine engine systems and components
MEA322C	Test and troubleshoot gas turbine engine systems and components
MEA323B	Perform advanced troubleshooting in aircraft mechanical maintenance

Target Group

Holders of CASA B1.1 licences endorsed with a power plant exclusion E3 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before undergoing specific power plant type training.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of power plant exclusion E3 from a CASR Part 66 B1.1 licence.

Custom Content Section

Not applicable.

MEASS00207 Power Plant - B1.2 Licence Exclusion E3 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA306C	Remove and install engines and engine system components
MEA313C	Inspect, test and troubleshoot piston engine systems and components

Target Group

Holders of CASA B1.2 licences endorsed with a power plant exclusion E3 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before being able to certify piston engine maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of power plant exclusion E3 from a CASR Part 66 B1.2 licence.

Custom Content Section

Not applicable.

MEASS00208 Power Plant - B1.2 Licence Exclusion E3 Removal (when competencies are being gained on basic light aircraft)

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA353A	Maintain basic light aircraft engines and propellers

Target Group

Holders of CASA B1.2 licences endorsed with a power plant exclusion E3 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before being able to certify maintenance on basic light aircraft engines and propellers.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of power plant exclusion E3 from a CASR Part 66 B1.2 licence for maintenance of basic light aircraft engines and propellers.

Custom Content Section

Not applicable.

MEASS00209 Power Plant - B1.3 Licence Exclusion E3 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA306C	Remove and install engines and engine system components
MEA319C	Inspect gas turbine engine systems and components
MEA322C	Test and troubleshoot gas turbine engine systems and components
MEA323B	Perform advanced troubleshooting in aircraft mechanical maintenance

Target Group

Holders of CASA B1.3 licences endorsed with a power plant exclusion E3 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before undergoing specific power plant type training.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of power plant exclusion E3 from a CASR Part 66 B1.3 licence.

Custom Content Section

Not applicable.

MEASS00210 Power Plant - B1.4 Licence Exclusion E3 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA306C	Remove and install engines and engine system components
MEA313C	Inspect, test and troubleshoot piston engine systems and components

Target Group

Holders of CASA B1.4 licences endorsed with a power plant exclusion E3 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before being able to certify helicopter piston engine maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of power plant exclusion E3 from a CASR Part 66 B1.4 licence.

Custom Content Section

Not applicable.

MEASS00211 Power Plant - B1.4 Licence Exclusion E3 Removal (when competencies are being gained on basic helicopters)

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA353A	Maintain basic light aircraft engines and propellers

Target Group

Holders of CASA B1.4 licences endorsed with a power plant exclusion E3 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before being able to certify maintenance on engines of basic helicopters.

Suggested words for Statement of Attainment

These competencies from the MEA11Aeroskills Training Package meet the requirements of CASA for the removal of power plant exclusion E3 from a CASR Part 66 B1.4 licence for basic helicopter engine maintenance.

Custom Content Section

Not applicable.

MEASS00181 Instrument - B1 Licence Exclusions E5 and E7 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201B	Remove and install miscellaneous aircraft electrical hardware/components
MEA203C	Remove and install advanced aircraft electrical systems and components
MEA211C	Inspect, test and troubleshoot advanced aircraft electrical systems and components
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts
MEA260B	Use electrical test equipment
MEA343B	Remove and install avionic system components

Target Group

Holders of CASA B1 licences endorsed with instrument E5 and/or E7 exclusions who wish to have the exclusions removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before undergoing specific type training in instrument-related avionic systems or before being able to certify maintenance in the case of non-rated aircraft types.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of instrument exclusions E5 and/or E7 from all CASR Part 66 B1 licences.

Custom Content Section

Not applicable.

MEASS00182 Instrument - B1.2 and B1.4 Licence Exclusions E5 and E7 Removal (when competencies are being gained on basic light aircraft or helicopters)

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201B	Remove and install miscellaneous aircraft electrical hardware/components
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts
MEA260B	Use electrical test equipment
MEA275A	Maintain basic light aircraft instrument systems and components

Target Group

Holders of CASA B1.2 and B1.4 licences endorsed with instrument E5 and/or E7 exclusions who wish to have the exclusions removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before being able to certify maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of instrument exclusions E5 and/or E7 from CASR Part 66 B1.2 and B1.4 licences for maintenance of basic light aircraft and helicopters.

Custom Content Section

Not applicable.

MEASS00188 Instrument - B2 Licence Exclusions E5 and E7 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA205C	Remove and install advanced aircraft instrument system components
MEA207C	Remove and install aircraft electronic system components
MEA224C	Inspect aircraft instrument systems and components
MEA225C	Inspect fixed wing aircraft automatic flight control systems and components
MEA226D	Inspect aircraft electronic systems and components
MEA228D	Test and troubleshoot aircraft instrument systems and components
MEA230C	Test and troubleshoot fixed wing aircraft automatic flight control systems and components
MEA231C	Inspect, test and troubleshoot rotary wing aircraft automatic flight control systems and components (*may be taken instead of MEA225C and MEA230C where ratings sought are entirely helicopte*r)
MEA235B	Perform advanced troubleshooting in aircraft avionic maintenance

Target Group

Holders of CASA B2 licences endorsed with instrument E5 and/or E7 exclusions who wish to have the exclusions removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before undergoing specific type training in instrument-related avionic systems.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of instrument exclusions E5 and/or E7 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00189 Instrument and Radio - B1 Licence Exclusion E6 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201B	Remove and install miscellaneous aircraft electrical hardware/components
MEA203C	Remove and install advanced aircraft electrical systems and components
MEA211C	Inspect, test and troubleshoot advanced aircraft electrical systems and components
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts
MEA260B	Use electrical test equipment
MEA343B	Remove and install avionic system components

Target Group

Holders of CASA B1 licences endorsed with an instrument and radio E6 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before undergoing specific type training in instrument-related avionic systems or before being able to certify maintenance in the case of non-rated aircraft types.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of instrument and radio exclusion E6 from all CASR Part 66 B1 licences.

Custom Content Section

Not applicable.

MEASS00190 Instrument and Radio - B1.2 and B1.4 Licence Exclusion E6 Removal (when competencies are being gained on basic light aircraft or helicopters)

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201B	Remove and install miscellaneous aircraft electrical hardware/components
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts
MEA260B	Use electrical test equipment
MEA275A	Maintain basic light aircraft instrument systems and components
MEA276A	Maintain basic aircraft communication and radio navigation systems and components

Target Group

Holders of CASA B1.2 and B1.4 licences endorsed with an instrument and radio E6 exclusions who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before being able to certify maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of instrument and radio exclusion E6 from CASR Part 66 B1.2 and B1.4 licences for maintenance of basic light aircraft and helicopters.

Custom Content Section

Not applicable.

MEASS00191 Instrument and Radio - B2 Licence Exclusion E6 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA205C	Remove and install advanced aircraft instrument system components
MEA206C	Remove and install aircraft basic radio communication and navigation system components
MEA207C	Remove and install aircraft electronic system components
MEA224C	Inspect aircraft instrument systems and components
MEA225C	Inspect fixed wing aircraft automatic flight control systems and components
MEA226D	Inspect aircraft electronic systems and components
MEA228D	Test and troubleshoot aircraft instrument systems and components
MEA229D	Test and troubleshoot aircraft radio frequency navigation and communications systems and components
MEA230C	Test and troubleshoot fixed wing aircraft automatic flight control systems and components
MEA231C	Inspect, test and troubleshoot rotary wing aircraft automatic flight

	control systems and components (*may be taken instead of MEA225C and MEA230C where ratings sought are entirely helicopter*)
MEA232C	Test and troubleshoot aircraft pulse systems and components
MEA235B	Perform advanced troubleshooting in aircraft avionic maintenance

Target Group

Holders of CASA B2 licences endorsed with an instrument and radio E6 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before undergoing specific type training in instrument and radio systems.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of instrument and radio exclusion E6 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00192 Instrument and Radio - B2 Licence Exclusion E6 Removal (non-type rated aircraft and helicopters only)

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA205C	Remove and install advanced aircraft instrument system components
MEA213C	Inspect, test and troubleshoot advanced aircraft instrument systems
MEA289A	Maintain basic light aircraft avionic systems and components

Target Group

Holders of CASA B2 licences involved only in the maintenance of non-type rated aircraft and helicopters whose licences are endorsed with an instrument and radio E6 exclusion and who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before being able to certify instrument and radio systems maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of instrument and radio exclusion E6 from a CASR Part 66 B2 licence for maintenance of non-type rated aircraft and helicopters.

Custom Content Section

Not applicable.

MEASS00215 Radio - B1 Licence Exclusion E8 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201B	Remove and install miscellaneous aircraft electrical hardware/components
MEA203C	Remove and install advanced aircraft electrical systems and components
MEA211C	Inspect, test and troubleshoot advanced aircraft electrical systems and components
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts
MEA260B	Use electrical test equipment
MEA343B	Remove and install avionic system components

Target Group

Holders of CASA B1 licences endorsed with a radio E8 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before undergoing specific type training in instrument-related avionic systems or before being able to certify maintenance in the case of non-rated aircraft types.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of radio exclusion E8 from all CASR Part 66 B1 licences.

Custom Content Section

Not applicable.

MEASS00216 Radio - B1.2 and B1.4 Licence Exclusion E8 Removal (when competencies are being gained on basic light aircraft or helicopters)

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201B	Remove and install miscellaneous aircraft electrical hardware/components
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts
MEA260B	Use electrical test equipment
MEA276A	Maintain basic aircraft communication and radio navigation systems and components

Target Group

Holders of CASA B1.2 and B1.4 licences endorsed with radio E8 exclusions who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before being able to certify maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of instrument and radio exclusion E6 from CASR Part 66 B1.2 and B1.4 licences for maintenance of basic light aircraft and helicopters.

Custom Content Section

Not applicable.

MEASS00227 Radio - B2 Licence Exclusion E8 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA206C	Remove and install aircraft basic radio communication and navigation system components
MEA207C	Remove and install aircraft electronic system components
MEA226D	Inspect aircraft electronic systems and components
MEA229D	Test and troubleshoot aircraft radio frequency navigation and communications systems and components
MEA232C	Test and troubleshoot aircraft pulse systems and components
MEA235B	Perform advanced troubleshooting in aircraft avionic maintenance

Target Group

Holders of CASA B2 licences endorsed with a radio E8 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before undergoing specific type training in radio systems.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of radio exclusion E8 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00228 Radio - B2 Licence Exclusion E8 Removal (when competencies are being gained on non-type rated aircraft and helicopters)

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA289A	Maintain basic light aircraft avionic systems and components

Target Group

Holders of CASA B2 licences involved only in the maintenance of non-type rated aircraft and helicopters whose licences are endorsed with an instrument and radio E8 exclusion and who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before being able to certify radio systems maintenance on non-type rated aircraft.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of radio exclusion E8 from a CASR Part 66 B2 licence for maintenance of non-type rated aircraft and helicopters.

Custom Content Section

Not applicable.

MEASS00133 Airframe - B1 Licence Exclusion E9 and E43 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA357A	Inspect, test and repair aircraft fabric surfaces

Target Group

Holders of CASA B1 licences endorsed with an airframe exclusion E9 or E43 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before being able to certify aircraft fabric surface maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E9 or E43 from CASR Part 66 B1 licences.

Custom Content Section

Not applicable.

MEASS00127 Airframe - B1 Licence Exclusion E10 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA359A Inspect and repair aircraft wooden structures

Target Group

Holders of CASA B1 licences endorsed with an airframe exclusion E10 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before being able to certify aircraft wooden structure maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E10 from CASR Part 66 B1 licences.

Custom Content Section

Not applicable.

MEASS00217 Radio - B2 Licence Exclusion E11 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA206C	Remove and install basic radio communication and navigation system components
MEA215C	Inspect, test and troubleshoot advanced aircraft communications systems and components

Target Group

Holders of CASA B2 licences endorsed with a radio E11 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify audio CVR system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of radio exclusion E11 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00148 Airframe/Engine - B1.1 and B1.2 Licence Exclusion E12 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA307C	Remove and install propeller systems and components
MEA315C	Inspect, test and troubleshoot propeller systems and components

Target Group

Holders of CASA B1.1 or B1.2 licences endorsed with an engine or airframe exclusion E12 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify propeller system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of airframe/engine exclusion E12 from CASR Part 66 B1.1 and B1.2 licences.

Custom Content Section

Not applicable.

MEASS00128 Airframe - B1 Licence Exclusion E13 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA302C	Remove and install aircraft hydro-mechanical and landing gear system components
MEA309C	Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components

Target Group

Holders of CASA B1 licences endorsed with an airframe exclusion E13 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify hydraulic system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E13 from CASR Part 66 B1 licences.

Custom Content Section

Not applicable.

MEASS00129 Airframe - B1 Licence Exclusion E14 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201B	Remove and install miscellaneous aircraft electrical hardware/components
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts
MEA260B	Use electrical test equipment
MEA362A	Maintain aircraft vapour cycle air conditioning systems

Target Group

Holders of CASA B1 licences endorsed with an airframe exclusion E14 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before being able to certify vapour cycle air conditioning system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E14 from CASR Part 66 B1 licences.

Custom Content Section

Not applicable.

MEASS00134 Airframe - B1.1 and B1.3 Licence Exclusion E15 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201B	Remove and install miscellaneous aircraft electrical hardware/components
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts
MEA260B	Use electrical test equipment
MEA355A	Maintain light aircraft air cycle air conditioning systems

Target Group

Holders of CASA B1.1.and B1.3 licences endorsed with an airframe exclusion E15 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before being able to certify maintenance of air cycle air conditioning systems of unpressurised aircraft and helicopters.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E15 from CASR Part 66 B1.1 and B1.3 licences.

Custom Content Section

Not applicable.

MEASS00135 Airframe - B1.1 Licence Exclusion E15 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201B	Remove and install miscellaneous aircraft electrical hardware/components
MEA203C	Remove and install advanced aircraft electrical systems and components
MEA211C	Inspect, test and troubleshoot advanced aircraft electrical systems and components
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts
MEA260B	Use electrical test equipment
MEA303D	Remove and install aircraft pneumatic system components
MEA310C	Inspect, test and troubleshoot aircraft pneumatic systems and components

Target Group

Holders of CASA B1.1 licences endorsed with an airframe exclusion E15 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before undergoing specific type training in air cycle air conditioning systems of pressurised aircraft.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E15 from CASR Part 66 B1.1 licences.

Custom Content Section

Not applicable.

MEASS00136 Airframe - B1.1 Licence Exclusion E16 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201B	Remove and install miscellaneous aircraft electrical hardware/components
MEA203C	Remove and install advanced aircraft electrical systems and components
MEA208C	Remove and install aircraft pressurisation control system components
MEA211C	Inspect, test and troubleshoot advanced aircraft electrical systems and components
MEA219C	Inspect, test and troubleshoot aircraft pressurisation control systems and components
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts
MEA260B	Use electrical test equipment
MEA303D	Remove and install aircraft pneumatic system components
MEA310C	Inspect, test and troubleshoot aircraft pneumatic systems and components
MEA317C	Remove and install pressurised aircraft structural and non-structural

	components
MEA323B	Perform advanced troubleshooting in aircraft mechanical maintenance

Target Group

Holders of CASA B1.1 licences endorsed with an airframe exclusion E16 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before undergoing specific type training in pressurisation systems.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E16 from CASR Part 66 B1.1 licences.

Custom Content Section

Not applicable.

MEASS00141 Airframe - B1.2 Licence Exclusion E16 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201B	Remove and install miscellaneous aircraft electrical hardware and components
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts
MEA356A	Maintain light piston engine aircraft pressurisation systems

Target Group

Holders of CASA B1.2 licences endorsed with an airframe exclusion E16 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before being able to certify pressurisation system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E16 from CASR Part 66 B1.2 licences.

Custom Content Section

Not applicable.

MEASS00218 Radio - B2 Licence Exclusion E18 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA206C	Remove and install aircraft basic radio communication and navigation system components
MEA214C	Inspect, test and troubleshoot aircraft basic communication and radio navigation systems and components

Target Group

Holders of CASA B2 licences endorsed with a radio E18 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify ADF system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of radio exclusion E18 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00219 Radio - B2 Licence Exclusion E19 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA206C	Remove and install aircraft basic radio communication and navigation system components
MEA214C	Inspect, test and troubleshoot aircraft basic communication and radio navigation systems and components

Or the following two units in lieu of MEA214C:

MEA226D	Inspect aircraft electronic systems and components
MEA229D	Test and troubleshoot aircraft radio frequency navigation and communications systems and components

Target Group

Holders of CASA B2 licences endorsed with a radio E19 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify VOR system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of radio exclusion E19 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00220 Radio - B2 Licence Exclusion E20 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA206C	Remove and install aircraft basic radio communication and navigation system components
MEA207C	Remove and install aircraft electronic system components
MEA216C	Inspect, test and troubleshoot instrument landing systems and components

Target Group

Holders of CASA B2 licences endorsed with a radio E20 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify ILS system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of radio exclusion E20 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00221 Radio - B2 Licence Exclusion E21 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA207C	Remove and install aircraft electronic system components
MEA220C	Inspect, test and troubleshoot aircraft primary radar systems and components

Target Group

Holders of CASA B2 licences endorsed with a radio E21 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify weather radar system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of radio exclusion E21 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00222 Radio - B2 Licence Exclusion E22 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA207C	Remove and install aircraft electronic system components
MEA221C	Inspect, test and troubleshoot aircraft secondary radar systems and components

Target Group

Holders of CASA B2 licences endorsed with a radio E22 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify ATC transponder system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of radio exclusion E22 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00223 Radio - B2 Licence Exclusion E23 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA207C	Remove and install aircraft electronic system components
MEA221C	Inspect, test and troubleshoot aircraft secondary radar systems and components

Target Group

Holders of CASA B2 licences endorsed with a radio E23 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify radio altimeter system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of radio exclusion E23 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00224 Radio - B2 Licence Exclusion E24 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA207C	Remove and install aircraft electronic system components
MEA221C	Inspect, test and troubleshoot aircraft secondary radar systems and components

Target Group

Holders of CASA B2 licences endorsed with a radio E24 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify DME system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of radio exclusion E24 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00225 Radio - B2 Licence Exclusion E25 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA207C	Remove and install aircraft electronic system components
MEA221C	Inspect, test and troubleshoot aircraft secondary radar systems and components

Target Group

Holders of CASA B2 licences endorsed with a radio E25 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify doppler system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of radio exclusion E25 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00226 Radio - B2 Licence Exclusion E26 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA206C	Remove and install aircraft basic radio communication and navigation system components
MEA207C	Remove and install aircraft electronic system components
MEA234C	Inspect, test and troubleshoot aircraft global navigation systems and components

Target Group

Holders of CASA B2 licences endorsed with a radio E26 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify satellite navigation system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of radio exclusion E26 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00183 Instrument - B2 Licence Exclusion E27 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA207C	Remove and install aircraft electronic system components
MEA291A	Inspect, test and troubleshoot fixed wing single axis autopilot systems and components

Target Group

Holders of CASA B2 licences endorsed with instrument E27 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before being able to certify single axis autopilot system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of instrument exclusion E27 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00184 Instrument - B2 Licence Exclusion E28 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA207C	Remove and install aircraft electronic system components
MEA217C	Inspect, test and troubleshoot fixed wing autopilot systems and components

Or, if helicopter systems are being maintained:

MEA218C	Inspect, test and troubleshoot rotary wing autopilot systems and components

Target Group

Holders of CASA B2 licences endorsed with instrument E28 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify multi-axis autopilot system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of instrument exclusion E28 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00185 Instrument - B2 Licence Exclusion E29 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA205C	Remove and install advanced aircraft instrument system components
MEA213C	Inspect, test and troubleshoot advanced aircraft instrument systems

Target Group

Holders of CASA B2 licences endorsed with instrument E29 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify remote indicating compass system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of instrument exclusion E29 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00186 Instrument - B2 Licence Exclusion E30 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA207C	Remove and install aircraft electronic system components
MEA233C	Inspect, test and troubleshoot aircraft inertial navigation and reference systems and components

Target Group

Holders of CASA B2 licences endorsed with instrument E30 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify inertial navigation and reference system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of instrument exclusion E30 from a CASR Part 66 B2 licence

Custom Content Section

Not applicable.

MEASS00187 Instrument - B2 Licence Exclusion E31 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA208C	Remove and install aircraft pressurisation control system components
MEA219C	Inspect, test and troubleshoot aircraft pressurisation control systems and components

Target Group

Holders of CASA B2 licences endorsed with instrument E31 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify pressurisation system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of instrument exclusion E31 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00163 Electrical - B2 Licence Exclusion E32 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA202C	Remove and install basic aircraft electrical systems and components
MEA210C	Inspect, test and troubleshoot basic aircraft electrical systems and components
MEA277A	Maintain twin engine aircraft electrical systems and components

Target Group

Holders of CASA B2 licences endorsed with electrical E32 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify maintenance of multi-generator power systems.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of electrical exclusion E32 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00170 Engine - B1.2 or B1.4 Licence Exclusions E33 and E38 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA306C	Remove and install engines and engine system components
MEA313C	Inspect, test and troubleshoot piston engine systems and components

Target Group

Holders of CASA B1.2 or B1.4 licences endorsed with engine E33 or E38 exclusions who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before being able to certify supercharging and/or turbocharging system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of engine exclusions E33 or E38 from a CASR Part 66 B1.2 or B1.4 licence.

Custom Content Section

Not applicable.

MEASS00157 Electical/Instrument/Radio - B2 Licence Exclusion E34 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA207C	Remove and install aircraft electronic system components
And any one of	
MEA227D	Test and troubleshoot aircraft electrical systems and components
MEA228D	Test and troubleshoot aircraft instrument systems and components
MEA229D	Test and troubleshoot aircraft radio frequency navigation and communications systems and components
MEA230C	Test and troubleshoot fixed wing aircraft automatic flight control systems and components
MEA231C	Inspect, test and troubleshoot rotary wing aircraft automatic flight control systems and components
MEA232C	Test and troubleshoot aircraft pulse systems and components
MEA278A	Inspect, test and troubleshoot instrument display systems and components

Target Group

Holders of CASA B2 licences endorsed with electrical/instrument/radio E34 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify maintenance of digital electronic systems.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of electrical/instrument/radio exclusion E34 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00139 Airframe - B1.1 or B1.2 Licence Exclusion E35 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA317C	Remove and install pressurised aircraft structural and non-structural components
MEA339C	Inspect, repair and maintain aircraft structures

Target Group

Holders of CASA B1.1 or B1.2 licences endorsed with airframe E35 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before being able to certify pressurised structure maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E35 from a CASR Part 66 B1.1 or B1.2 licence.

Custom Content Section

Not applicable.

MEASS00171 Engine - B1.2 or B1.4 Licence Exclusions E36 and E37 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA306C	Remove and install engines and engine system components
MEA313C	Inspect, test and troubleshoot piston engine systems and components

Target Group

Holders of CASA B1.2 or B1.4 licences endorsed with engine E36 or E37 exclusions who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before being able to certify carburettor or fuel injection system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of engine exclusion E36 or E37 from a CASR Part 66 B1.2 or B1.4 licence.

Custom Content Section

Not applicable.

MEASS00172 Engine - B1.2 or B1.4 Licence Exclusions E36 and E37 Removal (when competencies are being gained on basic light aircraft or helicopters)

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA353A	Maintain basic light aircraft engines and propellers

Target Group

Holders of CASA B1.2 or B1.4 licences endorsed with engine E36 or E37 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before being able to certify carburettor or fuel injection system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of engine exclusion E36 or E37 from a CASR Part 66 B1.2 or B1.4 licence.

Custom Content Section

Not applicable.

MEASS00140 Airframe - B1.1 or B1.3 Licence Exclusions E39 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA303D	Remove and install aircraft pneumatic system components
MEA310C	Inspect, test and troubleshoot aircraft pneumatic systems and components

Target Group

Holders of CASA B1.1 or B1.3 licences endorsed with airframe E39 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before being able to certify airframe ice protection system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E39 from a CASR Part 66 B1.1 or B1.3 licence.

Custom Content Section

Not applicable.

MEASS00145 Airframe - B1.2 or B1.4 Licence Exclusion E39 Removal (when competencies are being gained on basic light aircraft or helicopters)

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA354A	Maintain light aircraft pneumatic systems

Target Group

Holders of CASA B1.2 or B1.4 licences endorsed with airframe E39 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package unit of competency that must be attained before being able to certify airframe ice protection system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E39 from a CASR Part 66 B1.2 or B1.4 licence.

Custom Content Section

Not applicable.

MEASS00130 Airframe - B1 Licence Exclusion E40 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA303D	Remove and install aircraft pneumatic system components
MEA310C	Inspect, test and troubleshoot aircraft pneumatic systems and components

Target Group

Holders of CASA B1 licences endorsed with airframe E40 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before being able to certify airframe fire protection system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E40 from a CASR Part 66 B1 licence.

Custom Content Section

Not applicable.

MEASS00131 Airframe - B1 Licence Exclusion E41 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA209C	Remove and install aircraft oxygen system components
MEA222C	Inspect, test and troubleshoot aircraft oxygen systems and components

Target Group

Holders of CASA B1 licences endorsed with airframe E41 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before being able to certify oxygen system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E41 from a CASR Part 66 B1 licence.

Custom Content Section

Not applicable.

MEASS00132 Airframe - B1 Licence Exclusion E42 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201B	Remove and install miscellaneous aircraft electrical hardware/components
MEA202C	Remove and install basic aircraft electrical systems and components
MEA210C	Inspect, test and troubleshoot basic aircraft electrical systems and components
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts
MEA260B	Use electrical test equipment
MEA302C	Remove and install aircraft hydro-mechanical and landing gear system components
MEA309C	Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components

Target Group

Holders of CASA B1 licences endorsed with airframe E42 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before being able to certify landing gear retraction system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E42 from a CASR Part 66 B1 licence.

Custom Content Section

Not applicable.

MEASS00158 Electrical - B1 Licence Exclusion E44 Removal

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201B	Remove and install miscellaneous aircraft electrical hardware/components
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts
MEA260B	Use electrical test equipment

Target Group

Holders of CASA B1 licences endorsed with electrical E44 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA11 Aeroskills Training Package units of competency that must be attained before being able to certify repairs to wiring.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the removal of electrical exclusion E44 from a CASR Part 66 B1 licence.

Custom Content Section

Not applicable.

MEASS00082 Aircraft egress system maintenance

Modification History

Release 2 - Imported unit code updated to current version - equivalent

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Certificate IV in Aeroskills (Armament).

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
MEA601A	Maintain aircraft egress systems
DEFEO101D	Work safely with explosive ordnance

Target Group

Individuals who wish to gain approval to maintain egress systems that contain explosive ordnance that are fitted to civil registered aircraft, such as Warbirds.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the grant of an approval to perform maintenance on aircraft egress systems that contain explosive ordnance.

Custom Content Section

Not applicable.

MEASS00180 In-flight entertainment system maintenance

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Certificate II in Aircraft Line Maintenance.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
MEA264A	Remove and install aircraft electrical/avionic components during line maintenance
MEA265A	Remove and install general aircraft electrical hardware

Target Group

Individuals who are required to maintain aircraft in-flight entertainment systems (IFE).

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA, when combined with applicable IFE equipment vendor training, for the grant of an approval to perform maintenance on IFE.

Custom Content Section

Not applicable.

MEASS00153 Borescope inspection approval

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers this unit as a Skill Set that meets regulatory requirements.

Licensing/Regulatory Information

Refer to pathways information.

Skill Set Requirements

MEA366A	Perform borescope inspections

Target Group

Qualified Aircraft Maintenance Engineers seeking approval to perform borescope inspections on aircraft engines.

Suggested words for Statement of Attainment

This competency from the MEA11 Aeroskills Training Package meets the requirements of CASA for the grant of an approval to perform borescope inspections on aircraft engines.

Custom Content Section

Not applicable.

MEASS00080 Aircraft composite structure repair/modification using hot and cold bonding

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Certificate IV in Aeroskills (Mechanical) and (Mechatronics) and of a Diploma of Aeroskills (Mechanical).

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA401C	Inspect aircraft structures
or	
MEA339C	Inspect, repair and maintain aircraft structures
or	
MEA363B	Inspect, repair and maintain structures and related components of non-pressurised small aircraft
MEA405B	Repair/modify aircraft composite material structure/components

Target Group

Individuals with Certificate IV in Aeroskills (Mechanical) or holders of B1 Maintenance Certification Licences who require an approval to repair or modify aircraft composite structure using hot and/or cold bonding.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the grant of an approval to perform repairs and modifications on aircraft composite structures using hot and/or cold bonding.

Custom Content Section

Not applicable.

MEASS00079 Aircraft composite structure repair/modification using cold bonding only

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Certificate IV in Aeroskills (Mechanical) and (Mechatronics).

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA401C	Inspect aircraft structures
or	
MEA339C	Inspect, repair and maintain aircraft structures
or	
MEA363B	Inspect, repair and maintain structures and related components of non-pressurised small aircraft
MEA367A	Repair/modify aircraft composite structure using cold bonding

Target Group

Individuals with Certificate IV in Aeroskills (Mechanical) or holders of B1 Maintenance Certification Licences who require an approval to repair or modify aircraft composite structure using cold bonding only.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA for the grant of an approval to perform repairs and modifications on aircraft composite structures using cold bonding only.

Custom Content Section

Not applicable.

MEASS00106 Aircraft welding using the gas welding process - aluminium alloys

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of aluminium alloys using the gas welding process. The competency elements of MEA430A must be attained using the aluminium alloy parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05004C	Perform routine oxy acetylene welding
MEM05007C	Perform manual heating and thermal cutting
MEM05022C	Perform advanced welding using oxy acetylene welding process
MEM05026C	Apply welding principles
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance

MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA430A	Gas weld aircraft components

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld aluminium alloy aircraft components using the gas welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and of the ADF for the grant of an approval to weld aluminium alloys using the gas welding process.

Custom Content Section

Not applicable.

MEASS00110 Aircraft welding using the gas welding process - magnesium alloys

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of magnesium alloys using the gas welding process. The competency elements of MEA430A must be attained using the magnesium alloy parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05004C	Perform routine oxy acetylene welding
MEM05007C	Perform manual heating and thermal cutting
MEM05022C	Perform advanced welding using oxy acetylene welding process
MEM05026C	Apply welding principles
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance

MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA430A	Gas weld aircraft components

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld magnesium alloy aircraft components using the gas welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and of the ADF for the grant of an approval to weld magnesium alloys using the gas welding process.

Custom Content Section

Not applicable.

MEASS00107 Aircraft welding using the gas welding process - carbon and low alloy steels

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of carbon and low alloy steels using the gas welding process. The competency elements of MEA430A must be attained using the carbon steel and low alloy steel parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05004C	Perform routine oxy acetylene welding
MEM05007C	Perform manual heating and thermal cutting
MEM05022C	Perform advanced welding using oxy acetylene welding process
MEM05026C	Apply welding principles
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance

MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA430A	Gas weld aircraft components

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld carbon and low alloy steel aircraft components using the gas welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and of the ADF for the grant of an approval to weld carbon and low alloy steels using the gas welding process.

Custom Content Section

Not applicable.

MEASS00109 Aircraft welding using the gas welding process - corrosion and heat resisting steels

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of corrosion and heat resisting steel using the gas welding process. The competency elements of MEA430A must be attained using the corrosion and heat resisting steel parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05004C	Perform routine oxy acetylene welding
MEM05007C	Perform manual heating and thermal cutting
MEM05022C	Perform advanced welding using oxy acetylene welding process
MEM05026C	Apply welding principles
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance

MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA430A	Gas weld aircraft components

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld corrosion and heat resisting steel aircraft components using the gas welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and of the ADF for the grant of an approval to weld corrosion and heat resisting steels using the gas welding process.

Custom Content Section

Not applicable.

MEASS00111 Aircraft welding using the gas welding process - nickel alloys

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of nickel alloys using the gas welding process. The competency elements of MEA430A must be attained using the nickel alloy parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05004C	Perform routine oxy acetylene welding
MEM05007C	Perform manual heating and thermal cutting
MEM05022C	Perform advanced welding using oxy acetylene welding process
MEM05026C	Apply welding principles
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance

MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA430A	Gas weld aircraft components

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld nickel alloy aircraft components using the gas welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and of the ADF for the grant of an approval to weld nickel alloys using the gas welding process.

Custom Content Section

Not applicable.

MEASS00108 Aircraft welding using the gas welding process - copper based alloys

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of copper based alloys using the gas welding process. The competency elements of MEA430A must be attained using the copper based alloy parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05004C	Perform routine oxy acetylene welding
MEM05007C	Perform manual heating and thermal cutting
MEM05022C	Perform advanced welding using oxy acetylene welding process
MEM05026C	Apply welding principles
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance

MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA430A	Gas weld aircraft components

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld copper based alloy aircraft components using the gas welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and of the ADF for the grant of an approval to weld copper based alloys using the gas welding process.

Custom Content Section

Not applicable.

MEASS00112 Aircraft welding using the gas welding process - titanium alloys

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of titanium alloys using the gas welding process. The competency elements of MEA430A must be attained using the titanium alloy parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05004C	Perform routine oxy acetylene welding
MEM05007C	Perform manual heating and thermal cutting
MEM05022C	Perform advanced welding using oxy acetylene welding process
MEM05026C	Apply welding principles
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance

MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA430A	Gas weld aircraft components

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld titanium alloy aircraft components using the gas welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and of the ADF for the grant of an approval to weld titanium alloys using the gas welding process.

Custom Content Section

Not applicable.

MEASS00087 Aircraft welding using the braze welding process - aluminium alloys

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of aluminium alloys using the braze welding process. The competency elements of MEA431A must be attained using the aluminium alloy parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05006C	Perform brazing and/or silver soldering
MEM05026C	Apply welding principles
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA431A	Braze weld aircraft components

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld aluminium alloy aircraft components using the braze welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld aluminium alloy aircraft components using the braze welding process.

Custom Content Section

Not applicable.

MEASS00091 Aircraft welding using the braze welding process - magnesium alloys

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of magnesium alloys using the braze welding process. The competency elements of MEA431A must be attained using the magnesium alloy parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05006C	Perform brazing and/or silver soldering
MEM05026C	Apply welding principles
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA431A	Braze weld aircraft components

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld magnesium alloy aircraft components using the braze welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld magnesium alloy aircraft components using the braze welding process.

Custom Content Section

Not applicable.

MEASS00088 Aircraft welding using the braze welding process - carbon and low alloy steels

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of carbon and low alloy steel using the braze welding process. The competency elements of MEA431A must be attained using the carbon steel and low alloy steel parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05006C	Perform brazing and/or silver soldering
MEM05026C	Apply welding principles
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA431A	Braze weld aircraft components

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld carbon and low alloy steel aircraft components using the braze welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld carbon and low alloy steel aircraft components using the braze welding process.

Custom Content Section

Not applicable.

MEASS00090 Aircraft welding using the braze welding process - corrosion and heat resisting steels

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of corrosion and heat resisting steel using the braze welding process. The competency elements of MEA431A must be attained using the corrosion and heat resisting steel parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05006C	Perform brazing and/or silver soldering
MEM05026C	Apply welding principles
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA431A	Braze weld aircraft components

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld corrosion and heat resisting steel aircraft components using the braze welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld corrosion and heat resisting steel aircraft components using the braze welding process.

Custom Content Section

Not applicable.

MEASS00092 Aircraft welding using the braze welding process - nickel alloys

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of nickel alloy using the braze welding process. The competency elements of MEA431A must be attained using the nickel alloy parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05006C	Perform brazing and/or silver soldering
MEM05026C	Apply welding principles
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA431A	Braze weld aircraft components

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld nickel alloy aircraft components using the braze welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld nickel alloy aircraft components using the braze welding process.

Custom Content Section

Not applicable.

MEASS00089 Aircraft welding using the braze welding process - copper based alloys

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of copper based alloy using the braze welding process. The competency elements of MEA431A must be attained using the copper based alloy parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05006C	Perform brazing and/or silver soldering
MEM05026C	Apply welding principles
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA431A	Braze weld aircraft components

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld copper based alloy aircraft components using the braze welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld copper based alloy aircraft components using the braze welding process.

Custom Content Section

Not applicable.

MEASS00093 Aircraft welding using the braze welding process - titanium alloys

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of titanium alloy using the braze welding process. The competency elements of MEA431A must be attained using the titanium alloy parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05006C	Perform brazing and/or silver soldering
MEM05026C	Apply welding principles
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA431A	Braze weld aircraft components

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld titanium alloy aircraft components using the braze welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld titanium alloy aircraft components using the braze welding process.

Custom Content Section

Not applicable.

MEASS00094 Aircraft welding using the gas metal arc welding process - aluminium alloys

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of aluminium alloys using the gas metal arc welding process. The competency elements of MEA433A must be attained using the aluminium alloy parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05007C	Perform manual heating and thermal cutting
MEM05017D	Weld using gas metal arc welding process
MEM05018C	Perform advanced welding using gas metal arc welding process
MEM05026C	Apply welding principles
MEM05043B	Perform welds to code standards using gas metal arc welding
MEM05050B	Perform routine gas metal arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools

MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA433A	Weld aircraft components using the gas metal arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld aluminium alloy aircraft components using the gas metal arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld aluminium alloy aircraft components using the gas metal arc welding process.

Custom Content Section

Not applicable.

MEASS00098 Aircraft welding using the gas metal arc welding process - magnesium alloys

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of magnesium alloy using the gas metal arc welding process. The competency elements of MEA433A must be attained using the magnesium alloy parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05007C	Perform manual heating and thermal cutting
MEM05017D	Weld using gas metal arc welding process
MEM05018C	Perform advanced welding using gas metal arc welding process
MEM05026C	Apply welding principles
MEM05043B	Perform welds to code standards using gas metal arc welding
MEM05050B	Perform routine gas metal arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools

MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA433A	Weld aircraft components using the gas metal arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld magnesium alloy aircraft components using the gas metal arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld magnesium alloy aircraft components using the gas metal arc welding process.

Custom Content Section

Not applicable.

MEASS00095 Aircraft welding using the gas metal arc welding process - carbon and low alloy steels

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of carbon and low alloy steel using the gas metal arc welding process. The competency elements of MEA433A must be attained using the carbon steel and low alloy steel parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05007C	Perform manual heating and thermal cutting
MEM05017D	Weld using gas metal arc welding process
MEM05018C	Perform advanced welding using gas metal arc welding process
MEM05026C	Apply welding principles
MEM05043B	Perform welds to code standards using gas metal arc welding
MEM05050B	Perform routine gas metal arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA433A	Weld aircraft components using the gas metal arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld carbon and low alloy steel aircraft components using the gas metal arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld carbon and low alloy steel aircraft components using the gas metal arc welding process.

Custom Content Section

Not applicable.

MEASS00097 Aircraft welding using the gas metal arc welding process - corrosion and heat resisting steels

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of corrosion and heat resisting steel using the gas metal arc welding process. The competency elements of MEA433A must be attained using the corrosion and heat resisting steel parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05007C	Perform manual heating and thermal cutting
MEM05017D	Weld using gas metal arc welding process
MEM05018C	Perform advanced welding using gas metal arc welding process
MEM05026C	Apply welding principles
MEM05043B	Perform welds to code standards using gas metal arc welding
MEM05050B	Perform routine gas metal arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA433A	Weld aircraft components using the gas metal arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld corrosion and heat resisting steel aircraft components using the gas metal arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld corrosion and heat resisting steel aircraft components using the gas metal arc welding process.

Custom Content Section

Not applicable.

MEASS00099 Aircraft welding using the gas metal arc welding process - nickel alloys

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of nickel alloy using the gas metal arc welding process. The competency elements of MEA433A must be attained using the nickel alloy parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05007C	Perform manual heating and thermal cutting
MEM05017D	Weld using gas metal arc welding process
MEM05018C	Perform advanced welding using gas metal arc welding process
MEM05026C	Apply welding principles
MEM05043B	Perform welds to code standards using gas metal arc welding
MEM05050B	Perform routine gas metal arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools

MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA433A	Weld aircraft components using the gas metal arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld nickel alloy aircraft components using the gas metal arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld nickel alloy aircraft components using the gas metal arc welding process.

Custom Content Section

Not applicable.

MEASS00096 Aircraft welding using the gas metal arc welding process - copper based alloys

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of copper based alloy using the gas metal arc welding process. The competency elements of MEA433A must be attained using the copper based alloy parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05007C	Perform manual heating and thermal cutting
MEM05017D	Weld using gas metal arc welding process
MEM05018C	Perform advanced welding using gas metal arc welding process
MEM05026C	Apply welding principles
MEM05043B	Perform welds to code standards using gas metal arc welding
MEM05050B	Perform routine gas metal arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools

MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA433A	Weld aircraft components using the gas metal arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld copper based alloy aircraft components using the gas metal arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld copper based alloy aircraft components using the gas metal arc welding process.

Custom Content Section

Not applicable.

MEASS00100 Aircraft welding using the gas metal arc welding process - titanium alloys

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of titanium alloy using the gas metal arc welding process. The competency elements of MEA433A must be attained using the titanium alloy parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05007C	Perform manual heating and thermal cutting
MEM05017D	Weld using gas metal arc welding process
MEM05018C	Perform advanced welding using gas metal arc welding process
MEM05026C	Apply welding principles
MEM05043B	Perform welds to code standards using gas metal arc welding
MEM05050B	Perform routine gas metal arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools

MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA433A	Weld aircraft components using the gas metal arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld titanium alloy aircraft components using the gas metal arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld titanium alloy aircraft components using the gas metal arc welding process.

Custom Content Section

Not applicable.

MEASS00101 Aircraft welding using the gas tungsten arc welding process - aluminium alloys

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of aluminium alloys using the gas tungsten arc welding process. The competency elements of MEA432A must be attained using the aluminium alloy parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05007C	Perform manual heating and thermal cutting
MEM05019D	Weld using gas tungsten arc welding process
MEM05020C	Perform advanced welding using gas tungsten arc welding process
MEM05026C	Apply welding principles
MEM05044B	Perform welds to code standards using gas tungsten arc welding
MEM05049B	Perform routine gas tungsten arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA432A	Weld aircraft components using the gas tungsten arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld aluminium alloy aircraft components using the gas tungsten arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld aluminium alloy aircraft components using the gas tungsten arc welding process.

Custom Content Section

Not applicable.

MEASS00104 Aircraft welding using the gas tungsten arc welding process - magnesium alloys

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of magnesium alloy using the gas tungsten arc welding process. The competency elements of MEA432A must be attained using the magnesium alloy parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05007C	Perform manual heating and thermal cutting
MEM05019D	Weld using gas tungsten arc welding process
MEM05020C	Perform advanced welding using gas tungsten arc welding process
MEM05026C	Apply welding principles
MEM05044B	Perform welds to code standards using gas tungsten arc welding
MEM05049B	Perform routine gas tungsten arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA432A	Weld aircraft components using the gas tungsten arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld magnesium alloy aircraft components using the gas tungsten arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld magnesium alloy aircraft components using the gas tungsten arc welding process.

Custom Content Section

Not applicable.

MEASS00102 Aircraft welding using the gas tungsten arc welding process - carbon and low alloys steels

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of carbon and low alloy steel using the gas tungsten arc welding process. The competency elements of MEA432A must be attained using the carbon steel and low alloy steel parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05007C	Perform manual heating and thermal cutting
MEM05019D	Weld using gas tungsten arc welding process
MEM05020C	Perform advanced welding using gas tungsten arc welding process
MEM05026C	Apply welding principles
MEM05044B	Perform welds to code standards using gas tungsten arc welding
MEM05049B	Perform routine gas tungsten arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA432A	Weld aircraft components using the gas tungsten arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld carbon and low alloy steel aircraft components using the gas tungsten arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld carbon and low alloy steel aircraft components using the gas tungsten arc welding process.

Custom Content Section

Not applicable.

MEASS00103 Aircraft welding using the gas tungsten arc welding process - corrosion and heat resisting steels

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of corrosion and heat resisting steel using the gas tungsten arc welding process. The competency elements of MEA432A must be attained using the corrosion and heat resisting steel parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05007C	Perform manual heating and thermal cutting
MEM05019D	Weld using gas tungsten arc welding process
MEM05020C	Perform advanced welding using gas tungsten arc welding process
MEM05026C	Apply welding principles
MEM05044B	Perform welds to code standards using gas tungsten arc welding
MEM05049B	Perform routine gas tungsten arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA432A	Weld aircraft components using the gas tungsten arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld corrosion and heat resisting steel aircraft components using the gas tungsten arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld corrosion and heat resisting steel aircraft components using the gas tungsten arc welding process.

Custom Content Section

Not applicable.

MEASS00105 Aircraft welding using the gas tungsten arc welding process - nickel alloys

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of nickel alloy using the gas tungsten arc welding process. The competency elements of MEA432A must be attained using the nickel alloy parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05007C	Perform manual heating and thermal cutting
MEM05019D	Weld using gas tungsten arc welding process
MEM05020C	Perform advanced welding using gas tungsten arc welding process
MEM05026C	Apply welding principles
MEM05044B	Perform welds to code standards using gas tungsten arc welding
MEM05049B	Perform routine gas tungsten arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools

MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA432A	Weld aircraft components using the gas tungsten arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld nickel alloy aircraft components using the gas tungsten arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld nickel alloy aircraft components using the gas tungsten arc welding process.

Custom Content Section

Not applicable.

MEASS00120 Aircraft welding using the plasma arc welding process - aluminium alloys

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of aluminium alloys using the plasma arc welding process. The competency elements of MEA434A must be attained using the aluminium alloy parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05007C	Perform manual heating and thermal cutting
MEM05019D	Weld using gas tungsten arc welding process
MEM05020C	Perform advanced welding using gas tungsten arc welding process
MEM05026C	Apply welding principles
MEM05044B	Perform welds to code standards using gas tungsten arc welding
MEM05049B	Perform routine gas tungsten arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools

MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA434A	Weld aircraft components using the plasma arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld aluminium alloy aircraft components using the plasma arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld aluminium alloy aircraft components using the plasma arc welding process.

Custom Content Section

Not applicable.

MEASS00124 Aircraft welding using the plasma arc welding process - magnesium alloys

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of magnesium alloy using the plasma arc welding process. The competency elements of MEA434A must be attained using the magnesium alloy parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05007C	Perform manual heating and thermal cutting
MEM05019D	Weld using gas tungsten arc welding process
MEM05020C	Perform advanced welding using gas tungsten arc welding process
MEM05026C	Apply welding principles
MEM05044B	Perform welds to code standards using gas tungsten arc welding
MEM05049B	Perform routine gas tungsten arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools

MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA434A	Weld aircraft components using the plasma arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld magnesium alloy aircraft components using the plasma arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld magnesium alloy aircraft components using the plasma arc welding process.

Custom Content Section

Not applicable.

MEASS00121 Aircraft welding using the plasma arc welding process - carbon and low alloy steels

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of carbon and low alloy steel using the plasma arc welding process. The competency elements of MEA434A must be attained using the carbon steel and low alloy steel parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05007C	Perform manual heating and thermal cutting
MEM05019D	Weld using gas tungsten arc welding process
MEM05020C	Perform advanced welding using gas tungsten arc welding process
MEM05026C	Apply welding principles
MEM05044B	Perform welds to code standards using gas tungsten arc welding
MEM05049B	Perform routine gas tungsten arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA434A	Weld aircraft components using the plasma arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld carbon and low alloy steel aircraft components using the plasma arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld carbon and low alloy steel aircraft components using the plasma arc welding process.

Custom Content Section

Not applicable.

MEASS00123 Aircraft welding using the plasma arc welding process - corrosion and heat resisting steels

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of corrosion and heat resisting steel using the plasma arc welding process. The competency elements of MEA434A must be attained using the corrosion and heat resisting steel parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05007C	Perform manual heating and thermal cutting
MEM05019D	Weld using gas tungsten arc welding process
MEM05020C	Perform advanced welding using gas tungsten arc welding process
MEM05026C	Apply welding principles
MEM05044B	Perform welds to code standards using gas tungsten arc welding
MEM05049B	Perform routine gas tungsten arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA434A	Weld aircraft components using the plasma arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld corrosion and heat resisting steel aircraft components using the plasma arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld corrosion and heat resisting steel aircraft components using the plasma arc welding process.

Custom Content Section

Not applicable.

MEASS00125 Aircraft welding using the plasma arc welding process - nickel alloys

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of nickel alloy using the plasma arc welding process. The competency elements of MEA434A must be attained using the nickel alloy parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05007C	Perform manual heating and thermal cutting
MEM05019D	Weld using gas tungsten arc welding process
MEM05020C	Perform advanced welding using gas tungsten arc welding process
MEM05026C	Apply welding principles
MEM05044B	Perform welds to code standards using gas tungsten arc welding
MEM05049B	Perform routine gas tungsten arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools

MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA434A	Weld aircraft components using the plasma arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld nickel alloy aircraft components using the plasma arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld nickel alloy aircraft components using the plasma arc welding process.

Custom Content Section

Not applicable.

MEASS00122 Aircraft welding using the plasma arc welding process - copper based alloys

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of copper based alloy using the plasma arc welding process. The competency elements of MEA434A must be attained using the copper based alloy parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05007C	Perform manual heating and thermal cutting
MEM05019D	Weld using gas tungsten arc welding process
MEM05020C	Perform advanced welding using gas tungsten arc welding process
MEM05026C	Apply welding principles
MEM05044B	Perform welds to code standards using gas tungsten arc welding
MEM05049B	Perform routine gas tungsten arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools

MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA434A	Weld aircraft components using the plasma arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld copper based alloy aircraft components using the plasma arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld copper based alloy aircraft components using the plasma arc welding process.

Custom Content Section

Not applicable.

MEASS00126 Aircraft welding using the plasma arc welding process - titanium alloys

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of titanium alloy using the plasma arc welding process. The competency elements of MEA434A must be attained using the titanium alloy parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05007C	Perform manual heating and thermal cutting
MEM05019D	Weld using gas tungsten arc welding process
MEM05020C	Perform advanced welding using gas tungsten arc welding process
MEM05026C	Apply welding principles
MEM05044B	Perform welds to code standards using gas tungsten arc welding
MEM05049B	Perform routine gas tungsten arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools

MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA434A	Weld aircraft components using the plasma arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld titanium alloy aircraft components using the plasma arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld titanium alloy aircraft components using the plasma arc welding process.

Custom Content Section

Not applicable.

MEASS00113 Aircraft welding using the manual metal arc welding process - aluminium alloys

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of aluminium alloys using the manual metal arc welding process. The competency elements of MEA435A must be attained using the aluminium alloy parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05007C	Perform manual heating and thermal cutting
MEM05012C	Perform routine manual metal arc welding
MEM05015D	Weld using manual metal arc welding process
MEM05016C	Perform advanced welding using manual metal arc welding process
MEM05026C	Apply welding principles
MEM05046B	Perform welds to code standards using manual metal arc welding process
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA435A	Weld aircraft components using the manual metal arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld aluminium alloy aircraft components using the manual metal arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld aluminium alloy aircraft components using the manual metal arc welding process.

Custom Content Section

Not applicable.

MEASS00117 Aircraft welding using the manual metal arc welding process - magnesium alloys

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of magnesium alloy using the manual metal arc welding process. The competency elements of MEA435A must be attained using the magnesium alloy parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05007C	Perform manual heating and thermal cutting
MEM05012C	Perform routine manual metal arc welding
MEM05015D	Weld using manual metal arc welding process
MEM05016C	Perform advanced welding using manual metal arc welding process
MEM05026C	Apply welding principles
MEM05046B	Perform welds to code standards using manual metal arc welding process
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA435A	Weld aircraft components using the manual metal arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld magnesium alloy aircraft components using the manual metal arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld magnesium alloy aircraft components using the manual metal arc welding process.

Custom Content Section

Not applicable.

MEASS00114 Aircraft welding using the manual metal arc welding process - carbon and low alloy steels

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of carbon and low alloy steel using the manual metal arc welding process. The competency elements of MEA435A must be attained using the carbon steel and low alloy steel parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05007C	Perform manual heating and thermal cutting
MEM05012C	Perform routine manual metal arc welding
MEM05015D	Weld using manual metal arc welding process
MEM05016C	Perform advanced welding using manual metal arc welding process
MEM05026C	Apply welding principles
MEM05046B	Perform welds to code standards using manual metal arc welding process
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA435A	Weld aircraft components using the manual metal arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld carbon and low alloy steel aircraft components using the manual metal arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld carbon and low alloy steel aircraft components using the manual metal arc welding process.

Custom Content Section

Not applicable.

MEASS00116 Aircraft welding using the manual metal arc welding process - corrosion and heat resisting steels

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of corrosion and heat resisting steel using the manual metal arc welding process. The competency elements of MEA435A must be attained using the corrosion and heat resisting steel parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05007C	Perform manual heating and thermal cutting
MEM05012C	Perform routine manual metal arc welding
MEM05015D	Weld using manual metal arc welding process
MEM05016C	Perform advanced welding using manual metal arc welding process
MEM05026C	Apply welding principles
MEM05046B	Perform welds to code standards using manual metal arc welding process
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA435A	Weld aircraft components using the manual metal arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld corrosion and heat resisting steel aircraft components using the manual metal arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld corrosion and heat resisting steel aircraft components using the manual metal arc welding process.

Custom Content Section

Not applicable.

MEASS00118 Aircraft welding using the manual metal arc welding process - nickel alloys

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of nickel alloy using the manual metal arc welding process. The competency elements of MEA435A must be attained using the nickel alloy parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05007C	Perform manual heating and thermal cutting
MEM05012C	Perform routine manual metal arc welding
MEM05015D	Weld using manual metal arc welding process
MEM05016C	Perform advanced welding using manual metal arc welding process
MEM05026C	Apply welding principles
MEM05046B	Perform welds to code standards using manual metal arc welding process
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA435A	Weld aircraft components using the manual metal arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld nickel alloy aircraft components using the manual metal arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld nickel alloy aircraft components using the manual metal arc welding process.

Custom Content Section

Not applicable.

MEASS00115 Aircraft welding using the manual metal arc welding process - copper based alloys

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of copper based alloy using the manual metal arc welding process. The competency elements of MEA435A must be attained using the copper based alloy parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05007C	Perform manual heating and thermal cutting
MEM05012C	Perform routine manual metal arc welding
MEM05015D	Weld using manual metal arc welding process
MEM05016C	Perform advanced welding using manual metal arc welding process
MEM05026C	Apply welding principles
MEM05046B	Perform welds to code standards using manual metal arc welding process
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA435A	Weld aircraft components using the manual metal arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld copper based alloy aircraft components using the manual metal arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld copper based alloy aircraft components using the manual metal arc welding process.

Custom Content Section

Not applicable.

MEASS00119 Aircraft welding using the manual metal arc welding process - titanium alloys

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of titanium alloy using the manual metal arc welding process. The competency elements of MEA435A must be attained using the titanium alloy parent metal group as listed in the Range Statement.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05007C	Perform manual heating and thermal cutting
MEM05012C	Perform routine manual metal arc welding
MEM05015D	Weld using manual metal arc welding process
MEM05016C	Perform advanced welding using manual metal arc welding process
MEM05026C	Apply welding principles
MEM05046B	Perform welds to code standards using manual metal arc welding process
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA435A	Weld aircraft components using the manual metal arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld titanium alloy aircraft components using the manual metal arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld titanium alloy aircraft components using the manual metal arc welding process.

Custom Content Section

Not applicable.

MEASS00193 Liquid penetrant inspection approval for aerospace

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Diploma of Aeroskills (Non-Destructive Testing). The MEA units also count towards the Diploma and Advanced Diploma of Aviation Maintenance Management. The MEM units count towards Diploma qualifications in the MEM05 Metal and Engineering Training Package.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance Note: This unit is equivalent to MEM18001C as a prerequisite for MEM24002B
MEM24002B	Perform penetrant testing
MEM24012C	Apply metallurgy principles

Target Group

Holders of aircraft engineer licences, qualified AMEs and aviation tradespersons employed on aircraft and component maintenance plus other tradespersons employed in component maintenance workshops seeking approval under either the CASA or ADF Regulatory system to perform liquid penetrant inspection of aircraft structure and items of aeronautical product at *AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace* Level 2.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to perform liquid penetrant inspections on aircraft structure and items of aeronautical product at *AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace* Level 2.

Custom Content Section

Not applicable.

MEASS00199 Magnetic particle inspection approval for aerospace

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Diploma of Aeroskills (Non-Destructive Testing). The MEA units also count towards the Diploma and Advanced Diploma of Aviation Maintenance Management. The MEM units count towards Diploma qualifications in the MEM05 Metal and Engineering Training Package.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance Note: This unit is equivalent to MEM18001C as a prerequisite for MEM24004B
MEM24004B	Perform magnetic particle testing

MEM24012C Apply metallurgy principles

Target Group

Holders of aircraft engineer licences, qualified AMEs and aviation tradespersons employed on aircraft and component maintenance plus other tradespersons employed in component maintenance workshops seeking approval under either the CASA or ADF Regulatory system to perform magnetic particle inspection of aircraft structure and items of aeronautical product at *AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace* Level 2.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to perform magnetic particle inspections on aircraft structure and items of aeronautical product at *AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace* Level 2.

Custom Content Section

Not applicable.

MEASS00156 Eddy current inspection approval for aerospace

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Diploma of Aeroskills (Non-Destructive Testing). The MEA units also count towards the Diploma and Advanced Diploma of Aviation Maintenance Management. The MEM units count towards Diploma qualifications in the MEM05 Metal and Engineering Training Package.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance Note: This unit is equivalent to MEM18001C as a prerequisite for MEM24006B
MEM24006B	Perform eddy current testing
MEM24012C	Apply metallurgy principles

Target Group

Holders of aircraft engineer licences, qualified AMEs and aviation tradespersons employed on aircraft and component maintenance plus other tradespersons employed in component maintenance workshops seeking approval under either the CASA or ADF Regulatory system to perform eddy current inspection of aircraft structure and items of aeronautical product at *AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace* Level 2.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to perform eddy current inspections on aircraft structure and items of aeronautical product at *AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace* Level 2.

Custom Content Section

Not applicable.

MEASS00231 Ultrasonic inspection approval for aerospace

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Diploma of Aeroskills (Non-Destructive Testing). The MEA units also count towards the Diploma and Advanced Diploma of Aviation Maintenance Management. The MEM units count towards Diploma qualifications in the MEM05 Metal and Engineering Training Package.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance Note: This unit is equivalent to MEM18001C as a prerequisite for MEM24008B
MEM24008B	Perform ultrasonic testing
MEM24012C	Apply metallurgy principles

Target Group

Holders of aircraft engineer licences, qualified AMEs and aviation tradespersons employed on aircraft and component maintenance plus other tradespersons employed in component maintenance workshops seeking approval under either the CASA or ADF Regulatory system to perform ultrasonic inspection of aircraft structure and items of aeronautical product at *AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace* Level 2.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to perform ultrasonic inspections on aircraft structure and items of aeronautical product at *AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace* Level 2.

Custom Content Section

Not applicable.

MEASS00229 Radiographic inspection approval for aerospace

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as part of a Diploma of Aeroskills (Non-Destructive Testing). The MEA units also count towards the Diploma and Advanced Diploma of Aviation Maintenance Management. The MEM units count towards Diploma qualifications in the MEM05 Metal and Engineering Training Package.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance Note: This unit is equivalent to MEM18001C as a prerequisite for MEM24010B
MEM13013B	Work safely with ionising radiation
MEM24010B	Perform radiographic testing

MEM24012C Apply metallurgy principles

Target Group

Holders of aircraft engineer licences, qualified AMEs and aviation tradespersons employed on aircraft and component maintenance plus other tradespersons employed in component maintenance workshops seeking approval under either the CASA or ADF Regulatory system to perform radiographic inspection of aircraft structure and items of aeronautical product at *AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace* Level 2.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to perform radiographic inspections on aircraft structure and items of aeronautical product at *AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace* Level 2.

Custom Content Section

Not applicable.

MEASS00152 Basic visual liquid dye penetrant inspection approval for aerospace

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as a Skill Set that meets regulatory requirements.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance Note: This unit is equivalent to MEM18001C as a prerequisite for MEM24001B
MEM24001B	Perform basic penetrant testing

Target Group

Qualified AMEs and aviation tradespersons employed on aircraft and component maintenance plus other tradespersons employed in component maintenance workshops seeking approval under either the CASA or ADF Regulatory system to perform basic visual liquid dye penetrant inspection of aircraft structure and items of aeronautical product.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to perform basic visual liquid dye penetrant inspections on aircraft structure and items of aeronautical product.

Custom Content Section

Not applicable.

MEASS00150 Basic magnetic particle inspection approval for aerospace

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as a Skill Set that meets regulatory requirements.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance Note: This unit is equivalent to MEM18001C as a prerequisite for MEM24003B
MEM24003B	Perform basic magnetic particle testing

Target Group

Holders of aircraft engineer licences, qualified AMEs and aviation tradespersons employed on aircraft and component maintenance plus other tradespersons employed in component maintenance workshops seeking approval under either the CASA or ADF Regulatory system to perform basic magnetic particle inspection of aircraft structure and items of aeronautical product.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to perform basic magnetic particle inspections on aircraft structure and items of aeronautical product.

Custom Content Section

Not applicable.

MEASS00149 Basic eddy current inspection approval for aerospace

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as a Skill Set that meets regulatory requirements.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance Note: This unit is equivalent to MEM18001C as a prerequisite for MEM24005B
MEM24005B	Perform basic eddy current testing

Target Group

Holders of aircraft engineer licences, qualified AMEs and aviation tradespersons employed on aircraft and component maintenance plus other tradespersons employed in component maintenance workshops seeking approval under either the CASA or ADF Regulatory system to perform basic eddy current inspection of aircraft structure and items of aeronautical product.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to perform basic eddy current inspection of aircraft structure and items of aeronautical product.

Custom Content Section

Not applicable.

MEASS00232 Ultrasonic thickness testing inspection approval for aerospace

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as a Skill Set that meets regulatory requirements.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance Note: This unit is equivalent to MEM18001C as a prerequisite for MEM24007B
MEM24007B	Perform ultrasonic thickness testing

Target Group

Holders of aircraft engineer licences, qualified AMEs and aviation tradespersons employed on aircraft and component maintenance plus other tradespersons employed in component maintenance workshops seeking approval under either the CASA or ADF Regulatory system to perform ultrasonic thickness testing inspection of aircraft structure and items of aeronautical product.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to perform ultrasonic thickness testing inspections on aircraft structure and items of aeronautical product.

Custom Content Section

Not applicable.

MEASS00151 Basic radiographic inspection approval for aerospace

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

The MEA11 Aeroskills Training Package offers these units as a Skill Set that meets regulatory requirements.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance Note: This unit is equivalent to MEM18001C as a prerequisite for MEM24009B
MEM13013B	Work safely with ionising radiation
MEM24009B	Perform basic radiographic testing

Target Group

Holders of aircraft engineer licences, qualified AMEs and aviation tradespersons employed on aircraft and component maintenance plus other tradespersons employed in component maintenance workshops seeking approval under either the CASA or ADF Regulatory system to perform basic radiographic inspection of aircraft structure and items of aeronautical product.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to perform basic radiographic inspection of aircraft structure and items of aeronautical product.

Custom Content Section

Not applicable.

MEASS00168 Electroplate aeronautical product component parts

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 145 and does not relate to an Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B	Complete aviation maintenance industry documentation
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
MEM07001B	Perform operational maintenance of machines equipment
MEM08001B	Perform wire, jig and barrel load unload work
MEM08003C	Perform electroplating operations
MEM08018B	Electroplate engineering coatings
MEM13003B	Work safely with industrial chemicals and materials
MEM18001C	Use hand tools
MEM15004B	Perform inspection

Target Group

Individuals with allied trade qualifications who are employed in CASR Part 145 AMOs and require approval to electroplate aeronautical product component parts.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on the electroplating of aeronautical product component parts.

Custom Content Section

Not applicable.

MEASS00213 Produce anodised film on aluminium alloy components

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 145 and does not relate to an Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B	Complete aviation maintenance industry documentation
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
MEM08002C	Pre-treat work for subsequent surface coating
MEM08006B	Produce clear and/or coloured and/or sealed anodised film on aluminium

Target Group

Individuals with allied trade qualifications who are employed in CASR Part 145 AMOs and require approval to produce anodised film on aluminium alloy components.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on the production of anodised film on aluminium alloy components.

Custom Content Section

Not applicable.

MEASS00202 Metal spray aeronautical product component parts

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 145 and does not relate to an Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B	Complete aviation maintenance industry documentation
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
MEM08002C	Pre-treat work for subsequent surface coating
MEM08004B	Finish work using wet, dry and vapour deposition methods
MEM13003B	Work safely with industrial chemicals and materials

Target Group

Individuals with allied trade qualifications who are employed in CASR Part 145 AMOs and require approval to perform metal spraying operations.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on metal spraying operations.

Custom Content Section

Not applicable.

MEASS00194 Machine aeronautical product component parts (general)

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 145 and does not relate to an Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B	Complete aviation maintenance industry documentation
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
MEM07002B	Perform precision shaping/planning/slotting operations
MEM07005C	Perform general machining
MEM07006C	Perform lathe operations
MEM07007C	Perform milling operations
MEM07021B	Perform complex lathe operations
MEM09002B	Interpret technical drawing
MEM12003B	Perform precision mechanical measurement
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools

Target Group

Individuals with allied trade qualifications who are employed in CASR Part 145 AMOs and require approval to perform general machining of aeronautical product component parts.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on general machining of aeronautical product component parts.

Custom Content Section

Not applicable.

MEASS00178 Grind aeronautical product component parts

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 145 and does not relate to an Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B	Complete aviation maintenance industry documentation
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
MEM07005C	Perform general machining
MEM07008D	Perform grinding operations
MEM07010B	Perform tool and cutter grinding operations
MEM07012B	Perform complex grinding operations
MEM09002B	Interpret technical drawing
MEM12003B	Perform precision mechanical measurement
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools

Target Group

Individuals with allied trade qualifications who are employed in CASR Part 145 AMOs and require approval to perform grinding operations on aeronautical product component parts.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on grinding of aeronautical product component parts.

Custom Content Section

Not applicable.

MEASS00212 Precision jig boring of aeronautical product component parts

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 145 and does not relate to an Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B	Complete aviation maintenance industry documentation
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
MEM07005C	Perform general machining
MEM07007C	Perform milling operations
MEM07009B	Perform precision jig boring operations
MEM09002B	Interpret technical drawing
MEM12003B	Perform precision mechanical measurement
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools

Target Group

Individuals with allied trade qualifications who are employed in CASR Part 145 AMOs and require approval to perform precision jig boring of aeronautical product component parts.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on general machining of aeronautical product component parts.

Custom Content Section

Not applicable.

MEASS00154 Complex milling of aeronautical product component parts

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 145 and does not relate to an Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B	Complete aviation maintenance industry documentation
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
MEM07005C	Perform general machining
MEM07007C	Perform milling operations
MEM07011B	Perform complex milling operations
MEM09002B	Interpret technical drawing
MEM12003B	Perform precision mechanical measurement
MEM12023A	Perform engineering measurement
MEM12024A	Perform computations
MEM18001C	Use hand tools

Target Group

Individuals with allied trade qualifications who are employed in CASR Part 145 AMOs and require approval to perform complex milling operations on aeronautical product component parts.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on complex milling of aeronautical product component parts.

Custom Content Section

Not applicable.

MEASS00195 Machine aeronautical product component parts using horizontal and/or vertical boring machines

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 145 and does not relate to an Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B	Complete aviation maintenance industry documentation
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
MEM07005C	Perform general machining
MEM07013B	Perform machining operations using horizontal and/or vertical boring machines
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools

Target Group

Individuals with allied trade qualifications who are employed in CASR Part 145 AMOs and require approval to perform machining of aeronautical product component parts using horizontal and/or vertical boring machines.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on machining of aeronautical product component parts using horizontal and/or vertical boring machines.

Custom Content Section

Not applicable.

MEASS00196 Machine aeronautical product component parts using NC/CNC machines

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 145 and does not relate to an Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B	Complete aviation maintenance industry documentation
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
MEM07015B	Set computer controlled machines/processes
MEM07016C	Set and edit computer controlled machines/processes
MEM07018C	Write basic NC/CNC programs
MEM07022C	Program CNC wire cut machine
MEM07024B	Operate and monitor machine processes
MEM07028B	Operate computer controlled machine processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools

Target Group

Individuals with allied trade qualifications who are employed in CASR Part 145 AMOs and require approval to machine aeronautical product component parts using NC/CNC machines.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on machining of aeronautical product component parts using NC/CNC machines.

Custom Content Section

Not applicable.

MEASS00197 Machine aeronautical product components using NC/CNC machining centres

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 145 and does not relate to an Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B	Complete aviation maintenance industry documentation
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
MEM07015B	Set computer controlled machines/processes
MEM07016C	Set and edit computer controlled machines/processes
MEM07018C	Write basic NC/CNC programs
MEM07019C	Program NC/CNC machine centre
MEM07020C	Program multiple spindle and/or multiple axis NC/CNC machining centre
MEM07024B	Operate and monitor machine processes
MEM07028B	Operate computer controlled machine processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C Use hand tools

Target Group

Individuals with allied trade qualifications who are employed in CASR Part 145 AMOs and require approval to machine aeronautical product component parts using NC/CNC machining centres.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on machining of aeronautical product component parts using NC/CNC machines.

Custom Content Section

Not applicable.

MEASS00198 Machine plastic aeronautical product component parts

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 145 and does not relate to an Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B	Complete aviation maintenance industry documentation
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
MEM07001B	Perform operational maintenance of machines equipment
MEM07024B	Operate and monitor machine processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement
MEM16006A	Organise and communicate information
MEM18001C	Use hand tools

Target Group

Individuals with allied trade qualifications who are employed in CASR Part 145 AMOs and require approval to machine plastic (including composite) aeronautical product component parts.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on machining of plastic (including composite) aeronautical product component parts.

Custom Content Section

Not applicable.

MEASS00077 Aeronautical product component parts - metal spinning lathe operations

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 145 and does not relate to an Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B	Complete aviation maintenance industry documentation
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
MEM07030C	Perform metal spinning lathe operations (basic)
MEM07031C	Perform metal spinning lathe operations (complex)
MEM07032B	Use workshop machines for basic operations
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations

Target Group

Individuals with allied trade qualifications who are employed in CASR Part 145 AMOs and require approval to perform metal spinning lathe operations on aeronautical product component parts.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on metal spinning lathe operations on aeronautical product component parts.

Custom Content Section

Not applicable.

MEASS00086 Aircraft tyre retreading (basic)

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 145 and does not relate to an Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

PMBPROD262B	Operate tyre curing equipment
PMBPROD263B	Operate tyre retread curing equipment
PMBPROD264C	Check recycle wash process
PMBPROD265C	Operate portable vulcanising equipment
PMBPROD266B	Prepare tyre casing for retreading

Target Group

Individuals who are employed in CASR Part 145 AMOs and require approval to prepare tyres for retreading and operate aircraft tyre retreading equipment.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment of individuals in aircraft tyre retreading, including preparation of tyres and operation of retreading equipment.

Custom Content Section

Not applicable.

MEASS00085 Aircraft tyre retreading (advanced)

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 145 and does not relate to an Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108B	Complete aviation maintenance industry documentation
MEA145A	Conversion from allied trades for employment in aviation maintenance workshops
PMBPROD324B	Inspect tyres for retreading
PMBPROD325B	Lay on tyre retreads
PMBPROD326B	Inspect tyres

Target Group

Individuals with applicable trade qualifications who are employed in CASR Part 145 AMOs and require approval to select tyres for retreading, set up retreading equipment and inspect tyres for serviceability following retread.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for employment of trade qualified individuals in aircraft tyre inspection before and after retreading, and in setting up retreading equipment.

Custom Content Section

Not applicable.

MEASS00233 A1 Licence Skill Set if Certificate IV Aeroskills (Mechanical) is held

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 66 requirements for the A1 Licence and does not relate to attainment of an additional Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA119B	Perform administrative processes to prepare for certification of civil aircraft A level line maintenance
MEA240B	Use electrical test equipment to perform basic electrical tests (Not required if elective MEA260B is held)
MEA264A	Remove and install aircraft electrical/avionic components during line maintenance
MEA265A	Remove and install general aircraft electrical hardware (Not required if elective MEA201B is held)
MEA344A	Remove and install aircraft components (Not required if electives MEA301C, MEA302C and either MEA304C or MEA317C are held)
MEA345A	Perform scheduled line maintenance activities on gas turbine engine fixed wing aircraft (Not required if MEA301C plus either the five units MEA309C, MEA310C, MEA312C, MEA314C and MEA339C or MEA401C OR the three units MEA318C, MEA319C and MEA339C or MEA401C are held)
MEA418A	Perform basic repair of aircraft internal fittings during line maintenance

(Not required if any one of MEA311C, MEA339C or MEA363B is held)

Target Group

Individuals with Certificate IV in Aeroskills (Mechanical) seeking the grant of an A1 Licence. Note that requirements may vary according to the elective units taken for the Certificate IV.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for the grant of an A1 Licence to individuals who hold a Certificate IV in Aeroskills (Mechanical).

Custom Content Section

Not applicable.

MEASS00234 A2 Licence Skill Set if Certificate IV in Aeroskills (Mechanical) is held

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 66 requirements for the A2 Licence and does not relate to attainment of an additional Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA119B	Perform administrative processes to prepare for certification of civil aircraft A level line maintenance
MEA240B	Use electrical test equipment to perform basic electrical tests (Not required if elective MEA260B is held)
MEA264A	Remove and install aircraft electrical/avionic components during line maintenance
MEA265A	Remove and install general aircraft electrical hardware (Not required if elective MEA201B is held)
MEA344A	Remove and install aircraft components (Not required if electives MEA301C, MEA302C and either MEA304C or MEA317C are held)
MEA347A	Perform scheduled line maintenance activities on piston engine fixed wing aircraft (Not required if MEA301C, MEA309C, MEA312C, MEA313C and MEA339C or MEA401C are held)
MEA418A	Perform basic repair of aircraft internal fittings during line maintenance (Not required if any one of MEA311C, MEA339C or MEA363B is held)

Target Group

Individuals with Certificate IV in Aeroskills (Mechanical) seeking the grant of an A2 Licence. Note that requirements may vary according to the elective units taken for the Certificate IV.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for the grant of an A2 Licence to individuals who hold a Certificate IV in Aeroskills (Mechanical).

Custom Content Section

Not applicable.

MEASS00235 A3 Licence Skill Set if Certificate IV in Aeroskills (Mechanical) is held

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 66 requirements for the A3 Licence and does not relate to attainment of an additional Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA119B	Perform administrative processes to prepare for certification of civil aircraft A level line maintenance
MEA240B	Use electrical test equipment to perform basic electrical tests (Not required if elective MEA260B is held)
MEA264A	Remove and install aircraft electrical/avionic components during line maintenance
MEA265A	Remove and install general aircraft electrical hardware (Not required if elective MEA201B is held)
MEA344A	Remove and install aircraft components (Not required if electives MEA301C, MEA302C, MEA308C and either MEA304C or MEA317C are held)
MEA346A	Perform scheduled line maintenance activities on gas turbine engine rotary wing aircraft (Not required if MEA301C, MEA309C, MEA310C, MEA314C or MEA319C, MEA316C and MEA339C or MEA401C are held)
MEA418A	Perform basic repair of aircraft internal fittings during line maintenance (Not required if any of MEA311C, MEA339C or MEA363B are held)

Target Group

Individuals with Certificate IV in Aeroskills (Mechanical) seeking the grant of an A3 Licence. Note that requirements may vary according to the elective units taken for the Certificate IV.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for the grant of an A3 Licence to individuals who hold a Certificate IV in Aeroskills (Mechanical).

Custom Content Section

Not applicable.

MEASS00236 A4 Licence Skill Set if Certificate IV in Aeroskills (Mechanical) is held

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 66 requirements for the A4 Licence and does not relate to attainment of an additional Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA119B	Perform administrative processes to prepare for certification of civil aircraft A level line maintenance
MEA240B	Use electrical test equipment to perform basic electrical tests (Not required if elective MEA260B is held)
MEA264A	Remove and install aircraft electrical/avionic components during line maintenance
MEA265A	Remove and install general aircraft electrical hardware (Not required if elective MEA201B is held)
MEA344A	Remove and install aircraft components (Not required if electives MEA301C, MEA302C, MEA308C and either MEA304C or MEA317C are held)
MEA348A	Perform scheduled line maintenance activities on piston engine rotary wing aircraft (Not required if MEA301C, MEA309C, MEA313C, MEA316C and MEA339C or MEA401C are held)
MEA418A	Perform basic repair of aircraft internal fittings during line maintenance (Not required if any one of MEA311C, MEA339C or MEA363B is held)

Target Group

Individuals with Certificate IV in Aeroskills (Mechanical) seeking the grant of an A4 Licence. Note that requirements may vary according to the elective units taken for the Certificate IV.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for the grant of an A4 licence to individuals who hold a Certificate IV in Aeroskills (Mechanical).

Custom Content Section

Not applicable.

MEASS00237 A1 Licence Skill Set if Certificate IV in Aeroskills (Avionics) is held

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 66 requirements for the A1 Licence and does not relate to attainment of an additional Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA119B	Perform administrative processes to prepare for certification of civil aircraft A level line maintenance
MEA264A	Remove and install aircraft electrical/avionic components during line maintenance (Not required if MEA203C and MEA207C are held)
MEA344A	Remove and install aircraft components
MEA345A	Perform scheduled line maintenance activities on gas turbine engine fixed wing aircraft
MEA418A	Perform basic repair of aircraft internal fittings during line maintenance

Target Group

Individuals with Certificate IV in Aeroskills (Avionics) seeking the grant of an A1 Licence. Note that requirements may vary according to the elective units taken for the Certificate IV.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for the grant of an A1 Licence to individuals who hold a Certificate IV in Aeroskills (Avionics).

Custom Content Section

Not applicable.

MEASS00238 A2 Licence Skill Set if Certificate IV in Aeroskills (Avionics) is held

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 66 requirements for the A2 Licence and does not relate to attainment of an additional Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA119B	Perform administrative processes to prepare for certification of civil aircraft A level line maintenance
MEA264A	Remove and install aircraft electrical/avionic components during line maintenance (Not required if MEA203C and MEA207C are held)
MEA344A	Remove and install aircraft components
MEA347A	Perform scheduled line maintenance activities on piston engine fixed wing aircraft
MEA418A	Perform basic repair of aircraft internal fittings during line maintenance

Target Group

Individuals with Certificate IV in Aeroskills (Avionics) seeking the grant of an A2 Licence. Note that requirements vary according to the elective units taken for the Certificate IV.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for the grant of an A2 Licence to individuals who hold a Certificate IV in Aeroskills (Avionics).

Custom Content Section

Not applicable.

MEASS00239 A3 Licence Skill Set if Certificate IV in Aeroskills (Avionics) is held

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 66 requirements for the A3 Licence and does not relate to attainment of an additional Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA119B	Perform administrative processes to prepare for certification of civil aircraft A level line maintenance
MEA264A	Remove and install aircraft electrical/avionic components during line maintenance (Not required if MEA203C and MEA207C are held)
MEA344A	Remove and install aircraft components
MEA346A	Perform scheduled line maintenance activities on gas turbine engine rotary wing aircraft
MEA418A	Perform basic repair of aircraft internal fittings during line maintenance

Target Group

Individuals with Certificate IV in Aeroskills (Avionics) seeking the grant of an A3 Licence. Note that requirements may vary according to the elective units taken for the Certificate IV.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for the grant of an A3 Licence to individuals who hold a Certificate IV in Aeroskills (Avionics).

Custom Content Section

Not applicable.

MEASS00240 A4 Licence Skill Set if Certificate IV in Aeroskills (Avionics) is held

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 66 requirements for the A4 Licence and does not relate to attainment of an additional Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA119B	Perform administrative processes to prepare for certification of civil aircraft A level line maintenance
MEA264A	Remove and install aircraft electrical/avionic components during line maintenance (Not required if MEA203C and MEA207C are held)
MEA344A	Remove and install aircraft components
MEA348A	Perform scheduled line maintenance activities on piston engine rotary wing aircraft
MEA418A	Perform basic repair of aircraft internal fittings during line maintenance

Target Group

Individuals with Certificate IV in Aeroskills (Avionics) seeking the grant of an A4 Licence. Note that requirements may vary according to the elective units taken for the Certificate IV.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for the grant of an A4 Licence to individuals who hold a Certificate IV in Aeroskills (Avionics).

Custom Content Section

Not applicable.

MEASS00241 A1 Licence Skill Set if a B2 Licence is held

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 66 requirements for the A1 Licence and does not relate to attainment of an additional Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA344A	Remove and install aircraft components
MEA345A	Perform scheduled line maintenance activities on gas turbine engine fixed wing aircraft
MEA418A	Perform basic repair of aircraft internal fittings during line maintenance

Target Group

Individuals with a B2 Licence seeking the grant of an A1 Licence.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for the grant of an A1 Licence to individuals who hold a B2 Licence.

Custom Content Section

Not applicable.

MEASS00242 A2 Licence Skill Set if a B2 Licence is held

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 66 requirements for the A2 Licence and does not relate to attainment of an additional Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA344A	Remove and install aircraft components
MEA347A	Perform scheduled line maintenance activities on piston engine fixed wing aircraft
MEA418A	Perform basic repair of aircraft internal fittings during line maintenance

Target Group

Individuals with a B2 Licence seeking the grant of an A2 Licence.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for the grant of an A2 Licence to individuals who hold a B2 Licence.

Custom Content Section

Not applicable.

MEASS00243 A3 Licence Skill Set if a B2 Licence is held

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 66 requirements for the A3 Licence and does not relate to attainment of an additional Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA344A	Remove and install aircraft components
MEA346A	Perform scheduled line maintenance activities on gas turbine engine rotary wing aircraft
MEA418A	Perform basic repair of aircraft internal fittings during line maintenance

Target Group

Individuals with a B2 Licence seeking the grant of an A3 Licence.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for the grant of an A3 Licence to individuals who hold a B2 Licence.

Custom Content Section

Not applicable.

MEASS00244 A4 Licence Skill Set if a B2 Licence is held

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 66 requirements for the A4 Licence and does not relate to attainment of an additional Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA344A	Remove and install aircraft components
MEA348A	Perform scheduled line maintenance activities on piston engine rotary wing aircraft
MEA418A	Perform basic repair of aircraft internal fittings during line maintenance

Target Group

Individuals with a B2 Licence seeking the grant of an A4 Licence.

Suggested words for Statement of Attainment

These competencies from the MEA11 Aeroskills Training Package meet the requirements for the grant of an A4 Licence to individuals who hold a B2 Licence.

Custom Content Section

Not applicable.

MEA101B Interpret occupational health and safety practices in aviation maintenance

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency covers the competencies required to comply with occupational health and safety (OHS) regulations and work safely in aircraft maintenance areas and incorporates the requirements of NOHSC:7025(1998) Generic Competency A. Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer licence under CASR Part 66, in accordance with the licensing provisions in the Assessment Guidelines.

Application of the Unit

This unit requires application of OHS practices relevant to aviation maintenance workplaces in order to ensure own safety and that of others in the workplace.

Applications include the performance of maintenance activities on fixed or rotary wing aircraft on the flight line or tarmac, in the hanger, including during functional testing of systems and in the workshop environment.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Interpret safe work practices	1.1. ***Relevant regulatory and enterprise policies and procedures*** that identify the ***requirements for conduct of safe work*** are interpreted and understood 1.2. Workplace housekeeping measures are identified in accordance with standard enterprise procedures 1.3. Use of ***personal protective equipment*** and clothing is identified and understood and maintenance measures are interpreted and understood according to regulatory and enterprise procedures 1.4. Safety signs and symbols are interpreted and understood, and their directions observed in accordance with enterprise and safety requirements
2. Interpret reporting procedures for workplace hazards	2.1. Workplace hazards are correctly identified and reporting procedures interpreted and understood according to standard enterprise procedures
3. Interpret emergency procedures	3.1. Method of contacting the appropriate personnel and emergency services in the event of an accident is appropriate to enterprise requirements 3.2. Emergency and evacuation procedures are interpreted and understood to ensure safe conduct of personnel according to enterprise procedures 3.3. Use of emergency equipment is correctly identified to comply with regulatory or enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- correctly interpreting OHS regulations, instructions and procedures relevant to the range of applications listed in the Range Statement

- recognising and adhering to aerospace industry signage, including aircraft systems plumbing markings
- recognising and reporting to designated personnel hazardous situations in the workplace
- risk assessment and control
- selecting appropriate protective clothing for the maintenance activity being undertaken
- correct interpretation of enterprise and regulatory emergency procedures
- correct identification and operation of enterprise/industry specific workplace emergency equipment
- application of first aid procedures, such as DRABC

Required knowledge

Look for evidence that confirms knowledge of:

- the applicable sources of OHS requirements and procedures and their application in workplace situations as listed in the Range Statement
- how to recognise and report hazardous situations in the workplace
- methods of risk assessment and control
- the preferred order of ways to control risks (known as the hierarchy of control)
- work operations to control risks, e.g. permit to work systems, such as confined space entry and isolation procedures
- how to determine requirements for personal protective equipment associated with maintenance activities
- the correct selection and use of workplace emergency equipment
- action to be taken in emergency situations
- first aid procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to correctly interpret and apply all relevant OHS procedures and standard processes in the aviation maintenance environment.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	This unit must be related in its assessment and application to all other units. The relationship between general workplace OHS requirements, as included in enterprise procedures, and the relevant federal and/or

	state and territory legislation must be clearly linked. Evidence of knowledge and skills associated with the application of OHS standards is required to supplement evidence of ability to interpret and apply specific safe practices in the workplace. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency under routine supervision on at least one item against each Group 1 to 10 (Groups 11 and 12 must also be included if applicable to the enterprise) as listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry. The relationship between general workplace OHS requirements, as included in enterprise procedures, and the relevant federal and/or state and territory legislation must be clearly linked.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. Should a demonstration of skill application be necessary, the candidate must have access to all necessary tools, equipment, materials and relevant documentation. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate,

accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Requirements for conduct of safe work	The requirements for conduct of safe work may cover: 1. Applying general duty of care under OHS legislation and common law 2. Fluid and gas high and low pressure systems, including fluid handling (for example, hydraulic fluids, lubricants, compressed air, nitrogen and oxygen) 3. Fuelling/defuelling and working on fuel systems, including confined space entry 4. Using and handling chemicals, including solvents, battery acids 5. Electrical systems, outlets and leads 6. Noise hazard areas and aircraft safety zones 7. Aircraft handling, towing, jacking, ground equipment operation and signage 8. Personal protection 9. First aid 10. Housekeeping and cleaning, waste disposal and FOD prevention practices and procedures 11. Aircraft strobe lighting 12. Ionising, non-ionising radiation equipment
Application	Application of this unit of competency relates to all aviation maintenance workplace environments
Relevant regulatory and enterprise policies and procedures	Relevant regulatory and enterprise policies and procedures may be found in: • Commonwealth, State and Territory OHS Acts, regulations and codes of practice, including regulations and codes of practice relating to hazards present in the workplace or industry • organisational safety manuals that specify provisions relating to roles and responsibilities of health and safety representatives and/or OHS committees and provisions relating to OHS issue resolution • maintenance organisation manual • procedures manuals

	• work instructions • relevant Defence Instructions • Civil Aviation Safety Regulations
Personal protective equipment and clothing requirements	Personal protective equipment and clothing requirements may be found in: • MSDS • safety manual • procedures manual • maintenance manual • work instructions • relevant defence instructions
Workplace hazards	Workplace hazards are correctly identified through: • checking equipment or the work area before work commences and during work • workplace inspections • housekeeping

Unit Sector(s)

Aviation maintenance

Competency field

Not applicable

Co-requisite units

Not applicable

MEA103B Plan and organise aviation maintenance work activities

Modification History

Minor formatting and editorial changes made. Prerequisite unit version updated.

Unit Descriptor

This unit of competency is applicable to all Aeroskills maintenance training pathways. It covers the competencies required for planning and organising individual and group work activities. Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in the Assessment Guidelines.

Application of the Unit

This unit requires application of work planning and organising principles that are applied within the framework of defined single or multiple aviation maintenance tasks that involve more than one individual.

Applications include flight line/tarmac, hangar and workshop maintenance tasks.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA105C	Apply quality standards applicable to aviation maintenance practices
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Identify task requirements	1.1. Task requirements are determined or confirmed, and clarified to ensure correct interpretation of specifications or requirements
2. Plan steps to complete task	2.1. Task is interpreted and relevant steps are identified to ensure efficient conduct of work to meet specifications in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices
	2.2. Steps are planned in conjunction with the work of other personnel to allow achievement of practical outcomes, in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices
	2.3. Human factors are allowed for in planning of steps
3. Organise work	3.1. Work activity is organised with other involved personnel, allowing for relevant human factors and using relevant communication processes to ensure safe and appropriate sequencing of tasks
	3.2. All necessary documentation related to job planning and progress is completed, and recorded in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- the interpretation of information relating to the work activity from a range of industry manuals, industry and enterprise regulations and industry documentation
- consideration of OHS regulations/precautions specific to the work activity and others working in the vicinity of the planned work activity, particularly with regard to electricity, gases (especially oxygen), oils and chemicals
- the use of MSDS
- the application of human factors in planning maintenance activities

Required knowledge

Look for evidence that confirms knowledge of:

- the impact of human factors on the safe and effective performance of maintenance on aircraft and aircraft components
- MSDS
- the types of servicings performed on aircraft, i.e. scheduled and unscheduled maintenance activities, and their impact on planning aviation work activity
- aircraft reference numbering systems as an aid to organising effective work activity in terms of related tasks and inspection/servicing zones

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able plan and organise work activities involving more than one person in the case of single and multiple tasks while allowing for human factors and observing all relevant OHS procedures.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The relationship between broader planning and organising requirements and service specific procedures must be clearly linked. Evidence of underlying knowledge and skills associated with the general application of planning and organising while allowing for relevant human factors and OHS requirements is required to supplement evidence of ability to integrate these processes in conjunction with other personnel in the workplace. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace

	assessor that the relevant elements of the Unit of Competency are being achieved under routine supervision on single and multiple tasks involving more than one person. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent industry .
Context of and specific resources for assessment	Competency should be assessed in the work environment, or by use of simulated activities, covering planning and organising situations applicable in the aircraft maintenance environment. This unit must be related in its assessment and application to all other units, particularly those that apply to the actual maintenance of aircraft.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • team-related activities • single or multiple tasks

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA105C Apply quality standards applicable to aviation maintenance processes

Modification History

Additional knowledge requirements regarding inspection - units are equivalent.

Unit Descriptor

This unit of competency is applicable to all Aeroskills Maintenance training pathways. It covers the competencies required to correctly apply quality standards applicable to the maintenance of aircraft and aircraft components, either individually, or as a member of a team. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in the Assessment Guidelines.

Application of the Unit

This unit requires application of quality standards in the performance of aviation maintenance activities.

Applications include flight line/tarmac, hangar and workshop maintenance tasks.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B Interpret occupational health and safety practices in aviation maintenance

MEA107B Interpret and use aviation maintenance industry manuals and specifications

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Interpret quality standards	1.1 Standards or specifications set out in maintenance documents and process specifications are identified and interpreted
	1.2 Enterprise quality requirements are identified and confirmed
2 Apply quality standards	2.1 Standards are applied appropriately for individual and team-related activities
	2.2 Defects within the quality system are detected and reported in accordance with standard procedures
	2.3 Documentation is handled and completed accurately and clearly to enable information to be easily read or interpreted
3 Interpret quality improvement	3.1 Performance monitoring measures are identified to ensure product or service standards are maintained or improved

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- typical quality systems and their operation in the workplace
- workplace quality documentation such as quality manuals, procedures manuals, work instructions and worksheets
- the relationship between the quality system and OHS requirements, such as workplace hazard reporting
- the relationship between the quality system and identification systems for aircraft hardware, materials and components
- the role of inspection in maintaining aircraft continuing airworthiness and reliability, including ageing aircraft inspection requirements
- how inspection programs are derived and developed
- individual and organisational responsibility associated with ‘on condition’ maintenance

- inspection terminology and standards of inspection with regard to the quality system
- identifying potential areas for inspection process improvement as a quality system activity

Look for evidence that confirms skills in:

- the application of workplace hazard reporting and identification procedures
- interpretation and application of information from a range of industry manuals, in particular, amendment status block information, amendment procedures, specification/modification leaflet applicability and changes to drawings
- the correct identification of aircraft hardware, materials and components by marking, part number, size and shape
- being able to differentiate the elements which constitute the system and able to identify processes, workplace regulations and ISO 9000 compliant documentation and specifications within the workplace environment

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to interpret and apply quality systems in the workplace and interface quality requirement with OHS procedures and identification systems for aircraft hardware, materials and components.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The relationship between broader quality standards requirements and service specific procedures must be clearly linked. It is essential that actual and potential defects within the quality system are considered, together with ongoing abnormalities of equipment or systems as they affect the quality system. Evidence of underlying knowledge and skills associated with the general application of quality standards is required to supplement evidence of ability to integrate these processes in conjunction with other personnel in the workplace. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision in both single and multiple tasks involving more than one person. This shall be established via the records in the Log of Industrial Experience and Achievement or, where

	appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, or by use of simulated activities, covering the application of quality standards in situations within the aircraft maintenance environment. This unit must be related in its assessment and application to all other units.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • team-related activities • single or multiple tasks

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA107B Interpret and use aviation maintenance industry manuals and specifications

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is applicable to all Aeroskills training pathways. It covers the competencies required to use and correctly interpret industry manuals, specifications and drawings used in the maintenance and manufacture of aircraft and aircraft components. Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in the Assessment Guidelines.

Application of the Unit

This unit requires application of the information contained in industry manuals and specifications in the performance of aviation maintenance activities.

Applications include on-aircraft and workshop-related activities.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Identify and access industry manuals, specifications and drawings	1.1. ***Appropriate manuals*** are identified and accessed for the type of aircraft or component to be maintained 1.2. Amendment status is clearly established to ensure the correct specifications and procedures are applied
2. Interpret information	2.1. Relevant chapter or section of manual or drawing is located in relation to the work to be carried out 2.2. Information is interpreted and procedures to be followed are accurately determined
3. Apply information	3.1. Work steps are correctly identified in accordance with manual or specification procedures 3.2. All correct sequencing and adjustments are interpreted in accordance with information contained in industry manuals or specifications
4. Amend manuals, specifications or drawings	4.1. Manual, specification or drawing changes and/or amendments are incorporated and documented correctly in accordance with ***statutory regulations and/or enterprise procedures***
5. Store manuals, specifications or drawings	5.1. Manuals, specifications or drawings are stored appropriately to ensure prevention of damage, ready access and updating of information, when required, in accordance with regulatory and/or enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- accessing and interpreting information from industry manuals, including paper-based, microfiche or computer-based media, relating to work activities, including determination of manual amendment status, knowledge of manual

structures and locating relevant information/instructions for work activity
- amending industry manuals to reflect current/approved amendment status
- identifying and interpreting information from drawings and diagrams in aircraft maintenance manuals, including component scaling, section, assembly, location, drawing applicability and amendment status from the title block
- correct handling and storage of drawings, manuals and industry media, i.e. microfiche and digital formats
- calculating allowable dimension variations on a component from information in drawing title blocks and drawings
- calculating dimensions from drawings for the purpose of manufacturing aircraft components and hardware

Required knowledge

Look for evidence that confirms knowledge of:

- the types of industry manuals used in aviation maintenance and types of media
- requirements for custody and upkeep of industry manuals
- techniques for obtaining and applying data contained in industry manuals

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to correctly interpret the information in industry manuals and specifications and apply that information during the performance of aviation maintenance tasks.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The transferability of general manual interpretation and use in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices must be clearly established. Evidence of underlying knowledge and skills associated with the interpretation and use of manuals is required to supplement understanding of the structure and regulatory requirements associated with the aircraft maintenance environment in this area. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the Unit of Competency are being achieved under routine supervision on at least one manual from each of Groups

	1, 2 and 3 listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry .
Context of and specific resources for assessment	Competency should be assessed in the work environment, or by use of simulated activities, covering the interpretation and use of Enterprise Aviation manuals, aircraft publications, process sheets, specifications and drawings applicable to the aircraft maintenance environment. This unit must be linked in its assessment and application to those that apply to the actual maintenance of aircraft.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	The Range Statements below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Types of manual	Appropriate manuals may include: 1. Aircraft publications, maintenance instruction manuals, process specifications, servicing or service bulletins or structural repair manuals 2. Tooling or equipment manuals, manufacturer's manuals, standard practices, enterprise aviation regulations and publications 3. Illustrated parts catalogues, aircraft wiring manuals or drawings
Statutory regulations and/or enterprise procedures	Statutory regulations and/or enterprise procedures may include: • civil aviation regulations or civil aviation safety

	regulations • applicable defence regulations and instructions • maintenance organisation manual • standing instructions
Application	Application of this unit may relate to both on-aircraft and workshop-related activities in the aircraft maintenance environment

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA108B Complete aviation maintenance industry documentation

Modification History

Release 3 - Typographical error corrected in Required Skills - equivalent

Release 2 - Minor formatting and editorial changes made. Prerequisite unit version updated.

Unit Descriptor

This unit of competency is applicable to all Aeroskills training pathways. It covers the competencies required to correctly interpret, use and complete documentation associated with aircraft and aircraft component maintenance and manufacture. Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in the Assessment Guidelines.

Application of the Unit

This unit requires application of skills and knowledge relating to the requirements for the completion and processing of documentation during, and on completion of, aviation maintenance activities.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA105C	Apply quality standards applicable to aviation maintenance processes

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Interpret documentation	1.1. ***Documentation*** requirements are determined and accessed, where necessary, from relevant sources in accordance with regulatory and enterprise procedures
	1.2. Information contained in existing documentation is interpreted correctly and, where necessary, requirements carried out in accordance with ***regulatory and enterprise procedures***
2. Complete documentation	2.1. Information requirements for new documentation or updating of existing documentation are determined to allow for accurate completion of records
	2.2. Documentation is completed accurately and clearly to enable information to be easily read or interpreted
3. Store and distribute documentation	3.1. All procedures for storing and distributing documentation are followed to ensure ready access when required in accordance with regulatory and enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- identification and accurate completion of industry documentation associated with aircraft/aircraft component maintenance, repair, overhaul and modification activities, industry regulatory reports and OHS hazard reporting formats
- handling industry documentation appropriately to ensure that records are accurately processed, forwarded and/or stored as required by industry and enterprise regulations

Required knowledge

Look for evidence that confirms knowledge of:

- maintenance practice terminology and the associated relationship with industry documentation, i.e. scheduled and unscheduled servicing, aircraft/component lifing, i.e. on condition, life expired, throwaway, repair and overhaul

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to correctly complete and process maintenance documentation applicable to maintenance tasks that are being performed.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that information generated in the process of completing paperwork is in a form which is acceptable to the workplace environment and regulatory requirements in accordance with the relevant aircraft publications/maintenance regulations/orders and standards and practices. Evidence of underlying knowledge and skills associated with the interpretation and completion of paperwork is required to supplement evidence of appropriate levels of literacy and numeracy, associated with presenting clear and concise information. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one type of documentation from each of Groups 1 and 2 from the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry .
Context of and specific resources for assessment	Competency should be assessed in the work environment, or by use of simulated activities, covering the interpretation, use and completion of aircraft maintenance documentation in the maintenance environment in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices. This unit must be linked in its assessment and application

	to those that apply to the actual maintenance of aircraft.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Documentation	Documentation may include: 1. Maintenance logs, overhaul test/check sheets, job history sheets, traveller cards, maintenance reports, irregularity reports, serviceable tags or removal tags 2. MSDS or material record sheets
Regulatory and enterprise procedures	Regulatory and enterprise procedures may be found in: • CARs or CASRs • maintenance organisation manual • procedures manual • work instructions • quality manual • safety manual • applicable defence regulations and instructions • standing instructions
Application	Application of this unit may relate to on-aircraft and workshop-related activities in the aircraft maintenance environment

Unit Sector(s)

Aviation maintenance

Competency field

Not applicable.

Co-requisite units

Not applicable

MEA109B Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Modification History

Minot formatting and editorial changes made. Prerequisite unit version updated.

Unit Descriptor

This unit of competency is applicable to all Aeroskills Maintenance training pathways. It covers the competencies required to perform basic hand skills, apply standard trade practices and fundamentals relevant to the maintenance of aircraft and aircraft components. Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in the Assessment Guidelines.

Application of the Unit

This unit requires application of basic hand skills and standard trade practices in the maintenance of aircraft and aircraft components.

Applications include the use of hand and power tools, and the selection and use of aircraft hardware.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA108B	Complete aviation maintenance industry documentation

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Assess task requirements	1.1. Available information from relevant documentation and/or other sources, including communication with other personnel, is interpreted and assessed to determine the task and tooling requirements
2. Select tools and/or equipment	2.1. Hand and/or power tools or equipment are selected for appropriate application to the required task 2.2. All tools and/or equipment to be used are checked for condition or calibration, where necessary 2.3. Unsafe or faulty tools or equipment are identified and marked for repair according to enterprise procedures
3. Use tools and/or equipment	3.1. Tools and/or equipment are used according to standard practices to ensure the correct outcome is produced 3.2. Tools and/or equipment use is carried out without damage to components or tooling in a safe and efficient manner 3.3. Operational maintenance of tools or equipment is undertaken according to standard workshop procedures
4. Store tools and/ or equipment	4.1. Tools and/or equipment are stored safely and securely in accordance with enterprise procedures
5. Apply standard trade practices	5.1. Simple items are manufactured using basic engineering hand skills 5.2. Common types of aircraft attachment hardware are correctly selected and used 5.3. Common types of safety locking devices and fasteners are correctly selected and used 5.4. Aircraft components, devices and hardware are lockwired in the

correct manner, using the appropriate wire gauge

5.5. Common types of aircraft connectors and plumbing are accurately assembled or connected

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- the correct identification, inspection of, application, use and storage of general and purpose specific hand tools (i.e. spanners, screwdrivers, pliers, hammers, cutting devices, files, punches, drills and marking out tools) that may be found in an aircraft engineering workshop or hangar
- the correct identification, inspection of (including calibration), application, use and storage of precision measuring tools (i.e. micrometers, vernier instruments, feeler gauges, go/no-go gauges) that may be found in an aircraft engineering workshop or hangar. Reading instrument scales must be clearly demonstrated during application of instruments to ensure compliance with specifications
- the correct identification, inspection of, application, operation and storage/servicing of portable and fixed power and machine tools (i.e. drills, presses, grinders, shears, pan breaks) that may be found in an aircraft engineering workshop or hangar
- identification, inspection and use of lubrication equipment
- determination of correct lubricants for specified applications
- identification of common ferrous and non-ferrous aircraft materials
- identification of common aircraft composite and non-metallic materials (other than wood)
- identification of aircraft hardware by markings, part numbers, size, shape and material
- the installation of aircraft hardware using standard practices/techniques to ensure safe security and includes:
  - minimum thread engagement
  - split pinning
  - lockwiring
  - application of locking compounds
  - locking tabs, spring washers
  - lock nuts
- the installation of aircraft hardware using tightening, torquing and tensioning techniques. Calculating setting, reading scales and setting up of torque wrench and/or tensioning devices must be clearly demonstrated before application of wrench or device
- identification of various types of aircraft rigid and flexible plumbing and their

connectors
- identification of aircraft control cables and related cable system hardware

Required knowledge

Look for evidence that confirms knowledge of:

- types of standard aircraft hardware and methods of identification, including bolts, nuts, washers, pins (cotter, tapered), and fasteners (rivets and camlocs)
- materials from which hardware is manufactured and its applications, including plain, corrosion resistant and temperature/heat resistant
- types of safety locking devices and their application
- common ferrous and non-ferrous aircraft materials, heat treatment and testing
- characteristics and properties of common composite and non-metallic materials other than wood
- types of aircraft cable, turnbuckles, end fittings, tensiometers, pulleys and cable system components, aircraft flexible control systems
- types and characteristics of lubricants
- types and uses of lubrication equipment
- fits and clearances
- hand and power tool storage and maintenance requirements
- tool calibration requirements
- OHS requirements relation to the use of hand and power tools

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to use aviation maintenance hand and power tools to lay out and fabricate simple items, correctly assemble items and apply safety locking devices.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	This unit must be linked in its assessment and application to those units that apply to actual maintenance of aircraft. It is essential that all OHS requirements are met and understood. Evidence of knowledge about how tools and equipment are selected, used and maintained is essential. The ability to manipulate tools and equipment correctly in the performance of tasks is necessary to demonstrate transferability of hand skills across a variety of

	applications. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on the tasks listed in Groups 1 to 4 in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry.
Context of and specific resources for assessment	Competency should be assessed in the work environment, or by use of simulated activities, using tools and equipment specified by aircraft manuals as well as general purpose tools and test equipment found in most routine situations. It is expected that the person operating these tools and equipment would be able to demonstrate a broad application of their skills.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Application of competency	The competency applies to the selection and use of hand and power tools and equipment associated with on-aircraft or workshop related activities in the aircraft maintenance environment that involve: 1. Laying out and fabricating simple items from common aircraft materials 2. Assembling items using a representative range of common types of aircraft attachment hardware for which relevant fits and clearances, appropriate safety locking

	devices and fasteners, including lockwire, are correctly selected and applied 3. Assembling/connecting a range of common aircraft connectors and plumbing, applying safety locking devices, where applicable 4. Assembling/connecting aircraft control cables and applying safety locking devices, where applicable
The use of tools and equipment	The use of tools and equipment includes the related manipulative skills required to perform maintenance
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA111C Perform administrative processes to prepare for certification of civil aircraft maintenance

Modification History

Revised references to CASRs - equivalent to previous unit.

Unit Descriptor

This is one of the units of competency that must be attained to progress from Aircraft Maintenance Engineer to the grant of a maintenance certification licence under CASR Part 66, in accordance with the licensing provisions in the Assessment Guidelines. It covers the competencies required to correctly interpret and apply CASA airworthiness and certification requirements during aircraft maintenance.

The skills and knowledge covered by the units of competency at Certificate IV level listed in the MEA11 Aeroskills Training Package for the qualification leading to the applicable maintenance certification licence sought are prerequisite to the attainment of the elements of competency specified in this unit. This includes full coverage of the CASR Part 66 Avionics or Mechanical Syllabus subjects/topics listed in the Assessment Guidelines (Appendix 1).

Application of the Unit

This unit requires application of legislative and regulatory requirements relating to the certification of aviation maintenance.

Applications include all maintenance tasks that require certification by a Licensed Aircraft Maintenance Engineer.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Determine the registration status of an aircraft	1.1 Registration status is determined in accordance with CASR Part 47
	1.2 The person responsible for airworthiness and maintenance control is identified
2 Determine eligibility to certify the completion of aircraft maintenance activities	2.1 Eligibility to certify in terms of licence privileges is established in accordance with CASR Parts 42, 145 and 66
	2.2 Eligibility to certify in terms of the AMO Class/Rating is established in accordance with CASR Part 145 and Part 42 Sub-Part F
3 Prepare for return of aircraft to service	3.1 Completion of all scheduled and unscheduled maintenance activities is coordinated in accordance with CASR Parts 42 145, 66 and the approved maintenance program
	3.2 The requirement for a maintenance test flight is determined
	3.3 Documentation is prepared for return of aircraft to service in accordance with CASR Part 42 and/or 145 and the approved maintenance program
4 Compile and process maintenance documentation and reports	4.1 Maintenance documentation is raised and compiled for certification
	4.2 Configuration management procedures are applied
	4.3 Maintenance-related reports are compiled and processed
	4.4 Technical communication activities, both oral and written, are performed

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- Airworthiness Directive requirements under CASR 39
- Maintainers' Responsibilities under CASR Parts 42, 66 and 145
- Aircraft Registration and Markings under CASR 45– 47
- Aviation Maintenance Personnel Licensing Requirements under CASR 66
- Continuing Airworthiness Requirements under CASR Part 42.
- Maintenance Organisations Requirements under CASR 42 Sub-Part F and 145
- Design Organisations under CASR Part 21 Sub-Part J
- Maintenance Training Organisations under CASR 147
- Requirements associated with refuelling, taxying, use of radios and engine running

Look for evidence that confirms skills in:

- describing and applying the requirements applicable to the privileges of their authority
- application of Airworthiness Directive Requirements under CASR 39
- application of Maintainers' Responsibilities under CASR Parts 42, 66 and 145
- compliance with CASR 45 Sub-Part D
- application of Aviation Maintenance Personnel Licensing Requirements under CASR 66
- application of requirements related to conduct and issue of maintenance certifications and Certificates of Release to Service for the aircraft or aeronautical product under CASR 42, 66 and 145
- refuelling, taxying, use of radios and engine running
- demonstrating a familiarity with requirements related to the tasks and functions they may perform
- demonstration of literacy and oral expression skills required for clear written and oral communication
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Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply, without error, legislative and regulatory requirements relating to the certification of aviation maintenance.
Critical aspects for assessment and	It is essential that airworthiness compliance requirements

evidence required to demonstrate competency in this unit	are interpreted and fully applied without error. Evidence is required of underlying knowledge and skills associated with the application of airworthiness legislation and compliance requirements, along with evidence of appropriate levels of literacy and oral expression associated with presenting clear and concise information. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under supervision without intervention on a range of tasks fully representative of Groups 1 to 18 in the Range Statement. The body of evidence for this unit may be collected and logged during simulated activities at the CASR Part 147 MTO and/or performance during supervised workplace activities, such as PCT assessments. Knowledge must also be demonstrated of the concept of airworthiness that underpins the legislative framework and compliance requirements.
Context of and specific resources for assessment	Competency should be assessed in the work environment under supervision but without intervention for the purpose of Journal entries, and/or by use of simulated activities in a CASR Part 147 MTO, covering the interpretation and application of airworthiness control and certification requirements.
Method of assessment	This unit must be linked in its assessment and application to those that apply to the exercise of Aircraft Maintenance Engineer Licence or Aviation Maintenance Specialist privileges in the actual maintenance of aircraft.
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Application	The competency applies to the certification of aircraft maintenance activities, including: 1. Scheduled maintenance 2. Unscheduled maintenance 3. Configuration changes 4. Modification incorporation 5. Repairs In performing Tasks 1 to 5, knowledge is to be applied with regard to airworthiness regulatory systems and Australian legislation, and the application of compliance requirements in the performance, recording and certification of maintenance activities, as follows: 6. International and national regulatory bodies and recognition agreements, including bilateral agreements 7. Australian airworthiness regulatory bodies and the legislative framework 8. The basis of airworthiness certification and determination of non-conformity 9. Procedures for release of aircraft to service following maintenance, including the determination of the requirement for a maintenance test flight 10. Procedures for certification of scheduled and unscheduled maintenance activities 11. Procedures for certification of the incorporation of modifications 12. Procedures for certifying the completion of repairs 13. Determining and applying configuration management procedures, including the weighing of aircraft and the determination of the centre of gravity 14. Compiling and processing service difficulty reports 15. Compiling and processing technical investigation reports 16. Compiling and processing condition reports 17. Orally communicating on technical and airworthiness

	compliance topics 18. Communicating in writing on technical and airworthiness compliance issues

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA112B Plan and implement civil aircraft maintenance activities

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This is one of the units of competency that must be attained to progress from Aircraft Maintenance Engineer to the grant of an Aircraft Maintenance Engineer Licence or Aviation Maintenance Specialist Certificate under CASR Part 66, in accordance with the licensing provisions in the Assessment Guidelines. It covers the competencies required to plan and implement aircraft maintenance activities.

The skills and knowledge covered by the units of competency at Certificate IV level listed in the MEA11 Aeroskills Training Package for the qualification leading to the applicable Aircraft Maintenance Engineer Licence sought are prerequisite to the attainment of the elements of competency specified in this unit. This includes full coverage of the CASR Part 66 Avionics or Mechanical Syllabus subjects/topics listed in the Assessment Guidelines.

Application of the Unit

This unit requires application of maintenance planning and management skills to plan, implement, evaluate and report on aviation maintenance activities while complying with all legislative and regulatory requirements.

Applications include all aviation maintenance activities.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Plan aircraft maintenance activities	1.1. ***Maintenance requirements*** are determined from applicable sources 1.2. Maintenance tasks are analysed and prioritised 1.3. ***Resource requirements*** are identified and allocated to ensure the timely and efficient completion of maintenance tasks 1.4. Maintenance tasks to be performed are recorded in a maintenance schedule in accordance with enterprise policy and procedures
2. Implement aircraft maintenance activities	2.1. Roles and responsibilities of maintenance personnel are communicated and agreed 2.2. ***Resources and equipment required to perform maintenance tasks*** are identified and arranged 2.3. Regular liaison with maintenance personnel is maintained to ensure scheduled/unscheduled tasks are being completed and continuity is maintained 2.4. Management/stakeholders are provided with ***regular updates*** on maintenance progress, as required 2.5. Maintenance activities are monitored to ensure compliance with ***prescribed instructions***, ***policy***, ***procedures and/or regulatory requirements*** 2.6. ***Advice and assistance with maintenance activities*** is provided, as required 2.7. Maintenance problems are resolved in accordance with the approved maintenance data 2.8. Proposed changes to the maintenance schedule are processed and negotiated with management/stakeholders

3. Evaluate and report maintenance outcomes	3.1. Final maintenance outcomes are evaluated against the schedule in accordance with enterprise policy and procedures 3.2. Maintenance reports are collated, evaluated and forwarded to appropriate management personnel in accordance with enterprise policy and procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- application of the procedures for the identification of specific maintenance requirements through the review of:
  - maintenance releases
  - manufacturers' maintenance manuals and servicing schedules
  - computer maintenance data systems
  - service bulletins
  - modification incorporation instructions
  - repair instructions
  - feedback from maintenance personnel and aircrew via Technical Logs or approved maintenance documentation
- Aircraft Maintenance Organisation (AMO) internal work instructions or directives
- Airworthiness Directives (AD)
- basic project planning techniques, including planning chart development, timing, prioritising, resourcing, monitoring, performance measurement and evaluation of maintenance tasks
- financial and inventory management as an element of task planning
- the basic function, components, operation and interrelationship of all aircraft systems for the initial rating sought
- problem solving techniques and troubleshooting procedures
- damage assessment philosophies and procedures, particularly with regard to corrosion damage
- cost control during maintenance, including cost-effectiveness considerations for different repair types
- philosophies and considerations in repair versus replacement options
- the application of quality management systems in aircraft maintenance
- enterprise and regulatory requirements for undertaking, recording and reporting maintenance activities, including relevant OHS requirements and the use of PPE

Required knowledge

Look for evidence that confirms knowledge of:

- methods of determining and specifying maintenance requirements (MRB, MSG, EROPS, RVSM, Maintenance Programs, Minimum Equipment List, reliability, ATA codes)
- the procedures for the identification of specific maintenance requirements through the review of:
  - maintenance releases
  - manufacturers' maintenance manuals and servicing schedules
  - computer maintenance data systems
  - service bulletins
  - modification incorporation instructions
  - repair instructions
  - feedback from maintenance personnel and aircrew via Technical Logs or approved maintenance documentation
- AMO internal work instructions or directives
- AD
- the regulations governing aircraft maintenance coordination
- basic project planning techniques, including planning chart development, timing, prioritising, resourcing, monitoring, performance measurement and evaluation of maintenance tasks
- financial and inventory management as an element of task planning
- the basic function, components, operation and interrelationship of all aircraft systems for the initial rating sought
- problem solving techniques and troubleshooting procedures
- damage assessment philosophies and procedures, particularly with regard to corrosion damage
- cost control during maintenance, including cost-effectiveness considerations for different repair types
- philosophies and considerations in repair versus replacement options
- the application of quality management systems in aircraft maintenance
- enterprise and regulatory requirements for undertaking, recording and reporting maintenance activities, including relevant OHS requirements and the use of PPE

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to plan and implement aviation maintenance activities and evaluate and report on the outcome of the activities while complying with all relevant legislative

	and regulatory requirements.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that maintenance requirements are fully identified and that all applicable aspects of planning and implementation are identified and applied to meet organisational priorities and minimise workplace disruptions. Evidence is required of underlying knowledge and skills in the planning and implementation of maintenance activities, and in the associated compliance with airworthiness regulatory requirements. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved on a task representative of Groups 1 to 7 in the Range Statement. This shall be established via simulated activities at the CASR Part 147 MTO and performance during supervised workplace activities.
Context of and specific resources for assessment	Competency should be assessed under supervision without intervention in the work environment, and/or by use of simulated activities in a CASR Part 147 Maintenance Training Organisation (MTO), covering the full range of maintenance planning and implementation.
Method of assessment	This unit must be linked in its assessment and application to those that apply to the exercise of Aircraft Maintenance Engineer Licence or Aircraft Maintenance Specialist Certificate privileges in the actual maintenance of aircraft.
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in

	the Evidence Guide
Maintenance requirements	1. Maintenance requirements may be determined from any or all of: • maintenance releases • manufacturers' maintenance manuals and servicing schedules • computer maintenance data systems • service bulletins • modification incorporation instructions • repair instructions • feedback from maintenance personnel and aircrew via Technical Logs or approved maintenance documentation • Aircraft Maintenance Organisation (AMO) internal work instructions or directives • Airworthiness Directives (ADs)
Resource requirements	2. Resource requirements may include: • required numbers of personnel and their availability • personnel qualifications, experience and authorisations • the availability of the resources listed in Group 3
Resources and equipment required to perform maintenance tasks	3. Resources and equipment required to perform maintenance tasks may include: • personnel • spares • lubricants • consumables • tools • special equipment • PPE • associated equipment, including various items of ground support equipment
Regular updates	4. Regular updates may include: • both written and verbal reports, including notes, work sheets, status reports, briefs and individual directives
Prescribed instructions, policy, procedures and/or regulatory requirements	5. Prescribed instructions, policy, procedures and/or regulatory requirements may include: • manufacturers operating and maintenance manuals • CASA-approved enterprise operation manuals • quality procedures and work instructions

	• OHS policies and instructions, including MSDS • management directives.
Advice and assistance in maintenance activities	6. Advice and assistance in maintenance activities may include: • fault diagnosis procedures • troubleshooting • damage assessment • assessment of repair cost effectiveness • assessment of replacement options • technical services advice or directives
Maintenance problems	7. Maintenance problems may include: • lack of resources • unanticipated breakdowns or faults • changes in priorities
Application	The competency applies to the planning and implementation of aircraft maintenance activities, including: • scheduled maintenance • unscheduled maintenance • configuration changes • modification incorporation • repair

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA113C Supervise civil aircraft maintenance activities and manage human resources in the workplace

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This is one of the units of competency that must be attained to progress from AME to the grant of an Aircraft Maintenance Engineer Licence, Aviation Maintenance Specialist Certificate or an Aircraft Maintenance Technician Authorisation. It covers the competencies required to supervise maintenance activities, apply human resource management practices applicable at the supervisor level, and contribute to workplace training and competency assessment.

The skills and knowledge covered by the units of competency at Certificate IV level listed in the MEA11 Aeroskills Training Package for the qualification leading to the applicable Aircraft Maintenance Engineer Licence sought are prerequisite to the attainment of the elements of competency specified in this unit. This includes full coverage of the CASR Part 66 Avionics or Mechanical Syllabus subjects/topics listed in the Assessment Guidelines.

Application of the Unit

This unit requires application of supervisory and personnel management skills in the performance of maintenance activities.

Applications include all aviation maintenance activities.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Plan maintenance for teams	1.1. Maintenance tasks are identified and interpreted from available ***maintenance data or schedules*** in accordance with enterprise procedures
	1.2. Workload is organised in order of priority taking into consideration, where applicable, mandatory and optional maintenance tasks
	1.3. Timeframes are taken into consideration when prioritising maintenance tasks
	1.4. ***Required resources*** are obtained to facilitate planned maintenance tasks
2. Implement maintenance for teams	2.1. Maintenance tasks are allocated to appropriate team members with consideration of individual's experience and qualifications
	2.2. Personnel are clearly briefed on their responsibility and function in the team
	2.3. Team members are correctly authorised to operate the required items of ground support equipment
	2.4. Team members are instructed to observe occupational health and safety requirements and all safety hazards are promptly identified and addressed
3. Provide guidance	3.1. ***Guidance*** is provided to staff, appropriate to the maintenance task and individual's experience. This includes the communication of relevant maintenance data and procedures. Guidance is readily available, in person, as appropriate to the maintenance task
	3.2. Guidance is provided in determining the cause of difficult faults or faults not covered in maintenance manual fault

	diagnosis guides
4. Monitor maintenance quality	4.1. Activities are checked and personnel are guided to ensure that maintenance is performed in accordance with the applicable documentation, policies and procedures 4.2. Completed work including stages of maintenance are inspected for serviceability and prepared for certification on applicable documentation
5. Perform human resource management activities at the supervisor level	5.1. ***Human factors affecting job performance*** are identified and responded to 5.2. ***The possibility of maintenance errors is minimised*** 5.3. Sound teamwork is maintained through an awareness of contributing factors 5.4. Sound ***employment relations*** are maintained
6. Perform workplace training tasks	6.1. ***On-job training*** is delivered 6.2. The Supervisor's Verification portion of the Workplace History Sheets (Section 3) of the Log of Industrial Experience and Achievement is completed 6.3. Expert witness verification of competency for Maintenance Training Organisation (MTO) workplace assessors is provided, when required

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- planning and implementing team maintenance activities
- applying all relevant OHS procedures
- observing human factors in team maintenance activities
- providing guidance to team members
- human resource management at team level

Required knowledge

Look for evidence that confirms knowledge of:

- applicable state/territory and Commonwealth OHS regulations, and enterprise OHS instructions
- the correct use of applicable items of PPE
- the requirement for Confined Space Entry Permits and related training
- applicable MSDS
- ATA 113 Specification for Maintenance Human Factors Guidelines, and the following human factor elements:

- general factors, including:
  - weaknesses in task design and support
  - motivation and attitudes, task demands and limitations in performance
  - cooperative work, communication and leadership
  - allocation of resources, workload, work conditions, double standards
- aspects relating to the task, including:
  - physical and mental work
  - features of the task which limit efficiency or safety performance, including constraints, such as signing-off and shift changeover, time pressures, information sources, troubleshooting methods, tools and equipment
  - task performance levels: skill-based, rule-based and knowledge-based; and the limitations encountered in each category
  - complex and inter-related aircraft systems
- limitations of individual performance, including:
  - the sources and effects of fatigue, detection and countermeasures
  - vision and lighting
  - hearing and noise
  - memory, short and long term
  - claustrophobia and acrophobia
- the influence of external factors, including:
  - maintainability of aircraft
  - guidance availability
  - social environment
  - physical environment, including the effects of extremes of heat and cold, and countermeasures (e.g. limited periods of exposure), noise and fumes, motion and vibration
- the causes of variability in human performance, including:
  - effects of arousal
  - limitations of perception
  - limitations of memory, and management of these
  - limitations of decision-making
  - limitations of motor-functioning
  - information processing
- factors that degrade performance, including:
  - risk motivation
  - individual differences (e.g. depth of training and experience)
  - health
  - alcohol and drugs
- errors in maintenance tasks, including:
  - omissions, incorrect installation and wrong parts

    - assumptions
    - error management by minimisation, capture and tolerance
  - human factors within groups, including:
    - the distinction between groups and teams; coordination and synergy
    - types of groups: horizontal (same level of personnel) and vertical (different functions) composition
    - group characteristics; reducing overall task time; coordination
    - team characteristics; performance exceeds sum of individual performances
    - factors which lead to effective working in groups and teams: interaction, participation, open communication, clear expectations, shared leadership and self-assessment
    - team building
    - communication: the process and feedback
  - organisational aspects, including:
    - functions and dysfunctionality
    - double standards: professionalism, procedures and time pressure
    - organisational culture, professional culture and work-group culture, and peer pressure
  - violation of regulations, procedures and processes, including:
    - organisational failure: latent failure, error-provoking conditions and unsafe acts
    - organisational learning
    - maintenance error management program
- the MEA11 Aeroskills Training Package, including relevant competency units and training pathways
- the Log of Industrial Experience and Achievement, including:
  - purpose of the Log
  - its structure and content
  - responsibility for making entries therein
  - responsibility for the certification of entries
- the role of CASR Part 147 MTOs in the training and competency assessment process, and of the role of supervisors in assisting workplace competency assessors

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to supervise maintenance activities, provide

	guidance/on-job training and manage human resources at team level while complying with all relevant legislative and regulatory requirements.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that maintenance requirements are fully identified and that all applicable aspects of supervision, supervisor level human resource management and involvement in workplace training and competency assessment are identified and applied. Evidence is required of underlying knowledge and skills in the supervision of maintenance activities, and in the associated compliance with airworthiness regulatory requirements. The ability must be demonstrated to apply supervisor level human resource management processes during supervision activities, deliver workplace training, and to record experience and evidence for competency assessment associated with completion of the Log of Industrial Experience and Achievement. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under supervision, without intervention on a maintenance supervision task that includes Groups 1 to 7 in the Range Statement. This shall be established via simulated activities at the CASR Part 147 MTO and performance during supervised workplace activities.
Context of and specific resources for assessment	Competency should be assessed under supervision, without intervention in the work environment, and/or by use of approved simulated activities in a CASR Part 147 MTO, covering the full range of maintenance supervision, supervisor level human resource management and assistance with workplace training and competency assessment, as provided for in the Range Statement.
Method of assessment	This unit must be linked in its assessment and application to those that apply to the exercise of Aircraft Maintenance Engineer Licence, Aircraft Maintenance Specialist Certificate or Aircraft Maintenance Technician privileges in the actual maintenance of aircraft.
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Maintenance data or schedules	1. Maintenance data or schedules may include: • maintenance records • manufacturers' maintenance manuals and servicing schedules • computer maintenance data systems • service bulletins • airworthiness directives • modification incorporation instructions • repair instructions • observations and feedback from maintenance personnel and aircrew via Technical Log entries • AMO internal work instructions or directives.

Required resources	2. Required resources may include:
	• personnel
	• spares
	• lubricants
	• consumables
	• tools
	• special equipment
	• PPE
	• associated equipment including various items of ground support equipment
	• considerations regarding resources may also include:
	  • required numbers of personnel and their availability
	  • personnel qualifications, experience and authorisations
	  • availability of the listed resources

Guidance in maintenance activities	3. Guidance in maintenance activities may include: • fault diagnosis procedures • troubleshooting

	• damage assessment • assessment of repair cost effectiveness • assessment of replacement options
Human factors affecting job performance	4. Human factors affecting job performance may include: • individual health and disability • social psychology • time pressure and workload • the physical work environment
The possibility of maintenance errors may be minimised	5. The possibility of maintenance errors may be minimised through: • varying the extent of supervision according to the nature of the task and work conditions • allowance for qualification and experience levels within the team • allowance for human error and 'Murphy's Law' ('If something can go wrong, it will')
Employment relations at supervisor level	6. Employment relations at supervisor level may include: • resolution or referral to management of complaints and difficulties • resolution of conflict within the team • absence of team members from the job • maintenance of discipline in the performance of maintenance tasks • allowance for cultural diversity within the team • knowledge of relevant sections of industrial awards, enterprise agreements, and conditions of employment and service that apply to the particular workplace
On-job training	7. On-job training involves: • the reinforcement of knowledge and skills gained in off-job training and guiding their application to specific on-job maintenance tasks
Application	The competency applies to the supervision of aircraft maintenance activities, including: • scheduled maintenance • unscheduled maintenance • configuration changes • modification incorporation • repair
Prescribed instructions, policy, procedures and/or regulatory	Prescribed instructions, policy, procedures and/or regulatory

requirements	requirements governing maintenance activities may include: • manufacturer operating and maintenance manuals • CASA-approved enterprise operation manuals • quality procedures and work instructions • OHS policies and instructions, including MSDS • management directives

Unit Sector(s)

Supervision of aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA114A Certify aeronautical product maintenance

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency must be attained by individuals working in CASR Part 42 Sub-Part F and Part 145 maintenance organisations who are authorised to return items of aeronautical product to service after the completion of maintenance. It covers the competencies required to correctly interpret and apply CASA airworthiness and certification requirements during aircraft component maintenance.

The units of competency that are specified by the maintenance organisation for the repair, overhaul or modification of the item of aeronautical product being certified for return to service are co-requisites to this unit.

Application of the Unit

This unit requires application of legislative and regulatory requirements relating to the certification of aviation maintenance.

Applications include all aeronautical product maintenance tasks that require certification following completion of maintenance.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Comply with airworthiness regulations
   - 1.1. The status of aircraft components and component parts is determined
   - 1.2. Eligibility to certify the completion of maintenance activities is determined
   - 1.3. Item of aeronautical product is released to service
   - 1.4. Maintenance documentation required for certification is raised and compiled
   - 1.5. Configuration management procedures are applied
   - 1.6. Maintenance-related reports are compiled and processed
   - 1.7. Technical communication activities, both oral and written, are performed

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- describing and applying the requirements applicable to the privileges of their authority
- application of Airworthiness Directive requirements under CASR Part 39
- application of Aviation Maintenance Personnel Licensing Requirements under CASR Part 66
- application of requirements related to conduct and certification of maintenance under CASR Part 145 and CASR Part 42 Subpart F
- demonstrating a familiarity with requirements related to the tasks and functions they may perform
- demonstration of literacy and oral expression skills required for clear written and oral communication

Required knowledge

Look for evidence that confirms knowledge of:

- Airworthiness Directive requirements under CASR Part 39
- Maintainers' Responsibilities under CASR Parts 66, 145 and 42 Subpart F
- Aviation Maintenance Personnel Licensing Requirements under CASR Part 66
- Maintenance Organisations Requirements under CASR Part 145 and 42 Subpart F
- Design Organisations under CASR Part 21J
- Maintenance Training Organisations under CASR Part 147

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply without error legislative and regulatory requirements relating to the certification of aeronautical product maintenance.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that airworthiness compliance requirements are interpreted and fully applied without error. Evidence is required of underlying knowledge and skills associated with the application of airworthiness legislation and compliance requirements, along with evidence of appropriate levels of literacy and oral expression associated with presenting clear and concise information. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under supervision without intervention on a range of tasks fully representative of Groups 1 to 18 in the Range Statement. The body of evidence for this unit may be collected and logged during simulated activities at the CASR Part 147 MTO and/or performance during supervised workplace activities. Knowledge must also be demonstrated of the concept of airworthiness that underpins the legislative framework and compliance requirements.

Context of and specific resources for assessment	Competency should be assessed in the work environment under supervision but without intervention for the purpose of Journal entries, and/or by use of simulated activities in a CASR Part 147 MTO, covering the interpretation and application of airworthiness control and certification requirements.
Method of assessment	This unit must be linked in its assessment and application to those that apply to the performance of maintenance on the applicable items of aeronautical product.
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Application	The competency applies to the certification of aircraft maintenance activities, including: 1. Scheduled maintenance 2. Unscheduled maintenance 3. Configuration changes 4. Modification incorporation 5. Repairs In performing Tasks 1 to 5, knowledge is to be applied with regard to airworthiness regulatory systems and Australian legislation, and the application of compliance requirements in the performance, recording and certification of maintenance activities, as follows: 6. International and national regulatory bodies and recognition agreements, including bilateral agreements 7. Australian airworthiness regulatory bodies and the

	legislative framework 8. The basis of airworthiness certification and determination of non-conformity 9. Procedures for release of aeronautical product to service following maintenance 10. Procedures for certification of scheduled and unscheduled maintenance activities 11. Procedures for certification of the incorporation of modifications 12. Procedures for certifying the completion of repairs 13. Determining and applying configuration management procedures 14. Compiling and processing service difficulty reports 15. Compiling and processing technical investigation reports 16. Compiling and processing condition reports 17. Orally communicating on technical and airworthiness compliance topics 18. Communicating in writing on technical and airworthiness compliance issues

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA115A Plan and implement aeronautical product maintenance activities

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency covers the competencies required to plan and implement aeronautical product workshop maintenance activities while complying with airworthiness regulatory requirements.

Application of the Unit

This unit requires application of competencies relating to the planning, implementation and evaluation of workshop maintenance activities relating to items of aeronautical product.

Applications include the overhaul, repair and modification of items of aeronautical product.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Plan aeronautical product maintenance activities	1.1. ***Maintenance requirements*** are determined from ***applicable sources***
	1.2. Maintenance tasks are analysed and prioritised
	1.3. ***Resource requirements*** are identified and allocated to ensure the timely and efficient completion of maintenance tasks
	1.4. Maintenance tasks to be performed are recorded in accordance with ***enterprise policy and procedures***
2. Implement aeronautical product maintenance activities	2.1. Roles and responsibilities of maintenance personnel are communicated and agreed
	2.2. Resources and equipment required to perform maintenance tasks are identified and arranged
	2.3. Regular liaison with maintenance personnel is maintained to ensure that tasks are being completed and continuity is maintained
	2.4. Management/stakeholders are provided with regular updates on maintenance progress
	2.5. Maintenance activities are monitored to ensure compliance with prescribed instructions, policy, procedures and/or ***regulatory requirements***
	2.6. ***Advice and assistance*** with maintenance activities is provided, as required
	2.7. ***Maintenance problems*** are resolved in accordance with the applicable maintenance documentation
3. Evaluate and report maintenance outcomes	3.1. Final maintenance outcomes are evaluated against the applicable maintenance documentation in accordance with enterprise policy and procedures
	3.2. Maintenance reports are collated, evaluated and forwarded to appropriate management personnel in accordance with regulatory requirements, enterprise policy and procedures
	3.3. Required maintenance release documentation is packaged with items of aeronautical product that are being released to service

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- oral communication
- written communication
- planning
- problem solving
- management of personnel and resources
- application of regulations, policies and procedures, including OHS

Required knowledge

Look for evidence that confirms knowledge of:

- basic project planning techniques
- problem solving techniques
- basic function and theory of operation of applicable items of aeronautical product
- troubleshooting procedures, including test station operation
- cost-effectiveness considerations for different repair types
- philosophies and considerations in repair vs replacement options
- enterprise and regulatory requirements for undertaking, recording and reporting maintenance activities
- OHS legislation
- equity, fraud and ethics

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to plan aeronautical product maintenance, manage a workshop performing the maintenance and evaluate and report appropriately the maintenance outcomes.
Critical aspects for assessment and evidence required to demonstrate	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required

competency in this unit	knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Maintenance requirements	Maintenance requirements may include: • overhaul • repair

	• configuration changes • modification incorporation • defect investigation
Applicable data sources	Applicable sources may include: • component unserviceability details • manufacturers' maintenance manuals • computer maintenance data systems • service bulletins • modification incorporation instructions • repair instructions • management directives
Resource requirements	Resource requirements may include: • required numbers of personnel and their availability • personnel qualifications, experience and authorisations • spares • consumables • special equipment, including component test stations • ground support equipment • PPE • technical data
Enterprise policy and procedures	Enterprise policy and procedures may be specified in: • maintenance organisation manual • organisational policy manuals • procedures manuals • quality manuals • safety manuals • defence instructions and standards • standing instructions
Regular updates	Regular updates may be: • written or verbal, including notes, work sheets, status reports, briefs and individual directives
Regulatory requirements	Regulatory requirements may be found in: • Civil Aviation Regulations or Civil Aviation Safety Regulations • AAP 7001.053 Technical Airworthiness Maintenance Manual
Advice and assistance	Advice and assistance may include: • fault diagnosis procedures

	• troubleshooting • damage assessment • assessment of repair cost effectiveness • assessment of replacement options
Maintenance problems	Maintenance problems may include: • lack of resources • unanticipated breakdowns or faults • changes in priorities

Unit Sector(s)

Aviation maintenance

Competency field

Aviation maintenance management

Co-requisite units

Not applicable

MEA116B Apply occupational health and safety procedures at supervisor level in aviation maintenance

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of all training pathways at Diploma level, and at Certificate IV level where the training pathway leads to the responsibility for maintenance supervision. It covers the competencies required to implement and monitor the organisation's health and safety policies, procedures and programs in aviation maintenance work areas to achieve and maintain occupational health and safety (OHS) standards. The unit is based on the National Guidelines for integrating OHS competencies into national industry competency standards (NOHSC: 7025, 1998) and applies to the supervision of all aviation maintenance activities.

Application of the Unit

This unit requires application of OHS Acts, regulations, codes of practice and enterprise OHS procedures during the supervision of all aviation maintenance activities.

Applications include supervision of aviation maintenance activities performed on aircraft and in workshops.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Provide information to the work group about OHS and the organisation's OHS policies, procedures and programs	1.1. Relevant provisions of ***OHS legislation and codes of practice*** are accurately and clearly explained to the work group 1.2. ***Information*** on ***the organisation's OHS policies***, ***procedures and programs*** is provided in a readily accessible manner and is accurately and clearly explained to the work group 1.3. Information about identified hazards and the outcomes of risk assessment and risk control procedures is regularly provided and is accurately and clearly explained to the work group
2. Implement and monitor participative arrangements for the management of OHS	2.1. Organisational procedures for ***consultation over OHS issues*** are implemented and monitored to ensure that all members of the work group have the opportunity to contribute 2.2. Issues raised through consultation are dealt with and resolved promptly or referred to the appropriate personnel for resolution in accordance with workplace procedures for issue resolution 2.3. The outcomes of consultation over OHS issues are promptly made known to the work group
3. Implement and monitor the organisation's procedures for identifying hazards and assessing risks	3.1. ***Existing and potential hazards*** in the work areas are identified and reported so that risk assessment and ***risk control procedures*** can be applied
4. Implement and monitor the organisation's procedures for dealing with hazardous events	4.1. Work procedures to control risks are implemented and adherence to them by the work group is monitored in accordance with workplace procedures 4.2. Existing risk control measures are monitored and results reported regularly in accordance with workplace procedures 4.3. Inadequacies in existing risk control measures are

	identified in accordance with the hierarchy of control and reported to designated personnel
	4.4. Inadequacies in resource allocation for implementation of risk control measures are identified and reported to designated personnel
5. Implement the organisation's procedures for dealing with hazardous events	5.1. Workplace ***procedures for dealing with hazardous events*** are implemented whenever necessary to ensure that prompt control action is taken
	5.2. ***Hazardous events*** are investigated to identify their cause in accordance with investigation procedures
	5.3. Control measures to prevent recurrence and minimise risks of hazardous events are implemented based on the hierarchy of control if within scope of responsibilities and competencies or alternatively referred to designated personnel for implementation
6. Implement and monitor the organisation's procedures for providing OHS training	6.1. ***OHS training*** needs are identified accurately, specifying gaps between OHS competencies required and those held by work group members
	6.2. Arrangements are made for fulfilling identified OHS training needs in both on and off-the-job training programs in consultation with relevant parties
7. Implement and monitor the organisation's procedures for maintaining OHS records	7.1. ***OHS health and safety records*** for work area are accurately and legibly completed in accordance with workplace requirements for OHS records and legal requirements for the maintenance of records of occupational injury and disease
	7.2. Aggregate information from the area's OHS records is used to identify hazards and monitor risk control procedures within work area according to organisational procedures and within scope of responsibilities and competencies

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- analysing the entire work environment in the area of responsibility in order to identify hazards, assess risks and judge when intervention to control risks is necessary
- analysing relevant workplace data, such as incident or environmental monitoring data, to identify hazards, assess risks and evaluate the effectiveness of risk control measures

- assessing the resources needed to apply different risk control measures and make recommendations to management on that basis

Required knowledge

Look for evidence that confirms knowledge of:

- the provisions of OHS Acts, regulations and codes of practice relevant to the workplace, including legal responsibilities of employers, employees and other parties with legal responsibilities
- principles and practices of effective OHS management
- hazard identification and control in the workplace
- organisational OHS management systems, policies and procedures that support organisational compliance with legal requirements
- the impact on OHS management of workforce characteristics and composition
- the relevance of OHS management to other organisational systems, policies and procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply OHS Acts, regulations, codes of practice and enterprise OHS procedures during the supervision of aviation maintenance activities.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The demonstrated ability to apply the elements and performance criteria of this Unit in conjunction with other Units relating to the supervision of aviation maintenance activities is critical. Assessors must be satisfied that evidence has been provided of: • knowledge, consistent with the elements of competence, of all applicable OHS Acts, regulations and codes of practice • understanding of, and ability to apply, risk management procedures by undertaking hazard identification, risk assessment and risk control in accordance with the hierarchy of control • knowledge of how characteristics of the workforce impact on the management of OHS, and an ability to apply that understanding in the supervision of

	aviation maintenance activities.
Context of and specific resources for assessment	This unit may be assessed through a combination of workplace (or a realistic simulation) and off-the-job assessment. The context of assessment should ensure that evidence relating to the contingency management component of competency can be collected. Evidence must include observation in the workplace as well as off-the job techniques, such as interviews and simulations. Conditions for simulations should accurately simulate the range of circumstances (especially with regard to a realistic range of emergencies and hazardous events) that the individual could be expected to deal with in the workplace and allow for discussion. The individual must be given access to: • relevant OHS Acts, regulations and codes of practice • enterprise OHS policies and procedures • personal protective equipment • relevant work areas for identification of hazards and control measures The assessor should have recognised expertise in managing OHS in an aviation maintenance environment or work in an assessment team with such a person.
Method of assessment	To ensure that the contingency management component (ability to deal with irregularities and breakdowns) of competency is adequately assessed, evidence needs to be gathered across a range of work procedures and in a range of workplace circumstances. This could be either in an actual workplace or in a simulation of realistic workplace conditions. Techniques for assessment could include: • observation • simulation • case studies • interviews • written tests • workplace projects.
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Application	This unit of competency applies to supervisors working within both the CASA and the ADF regulatory systems. This unit is to be applied in combination with all other units in the Diploma of Aeroskills and the Diploma of Aviation Maintenance Management that relate to the supervision of aviation maintenance activities. It also applies to Certificate IV training pathways that lead to supervisory employment.
OHS legislation and codes of practice	OHS legislation and codes of practice may include: • State/Territory/Commonwealth OHS Acts, regulations and codes of practice, including general duty of care under OHS legislation and common law • relevant defence instructions • civil aviation safety regulations • requirements for the maintenance and confidentiality of records of occupational injury and disease • provisions relating to health and safety representatives and/or OHS committees • provisions relating to OHS issue resolution
The organisation's OHS policies, procedures and programs	The organisation's OHS policies, procedures and programs may be included in: • safety manuals • maintenance organisation manual • standing instructions • procedures manuals • work instructions
Information	Information may include information: • for the induction of new maintenance personnel • about the nature of work, tasks and procedures • to assist in work tasks • as part of providing direct supervision • to communicate organisational safety requirements and procedures • for consultation with health and safety representatives

	and OHS committees
Consultation over OHS issues	Consultation over OHS issues may include participative arrangements for: • formal and informal meetings which include OHS • OHS committees • other committees such as consultative, planning and purchasing • health and safety representatives • suggestions, requests, reports and concerns put forward by employees to management
Existing and potential hazards and risk	Existing and potential hazards may be identified and risk assessed through activities such as: • audits • workplace inspections • housekeeping • checking work area and/or equipment before and during work • job and work system assessment • reviews of OHS records, including registers of hazardous substances, dangerous goods, and so on • maintenance of plant and equipment • provision of supplies and equipment, e.g. review of MSDS and manufacturer/supplier information • identifying employee concerns

Risk control procedures	Risk control procedures may include actions such as:
	• measures to remove the cause of a risk at its source
	• application of the hierarchy of control:
	  • elimination of risk
	  • engineering controls
	  • administrative controls
	  • PPE
	• consultation with maintenance personnel and their representatives

Procedures for dealing with hazardous events	Procedures for dealing with hazardous events may include: • evacuation • chemical containment • first aid • accident/incident reporting and investigation
Hazardous events	Hazardous events may include:

	• accidents • fires and explosions • emergencies, e.g. fuel or chemical spills • bomb scares • violent incidents
OHS training	OHS training may include: • induction training • specific hazard training • specific task or equipment training • emergency and evacuation training • training as part of broader programs, such as equipment operation
OHS records	OHS records may include: • OHS audit and inspection reports • health surveillance and workplace environmental monitoring reports • records of instruction and training • manufacturers and suppliers information, including MSDS and dangerous goods storage lists • hazardous substances registers • maintenance and testing reports • workers compensation and rehabilitation records • first aid/medical post records

Unit Sector(s)

Supervision of aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA117A Apply self in the aviation maintenance environment

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit is part of all Certificate II training pathways. It covers the competencies required to work ethically and effectively in the maintenance of aircraft and aircraft components at Certificate II level while contributing to the development of the individual's own capabilities.

Application of the Unit

This unit requires application of competencies relating to ethical behaviour, effective work performance and skills development relating to aviation maintenance.

Applications include all aspects of aircraft and aircraft component maintenance.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the	Performance criteria describe the performance needed to demonstrate

essential outcomes of a unit of competency.	achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Manage self	1.1. Responsibility for own workload is accepted 1.2. Work is undertaken individually or as a team member to complete maintenance tasks in a timely manner and in accordance with enterprise procedures and requirements 1.3. Initiative is exercised in liaison with colleagues in identifying and analysing alternative approaches to resolving workplace issues and problems 1.4. Performance feedback from others is used to improve work performance 1.5. Organisational structure, career paths and eligibility criteria are identified 1.6. Awareness is maintained of the effects of fatigue, drugs and alcohol on performance
2. Work effectively with others	2.1. Effective c***ommunication skills*** are applied 2.2. Others are dealt with ethically and principles of diversity applied 2.3. The trust and confidence of others is developed and maintained at all levels of the organisation
3. Participate in the process of change and innovation	3.1. Work is undertaken with others to implement change in the workplace 3.2. Opportunities for product and service enhancement are identified and proposed to supervisors
4. Contribute to development of own skills	4.1. Competency standards relevant to current employment are identified and applied 4.2. Competency standards required for desired career path progression are identified and action is initiated through enterprise procedures to facilitate their attainment 4.3. New ideas and techniques are accepted and time and effort invested in learning new skills 4.4. Performance feedback is used to identify and develop ways to improve competence

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- oral communication
- written communication
- applying principles of equity and diversity
- managing own work performance
- interfacing effectively with others
- applying legislation, regulations and organisational policies and procedures relevant to role and workplace
- contributing to own knowledge, skills and competency development

Required knowledge

Look for evidence that confirms knowledge of:

- human factors
- the application within the workplace of legislative requirements and principles regarding equal opportunity, equity and diversity
- Aeroskills Training Package and relevant pathways to qualifications and their application within the enterprise
- problem solving principles
- constant improvement principles and procedures
- enterprise procedures for proposing modifications or changes in work procedures
- change management

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to effectively manage their own workload and contribute to the ongoing development of their skills, knowledge and competencies in the applicable field of aviation maintenance.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency

	in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Competency in this unit underpins competency in other aspects of the workplace role of employees at Certificate II level. It may be appropriate to assess parts of this unit in conjunction with units relating to the performance of maintenance activities.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities

Communication	Communication may be by way of: • oral communication • written communication, including email

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA118A Conduct self in the aviation maintenance environment

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of all Certificate III and IV level training pathways. It covers the competencies required to perform work ethically and efficiently in the maintenance of aircraft and aircraft components at Certificate IV level while contributing to the development of the individual's own capabilities.

Application of the Unit

This unit requires application of competencies relating to ethical behaviour, self-management and skills development relating to aviation maintenance.

Applications include all aspects of aircraft and aircraft component maintenance.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the	Performance criteria describe the performance needed to demonstrate

essential outcomes of a unit of competency.	achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Manage self	1.1. Responsibility for own workload is assessed, prioritised and accepted 1.2. Work is undertaken individually or as a team member to complete maintenance tasks in a timely manner and in accordance with enterprise procedures and requirements 1.3. Independence and initiative are demonstrated in identifying and solving problems 1.4. Initiative is exercised in liaison with colleagues in identifying and analysing alternative approaches to resolving workplace issues and problems 1.5. Own skills and knowledge are evaluated and monitored and confidence is built in own capability, ideas and vision 1.6. Performance feedback from others is used to improve work performance 1.7. Organisational structure, career paths and eligibility criteria are identified 1.8. Awareness is maintained of the effects of fatigue, drugs and alcohol on performance
2. Work effectively with others	2.1. Effective ***communication skills*** are applied 2.2. Others are dealt with ethically and principles of diversity applied 2.3. The trust and confidence of others is developed and maintained at all levels of the organisation 2.4. Guidance is provided to other team members as required regarding skills application and maintenance processes 2.5. Advantages, disadvantages and consequences of ideas are identified and considered
3. Participate in the process of change and innovation	3.1. Work is undertaken with others to implement change in the workplace 3.2. Opportunities for product and service enhancement and options for achieving the desired result are identified and proposed in accordance with enterprise procedures
4. Contribute to development of own	4.1. Competency standards relevant to current employment are identified and applied

skills	4.2. Competency standards required for desired career path progression are identified and action is initiated through enterprise procedures to facilitate their attainment 4.3. Problem solving skills are reviewed for further development 4.4. Own personal knowledge and skills are assessed and learning opportunities are accessed as required to fill gaps and enhance skills 4.5. New ideas and techniques are accepted and time and effort invested in learning new skills 4.6. Performance feedback is used to identify and develop ways to improve competence

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- oral communication
- written communication
- applying principles of equity and diversity
- managing own work performance
- interfacing effectively with others
- applying legislation, regulations and organisational policies and procedures relevant to role and workplace
- contributing to own knowledge, skills and competency development

Required knowledge

Look for evidence that confirms knowledge of:

- human factors
- the application within the workplace of legislative requirements and principles regarding equal opportunity, equity and diversity
- Aeroskills Training Package and relevant pathways to qualifications and their application within the enterprise
- problem solving principles
- constant improvement principles and procedures
- enterprise procedures for proposing modifications or changes in work procedures
- change management

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to demonstrate initiative, effectively manage their own workload and contribute to the ongoing development of their skills, knowledge and competencies in the applicable field of aviation maintenance.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways, including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Competency in this unit underpins competency in other aspects of the workplace role of employees at Certificate III or IV levels. It may be appropriate to assess parts of this unit in conjunction with units relating to aircraft or component maintenance activities.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Communication	Communication may be by way of: • oral communication • written communication, including email

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA119B Perform administrative processes to prepare for certification of civil aircraft A level line maintenance

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This is one of the units of competency that must be attained to progress from Aircraft Maintenance Engineer to the grant of an Aircraft Maintenance Engineer A Licence under CASR Part 66. It covers the competencies required to correctly interpret and apply CASA airworthiness and certification requirements during aircraft line maintenance tasks within the scope of the A Licence privileges.

The skills and knowledge covered by the units of competency listed in the MEA11 Aeroskills Training Package for the MEA20511 Certificate II in Aircraft Line Maintenance are prerequisite to the attainment of the elements of competency specified in this unit. This includes full coverage of the CASR Part 66 Avionics or Mechanical Syllabus subjects/topics as listed in the Assessment Guidelines.

Application of the Unit

This unit requires application of legislative and regulatory requirements relating to the certification of aviation maintenance within the scope of the A Licence.

Applications include all maintenance tasks that require certification by an Aircraft Maintenance Engineer who holds an A Licence.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Determine eligibility to certify the completion of aircraft maintenance activities	1.1. Eligibility to certify line maintenance activities in terms of licence privileges is established in accordance with CASR Parts M, 145 and 66
2. Prepare for return of aircraft to service	2.1. Allocated line maintenance activities are completed in accordance with CASR Parts M 145, 66 and the approved maintenance program 2.2. Documentation is prepared for return of aircraft to service in accordance with CASR Part M and/or 145 and the approved maintenance program
3. Compile and process maintenance documentation and reports	3.1. Maintenance documentation is raised and compiled for certification 3.2. Configuration management procedures are applied 3.3. Maintenance related reports are compiled and processed 3.4. Technical communication activities, both oral and written, are performed

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- describing and applying the requirements applicable to the privileges of their authority
- application of Airworthiness Directive Requirements under CASR 39
- application of Maintainers' Responsibilities under CASR Part M
- compliance with CASA 45 Sub-part D
- application of Aviation Maintenance Personnel Licensing Requirements under

CASR 66
- application of requirements related to conduct and certification of maintenance under CASR 145
- demonstrating a familiarity with requirements related to the tasks and functions they may perform
- demonstration of literacy and oral expression skills required for clear written and oral communication

Required knowledge

Look for evidence that confirms knowledge of:

- Airworthiness Directive Requirements under CASR 39
- Maintainers' Responsibilities under CASR Parts M, 66 and 145
- Aviation Maintenance Personnel Licensing Requirements under CASR 66
- Maintenance Requirements under the applicable CASR operational Parts
- Maintenance Organisations Requirements under CASR 145

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply without error legislative and regulatory requirements relating to the certification of aviation line maintenance activities that are within the scope of the A Licence privileges.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that airworthiness compliance requirements are interpreted and fully applied without error. Evidence is required of underlying knowledge and skills associated with the application of airworthiness legislation and compliance requirements, along with evidence of appropriate levels of literacy and oral expression associated with presenting clear and concise information. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under supervision without intervention on a range of tasks fully representative of Groups 1 to 13 in the Range Statement. The body of evidence for this unit may be collected and

	logged during simulated activities at the CASR Part 147 MTO and/or performance during supervised workplace activities. Knowledge must also be demonstrated of the concept of airworthiness that underpins the legislative framework and compliance requirements.
Context of and specific resources for assessment	Competency should be assessed in the work environment under supervision but without intervention for the purpose of Journal entries, and/or by use of simulated activities in a CASR Part 147 MTO, covering the interpretation and application of airworthiness control and certification requirements. This unit must be linked in its assessment and application to those that apply to the exercise of Aircraft Maintenance Engineer A Licence privileges in the actual maintenance of aircraft.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	The Range Statements below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Certification of aircraft maintenance activities	The competency applies to the certification of aircraft maintenance activities, including: 1. Scheduled line maintenance up to Weekly Check level or equivalent 2. Unscheduled maintenance involving component removal and installation within the scope of the A Licence 3. Configuration changes that are within the scope of the A Licence

	4. Repairs to internal fittings
Regulatory systems, legislation and compliance	In performing Tasks 1 to 4, knowledge is to be applied with regard to airworthiness regulatory systems and Australian legislation, and the application of compliance requirements in the performance, recording and certification of maintenance activities, as follows: 5. International and national regulatory bodies and recognition agreements, including bilateral agreements 6. Australian airworthiness regulatory bodies and the legislative framework 7. Procedures for release of aircraft to service following maintenance 8. Procedures for certification of scheduled and unscheduled maintenance activities 9. Procedures for certifying the completion of repairs 10. Determining and applying configuration management procedures involving items of removable equipment 11. Compiling and processing service difficulty reports 12. Orally communicating on technical and airworthiness compliance topics 13. Communicating in writing on technical and airworthiness compliance issues

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA120B Manage an aviation maintenance quality system

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Aeroskills Advanced Diploma training pathways. It covers the management of an aviation maintenance quality system in compliance with regulatory requirements.

Application of the Unit

This unit requires application of quality system concepts and management procedures within an aerospace maintenance organisation.

Applications include setting up a quality process and the monitoring and evaluation of quality processes within a quality system.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the	Performance criteria describe the performance needed to demonstrate

essential outcomes of a unit of competency.	achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Establish a quality process	1.1. Organisational structure, work processes and outcomes are identified and defined 1.2. Operating procedures, job descriptions and ***supporting documentation*** are developed 1.3. Quality control processes/checks are established and documented 1.4. ***Aviation regulatory instructions***/***policies*** are identified and incorporated into quality system processes and documentation 1.5. Personnel roles and responsibilities are allocated and communicated
2. Monitor and evaluate quality processes within a quality system	2.1. Quality control checks are conducted in accordance with ***organisational policy and procedures*** 2.2. Non-compliances are identified, analysed and appropriate responses initiated in accordance with air safety management guidelines 2.3. Outcomes are recorded and reported in accordance with organisational policy and procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- leadership
- research and interpretation of regulations and guidelines
- written communication
- oral communication
- inspecting and auditing
- quality management

Required knowledge

Look for evidence that confirms knowledge of:

- enterprise authorisation and re-authorisation procedures
- organisational policy and procedures
- enterprise and industry regulatory requirements in monitoring and assessing quality in the aviation maintenance environment
- quality system audit and review requirements and processes
- relevant OHS legislation at state/territory and Commonwealth level
- quality management principles

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply quality system principles and applicable regulatory requirements in setting up a quality system process and monitoring the operation of the process within a quality system.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways, including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference

	materials. The assessment environment should not disadvantage the candidate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Supporting documentation	Supporting documentation may include: • maintenance personnel authorisation workbooks • duty statements • standing instructions
Aviation regulatory instructions/policies	Aviation regulatory instructions/policies may include: • Civil Aviation Regulations (CARs) • CASRs, Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material • AAP 7001.053 Technical Airworthiness Maintenance Manual • relevant overseas regulations, such as Federal Aviation Regulations or European Aviation Safety Regulations • OHS legislation (state/territory and Commonwealth)
Organisational policy and procedures	Organisational policy and procedures may include: • maintenance organisation manual • maintenance organisation exposition • procedures manuals • work instructions • quality manuals • safety manuals

	• defence instructions • Australian Air publications • Civil Aviation advisory publications and advisory circulars • specific aircraft/equipment maintenance manuals • inspection schedules and worksheets

Unit Sector(s)

Aviation maintenance management

Competency field

Co-requisite units

Not applicable

MEA121B Manage aircraft/aeronautical product configuration

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

Unit descriptor	This unit of competency is part of the Aeroskills Diploma and Advanced Diploma training pathways. It covers the management of aircraft and aeronautical product configuration in accordance with regulatory requirements.

Application of the Unit

This unit requires application of configuration management procedures specified by applicable regulatory bodies and the organisation.

Applications include management of weight and balance, role equipment, modification state and of spares authenticity and traceability.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text

unit of competency.	is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Manage aircraft/aeronautical product configuration	1.1. Aircraft and aeronautical product ***maintenance configuration*** is maintained in accordance with ***applicable maintenance documentation***
	1.2. ***Aircraft configuration*** is changed and maintained to meet established role requirements in accordance with ***airworthiness regulations and organisational policy and procedures***
	1.3. Modifications to aircraft and aeronautical product are carried out in accordance with airworthiness regulations and organisational policy and procedures
	1.4. Aeronautical product is ***authenticated*** and checked for serviceability in accordance with airworthiness regulations and organisational policy and procedures
	1.5. Locally manufactured components are produced to authorised specifications and technical drawings
	1.6. Aircraft weight and balance is maintained and validated in accordance with regulatory requirements and organisational policy and procedures
	1.7. Revised weight and balance data is provided for revision of aircraft loading systems
2. Manage maintenance records and documentation	2.1. ***Maintenance reports and documentation*** are compiled and despatched in accordance with regulatory requirements and organisational policy and procedures
	2.2. ***Maintenance records and associated documentation*** are maintained in accordance with organisational policy and procedures
	2.3. Deficiencies in documentation are remedied in accordance with organisational policy and procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- management

- auditing
- documentation of maintenance activities

Required knowledge

Look for evidence that confirms knowledge of:

- modification documentation and recording
- weight and balance documentation and recording
- role/alternate mission changes and related maintenance actions
- deviations
- local manufacture of components
- procedures for determining authenticity of components
- cannibalisation procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to manage aircraft configuration and aircraft/aeronautical product technical configuration in accordance with relevant regulations and organisational policy and procedures.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways, including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations.The candidate must have access to

	all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Maintenance configuration	The maintenance configuration is defined by the original drawings, standards and component fit of the aircraft or aeronautical product, and as subsequently varied by approved modifications or approved component/material substitution
Applicable maintenance documentation	Applicable maintenance documentation may include: • aircraft/equipment maintenance documentation required by applicable regulations and organisational policy and procedures • computer maintenance databases
Aircraft configuration	Aircraft configuration covers the equipment fit for approved operation, including specified role equipment
Airworthiness regulations and organisational policy and procedures	Airworthiness regulations and organisational policy and procedures may include: • Civil Aviation Regulations (CARs) and associated Advisory Circulars (ACs) • CASRs, Manuals of Standards and associated Acceptable Means of Compliance and Guidance

	Material • AAP 7001.053 Technical Airworthiness Maintenance Manual • maintenance organisation manual • maintenance organisation exposition • continuing airworthiness management organisation exposition • maintenance control manual • procedures manual • work instructions
Evidence of component authenticity	Evidence of component authenticity may include: • authorised ADF technical documentation • original equipment manufacturer's documentation • authorised release certificate • certificate of conformance • a certifying statement
Maintenance reports and documentation	Maintenance reports and documentation may include: • reports and documents that must be forwarded to the CASA as specified by CARs or CASRs • continuing airworthiness documentation and reports • computer maintenance database reports • stores forms • articles in use accounts • aircraft/equipment cross-reference records
Maintenance records and associated documentation	Maintenance records and associated documentation may include: • aircraft maintenance record • aeronautical product maintenance record • completed worksheets

Unit Sector(s)

Aviation maintenance management

Competency field

Co-requisite units

Not applicable

MEA122B Manage aircraft/equipment system performance testing

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Aeroskills Advanced Diploma training pathways. It covers the competencies required to evaluate and advise on airworthiness as a consequence of aircraft/equipment system performance testing and in compliance with relevant airworthiness regulations.

Application of the Unit

This unit requires application of skills and knowledge relating to the use of performance testing in establishing the airworthiness state of aircraft and aircraft systems.

Applications include aircraft flight testing, engine ground runs, system functional tests and test equipment calibration.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA126B Manage aircraft maintenance activities

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Plan and specify aircraft/equipment systems performance tests	1.1. ***Aircraft*/*equipment system performance test*** requirements are established in accordance with ***airworthiness regulations***, ***policy and procedures***
	1.2. Aircraft/systems performance tests are programmed in conjunction with ***appropriate personnel***
	1.3. Aircraft/systems performance test specifications are communicated to appropriate personnel in accordance with organisational policy and procedures
	1.4. Test equipment calibration is managed in accordance with regulatory requirements and organisational policy and procedures
2. Assess aircraft/equipment systems performance	2.1. Test results are assessed for compliance with test specifications
	2.2. Non-compliant test results are identified and diagnosed in consultation with appropriate personnel
	2.3. Aircraft/equipment systems are assessed for airworthiness compliance
	2.4. Rectification ***recommendations*** are produced and reported in accordance with airworthiness policy and procedures
	2.5. Test results are documented in accordance with approved guidelines

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- communicating and consulting
- problem solving

- researching
- report writing
- observing relevant regulatory requirements
- applying OHS requirements associated with engine ground runs and system functional testing

Required knowledge

Look for evidence that confirms knowledge of:

- procedures and documentation action for test flights
- procedures and documentation action for engine ground runs
- procedures for functional testing of systems and evaluation of results
- OHS procedures relating to engine ground runs and system functional testing

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to determine the requirement for performance tests, complete the authorisation process and participate in the assessment of results and determining any remedial action. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways, including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic

	workplace situations. The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Aircraft/equipment system performance tests	Aircraft/equipment system performance tests may include: • engine ground runs • maintenance/validation test flights • system functional testing
Airworthiness regulations, **policy and procedures**	Airworthiness regulations, policy and procedures may include: • Civil Aviation Regulations (CARs) and associated Advisory Circulars (ACs) • CASRs, Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material • AAP 7001.053 Technical Airworthiness Maintenance Manual • airworthiness directives • maintenance management plan • maintenance organisation expositions • continuing airworthiness management organisation

	expositions • procedures manual • work instructions • flight test schedule • maintenance manuals
Appropriate personnel	Appropriate personnel may include: • maintenance test pilots • authorised engineering officers • authorised airworthiness representatives • accountable managers/responsible managers • senior maintenance managers • continuing airworthiness management personnel • authorised maintenance personnel
Recommendations	Recommendations may include: • completed test schedules • auditable reports

Unit Sector(s)

Aviation maintenance management

Competency field

Co-requisite units

Not applicable

MEA123B Manage aviation maintenance work environment policy and practices

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Aeroskills Advanced Diploma training pathways. It covers planning and implementing work practices and work environment policy and practices in an aviation maintenance environment in accordance with regulatory requirements.

Application of the Unit

This unit requires application of knowledge of relevant regulations and organisational policy and procedures in planning, developing and implementing work practices.

Applications include aviation maintenance workshops, aircraft hangars and flight lines.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Plan work practices and policies	1.1. Work practices and policies are planned which emphasise the safety and wellbeing of others and comply with ***legislation***, ***rules and regulations***
	1.2. Guidance from appropriate authorities is sought, where necessary
	1.3. Plans are prepared for the implementation of corrective action to remedy identified deficiencies
	1.4. Learning programs are planned to provide personnel with the knowledge and skills required to maintain a safe working environment
2. Control the development and implementation of work practices	2.1. ***Work practices*** are developed and implemented within OHS requirements and industrial agreement provisions
	2.2. Employment conditions are interpreted and applied in the work context
	2.3. Employees are informed of their obligations and rights under legislation and the organisation's conditions of employment
	2.4. Quality standards required by regulations and instructions are maintained in industry/enterprise work practices
	2.5. Work practices are adequately communicated to all aviation personnel and performance difficulties are identified
3. Implement work environment policy and practices	3.1. Responsibility for implementing policies and practices for a clean, safe and healthy ***work environment*** is delegated to appropriate personnel in accordance with regulatory requirements and organisational policy and procedures
	3.2. Appropriate reporting systems practices are modified to incorporate improvements in maintaining a safe, clean and healthy work environment
	3.3. Work practices and procedures are modified on the basis of incident analysis statistics to reduce/eliminate the causative factors

4. Conduct investigations into injuries and related claims	4.1. Injury reports and associated claims investigations are initiated in the shortest possible time after an incident in accordance with legislative, regulatory and organisational requirements 4.2. Injury and claim statistics are analysed to determine causes and prevent recurrence

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- ability to analyse the working environment and develop appropriate work practices
- complying with relevant legislation, rules and regulations
- ability to manage the work environment through delegation of responsibilities to appropriate personnel

Required knowledge

Look for evidence that confirms knowledge of:

- OHS legislation at Commonwealth and state/territory levels
- enterprise and organisational level OHS policies, rules and procedures
- airworthiness regulations and associated documentation relating to workplaces and work practices

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to develop, establish and manage work environment policies and practices.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be

	gathered through a variety of ways, including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Legislation, **rules and regulations**	Legislation, rules and regulations may include: • Commonwealth and state/territory OHS legislation • AAP 7001.053 Technical Airworthiness Maintenance Manual • defence instructions and standards • standing instructions • safety manuals

	• work procedures • work instructions • CASRs, Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material • maintenance organisation expositions • continuing airworthiness management organisation expositions
Work practices	Work practices apply to: • plant and machinery • all personnel present in work areas
Aspects of the work environment	Aspects of the work environment may include: • lighting • noise • atmospheric contamination • physical hazards • chemical materials • enclosed spaces

Unit Sector(s)

Aviation maintenance management

Competency field

Co-requisite units

Not applicable

MEA124B Coordinate change programs in the aviation maintenance environment

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Aeroskills Advanced Diploma training pathways. It covers the promotion and initiation of change within the aviation maintenance environment while observing regulatory requirements.

Application of the Unit

This unit requires application of management processes that promote and initiate desirable changes that will improve individual and organisational effectiveness in the aviation maintenance environment.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the	Performance criteria describe the performance needed to demonstrate

essential outcomes of a unit of competency.	achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Promote change within workplace practices	1.1. ***Change*** is promoted as an opportunity for improving individual and organisational effectiveness 1.2. Personnel are encouraged to adopt changes which make improvements in individual and organisational effectiveness 1.3. ***Opportunities and threats*** presented by change are identified and appropriate responses are planned 1.4. Personnel are involved in designing and implementing change within ***organisational and regulatory guidelines***
2. Initiate change where necessary	2.1. The proposed ***initiatives for bringing about improvements*** are supported within the organisation 2.2. Change for the better is initiated where necessary and is managed in a planned and constructive manner 2.3. ***Consultative processes*** are initiated

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- interpersonal communication
- analysis techniques
- problem solving
- team skills
- monitoring and observation

Required knowledge

Look for evidence that confirms knowledge of:

- strengths, weaknesses, opportunities, threats (SWOT) analysis
- organisational structure and culture
- policy and procedures
- legislation and regulations

- effects of change in the workplace
- change strategies
- OHS, equity, fraud and ethics

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to analyse, promote and manage the initiation of the change process within the aviation maintenance environment.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways, including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Change	Change may come about as a result of changes in: • technology • procedures • policy • government legislation • regulations • personnel • finance • ongoing evaluation and feedback
Opportunities	Opportunities can include: • improved maintenance procedures that decrease maintenance times and/or man-hours • improved procedures for the management of maintenance or logistic support activities • improvements in physical working conditions • adoption of more effective tooling or support equipment • improvements to maintenance data
Threats	Threats can include: • adoption of changes that are in violation of regulatory requirements • adoption of changes that are in violation of organisational policy or procedures • failure to recognise additional training or authorisation requirements • failure to fully comply with relevant OHS legislation • failure to get the full support of all stakeholders, including those in other parts of the overall maintenance and logistic support organisation

	• failure to recognise a need for changes to industrial awards or agreements
Organisational and regulatory guidelines	Organisational and regulatory guidelines may include: • Civil Aviation Regulations (CARs) and associated Advisory Circulars (ACs) • CASRs, Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material • AAP 7001.053 Technical Airworthiness Maintenance Manual • defence regulations and instructions • maintenance organisation expositions • continuing airworthiness management organisation expositions • quality manual • procedures manual • standing instructions • work instructions • OHS legislation (state/territory and Commonwealth)
Initiatives for bringing about improvements	Initiatives for bringing about improvements may arise from: • changes to organisational policy and procedures • reform of regulations • changes to training and authorisation requirements • management review processes • suggestions from individual stakeholders • availability of new tools or support equipment • availability of new management technology • industry or original equipment manufacturer periodicals and newsletters • feedback from other operators of the aircraft type or item of aeronautical product
Consultative processes	Consultative processes may include: • consultation with regulators where the change has a regulatory component • consultation with higher management where organisational policy and procedures are involved • consultation with stakeholders elsewhere in the logistic support network • consultation at all levels in the relevant area of the aviation maintenance environment • consultation with stakeholders in the industrial relations system • consultation with suppliers of management systems,

	tooling or support equipment

Unit Sector(s)

Aviation maintenance management

Competency field

Co-requisite units

Not applicable

MEA125B Develop aviation maintenance personnel

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Aeroskills Advanced Diploma training pathways. It covers the development of aviation maintenance personnel to comply with regulatory requirements and assist in the achievement of organisational objectives.

Application of the Unit

This unit requires application of personnel management practices in the development and training of personnel within the aviation maintenance organisation.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be

	consistent with the evidence guide.

Elements and Performance Criteria

1. Mediate in and settle grievances and disputes	1.1. Problem solving issue resolution procedures are conducted in accordance with ***relevant policy and procedures***
	1.2. ***Grievances and disputes*** are managed in a timely and respectful manner
	1.3. Grievances and disputes are managed to optimise the likelihood of a favourable outcome for all parties
	1.4. Individual's rights and obligations are respected and communicated in a clear and concise manner
	1.5. Interviews and meetings are conducted in a participative and consultative manner
	1.6. Outcomes of proceedings are recorded, stored and made available to authorised personnel in accordance with organisational policy and procedures
2. Motivate team towards achieving quality output	2.1. Team members needs and wants are recognised and where possible incorporated into work assignments consistent with their level of responsibility
	2.2. The team's achievements are promoted and rewarded in a way that openly acknowledges the importance of team members' contributions
3. Control allocation of tasks to teams and individuals	3.1. Tasks are allocated to teams and individuals to take into account the needs of the organisation's operational requirements, individual/team goals, development needs, and individual strengths, ***qualifications and authorisations***
	3.2. Prompt corrective action is taken in response to actual or potential significant deviations from plans
4. Evaluate and report individual performance	4.1. Performance expectations based on an individual's situation and work requirements are identified and agreed
	4.2. Individual performance is reviewed on an ongoing basis against performance expectation
	4.3. Reporting on individual performance is in accordance with the organisation's policies and procedures
	4.4. Feedback is provided in a constructive manner
	4.5. Performance issues that cannot be rectified or addressed are referred to appropriate personnel according to the organisation's policies and procedures
5. Coordinate individual training	5.1. Individual training requirements are identified to meet the needs of the individual and the organisation

5.2. Individual training is delivered

5.3. Opportunities for individuals to develop and apply competencies on the job are facilitated

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- negotiation and dispute resolution
- performance appraisal
- interpersonal communication
- interviewing
- planning
- application of requirements regarding matching of allocated jobs with qualification and task authorisations

Required knowledge

Look for evidence that confirms knowledge of:

- relevant government legislation
- Civil Aviation Regulations (CARs) and Advisory Circulars (ACs)
- CASRs, Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material
- maintenance organisation expositions
- continuing airworthiness management organisation expositions
- relevant defence regulations and instructions
- maintenance organisation manuals
- OHS legislation
- organisational safety manuals
- organisational policy and procedures manuals
- organisational performance appraisal reporting requirements
- personnel development principles and practices
- equity and diversity
- fraud and ethics

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment

Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to effectively perform tasks associated with the development of personnel and the resolution of grievances.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways, including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Relevant policy and procedures	Relevant policy and procedures may be found in: • organisational policy manuals • maintenance organisation manual • maintenance management plan • procedures manuals • work instructions • government legislation • defence regulations and instructions • standing instructions • grievance procedures • CASRs, Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material • maintenance organisation expositions • continuing airworthiness management organisation expositions
Grievances and disputes	Grievances and disputes may include: • progress towards qualifications • employment area • sexual harassment • equity and diversity • employment conditions • interpersonal differences
Qualifications and authorisations	Qualifications and authorisations may include: • Training Package qualifications issued under the Australian Qualifications Framework (AQF) • certificates issued by Registered Training Organisations (RTOs) for completion of non-accredited training courses • certificates issued on completion of equipment-related training courses • maintenance engineer licences and extensions thereto • aviation maintenance specialist certificates • authorisations as a CASA representative made under the provision of CARs or CASRs • task authorisations made in accordance with maintenance organisation expositions or continuing

	airworthiness management organisation expositions • task authorisations made in accordance with relevant defence regulations and instructions • task authorisations made in accordance with a maintenance management plan

Unit Sector(s)

Aviation maintenance management

Competency field

Co-requisite units

Not applicable

MEA126B Manage aircraft maintenance activities

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Aeroskills Advanced Diploma training pathways. It covers the competencies required to manage maintenance activities relating to aircraft and aeronautical product within the civil and defence regulatory systems.

Application of the Unit

This unit of competency requires application of competencies required to develop, implement and evaluate the outcomes of aircraft maintenance activities.

Applications include flight lines, hangars and workshops.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further

unit of competency.	information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Develop a maintenance program	1.1. ***Maintenance requirements for aircraft*** are determined from ***relevant documentation***
	1.2. ***Maintenance tasks*** are analysed and prioritised
	1.3. ***Resource requirements*** are identified and allocated to ensure the timely and efficient completion of maintenance tasks
2. Implement a maintenance program	2.1. Roles and responsibilities of maintenance personnel are communicated and agreed
	2.2. Appropriate resources and equipment to achieve scheduled tasks are ***considered*** and arranged
	2.3. Maintenance personnel are regularly consulted to ensure scheduled tasks are being achieved
	2.4. ***Management/stakeholder updates*** on maintenance progress are provided
	2.5. Maintenance activities are monitored to ensure compliance with ***authorised instructions***, ***policy and procedures***
	2.6. ***Advice and assistance with maintenance activities*** is provided, as required
	2.7. ***Maintenance problems*** are identified and/or anticipated and avoided or controlled in accordance with the maintenance program
	2.8. Maintenance program effectiveness is reviewed and analysed
	2.9. Proposed changes to the maintenance program are identified, investigated and negotiated with management/stakeholders
3. Evaluate and report maintenance outcomes	3.1. Final maintenance outcomes are evaluated against the program in accordance with organisational policy and procedures
	3.2. Maintenance reports are collated, evaluated and forwarded to appropriate authorities in accordance with organisational policy and procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- using documentation and relevant regulations to determine maintenance and reporting requirements
- using MSDS to determine handling precautions and PPE requirements
- application of OHS requirements
- planning
- communicating
- questioning
- fault diagnosis techniques

Required knowledge

Look for evidence that confirms knowledge of:

- sources of information relating to scheduled and unscheduled maintenance activities and configuration change requirements
- basic project planning techniques, including timing, prioritising, resourcing, monitoring and evaluation of maintenance tasks
- techniques for mapping maintenance activities and recording progress
- the aircraft and systems being maintained
- fault diagnosis and troubleshooting procedures, damage assessment philosophies and procedures, cost-effectiveness considerations for different repair types, philosophies and considerations in repair versus replacement options
- applicable regulations, organisational policy and procedures manuals, maintenance manuals and instructions
- MSDS
- OHS, equity, fraud and ethics

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to set up and implement an aircraft maintenance program, evaluate the outcomes and correctly report the maintenance activities.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.

	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways, including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Maintenance requirements for aircraft	Maintenance requirements for aircraft includes: • maintenance of the airframe and aircraft systems, power plant, avionic systems and fitted role equipment
Relevant documentation	Relevant documentation may include: • computer data systems

	• log books • authorised maintenance manuals • management directives • feedback from maintenance and operating personnel • aircraft flight and technical records • aircraft maintenance program • Civil Aviation Regulations (CARs) and Advisory Circulars (ACs) • CASRs, Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material • airworthiness directives • maintenance organisation expositions • continuing airworthiness management organisation expositions • aircraft type certificate design certificate • relevant defence regulations and instructions
Maintenance tasks	Maintenance tasks may include: • scheduled • unscheduled • preventative • corrective
Resource requirements	Resource requirements include: • personnel • spare parts and consumables • special equipment • ground support equipment, such as power carts and hydraulic rigs • personal protective equipment • tools
Considerations regarding resource requirements	Considerations regarding resource requirements may include: • personnel numbers • personnel availability • personnel qualifications • personnel authorisations and experience • quantities and availability of parts, consumables special equipment, ground support equipment, PPE and tools
Management/stakeholder updates	Management/stakeholder updates may include:

	• verbal reports and briefings • written reports, including notes, worksheets and briefs
Authorised instructions, **policy and procedures**	Authorised instructions, policy and procedures may include: • manufacturers operating manuals • management directives • maintenance manuals • defence regulations and instructions • standing instructions • maintenance management plan • maintenance organisation expositions • continuing airworthiness management organisation expositions • procedures manuals • work instructions • CARs or CASRs, Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material • quality assurance instructions • OHS policies and instructions • MSDS
Advice and assistance with maintenance activities	Advice and assistance with maintenance activities may include: • work practices • fault diagnosis procedures • damage assessment • defect investigation • assessment of repair cost-effectiveness • assessment of repair versus replacement options • monitoring of telemetry maintenance data from aircraft during flight operations
Maintenance problems	Maintenance problems may include: • lack of resources or data • unanticipated breakdowns or faults • changes in priorities

Unit Sector(s)

Aviation maintenance management

Competency field

Co-requisite units

Not applicable

MEA127B Provide technical advice in the maintenance and management of aircraft and aeronautical product

Modification History

Minor formatting and editorial changes made. Prerequisite unit version codes updated.

Unit Descriptor

This unit of competency is part of the Aeroskills Advanced Diploma training pathways. It covers the provision of technical advice in the civil aviation regulatory environment on aircraft and aeronautical product regarding the maintenance, modification, repair and management of aircraft, their systems and items of aeronautical product.

Application of the Unit

This unit of competency requires application of technical knowledge to provide advice on the need for modifications, repairs and maintenance requirements within the jurisdiction of CASA.

Applications include aircraft, aircraft systems and items of aeronautical product.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA349B	Apply basic scientific principles and techniques in aeronautical engineering situations

AND

MEA350A	Select and test aeronautical engineering materials

OR

MEA272B	Apply basic scientific principles and techniques in avionic engineering situations

AND

MEA273A Select and test avionic engineering materials

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Develop an aircraft maintenance program and minimum equipment list	1.1. The requirements for an aircraft maintenance program are determined from ***relevant regulations and organisational policies and procedures***
	1.2. An applicable maintenance program is identified or is drafted in accordance with regulatory guidelines
	1.3. The proposed maintenance program is submitted for approval
	1.4. The requirement for a minimum equipment list is determined from relevant regulations and organisational policies and procedures
	1.5. A minimum equipment list is compiled and submitted for approval in accordance with relevant regulations and organisational policies and procedures
2. Develop a continuing airworthiness management organisation exposition	2.1. The need for a continuing airworthiness management organisation exposition is determined from relevant regulations
	2.2. A continuing airworthiness management organisation exposition is drafted and submitted for approval in accordance with organisational policies and procedures
3. Develop a maintenance organisation exposition	3.1. The requirement for a maintenance organisation exposition is determined from relevant regulations
	3.2. A maintenance organisation exposition is drafted in

	accordance with regulatory guidelines and organisational policies and procedures
4. Provide mechanical advice in aircraft maintenance	4.1. ***Independent technical input*** is provided with regard to ***aircraft structure*** and ***mechanical systems***/***components***
	4.2. Knowledge of aircraft structures and ***specialist input*** is utilised to determine airworthiness
	4.3. Knowledge of aircraft mechanical systems/components and specialist input is utilised to determine airworthiness
5. Provide avionic advice in aircraft maintenance	5.1. Independent technical input is provided with regard to ***avionic systems***/***components***
	5.2. Knowledge of avionic systems/components and specialist input is utilised to determine airworthiness
6. Evaluate and review aircraft maintenance and management system elements	6.1. ***Aircraft operation and maintenance trends*** are monitored
	6.2. Maintenance ***management system elements*** are reviewed against trends and amendments are proposed in accordance with regulatory requirements, organisational policies and procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- written and oral communication
- using regulations, policies and procedures to set up maintenance control and management systems
- effective use of trend data and specialist advice to determine airworthiness and propose variations to maintenance schedules, repairs and modifications

Required knowledge

Look for evidence that confirms knowledge of:

- CARs and CASRs relating to aircraft/aeronautical product maintenance and maintenance control
- organisational policies and procedures relating to aircraft/aeronautical product maintenance and maintenance control
- aircraft structure
- mechanical systems and components
- aircraft power plants
- avionic systems and components
- OHS, equity, fraud and ethics

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to set up maintenance control and management systems and provide advice on maintenance, modification and repair of aircraft, their systems and items of aeronautical product. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways, including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Relevant regulations and organisational policies and procedures	Relevant regulations and organisational policies and procedures may include: • CARs and Advisory Circulars (ACs) • CASRs, Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material • maintenance organisation expositions • continuing airworthiness management organisation expositions • policy manuals • procedures manuals • quality manuals
Independent technical input	Independent technical input may include: • defect investigation and compilation of service difficulty reports • modification proposals • repair scheme proposals • proposed amendments to servicing schedules and maintenance data and programs • advice to maintenance personnel, senior maintenance managers and higher technical/regulatory authorities
Aircraft structure	Aircraft structure includes: • primary and secondary structural components • seating and cargo restraints
Mechanical systems/components	Mechanical systems/components include: • engines and engine systems and components • propellers and propeller system components

	• landing gear systems and components • hydro-mechanical systems comprising hydraulic, pneumatic, fuel and components • mechanical systems and components • electrical systems and components • oxygen • furnishings and safety equipment
Specialist input	Specialist input may be obtained from: • professional engineers • NDT technicians • LAMEs with applicable ratings • personnel with CASR Part 145 or Part 42F certifying authorities
Avionic systems/components	Avionic systems/components include: • electrical power generation and distribution • electrical systems • control and warning systems • flight instruments • aircraft data communication • automatic flight and engine control systems • communication systems • navigation systems • radar • role equipment, such as forward-looking infra-red (FLIR) pods
Aircraft operation and maintenance trends	Aircraft operation and maintenance trends may be obtained from: • aircraft flight and technical records • service difficulty reports • maintenance worksheets • log books • continuing analysis maintenance program reports • data from manufacturers and other operators
Management system elements	Management system elements may include: • aircraft maintenance program • minimum equipment list • continuing airworthiness management organisation exposition • maintenance organisation expositions

Unit Sector(s)

Aviation maintenance management

Competency field

Co-requisite units

Not applicable

MEA128B Provide engineering advice in the modification, maintenance and management of aircraft systems

Modification History

Minor formatting and editorial changes made. Prerequisite code versions updated.

Unit Descriptor

This unit of competency is part of the Aeroskills Advanced Diploma training pathways. It covers the provision of engineering advice in the defence airworthiness environment on mechanical and avionics systems. The advice is provided in relation to the modification, repair, maintenance and management of aircraft and associated mechanical and avionic systems.

Application of the Unit

This unit requires application of engineering knowledge to provide advice on the need for modifications, repairs and maintenance requirements within the airworthiness jurisdiction of the ADF.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA349B	Apply basic scientific principles and techniques in aeronautical engineering situations

AND

MEA350A	Select and test aeronautical engineering materials

OR

MEA272B	Apply basic scientific principles and techniques in avionic engineering situations

AND

MEA273A Select and test avionic engineering materials

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Provide mechanical systems advice	1.1. ***Independent technical input*** in the maintenance, repair and modification design relating to ***aircraft mechanical systems*** and structures is provided when requested by maintenance personnel, senior maintenance managers and higher technical authorities
	1.2. Aircraft mechanical systems knowledge is utilised to determine aircraft airworthiness
	1.3. Knowledge of ***aircraft structures*** is utilised to determine aircraft airworthiness.
2. Provide avionic systems advice	2.1. Independent technical input in the maintenance and modification design for aircraft avionic systems is provided when requested by maintenance personnel, senior maintenance managers and higher technical authorities
	2.2. ***Aircraft avionic systems*** knowledge is utilised to determine aircraft airworthiness
3. Conduct/advise an aircraft recovery	3.1. Battle/incident damage and operational capability of an aircraft is evaluated
	3.2. Repair methods and/or limits are determined
	3.3. An aircraft recovery is planned

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- oral and written communication
- management
- damage assessment, including repair scheme development and/or extension
- development of modification proposals
- review of maintenance requirements
- OHS, equity, fraud and ethics

Required knowledge

Look for evidence that confirms knowledge of:

- modification proposal development and processing
- repair scheme proposal, including equivalent strength repair design and justification for extension of an approved repair scheme
- management processes for monitoring and reviewing maintenance requirements
- aircraft structure
- aircraft mechanical systems
- aircraft avionic systems
- aircraft recovery procedures
- OHS, equity, fraud and ethics

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to assemble and provide engineering advice relating to aircraft and aircraft system maintenance, repair and modification design.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be

	gathered through a variety of ways, including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Independent technical input	Independent technical input may be provided: • utilising subject matter experts and documented technical information • verbally • in writing • in accordance with regulations and organisational policy and procedures • to operators, engineering officers and executive

	personnel
Aircraft mechanical systems	Aircraft mechanical systems may include: • engines • landing gear systems • hydro-mechanical systems comprising oil, fuel, hydraulic and pneumatic • furnishings and safety equipment • propellers
Aircraft structures	Aircraft structures may include: • primary and secondary structure • flight controls • fairings • doors • access panels
Aircraft avionic systems	Aircraft avionic systems may include: • electrical generation and distribution • electrical systems • electrical control and warning • flight instruments • aircraft data communication • automatic flight and engine control • communications • navigation • radar • life support • ordnance

Unit Sector(s)

Aviation maintenance management

Competency field

Co-requisite units

Not applicable

MEA129A Investigate technical aspects of aviation occurrences

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of Advanced Diploma training pathways. It covers the competencies required to conduct technical investigations within the ADF regulatory environment as a result of aviation occurrences.

Application of the Unit

This unit requires application of required procedures and of technical knowledge in investigating the technical aspects of aviation occurrences within the ADF airworthiness jurisdiction.

Applications include aircraft accidents, aircraft incidents and maintenance incidents.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the	Performance criteria describe the performance needed to demonstrate

essential outcomes of a unit of competency.	achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Notify authorities of occurrence	1.1. Authorities are notified of ***the occurrence*** in accordance with ADF policy and procedures 1.2. Specialist advice is provided relevant to the occurrence 1.3. ***The investigation*** is planned in accordance with ADF and statuary requirements
2. Collect evidence	2.1. Evidence of personnel involved in the occurrence is documented 2.2. Witnesses are interviewed and information is documented 2.3. Evidence associated with the occurrence is collated
3. Analyse occurrence	3.1. Information is analysed in accordance with the established objectives of the investigation 3.2. Options for action are generated which are consistent with ADF and/or statuary requirements and lead to recommendations that reduce future risk 3.3. Criteria are specified to enable objective evaluation of the options to be undertaken
4. Produce report	4.1. All evidence is reviewed and satisfactory engineering conclusions and recommendations are made 4.2. Conclusions are reviewed with stakeholders 4.3. Recommendations are costed 4.4. ***Formal reports*** are produced in accordance with ADF policy and procedures and forwarded to appropriate authorities
5. Implement corrective measures	5.1. Measures selected for implementation are feasible in terms of practicality and costing 5.2. Measures are implemented

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- oral and written communication
- interviewing

- management and analysis of evidence
- technical aspects relating to the investigation

Required knowledge

Look for evidence that conforms knowledge in:

- ADF policy and procedures
- investigation procedures
- technical aspects relating to the aircraft type and its systems
- application of a no blame culture
- culpability matrix
- OHS, equity, fraud and ethics

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to conduct technical investigations associated with aircraft accidents and incidents and maintenance incidents, develop appropriate recommendations, compile applicable reports and implement corrective measures.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways, including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The candidate must have access to

	all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
The occurrence	The occurrence may include: • aircraft accidents • aircraft incidents • maintenance incidents
The investigation	The investigation may be conducted by means of: • visual observation • interviews • review of statements • technical investigation
Formal reports	Formal reports may be: • accident and incident reports • safety reports • defect reports • investigation reports

Unit Sector(s)

Aviation maintenance management

Competency field

Co-requisite units

Not applicable

MEA130A Manage deployed/detached aviation maintenance activities

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of Advanced Diploma training pathways. It covers the competencies required for planning, implementing and evaluating deployed/detached aviation maintenance activities in the ADF airworthiness regulatory environment.

Application of the Unit

This unit requires application of competencies required to plan deployed aircraft maintenance, provide support to deployed maintenance personnel and monitor and evaluate their activities within the ADF airworthiness jurisdiction.

Applications include the deployment and detachment away from home base of aircraft that are to be supported by a deployed maintenance team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the	Performance criteria describe the performance needed to

essential outcomes of a unit of competency.	demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Plan aircraft detachment maintenance activities	1.1. ***Deployment*/*detachment*** objectives are ascertained 1.2. ***Resource requirements*** are identified, obtained and allocated 1.3. ***Maintenance personnel qualifications and authorisations*** are validated 1.4. Liaison with ***detachment locality authorities*** is established 1.5. Detachment activities are scheduled
2. Prepare maintenance plan	2.1. Maintenance plan incorporates short and long-term goals in line with flight/squadron objectives and priorities 2.2. Maintenance plan conforms to ***airworthiness regulations***, ***ADF policies and procedures*** 2.3. Realistic and relevant work objectives are developed 2.4. The maintenance plan reflects the resources available
3. Detach aircraft	3.1. ***Pre-detachment inspections*** are performed and deficiencies are reported in accordance with ADF policy and procedures 3.2. Personnel briefings are provided 3.3. Aircraft and equipment are despatched
4. Exercise limited engineering authority	4.1. Maintenance interval extension requests are submitted, as required 4.2. Carried forward unserviceabilities are authorised
5. Provide technical airworthiness/engineering advice	5.1. Technical advice relating to maintenance and to design of modifications and repairs to aircraft structure/systems is provided to ***higher authorities***
6. Monitor and evaluate maintenance activities	6.1. Maintenance outcomes are assessed against the maintenance plan goals and objectives 6.2. Deviations/problems are identified, analysed and appropriate responses are initiated 6.3. Maintenance outcomes are recorded and reported in accordance with ADF policy and procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- planning
- communication
- problem solving
- liaison
- management

Required knowledge

Look for evidence that confirms knowledge of:

- airworthiness regulations
- relevant instructions
- aircraft maintenance documentation
- maintenance report compilation
- modifications and deviations
- defects and safety reports
- OHS, equity, fraud and ethics

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to plan deployed aircraft maintenance, set up the maintenance detachment and provide limited control and oversight of maintenance activities.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways, including direct

	observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Deployment/detachment	Deployment/detachment may be to: • military airfields within Australia or overseas • civilian airfields within Australia or overseas • unprepared areas of operations within Australia and overseas
Resource requirements	Resource requirements may include: • personnel • spare parts/fly-away kits

	• ground support equipment • facilities • vehicles • finance
Maintenance personnel qualifications and authorisations	Maintenance personnel qualifications and authorisations may include: • duty statements • job descriptions • maintenance personnel authorisation workbooks
Detachment locality authorities	Detachment locality authorities may include: • military command • location facilities personnel • civilian authorities • other detached units or organisations
Airworthiness regulations, **ADF policies and procedures**	Airworthiness regulations, ADF policies and procedures may include: • aircraft maintenance regulations • safety manuals • OHS legislation • defence instructions • standing instructions • local instructions • specific aircraft/equipment maintenance manuals • servicing schedules
Pre-detachment inspections	Pre-detachment inspections may include: • facilities/accommodation • fuel • technical facilities • site survey • spare parts • fire fighting equipment • personal protective equipment
Higher authorities	Higher authorities may include: • authorised maintenance organisations • authorised engineering organisations • Director General Technical Airworthiness • senior commanders

Unit Sector(s)

Aviation maintenance management

Competency field

Co-requisite units

Not applicable

MEA131B Manage the custody, transfer and disposal of aircraft, aeronautical product and support equipment

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Aeroskills Advanced Diploma training pathways. It covers the competencies required for the application of regulations relating to proper custody, transfer and disposal of aircraft, aeronautical product and support equipment.

Application of the Unit

This unit requires application of procedures relating to the custody, transfer and disposal of aircraft, aeronautical product and support equipment.

Applications include aircraft, items of aeronautical product, special test equipment and ground support equipment

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used,

unit of competency.	further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Maintain proper custody of aircraft, aeronautical product and support equipment	1.1. Aircraft and aeronautical product are maintained and/or stored in facilities or circumstances that comply with ***regulatory requirements and organisational policies and procedures***
	1.2. ***Special test equipment*** is stored in appropriate environmental conditions and calibration is carried out at required intervals
	1.3. ***Ground support equipment*** is stored and operated in an environment that will prevent undue deterioration or wear
	1.4. Storage and control requirements are observed for ***hazardous and controlled materials***
	1.5. Maintenance records and documentation are maintained in accordance with regulatory requirements, organisational policy and procedures
2. Transfer aircraft, aeronautical product and support equipment between organisations	2.1. Aircraft, aeronautical product and support equipment are transferred between organisations in accordance with regulatory requirements, organisational policy and procedures
	2.2. Documentation and maintenance records are transferred between organisations in accordance with regulatory requirements, organisational policy and procedures
3. Dispose of aircraft, aeronautical product and support equipment	3.1. Aircraft, items of aeronautical product and support equipment are correctly classified for disposal and appropriate documentation is compiled to allow disposal in accordance with regulatory requirements, organisational policy and procedures
	3.2. Aircraft and items of aeronautical product are prepared as directed for disposal
	3.3. Maintenance records and documentation are retained and stored in accordance with regulatory requirements, organisational policy and procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- administration
- management
- application of technical knowledge in the custody and disposal of aircraft, aeronautical product and support equipment
- compliance with regulatory requirements
- compliance with environmental protection requirements

Required knowledge

Look for evidence that confirms knowledge of:

- aircraft maintenance requirements/instructions
- aeronautical product maintenance requirements
- test equipment calibration requirements
- regulatory requirements relating to custody, transfer and disposal of aircraft, aeronautical product, support equipment and environmental protection
- organisational policies and procedures relating to custody, transfer and disposal of aircraft, aeronautical product and support equipment

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to implement procedures associated with the custody, transfer and disposal of aircraft, items of aeronautical product and support equipment.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways, including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not

	require language, literacy and numeracy skills beyond those required in this unit of competency
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Regulatory requirements and organisational policies and procedures	Regulatory requirements and organisational policies and procedures may include: • Civil Aviation Regulations (CARs) and associated Advisory Circulars (ACs) • CASRs, Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material • maintenance organisation expositions • continuing airworthiness management organisation expositions • policy manuals • procedures manuals

	• AAP 7001.053 Technical Airworthiness Maintenance Manual • defence regulations and instructions • maintenance management plan • standing instructions
Special test equipment	Special test equipment may include: • measuring equipment • NDT equipment • system test boxes • test stands • automatic test equipment
Ground support equipment	Ground support equipment may include: • power carts • hydraulic rigs • pneumatic rigs • refuelling equipment • towing equipment
Hazardous and controlled materials	Hazardous and controlled materials may include: • chemicals classified as hazardous • items, such as Halon fire-extinguishers, that require an Environmental Protection Agency (EPA) licence for storage • materials that have EPA standards for storage and use

Unit Sector(s)

Aviation maintenance management

Competency field

Co-requisite units

Not applicable

MEA132A Manage budgetary resources in the aviation maintenance environment

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Aeroskills Advanced Diploma training pathways. It is relevant to senior maintenance managers and maintenance managers within AMOs operating within either the ADF or CASA regulatory systems and covers the competencies required to manage budgeting activities in aircraft and aeronautical product maintenance and logistic support activities.

Application of the Unit

This unit requires application of procedures for the development and monitoring of a budget.

Applications include aircraft and aeronautical product maintenance organisations, including engineering and logistic support areas.

In the case of major maintenance budgets associated with integrated logistic support (ILS) maintenance programs the applicable units would be MEA139A Perform aviation maintenance-related integrated logistic support management activities and PSPMNGT610A Manage public sector financial resources, from the PSP04 Public Sector Training Package.

Those who may become Accountable Managers of CASR Part 145 AMOs may, instead of this unit, consider attaining MEA146A Prepare and manage aviation maintenance organisation budgets and financial plans.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Plan a budget	1.1. ***Workplace resource needs*** are identified and documented
	1.2. Resource needs are costed
	1.3. ***Budget*** document is prepared and processed in accordance with organisational requirements
2. Manage the acquisition and allocation of budgetary resources	2.1. ***Systems for monitoring expenditure*** are maintained
	2.2. Budgets are monitored to ensure expenditure is within targets
	2.3. Appropriate technology is applied to the resource management system
	2.4. Changing priorities are identified and discussed with applicable personnel
	2.5. Budget document is amended in response to changing activities or costs
	2.6. Accountability requirements are satisfied
3. Evaluate and report budget outcomes	3.1. Expenditure against planned budget is evaluated
	3.2. Impacts on financial changes/constraints on work unit objectives are evaluated and documented
	3.3. Report on expenditure/budget is prepared in accordance with organisational policy and procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- financial management
- monitoring
- evaluation and decision making
- mathematical calculation

Required knowledge

Look for evidence that confirms knowledge of:

- organisational budgetary processes
- tasking over the period of the budget
- requirements in CASR regarding financial status of maintenance organisations
- fraud and ethics

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to prepare and apply budgetary resources in the aviation maintenance management environment.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways, including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is, the candidate is not

	in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The candidate must have access to all materials and documentation required and must be permitted to refer to any relevant workplace procedures, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Application

Application of this unit may relate to:

- scheduled or unscheduled maintenance
- individual or team-related activities

Workplace resource needs

Workplace resource needs may include:

- personnel
- finance
- equipment
- facilities
- items of aeronautical product
- breakdown spares and materials
- consumables

Budget

Budget may be:

- annual
- length of project/activity
- quarterly
- for another period of time as required

Systems for monitoring expenditure

Systems for monitoring expenditure may include:

- paper-based systems

- computerised systems
- receipts and invoices
- quotes

Unit Sector(s)

Aviation maintenance management

Competency field

Co-requisite units

Not applicable

MEA133B Communicate aviation technical and maintenance management knowledge

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Aeroskills Diploma and Advanced Diploma training pathways. It covers the competencies required to effectively communicate aviation technical and maintenance management knowledge. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of written and oral communication skills relating to aviation technical and maintenance management knowledge.

Applications include the evaluation of written technical communication and the delivery of verbal briefings.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Evaluate written technical communication	1.1. Content of ***written technical communication*** is checked for accuracy and appropriateness 1.2. Format is checked against regulatory and organisational policy and procedures 1.3. The need for additional information is identified and writer advised of same 1.4. Verified communication is actioned in accordance with ***regulatory requirements***, ***organisational policy and procedures***
2. Present technical and non-technical briefings	2.1. ***Briefing*** is planned and prepared in a well structured manner 2.2. Briefing is delivered in an audible, articulate manner 2.3. ***Information*** delivered is accurate 2.4. Audiovisual equipment, where applicable, is used in an effective, professional manner

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- oral communication
- written communication
- evaluation
- planning of briefings and use of aids to delivery

Required knowledge

Look for evidence that confirms knowledge of:

- applicable technical aspects

- requirements for written communication
- planning and delivery of briefings

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to evaluate written technical communication and deliver verbal briefings on a wide range of topics related to maintenance management.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways, including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The candidate must have access to all equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team related activities
Written technical communication	Written technical communication may include: • instructions • reports • requests being submitted in accordance with regulatory requirements
Regulatory requirements, **organisational policy and procedures**	Regulatory requirements, organisational policy and procedures may include: • Civil Aviation Regulations (CARs) and associated Advisory Circulars (ACs) • CASRs, Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material • maintenance organisation expositions • continuing airworthiness management organisation expositions • policy manuals • procedures manuals • quality manuals • work instructions • AAP 7001.053 Technical Airworthiness Maintenance Manual • defence instructions • standing instructions • maintenance management plans
Briefing	Briefing may be for: • employees of the organisation • business associates, such as teaming partners • clients • contractors and subcontractors

	• representatives of regulatory bodies • higher authorities • visitors
Information	Information may include: • changes to policy and procedures or regulations • workload requirements • organisational activities • organisational familiarisation • technical knowledge and skills • work procedures • non-technical matters

Unit Sector(s)

Aviation maintenance management

Competency field

Co-requisite units

Not applicable

MEA134B Establish, maintain and evaluate the organisation's occupational health and safety system

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Aeroskills Advanced Diploma training pathways. It covers the competencies required to establish, maintain and evaluate an organisation's OHS system in order to ensure that the workplace is, so far as is practicable, safe and without risks to the health of employees.

The unit is based on the National Guidelines for integrating OHS competencies into national industry competency standards (NOHSC: 7025, 1998).

Application of the Unit

This unit requires application of OHS legislation and principles to establish, maintain and evaluate an OHS system within the maintenance organisation.

Applications include flight lines, hangars and workshops.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Establish and maintain the framework for the OHS system	1.1. OHS policies are developed which clearly express the organisation's commitment with respect to OHS within the area of managerial responsibility and how ***relevant OHS legislation*** will be implemented, consistent with overall organisational policies
	1.2. OHS responsibilities and duties which will allow implementation and integration of the OHS system are clearly defined, allocated and included in job descriptions and duty statements for all relevant positions
	1.3. Financial and human resources for the operation of the OHS system are identified and sought in a timely and consistent manner
	1.4. Information on the OHS system and procedures for the area of managerial responsibility is provided and explained in a form that is readily accessible to employees
2. Establish and maintain participative arrangements for the management of OHS	2.1. ***Appropriate consultative processes*** are established and maintained in consultation with employees and their representatives in accordance with relevant OHS legislation and consistent with the organisation's overall process for consultation
	2.2. Issues raised through participation and consultation are dealt with and resolved promptly and effectively in accordance with procedures for issue resolution
	2.3. Information about the outcomes of participation and consultation is provided in a manner accessible to employees
3. Establish and maintain procedures for identifying hazards	3.1. Existing and potential ***hazards*** within the area of managerial responsibility are correctly identified and identification confirmed in accordance with OHS legislation, codes of practice and trends identified from the OHS records system
	3.2. A procedure for ongoing identification of hazards is

	developed and integrated within systems of work and procedures
	3.3. Activities are appropriately monitored to ensure that this procedure is adopted effectively throughout the area of managerial responsibility
	3.4. Hazard identification is addressed at the planning, design and evaluation stages of any change in the workplace to ensure that new hazards are not created
4. Establish and maintain procedures for assessing risks	4.1. Risks presented by identified hazards are correctly assessed in accordance with OHS legislation and codes of practice
	4.2. A procedure for ongoing **assessment of risks** is developed and integrated within systems of work and procedures
	4.3. Activities are monitored to ensure that this procedure is adopted effectively throughout the area of managerial responsibility
	4.4. Risk assessment is addressed at the planning, design and evaluation stages of any change within the area of managerial responsibility to ensure that the risk from hazards is not increased
5. Establish and maintain procedures for controlling risks	5.1. Measures to control assessed risks are developed and implemented in accordance with the hierarchy of control, relevant OHS legislation, codes of practice and trends identified from the OHS records system
	5.2. When measures that control a risk at its source are not immediately practicable, interim solutions are implemented until a control measure is developed
	5.3. A procedure for ongoing control of risks, based on the hierarchy of control, is developed and integrated within general systems of work and procedures
	5.4. Activities are monitored to ensure that the ***risk control procedure*** is adopted effectively throughout the area of managerial responsibility
	5.5. Risk control is addressed at the planning, design and evaluation stages of any change within the area of managerial responsibility to ensure that adequate risk control measures are included
	5.6. Inadequacies in existing risk control measures are identified in accordance with the hierarchy of control, and resources enabling implementation of new measures are sought and/or provided according to appropriate procedures
6. Establish and maintain organisational	6.1. Potential hazardous events are correctly identified

procedures for dealing with hazardous events	6.2. Procedures which would control the risks associated with ***hazardous events*** and meet any legislative requirements as a minimum are developed in consultation with appropriate emergency services 6.3. Appropriate information and training is provided to all employees to enable implementation of the correct procedures in all relevant circumstances
7. Establish and maintain an OHS program	7.1. ***An OHS training program*** is developed and implemented to identify and fulfil employees' OHS training needs as part of the organisation's general training program
8. Establish and maintain a system for OHS records	8.1. ***A system for keeping occupational health and safety records*** is established and monitored to allow identification of patterns of occupational injury and disease within the area of managerial responsibility.
9. Evaluate the organisation's OHS system and related policies, procedures and programs	9.1. The ***effectiveness of the OHS system and related policies, procedures and programs is assessed*** according to the organisation's aims with respect to OHS 9.2. Improvements to the OHS system are developed and implemented to ensure more effective achievement of the organisation's aims with respect to OHS 9.3. Compliance with OHS legislation and codes of practice is assessed to ensure that legal OHS standards are maintained as a minimum

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- ability to analyse working environment and design appropriate OHS management systems
- ability to analyse relevant data and evaluate OHS system effectiveness
- ability to assess resources to establish and maintain OHS management systems

Required knowledge

Look for evidence that confirms knowledge of:

- provisions of relevant OHS legislation
- principles and practice of effective OHS management
- management arrangements relating to regulatory compliance
- enterprise hazards and risks, control measures and relevant expertise required
- characteristics and composition of workforce and their impact on OHS management

- relevance of enterprise management systems to OHS management

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to effectively utilise OHS legislation and organisational policies and procedures to establish, maintain and evaluate an OHS system.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways, including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The candidate must have access to all equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Application	*Application of this unit may relate to*: • scheduled or unscheduled maintenance performed on flight lines, in hangars and in workshops • individual or team-related activities
This competency is to be exhibited in accordance with all relevant OHS legislation, **particularly**:	• state/territory/Commonwealth OHS Acts, regulations and codes of practice, including regulations and organisational codes of practice relating to hazards present in the workplace • general duty of care under OHS legislation and common law; requirements for the maintenance and confidentiality of occupational injury and disease • requirements for provision of OHS information and training • provisions relating to health and safety representatives and/or OHS committees • provisions relating to OHS issue resolution • Civil Aviation Safety Regulations (CASRs), Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material
Establish and maintain the framework for OHS may include:	• policy development and updating • determining the ways in which OHS functions will be managed. This may include distinct OHS management activities, or inclusion of OHS functions within a range of management functions and operations, such as maintenance of plant and equipment; purchasing of materials and equipment • designing operations, work flow and materials handling; planning or implementing alterations to site, plant, operations or work systems; mechanisms for review and allocation of human, technical and financial resources needed to manage OHS, including defining and allocating OHS responsibilities for all relevant positions • mechanisms for keeping up to date with relevant information and updating the management arrangements for OHS, for example, information on health effects of hazards, technical developments in risk control and environmental monitoring and changes to legislation • mechanisms to assess and update OHS arrangements

	relevant to legislative requirements; a system for communicating OHS information to employees, supervisors and managers within the enterprise
Appropriate consultative processes for management of OHS may cover:	• OHS committees and other committees, for example, consultative, planning and purchasing • health and safety representatives; employee and supervisor involvement in OHS management activities, for example, OHS inspections, audits, environmental monitoring, risk assessment and risk control • procedures for reporting hazards, risks and OHS issues by managers and employees • inclusion of OHS in consultative or other meetings and processes
Establish and maintain procedures for identifying hazards may include developing and updating procedures for:	• workplace inspections, including plant and equipment; audits • maintaining and analysing OHS records, including environmental monitoring and health surveillance reports • maintenance of plant and equipment • reviews of materials and equipment purchases, including manufacturers and suppliers information • employee reporting of OHS issues
Establish and maintain procedures for assessing risks may include developing and updating procedures for:	• determining the likelihood and severity of adverse consequences form hazards • OHS audits; workplace inspections; maintenance of plant and equipment; purchasing of materials and equipment • planning or implementing alterations to site, operations or work systems • analysis of relevant records and reports, for example, injuries and incidents, hazardous substances inventories/registers, audit and environmental monitoring reports and OHS committee records
Establish and maintain procedures for controlling risks may include developing and updating procedures for:	• assessing the OHS consequences of materials, plant or equipment prior to purchase • obtaining expert advice; appropriate application of measures according to the hierarchy of control, namely: elimination of the risk • engineering controls • administrative controls • personal protective equipment • designing safe operations and systems of work; inclusion of new OHS information into procedures • checking enterprise compliance with regulatory

	requirements
Establish and maintain organisational procedures for hazardous events may include developing and updating procedures for:	• making inventories of, and inspecting, high risk operations • inspecting systems and operations associated with potentially hazardous events, for example, emergency communications, links to emergency services, fire fighting, chemical spill containment, bomb alerts and first aid services
Establish and maintain an OHS training program may include:	• arrangements for ongoing assessment of training needs, for example, relating to supervisors and managers • specific hazards; specific tasks or equipment • emergencies and evacuations • training required under OHS legislation • allocation of resources for OHS training, including acquisition of training resources, development of staff training skills and purchase of training services • induction training; training for new operations, materials or equipment
Establish and maintain a system for keeping OHS records may cover:	• identifying records required under OHS legislation, for example, worker's compensation and rehabilitation records • hazardous substances registers; material safety data sheets (MSDS) • major accident/injury notifications • certificates or licences • manufacturers and suppliers OHS information • OHS audits and inspection reports • maintenance and testing reports • workplace environmental monitoring and health surveillance records • records of instruction and training • first aid/medical post records
Effectiveness of the OHS system and related policies, procedures and programs is assessed through:	• reviewing the effectiveness of the OHS management system • regular review of operating procedures • regular analysis of OHS records • audits against OHS legislative requirements

Unit Sector(s)

Occupational health and safety

Competency field

Co-requisite units

Not applicable

MEA135A Use computers in aviation maintenance-related integrated logistic support activities

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Aeroskills Diploma and Advanced Diploma training pathways. It covers the competencies required to effectively use computers in support of maintenance-related ILS activities and comply with regulatory requirements relating to the compilation and safeguarding of data.

Application of the Unit

This unit requires application of competencies relating to the use of the Internet, word processing, spreadsheets, databases and project planning software to perform tasks relating to ILS activities associated with aviation maintenance, including aircraft technical records.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the	Performance criteria describe the performance needed to demonstrate

essential outcomes of a unit of competency.	achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Use word processing software	1.1. Correspondence is drafted using word processing software 1.2. Reports, including tables, are drafted using word processing software 1.3. Instructions are drafted and amended using word processing software
2. Use spreadsheets	2.1. Spreadsheets used within the enterprise are used to obtain data 2.2. Enterprise spreadsheets are updated through data input 2.3. A simple spreadsheet is developed for a ***typical ILS-related application***
3. Use databases	3.1. ***Databases used for maintenance-related ILS activities*** within the enterprise are used to obtain data 3.2. Databases are populated with data, as required
4. Use project-planning software	4.1. Project-planning software is used to plan a ***typical maintenance-related ILS task*** 4.2. Project-planning software is used to monitor the progress of a task 4.3. Use and input data to enterprise maintenance task management software, where applicable
5. Use the internet	5.1. Regulatory information is obtained from applicable internet websites 5.2. ***Technical data*** is obtained from Internet websites
6. Maintain and store backup copies of data	6.1. ***Required media for backup copies of data*** is determined 6.2. Backup copies of data are made and are updated as required by ***regulatory requirements***, ***organisational policy and procedures*** 6.3. Backup copies of data are stored in accordance with regulatory requirements, organisational policy and procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- use of word processing software
- development and use of spreadsheets
- populating and obtaining data from databases
- use of project planning software
- use of the internet to obtain regulatory and technical data

Required knowledge

Look for evidence that confirms knowledge of:

- types of word processing software commonly used in the maintenance-related ILS environment
- development and use of spreadsheets
- database usage in the maintenance-related ILS environment
- use of project planning software and the types of task management software used by maintenance organisations
- internet websites relating to regulatory requirements, standards and specifications
- use of internet search engines to obtain technical and commercial data
- procedures for backing up and storing data

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to use computer software and the internet effectively in support of maintenance-related ILS activities.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways, including direct observation, supervisor's reports, project work, samples

	and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The candidate must have access to all equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Spreadsheets	A typical ILS-related application for a spreadsheet may include: • costing a maintenance task or proposed modification • assessing the economic value of a proposed repair • costing a training program for maintenance personnel • management of items of aeronautical product both on and off aircraft • management of life critical parts • maintenance programs

Databases	Databases used for maintenance-related ILS activities may include: • life cycle costing data • baselines for reliability, availability and maintainability • life support analysis record data • personnel task authorisations and training records • management of items of aeronautical product both on and off aircraft • management of life critical parts • maintenance programs
Project planning software	A typical maintenance-related ILS task for project planning software may include: • planning an aircraft maintenance task • planning a modification program • planning a maintenance personnel training program
Technical data	*Technical data may include*: • standards • specifications • vendor data on materials, piece parts and components • engineering data
Required media for backup copies of data	Required media for backup copies of data may be specified in: • regulations • organisational policies and procedures • contract requirements
Regulatory requirements, organisational policy and procedures	Regulatory requirements, organisational policy and procedures may include: • CASRs, Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material • maintenance organisation expositions • continuing airworthiness management organisation expositions • aircraft maintenance programs • quality manuals • procedures manuals • work instructions • AAP 7001.053 Technical Airworthiness Maintenance Manual • defence regulations and instructions

	• standing instructions • maintenance management plan • applicable overseas airworthiness regulations, such as Federal Aviation Regulations and European Aviation Safety Regulations

Unit Sector(s)

Integrated logistics support

Competency field

Co-requisite units

Not applicable

MEA136A Assess aviation maintenance spares and manage repairable items

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Aeroskills Diploma and Advanced Diploma training pathways. It covers the competency required to assess spares and manage repairable items in aviation maintenance activities while complying with relevant airworthiness regulations. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of competencies required to apply ILS procedures in the assessment of spares and the management of repairable items.

Applications include aircraft and mechanical and avionic items of aeronautical product.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA135A	Use computers in aviation maintenance-related integrated logistic support activities

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Perform spares assessment activities	1.1. Enterprise ***spares assessment and supply information systems*** are identified and applied 1.2. Maintenance data, spares usage data and trends are monitored and required holdings of spares are varied, as required 1.3. Spares availability problems are identified and strategies are determined to resolve the problems 1.4. Where applicable, ***suitable substitute parts*** are identified and necessary engineering approvals obtained in accordance with ***applicable regulations***, ***organisational policy and procedures*** 1.5. Acceptable sources of substitute parts are identified and requirements for documentation, such as certification reports and release notes, are specified in accordance with regulatory requirements, organisational policy and procedures 1.6. Configuration management requirements are observed in spares assessing 1.7. Data required for input to ***ILS records*** is provided where applicable
2. Manage repairable items	2.1. Maintenance and reliability data is monitored and changes to maintenance programs are proposed, where necessary 2.2. Documentation is raised to allocate ***repairable items*** to maintenance facilities in accordance with contractual requirements, organisational policy and procedures 2.3. Any specific ***investigation or additional maintenance requirements*** are specified 2.4. Data required for input to ILS records is provided, where applicable

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- using software packages relevant to spares assessing and repairable item management
- oral communication
- written communication
- problem solving
- application of regulatory and procedural requirements
- identification and resolution of problems relating to availability of spares

Required knowledge

Look for evidence that confirms knowledge of:

- ILS principles relating to spares assessing, repairable item management and configuration management
- software packages used by the enterprise for spares assessment, supply management and repairable item management
- use of drawings, standards and specifications to identify substitute piece parts and materials
- use of catalogues and specifications to identify substitute components (items of aeronautical product)
- regulations, organisational policies and procedures relating to spares assessment and repairable item management
- OHS requirements relating to substitute piece parts, materials and components
- fraud and ethics

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to effectively apply organisational procedures and ILS principles relating to the assessment of spares and the management of repairable items.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid,

	sufficient, current and authentic. Evidence can be gathered through a variety of ways, including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Spares assessment and supply information systems	Spares assessment and supply information systems may be: • manual or computer-based systems • systems developed within the organisation or proprietary systems purchased by the organisation
Suitable substitute parts	Suitable substitute parts may be identified from: • modification data • drawings, standards and specifications in the case of

	piece parts and materials • manufacturers catalogues and specifications in the case of complete components (items of aeronautical product)
Applicable regulations, organisational policy and procedures	Applicable regulations, organisational policy and procedures may include: • Civil Aviation Regulations (CARs) and associated Advisory Circulars (ACs) • CASRs, Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material • maintenance organisation expositions • continuing airworthiness management organisation expositions • AAP 7001.053 Technical Airworthiness Maintenance Manual • organisational policy manuals • quality manuals • organisational procedures manuals • work instructions • defence regulations and instructions • maintenance management plan • standing instructions
ILS records	ILS records may include: • logistic support analysis plans • life cycle costing data • failure modes, effects and criticality analysis • baselines for reliability, availability and maintainability • life support analysis record data
Repairable items	Repairable items may include: • removable structural components • mechanical components • items of role equipment • hydraulic, pneumatic and fuel components • items of safety equipment • fire detection and extinguishing components • engines and engine components • propellers and rotors • electrical system components • instrument system components • radio system components • electronic systems components

Investigation or additional maintenance requirements	Investigation or additional maintenance requirements may include: • service difficulty (defect) report investigation • incident investigation • warranty claims • modifications • compliance with airworthiness directives or special technical instructions • service bulletin compliance

Unit Sector(s)

Integrated logistics support

Competency field

Co-requisite units

Not applicable

MEA137A Write aviation technical publications

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit is part of Diploma and Advanced Diploma training pathways. It covers the competencies required to draft and process aviation technical publications in accordance with relevant standards and regulatory requirements. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of competencies relating to the researching of data, drafting and processing of technical publications and amendments to technical publications.

Applications include maintenance manuals, operating instructions, parts catalogues, procedures manuals and related technical publications.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA135A	Use computers in aviation maintenance-related integrated logistic support activities

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Research data	1.1. ***The required medium***, ***style and layout*** are determined 1.2. ***Relevant data*** is obtained or accessed 1.3. Potential problems are identified and ***relevant experts*** are identified and consulted 1.4. Problem resolution strategies are determined
2. Draft publication or publication amendment	2.1. The publication or amendment is drafted using relevant guidelines and specified software package 2.2. Required graphics are selected and illustrator briefs are raised 2.3. Copyright legislation is observed 2.4. Completed graphics are inserted into the draft and annotations/labels added 2.5. The draft is prepared for publishing and is submitted for editorial review
3. Process draft publication or amendment	3.1. Proof copy of the publication or amendment is submitted for client acceptance 3.2. Publication or amendment is published 3.3. The publication management database is updated and the completed publication is delivered or distributed

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- research
- utilisation of international document standards, such as IATA and GAMA
- oral communication
- written communication

- problem solving
- use of word processing software and graphics packages

Required knowledge

Look for evidence that confirms knowledge of:

- word processing and graphics packages used for technical publication and publication amendment drafting
- publication writing conventions, standards and specifications
- the use of style guides
- illustration techniques
- reading of engineering drawings, including:
  - standard drawing sheets and drawing layouts
  - types of drawing
  - engineering standards and specifications
  - technical terms and abbreviations
  - sectioned views
  - dimensioning
  - tolerancing of dimensions
  - types of fit
  - aircraft standard hardware
  - screw threads
  - threaded components and washers
  - locking devices
  - rivets
  - special structural fasteners
  - spur gears
  - welding symbols and geometry tolerancing
  - surface texture
  - material specifications and metal surface treatment
- reading of electrical and electronic circuits and wiring diagrams
- development of system schematics
- development of block diagrams
- sketching
- use and development of logic charts
- development of fault diagnosis guides
- the preparation of illustrators' briefs
- the preparation of indexes to publication contents
- problem solving methodology
- regulations relating to technical publications
- OHS legislation
- for print-based publications, procedures for processing drafts through DTP to printing,

binding and distribution
- for electronic format publications, the principles for publication database systems and the development of input data
- requirements for, and methods of, maintaining publication records

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to research, draft and process technical publications and amendments thereto.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways, including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
The required medium	The required medium may be: • print-based • electronic • microfiche
Style and layout	Style and layout may be determined from: • an applicable style guide • contract requirements • industry standards and specifications
Relevant data sources	Relevant data sources may include: • design and production data and drawings • parts and materials listings • operating procedure documentation • maintenance schedules • modification instructions and service bulletins • manufacturer's and trade catalogues • relevant legislation and regulations
Relevant experts	Relevant experts may include: • the client • design engineers and staff • production staff • component and material suppliers • regulator representatives

Unit Sector(s)

Integrated logistics support

Competency field

Co-requisite units

Not applicable

MEA138B Perform aviation technical publication management activities

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Aeroskills Advanced Diploma training pathways. It covers the competencies required to manage the drafting, publication, distribution and control of technical publications while complying with applicable regulatory requirements.

Application of the Unit

This unit requires application of competencies relating to the application of editorial and management knowledge and skills in the production, publication, distribution and amendment of technical publications.

Applications include maintenance manuals, operating instructions, parts catalogues, procedures manuals and related technical publications.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA137A Write aviation technical publications

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Manage the drafting and publication of technical publications	1.1. The required ***style for technical publications*** is determined and specified 1.2. Technical publication drafts are edited
2. Manage the amendment of technical publications	2.1. ***The requirement for publication amendment*** action is identified 2.2. Amendment action is initiated 2.3. Draft amendments are ***edited***
3. Manage the distribution and control of technical publications	3.1. A publication distribution and amendment status database is established 3.2. Publications are managed in accordance with ***regulatory requirements***, ***organisational policies and procedures*** 3.3. The operation of the publication distribution and control system is monitored

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- specifying the style and layout of technical publications
- determining the need for amendment action
- effective control of technical publication distribution
- oral communication
- written communication

Required knowledge

Look for evidence that confirms knowledge of:

- layout, content, production and use of technical publication style guides
- applicable publication standards and systems, including ATA100 and Australian Air publications
- copyright legislation
- graphics conventions and techniques
- desktop publishing software systems
- printing methods
- binder systems
- regulations governing the production, amendment, custody and distribution of technical publications
- version control procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform management activities relating to the production, amendment and distribution of technical publications.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways, including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The candidate must have access to all materials and documentation required and must be permitted to refer to any relevant workplace procedures,

	product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities

Specifying style for technical publications	Specifying style for technical publications may involve:
	• determination of the client's requirements
	• identification of applicable standards and specifications for publications within the industry
	• identification of any applicable regulatory requirements
	• selection of an appropriate publishing system
	• development and issue of a style guide that specifies:
	  • writing style
	  • layout
	  • fonts
	  • graphics selection and conventions
	  • procedures for dealing with copyright issues
	  • requirements for processing of drafts
	  • preparation for publication

The requirement for publication amendment action	The requirement for publication amendment action may arise from: • publication user feedback • modifications to systems or components • test procedure development or refinement • quality system audits • service bulletins • compliance with regulatory requirements
The editing process	The editing process may involve checking for: • compliance with the style guide • completeness and ease of understanding • appropriate use of graphics • observance of applicable regulations and legislation including copyright • final draft mark-up for desktop publishing • application of version control procedures
Regulatory requirements, **organisational policies and procedures**	Regulatory requirements, organisational policies and procedures may be found in: • Civil Aviation Regulations (CARs) and associated Advisory Circulars (ACs) • CASRs, Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material • maintenance organisation expositions • continuing airworthiness management organisation expositions • organisational policy manuals • procedures manuals • quality manuals • AAP 7001.053 Technical Airworthiness Maintenance Manual • defence regulations and instructions • maintenance management plan • standing instructions

Unit Sector(s)

Integrated logistics support

Competency field

Co-requisite units

Not applicable

MEA139A Perform aviation maintenance-related integrated logistic support management activities

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit is part of Advanced Diploma training pathways. It covers the competencies required to perform a range of maintenance-related ILS activities at a managerial level within applicable airworthiness regulatory requirements. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of competencies relating to ILS elements and related data management and analysis tools in the maintenance-related management and support of systems throughout their life of type.

Applications include support of maintenance on aircraft, aircraft systems, avionic systems and items of aeronautical product.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Maintain logistic support analysis plans	1.1. Logistic support analysis plans are reviewed in line with trends in system supportability and affordability 1.2. Revisions are proposed to logistic support analysis plans
2. Perform life cycle cost analysis	2.1. Actual and anticipated costs ***through to life of type*** are identified 2.2. Cost data is ***analysed***
3. Establish and maintain baselines for reliability, availability and maintainability	3.1. Data on in-service reliability, availability and maintainability is gathered 3.2. ***Data is reviewed*** against established baselines and action is initiated to deal with deviations from the established baselines
4. Revise logistic support analysis record data	4.1. Logistic support analysis parameters are analysed using current data 4.2. ***Analysis results*** are entered in the logistic support analysis record
5. Manage data	5.1. ***A technical data management system*** is developed and managed in accordance with contractual and ***regulatory requirements*** 5.2. ***The relevance of technical data*** is monitored and amendment action is initiated where necessary 5.3. Logistic support management information systems are applied and supported

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- oral communication
- written communication
- populating and extracting data from databases
- task analysis
- applying ILS principles

Required knowledge

Look for evidence that confirms knowledge of:

- ILS management and support philosophy and practice
- logistic support analysis (LSA) concepts and methods, including:
  - preparation of LSA plans
  - management and conduct of LSA programs
  - supportability analysis
  - task analysis
  - LSA record population
- reliability, availability and maintainability (RAM) determination and application, including:
  - baseline determination and application
  - RAM modelling
  - reliability and maintainability apportionment
- data management concepts and methods

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform management-related ILS activities in support of the maintenance of aircraft, systems and items of aeronautical product.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways, including direct

	observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The candidate must have access to all relevant ILS management tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Life cycle cost analysis	Life cycle cost analysis includes: • the systematic identification and analysis of all actual and anticipated costs associated with implementing and sustaining a system throughout its service life
Costs through to life of type	Costs through to life of type may arise from: • operation • engineering support • maintenance support

	• supply support • facilities costs • personnel costs
Data analysis	Data analysis: • may be performed using enterprise databases and analysis tools
Data review	Data is reviewed: • using enterprise databases and analysis tools
Analysis Results	Analysis results may include: • in-service failure mode effects and criticality analysis • corrective maintenance analysis • reliability centred maintenance analysis • maintenance task analysis • repair level analysis
Regulatory requirements	Regulatory requirements may be found in: • Civil Aviation Regulations (CARs) or Civil Aviation Safety Regulations (CASRs) • AAP 7001.053 Technical Airworthiness Maintenance Manual
A technical data management system	A technical data management system should provide for: • maintenance of all applicable technical data • retention of original and backup data in separate locations • storage in a manner that minimises the risk of data loss, theft or destruction
The relevance of technical data	The relevance of technical data may be determined through: • monitoring engineering, maintenance and supply support activities • utilising user feedback

Unit Sector(s)

Integrated logistics support

Competency field

Co-requisite units

Not applicable

MEA140A Supervise aviation maintenance teams and perform maintenance quality inspections

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit is part of Diploma and Advanced Diploma training pathways. It covers the competency required to supervise maintenance teams and perform maintenance quality inspections in the ADF airworthiness regulatory environment.

Candidates must have been appointed as a MQI or Independent Inspector in order to be assessed for this unit of competency.

Application of the Unit

This unit requires application of competencies relating to the management and supervision of aviation maintenance teams and the performance of maintenance quality inspections.

Applications include maintenance teams within the ADF and within contractor organisations maintaining ADF aircraft and items of aeronautical product.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Plan maintenance for teams	1.1. ***Maintenance tasks*** are identified and interpreted from available ***maintenance data or schedule*** in accordance with organisational procedures 1.2. Workload is organised in order of priority taking into consideration all required maintenance tasks and specified timeframes 1.3. ***Required resources*** are identified and obtained Tools and support equipment are checked for serviceability and currency of calibration, where applicable
2. Implement team maintenance activities	2.1. Maintenance tasks are allocated to team members after consideration of individual experience, qualifications and task authorisations 2.2. Team members are clearly briefed on their responsibility and function in the team 2.3. Team members are correctly authorised to operate the required items of ***ground support and test equipment***
3. Provide guidance	3.1. ***Guidance*** is provided to team members appropriate to the complexity or criticality of the maintenance task and the experience level of the individual 3.2. Guidance is provided in determining the cause of complex faults or faults not covered in maintenance manual fault diagnosis guides
4. Monitor and certify maintenance quality	4.1. Activities are checked and personnel are guided to ensure that maintenance is performed and certified in accordance with the ***applicable documentation***, ***policies and procedures*** 4.2. Check inspections are performed on completed work or work stages and certified in accordance with ***regulatory requirements***, policies and procedures

5. Perform human resource management activities at the supervisor level	5.1. ***Human factors affecting job performance*** are identified and addressed 5.2. The possibility of ***maintenance errors*** is minimised 5.3. Sound teamwork is maintained through an awareness of contributing factors 5.4. ***Sound employment relations*** are maintained
6. Perform workplace training tasks	6.1 **O*n-job training*** is delivered 6.2. The Supervisor's Verification portion of the Workplace History Sheets (Section 3) of the Log of Industrial Experience and Achievement is completed 6.3. Expert witness verification of competency for workplace assessors is provided, when required 6.4. Opportunities for individuals to develop competencies are provided

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- oral communication
- written communication
- planning
- supervision
- inspection
- advanced troubleshooting
- man management
- on-job training delivery
- application of OHS requirements in the workplace

Required knowledge

Look for evidence that confirms knowledge of:

- principles of supervision
- high level technical knowledge applicable to the job
- fault diagnosis techniques
- maintenance data and documentation
- regulations, policies and procedures relating to supervision and certification of maintenance
- human factors and guidelines
- equity, diversity and fraud
- Commonwealth and state/territory OHS legislation

- MSDS
- use of PPE
- confined space entry permits
- avoidance of maintenance errors
- National Aeroskills Training Package, including relevant competency units and training pathways
- The Log of Industrial Experience and Achievement, responsibility for making entries and responsibility for the certification of entries
- the role of supervisors in assisting workplace competency assessors
- techniques for delivery of on-job training
- relevant industrial awards and/or workplace agreements, or conditions of service

Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to supervise work teams performing aviation maintenance tasks and certify maintenance quality/independent inspections. Individuals will need to have been appointed as an MQI or Independent Inspector before being assessed for competency in this Unit.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
Context of and specific resources for assessment	This unit may be assessed on the job, or a combination of both on and off the job. Where partial assessment occurs off the job an appropriate simulation must be used where the range of conditions reflects realistic workplace

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	situations. The competencies covered by this unit would be demonstrated by an individual working as a team leader. The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Maintenance tasks	Maintenance tasks include: • scheduled maintenance • unscheduled maintenance • configuration changes • modification incorporation • repair • overhaul
Maintenance data or schedule	Maintenance data or schedule includes any or all of: • maintenance records • maintenance manuals • servicing schedules • computer maintenance data systems

	• service bulletins • special technical instructions • modification orders • repair instructions • observations and feedback from maintenance personnel and aircrew • internal work instructions or management directives
Required resources	Required resources may include: • personnel in required numbers with applicable experience, qualifications and task authorisation • spares • consumables • tools • special equipment • ground support equipment • PPE
Ground support and test equipment	Ground support and test equipment may include: • power carts • hydraulic rigs • pneumatic rigs • stands and docking • component test stands
Guidance	Guidance may encompass: • damage assessment • assessment of repair cost effectiveness • assessment of replacement options
Applicable documentation, policies and procedures	The applicable documentation, policies and procedures include: • operating manuals • maintenance manuals • organisational policy manuals • quality manuals • safety manuals • MSDS • procedures manuals • work instructions • defence instructions and standards • standing instructions
Regulatory requirements	Regulatory requirements are found in:

	• AAP 7001.053 Technical Airworthiness Maintenance Manual • Commonwealth and state/territory OHS legislation
Human factors affecting job performance	Human factors affecting job performance may include: • individual health and disability • social psychology • time pressure and workload • the physical work environment
Actions to minimise maintenance errors may include:	Actions to minimise maintenance errors may include: • varying the extent of supervision according to the nature of the task and work conditions • allowance for qualification and experience levels within the team • allowance for human error and 'Murphy's Law' ('If something can go wrong, it will')
Sound employment relations	Sound employment relations include knowledge of: • relevant sections of industrial awards • content of enterprise agreements • conditions of employment and service that that apply to the particular workplace
On-job training	On-job training involves: • the reinforcement of knowledge and skills gained in off-job training and guiding their application to specific on-job maintenance tasks

Unit Sector(s)

Aviation maintenance management

Competency field

Co-requisite units

Not applicable

MEA141B Manage risk in aviation maintenance

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Aeroskills Advanced Diploma training pathways. It covers the competencies required to manage risk in aviation maintenance organisations while complying with legislative and regulatory requirements. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of competencies relating to the identification of risks and the management of risk.

Applications include both management of the performance of maintenance and in the provision of maintenance or ILS.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Identify the criteria for risk management	1.1. Risk management procedures are identified from the organisation's ***risk management plan***/***maintenance organisation exposition***
	1.2. Where a risk management plan does not exist ***potential risks*** are identified and documented
	1.3. ***Criteria for managing the identified risks*** are determined in accordance with ***standard risk management procedures*** and documented as a risk management plan
	1.4. The process for evaluation and review of the risk management plan is identified from the organisation's plan or an ***evaluation methodology*** is developed and included in the plan developed in accordance with criteria 1.3
2. Manage risk	2.1. Activities are monitored in accordance with the risk management plan
	2.2. Performance deviations are identified and responses are initiated in accordance with the risk management plan
	2.3. The effectiveness of risk responses are monitored and reported in accordance with risk management plan procedures
3. Evaluate risk management processes	3.1. Risk management outcomes are reviewed and analysed to assess the effectiveness of the risk management plan
	3.2. Recommendations on variations to the plan are developed and processed in accordance with organisational policy and procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- application of standards and procedures for assessing and evaluating risks

- development of risk treatment processes
- assessment of legal impact of risk occurrence
- evaluation of risk management plan operation
- oral communication
- written communication

Required knowledge

Look for evidence that confirms knowledge of:

- organisational policies and procedures for risk management
- CASR Part 145 Manual of Standards, in particular, Acceptable Means of Compliance and Guidance Material
- maintenance error management programs
- AS/NZS ISO 31000:2009 Risk Management - Principles and guidelines
- regulatory impact of risks
- contractual impact of risks
- cost-benefit analysis
- Commonwealth and state/territory OHS and environment protection legislation
- evaluation techniques
- equity, fraud and ethics

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to develop, apply and evaluate a risk management plan.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways, including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.

Context of and specific resources for assessment	This unit may be assessed on the job, or a combination of both on and off the job. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Risk management plans	Risk management plans may include: • potential risks and their probability of occurrence and degree of severity • treatment options in each case • responsibility for implementing treatment options and required response times • resources required for risk management • plan implementation timeframe • periodic review timetable • internal reporting system • review methodology
Potential risks	Potential risks may include:

	• human factors, such as fatigue, illness and maintenance errors • OHS issues resulting in injury or death • regulatory and procedural violations, such as inappropriate use of minimum equipment lists and failure to observe type certification standards • providing maintenance guidance to remotely located aircrew or maintenance personnel • maintenance difficulties, such as spares shortages and unexpected failures of systems or components • support equipment failure • environmental problems • contractual issues • skill and experience shortfalls • maintenance cost escalation • natural events
Criteria for managing the identified risks	Criteria for managing the identified risks may include: • level and degree of acceptability of each identified risk • legal aspects, such as regulatory violations and contractual commitments • cost of managing specific risks versus the cost to the organisation if the risk eventuated • stakeholder perceptions and expectations
Standard risk management procedures	Standard risk management procedures may be found in: • organisational risk management policies • websites dealing with risk management • AS/NZS ISO 31000:2009 Risk Management - Principles and guidelines • CASR Part 145 Manual of Standards
Evaluation methodology	Evaluation methodology may include: • oversight of day-to-day operations • interviews with personnel in the organisation • physical inspections • incident reports • questionnaires • periodic review of risk treatment procedures and outcomes

Unit Sector(s)

Aviation maintenance management

Competency field

Co-requisite units

Not applicable

MEA142B Manage self in the aviation maintenance environment

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Aeroskills Diploma and Advanced Diploma training pathways. It covers the competencies required to perform work ethically and efficiently in complying with legislative and regulatory requirements while managing the maintenance of aircraft and aircraft systems. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of competencies relating to self-management and skills/professional development relating to aviation management.

Applications include all aspects of aircraft maintenance, aeronautical product maintenance and other related ILS activities.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Manage self	1.1. Responsibility for own workload is assessed, prioritised and accepted 1.2. Work is undertaken autonomously to complete ***tasks***/***roles*** in a timely manner and in accordance with ***organisational and/or legislative and regulatory standards*** 1.3. Independence and initiative are demonstrated in identifying and solving problems 1.4. Initiative is exercised in liaison with colleagues in identifying and analysing alternative approaches to managing workplace issues and problems 1.5. Own performance is evaluated and monitored and confidence is built in own capability, ideas and vision 1.6. Performance feedback from others is used to improve work performance 1.7. Organisational structure, career paths and eligibility criteria are identified 1.8. Awareness is maintained of the effects of fatigue, drugs and alcohol on performance
2. Work effectively with others	2.1. Effective ***communication*** is applied when dealing with others 2.2. Others are dealt with ethically and principles of diversity applied 2.3. Judgement and discretion are used as is appropriate to the situation 2.4. The trust and confidence of others is developed and maintained at all levels of the organisation 2.5. Others are mentored in specific areas of aviation maintenance and maintenance management and performance feedback is provided 2.6. Advantages, disadvantages and consequences of ideas are identified and considered

	2.7. An awareness of the possibility of fraudulent behaviour is maintained
3. Comply with requirements	3.1. Applicable contractual, legislative, regulatory and organisational requirements are complied with 3.2. Work requirements are surveyed and quotes are provided 3.3. Organisation and customer needs are surveyed and assessed
4. Manage work priorities and resources	4.1. Competing demands to achieve objectives and meet requirements for deliverables are prioritised 4.2. Work plans, programs and budgets are prepared, monitored and reviewed 4.3. Resource use to achieve objectives is planned 4.4. The nature, extent and impact of any issues or changes relating to work priorities and resource allocation are identified
5. Facilitate and capitalise on change and innovation	5.1. Change is introduced by working closely with others 5.2. Opportunities for product and service enhancement and options for achieving the desired result are identified
6. Contribute to development of own skills and professional capability	6.1. Competency standards relevant to current employment and career path through managing own skills development are interpreted and applied 6.2. Problem solving skills are reviewed for further development 6.3. Own personal knowledge and skills are assessed and learning opportunities are accessed as required to fill gaps and enhance skills 6.4. New ideas and techniques are accepted and time and effort invested in learning new skills 6.5. Performance feedback is used to identify and develop ways to improve competence

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- oral communication
- written communication
- applying principles of equity and diversity
- managing own work performance

- managing and interfacing with others
- applying legislation, regulations and organisational policies and procedures relevant to role and workplace
- managing own professional development

Required knowledge

Look for evidence that confirms knowledge of:

- OHS legislation at Commonwealth and state/territory levels
- human factors
- equal opportunity legislation
- privacy legislation
- freedom of information legislation
- equity guidelines
- diversity principles
- detection of fraud
- Australian Quality Training Framework (AQTF) and relevant Training Packages
- leadership principles
- management principles and techniques
- regulations, policies, instructions and guidelines relevant to the organisation and role
- problem solving principles
- constant improvement principles and procedures
- change management

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to demonstrate initiative and effectively manage their own workload and professional development while engaged in the management of aviation maintenance and/or related ILS activities.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be

	gathered through a variety of ways, including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Competency in this unit underpins competency in other aspects of the workplace role of employees with managerial responsibilities in aviation maintenance and related ILS activities. It may be appropriate to assess parts of this unit in conjunction with units relating to the performance of such aspects of the role.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations.The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Tasks/roles	Tasks/roles may include: • self-directed application of knowledge and skills in

	performing tasks related to maintenance management and/or related ILS activities
Organisational and/or legislative and regulatory standards	Organisational and/or legislative and regulatory standards may include: • equal employment opportunity legislation • Commonwealth and state/territory OHS legislation • Civil Aviation Regulations (CARs) and Advisory Circulars (ACs) • CASRs, Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material • maintenance organisation expositions • continuing airworthiness management organisation expositions • procedures manuals • position descriptions • quality manuals • safety manuals • work instructions • relevant overseas regulations, such as Federal Aviation Regulations or Joint Aviation Regulations • AAP 7001.053Technical Airworthiness Maintenance Manual • defence regulations and instructions • Australian air publications • standing instructions • maintenance management plans • duty statements
Communication	Communication may be by way of: • oral communication, including briefings and presentations • written communication, including email
Quotations	Quotations may include any or all of: • man-hours • time requirements • spares, materials and consumables • resources, such as facilities, support equipment and tooling • price

Unit Sector(s)

Aviation maintenance management

Competency field

Co-requisite units

Not applicable

MEA143B Develop and manage maintenance error management programs

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Aeroskills Advanced Diploma training pathways. It covers the competencies required to develop and manage maintenance error management programs within the civil aviation maintenance environment, as required by CASA.

Application of the Unit

This unit requires application of competencies relating to the development and management of maintenance error management programs aimed at reducing human error rates within aviation maintenance organisations.

Applications include all maintenance activities relating to aircraft and aeronautical product that are performed within the jurisdiction of CASA.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Develop a maintenance error management program	1.1. The aims and objectives of the maintenance error management program are clearly stated and the program is structured in accordance with ***regulatory requirements***
	1.2. The maintenance error management program encourages open and blame free (unless negligent) reporting of maintenance errors
	1.3. Disciplinary boundaries are clearly stated for application in the event of negligence
	1.4. A maintenance error investigation procedure is specified, including compliance, where applicable, with ***regulatory procedures for the reporting of significant safety issues*** related to maintenance errors
	1.5. A strategy and procedure is specified for the development and delivery of staff training programs relating to maintenance error management
	1.6. Reference to the maintenance error management program is included in ***applicable organisational policies and procedures***
	1.7. Provision is made for feedback of program results to the workforce, and for analysis of accumulated data to identify maintenance error trends
2. Manage a maintenance error management program	2.1. Reported events are reviewed to determine if they should be investigated within the procedures of the maintenance error management program
	2.2. Significant safety issues related to maintenance errors are reported to CASA and/or the Australian Transport Safety Bureau (ATSB)
	2.3. Events applicable to the maintenance error management program are investigated in accordance with program procedures
	2.4. The results of the investigation are analysed to determine appropriate action to minimise the probability of a recurrence of the event

2.5. Necessary action is taken and feedback is provided to the workforce

2.6. The event and resultant action are reviewed to determine what information, if any, should be forwarded to bodies external to the organisation

2.7. Accumulated data is reviewed in accordance with the program procedures to determine and monitor maintenance error trends

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- written and oral communication
- use of regulations and advisory material to set up a maintenance error management program
- specification of training requirements
- application of human factors
- trend analysis

Required knowledge

Look for evidence that confirms knowledge of:

- relevant regulations and advisory material
- human factors
- investigative processes
- trend analysis
- how to specify training requirements
- equity, fraud and ethics

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to develop and manage a maintenance error management program within an aviation maintenance organisation.

Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways, including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Regulatory requirements and	Regulatory requirements and associated guidelines include:

associated guidelines	• CASR, Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material
Regulatory procedures for the reporting of significant safety issues	Regulatory procedures for the reporting of significant safety issues include: • Major Defect Report (MDR) • Service Difficulty Report (SDR) • Confidential Aviation Incident Report (CAIR)
Applicable organisational policies and procedures	Applicable organisational policies and procedures may include: • maintenance organisation expositions • quality manual • safety manual • procedures manual • work instructions

Unit Sector(s)

Aviation maintenance management

Competency field

Co-requisite units

Not applicable

MEA145A Conversion from allied trades for employment in aviation maintenance workshops

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is applicable to individuals with Certificate III or Certificate IV qualifications in allied trades (primarily automotive, electrotechnology or metals and engineering) who are to be employed in aviation maintenance workshops. It covers parts of common core competencies required of all individuals employed on the maintenance of items of aeronautical product that are aviation maintenance specific and would not have been covered in allied trade units that relate to similar areas of expertise. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit of competency requires application of common core skills and knowledge that are aviation maintenance specific and meet the requirements of the two Regulators, CASA and the ADF.

The skills and knowledge will be applied during the maintenance of items of aeronautical product in aviation maintenance workshops.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Identify and access aviation industry manuals, specifications and drawings	1.1. ***Appropriate manuals*** are identified and accessed for the type of aircraft or component to be maintained 1.2. Amendment status is clearly established to ensure the correct specifications and procedures are applied
2. Amend manuals, specifications or drawings	2.1. Manual, specification or drawing changes and/or amendments are incorporated and documented correctly in accordance with ***statutory regulations and/or enterprise procedures***
3. Store manuals, specifications or drawings	3.1. Manuals, specifications or drawings are stored appropriately to ensure prevention of damage, ready access and updating of information, when required, in accordance with regulatory and/or enterprise procedures
4. Apply standard trade practices	4.1. Common types of aircraft attachment hardware are correctly selected and used 4.2. Common types of safety locking devices and fasteners are correctly selected and used 4.3. Aircraft components, devices and hardware are lockwired in the correct manner, using the appropriate wire gauge 4.4. Common types of aircraft connectors and plumbing are accurately assembled or connected
5. Interpret and apply quality standards in the aviation maintenance environment	5.1. Standards or specifications set out in maintenance documents and process specifications are identified and interpreted 5.2. Enterprise quality requirements are identified, confirmed and applied
6. Plan steps and organise work to complete task	6.1. Steps are planned in conjunction with the work of other personnel to allow achievement of practical outcomes, in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices 6.2. ***Human factors*** are allowed for in planning of steps

6.3. Work activity is organised with other involved personnel, allowing for relevant human factors and using relevant communication processes to ensure safe and appropriate sequencing of tasks

6.4. All necessary ***documentation*** related to job planning and progress is completed, and recorded in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- accessing, interpreting and applying information from industry manuals, including paper-based, microfiche or computer-based media, relating to work activities, including determination of manual amendment status, knowledge of manual structures and locating relevant information/instructions for work activity
- amending industry manuals to reflect current/approved amendment status
- identifying and interpreting information from drawings and diagrams in aircraft maintenance manuals, including component scaling, section, assembly, location, drawing applicability and amendment status from the title block
- correct handling and storage of drawings, manuals and industry media, i.e. microfiche and digital formats
- determining correct lubricants for specified applications
- identifying common ferrous and non-ferrous aircraft materials
- identifying common aircraft composite and non-metallic materials (other than wood)
- identifying aircraft hardware by markings, part numbers, size, shape and material
- installing aircraft hardware using standard practices/techniques to ensure safe security and includes:
  - minimum thread engagement
  - split pinning
  - lockwiring
  - application of locking compounds
  - locking tabs and spring washers
  - lock nuts
- installing aircraft hardware using tightening, torquing and tensioning techniques
- identifying various types of aircraft rigid and flexible plumbing and their connectors
- identifying aircraft control cables and related cable system hardware
- applying workplace hazard reporting and identification procedures
- being able to differentiate the elements which constitute the quality system and the ability to identify processes, workplace regulations and ISO 9000 compliant documentation and

specifications within the workplace environment
- interpreting information relating to the work activity from a range of industry manuals, industry and enterprise regulations and industry documentation
- considering OHS regulations/precautions specific to the work activity and others working in the vicinity of the planned work activity, particularly with regard to electricity, gases (especially oxygen), oils and chemicals
- using MSDS
- applying human factors in planning maintenance activities

Required knowledge

Look for evidence that confirms knowledge of:

- the types of industry manuals used in aviation maintenance and types of media
- requirements for custody and upkeep of industry manuals
- techniques for obtaining and applying data contained in industry manuals
- types of standard aircraft hardware and methods of identification, including bolts, nuts, washers, pins (cotter and tapered), and fasteners (rivets and camlocs)
- materials from which hardware is manufactured and its applications, including plain, corrosion resistant and temperature/heat resistant
- types of safety locking devices and their application
- common ferrous and non-ferrous aircraft materials, heat treatment and testing
- characteristics and properties of common composite and non-metallic materials (other than wood)
- types of aircraft cable, turnbuckles, end fittings, tensiometers, pulleys and cable system components, and aircraft flexible control systems
- types and characteristics of lubricants
- typical quality systems and their operation in the workplace
- workplace quality documentation, such as quality manuals, procedures manuals, work instructions and worksheets
- the relationship between the quality system and OHS requirements, such as workplace hazard reporting
- the relationship between the quality system and identification systems for aircraft hardware, materials and components
- the impact of human factors on the safe and effective performance of maintenance on aircraft and aircraft components
- MSDS

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	A person who demonstrates competency in this unit must be able to correctly apply common core skills and knowledge covered by this unit that are specific to the maintenance of items of aeronautical product in aviation maintenance workshops.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	This unit must be linked in its assessment and application to those units that apply to actual maintenance of items of aeronautical product. It is essential that all OHS requirements are met and understood. The transferability of general manual interpretation and use in accordance with relevant aircraft component publications/maintenance regulations/orders and standards and practices must be clearly established. Evidence of underlying knowledge and skills associated with the interpretation and use of manuals is required to supplement understanding of the structure and regulatory requirements associated with the aircraft maintenance environment in this area. Evidence of knowledge about how aircraft materials, standard items of hardware and fittings are used in component maintenance and the application of quality systems and work planning must be demonstrated. The ability to apply the skills and knowledge across a variety of applications must also be demonstrated. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one manual from each of Groups 1, 2 and 3 listed in the Range Statement and on the tasks listed in Groups 4 to 7. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry .
Context of and specific resources for assessment	Competency should be assessed in the work environment, or by use of simulated activities, covering the use of publications/maintenance regulations/orders and standards and practices, the application of aviation maintenance specific standard trade practices and of task planning and quality system application in the aeronautical product maintenance environment. This unit must be linked in its assessment and application to those that apply to the actual maintenance of items of aeronautical product.

Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Appropriate manuals	Appropriate manuals may include: 1. Aircraft publications, maintenance instruction manuals, process specifications, servicing or service bulletins or structural repair manuals 2. Tooling or equipment manuals, manufacturer's manuals, standard practices, enterprise aviation regulations and publications 3. Illustrated parts catalogues, aircraft wiring manuals or drawings
Application of standard aviation trade practices	Application of standard aviation trade practices applies to the selection and use of hand and power tools and equipment associated with workshop-related activities in the aircraft maintenance environment that involve: 4. Laying out and fabricating simple items from common aircraft materials 5. Assembling items using a representative range of common types of aircraft attachment hardware for which relevant fits and clearances, appropriate safety locking devices and fasteners, including lockwire, are correctly selected and applied 6. Assembling/connecting a range of common aircraft connectors and plumbing, applying safety locking devices where applicable 7. Assembling/connecting aircraft control cables and

	applying safety locking devices where applicable
Regulatory and enterprise procedures	Regulatory and enterprise procedures may be found in: • CARs or SASRs • maintenance organisation manual • procedures manuals • work instructions • quality manuals • safety manuals • applicable defence regulations and instructions • standing instructions
Human factors	Human factors are: • the factors relating to human behaviour and performance in aviation maintenance environments that are defined by either CASA or the ADF
Documentation	Documentation may include: • maintenance logs, overhaul test/check sheets, job history sheets, traveller cards, maintenance reports, irregularity reports, serviceable tags or removal tags • MSDS or material record sheets

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

MEA108B Complete aviation maintenance industry documentation

MEA146A Prepare and manage aviation maintenance organisation budgets and financial plans

Modification History

New unit.

Unit Descriptor

This unit of competency is part of the Advanced Diploma training pathways. It covers the competencies required to prepare and manage AMOs budgets and financial plans and to effectively interface with professional finance advisers and accountants.

Application of the Unit

This unit requires application of procedures for the development and management of budgets and financial plans required to enable the effective operation of an AMO within the bounds of its exposition.

Applications include the financial management obligations of Accountable Managers of AMOs operating under the ADF or the CASA regulatory systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Analyse strategic opportunities and intended maintenance activities	1.1 ***Strategic opportunities*** are expressed in terms of aircraft and aeronautical product maintenance activities
	1.2 All intended maintenance activities are converted into special projects or work programs
	1.3 Financial trends are analysed and interpreted in the context of the organisational strategic objectives
	1.4 Financial planning objectives, process timeframes and resources are clearly identified
2 Develop revenue, expenditure and capital investment proposals	2.1 Individuals and groups are given responsibility for the development of specific ***budgets and plans***
	2.2 Consultation occurs with all ***relevant groups and individuals*** throughout the organisation
	2.3 Proposals are developed taking account of past experience, present trends and future expectations
	2.4 Outcomes of proposals are clearly linked to organisational strategic objectives
	2.5 Realistic cost-benefit and Maintenance Organisation Exposition compliance costs are incorporated into all proposals
	2.6 Organisational ***investment target rates*** are met for ***capital expenditure*** proposals
	2.7 Performance measures and tactics for monitoring and control processes are identified for each proposal/action and a **financial risk management plan** is developed
	2.8 Proposals comply with the organisation’s values, policies, code of conduct, ***legal and ethical obligations***
	2.9 Proposals are developed within the agreed timeframes
	2.10 ***Supporting evidence*** is valid and sufficient to allow proper evaluation of the proposals
3 Build agreement for budgets and financial plans	3.1 Negotiation is undertaken with relevant groups and individuals in ways that build commitment to the plans
	3.2 Links to the achievement of organisational strategic objectives are identified and agreed

	3.3	Outcomes are confirmed in terms of clear, concise objectives and timeframes
	3.4	Negotiations lead to a clear agreement of those matters to be incorporated into budgets and plans
	3.5	Budgets and plans incorporate the outcomes of negotiations and meet organisation's approval processes
	3.6	Delegations, accountabilities and responsibilities are agreed and confirmed in writing
	3.7	Final budget and plans are clearly documented and a communication plan developed
4 Communicate budget and financial plans	4.1	Budget/financial plan communication package is reviewed by finance specialists
	4.2	Package is amended/revised where appropriate
	4.3	Training activities are undertaken with users of the budget and plans across the organisation
	4.4	All data and terms are defined and understood by the users of the plans
	4.5	Communication outcomes are tested to ensure clear understanding of objectives, processes and accountabilities
5 Monitor and control activities against plans	5.1	Delegations and budget accountabilities are confirmed in writing prior to budget period
	5.2	Funds are allocated in accordance with budget objectives and parameters
	5.3	Recording systems and documentation meet all audit requirements and legal obligations
	5.4	Risk management plans are implemented and contingency plans put in place for all financial plans
	5.5	Performance is monitored and variances promptly identified
	5.6	Variances are analysed in conjunction with relevant experts to determine cause and effect

	5.7 Remedial action is taken swiftly to minimise negative impact and maximise benefits
	5.8 Budgets and plans are renegotiated/restructured where necessary to optimise organisational performance
6 Report outcomes of financial plans	6.1 Records of financial performance are properly maintained within organisational systems
	6.2 Financial performance is analysed and reported in a form and language appropriate to the audience
	6.3 Non-financial objectives are reported in the context of overall organisational performance
	6.4 Strategies and plans are reviewed and updated to optimise organisational performance

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- relevant legislation from all levels of government that affects business operation, especially in regard to OHS and environmental issues, equal opportunity, industrial relations and anti-discrimination
- requirements in CASR and TAMM regarding financial status of maintenance organisations
- aircraft and aeronautical product maintenance and maintenance management/certification requirements
- financial planning within the organisation
- budgeting
- organisation’s intended aircraft and aeronautical product maintenance activities
- consultative methods and processes
- capital investment evaluation techniques
- performance measurement
- organisation roles in respect to financial delegations, accountabilities and responsibilities
- standards for organisational record-keeping and audit requirements

Look for evidence that confirms skills in:

- analysis and interpretation of relevant financial information
- development of formal estimates of reviews, costs, cash flows and logistic requirements
- communication/consultation to ensure all relevant groups and individuals are advised of what is occurring and are provided with an opportunity for input
- cost and benefit analysis to produce balanced arguments to support financial proposals

- risk management to assess probability and consequences of any potential negative event
- investment analysis to evaluate capital expenditure proposals (NPV, IROR, etc)
- negotiating agreement on budgets and financial plans with the relevant managers
- relating to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities
- arranging and delivering training to ensure team members and other managers understand the budget/financial planning objectives and processes
- analysing and interpreting positive and negative variances from budget/plan, determining the reasons therefore, and identifying potential actions to remediate the situation
- developing and implementing systems to ensure financial performance records are collected, maintained and properly reported

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to prepare and manage budgets and financial plans in the aviation maintenance organisation environment.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways, including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The candidate must have access to all materials and documentation required and must be permitted to refer to any relevant workplace procedures, codes, standards, manuals and reference materials. The

	assessment environment should not disadvantage the candidate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Legislation, codes and national standards relevant to the workplace	Legislation, codes and national standards relevant to the workplace may include: • CASRs and associated Manuals of Standards • TAMM • award and enterprise agreements and relevant industrial instruments • relevant legislation from all levels of government that affects business operation, especially in regard to OHS, environmental and sustainability issues, equal opportunity, and anti-discrimination
Strategic opportunities	Strategic opportunities may include: • aircraft operators and fleet operators seeking to outsource maintenance • aeronautical product maintenance needs • changing regulatory requirements for maintenance • new aircraft types • provision of logistic support services • opportunity to respond to requests for tender to provide aircraft and/or aeronautical product maintenance • opportunity to accept sub-contract maintenance tasks from other maintenance organisations
Budgets and plans	Budgets and plans may include: • aircraft maintenance budgets • aeronautical product maintenance budgets

	• financial budgets • logistic services sales budgets • regulatory compliance budgets • capital expenditure budgets • cash flow plans
Relevant groups and individuals	Relevant groups and individuals include: • all personnel within the organisation affected by the budgets and financial plans being developed
Investment target rates	Investment target rates refers to: • the minimum percentage rate of return required by the organisation for a capital investment project to proceed
Capital expenditure	Capital expenditure refers to: • those components of the budget which, for internal policy reasons, are considered to provide benefits over more than one financial period and are to be evaluated as capital expenditure projects
Legal and ethical obligations	Legal and ethical obligations include: • compliance with all relevant statutes, regulations and audit requirements of the organisation, along with the organisation's policies, values and codes of conduct
Supporting evidence	Supporting evidence may include: • cost-benefit analyses • risk management plans • market research results • tender details • net present value • interest rate of return • pay pack calculations
Delegations	Delegations refers to: • the decision-making accountabilities relating to the person's position description and/or other written and verbal delegations
Accountabilities and responsibilities	Accountabilities and responsibilities include: • clarification of who is to be accountable for a decision or action prior to its execution, and identification of groups, individuals and activities for which a person is responsible for managing
Training activities	Training activities may include:

	• small group discussions • informal meetings • formal, structured competency-based training • television and video conferencing • e-learning
Delegations and budget accountabilities	Delegations and budget accountabilities may include: • monitoring expenditure • authorising expenditure within limits • reporting on variances to budget/plan • taking remedial action within budget authority
Audit requirements	Audit requirements include: • the internal standards required in the management of budgets and financial plans, approved by external/internal auditors
Risk management	Risk management refers to: • the process of identification of potential negative events and the development of plans to mitigate or minimise the likelihood of the negative event occurring and/or the consequences in the event it does occur
Appropriate non-financial objectives	Appropriate non-financial objectives may include: • environmental • sustainability • compliance with Maintenance Organisation Exposition (CASA regulatory system) • compliance with Maintenance Management Plan (ADF regulatory system) • compliance with requirements of the applicable airworthiness regulator • OHS • quality and safety management • market share • customer service • security or any other key result area

Unit Sector(s)

Aviation maintenance management

Custom Content Section

Not applicable.

MEA147A Perform airworthiness management and maintenance program tasks

Modification History

Release 1 - New unit of competency

Unit Descriptor

This unit of competency deals specifically with competencies required for employment within Civil Aviation Safety Regulation (CASR) Part 42 Continuing Airworthiness Management Organisations (CAMOs).

Application of the Unit

This unit involves the application of skills and knowledge required for employment within CAMOs on airworthiness review and maintenance program approval tasks.

Work will typically be performed as a staff member of a CAMO as defined in the Part 42 Manual of Standards and in the associated Acceptable Means of Compliance and Guidance Material.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA137A Write aviation technical publications

Employability Skills Information

This unit contains employability skills

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1	Perform airworthiness review tasks	1.1	Level of authorisation to perform airworthiness review tasks is determined
		1.2	Continuing airworthiness records for the aircraft under review are obtained
		1.3	Airworthiness status of the aircraft is determined
		1.4	The aircraft is surveyed for compliance with regulations and with the aircraft's approved type design
		1.5	The completion of any required corrective action is verified
		1.6	A record of the review is written in accordance with CAMO procedures
		1.7	The airworthiness review certificate is raised and issued in accordance with CAMO procedures, or, where applicable, a notice of decision not to issue an airworthiness review certificate is raised and issued
2	Perform maintenance program approval tasks	2.1	Level of authorisation to perform maintenance program approval tasks is determined
		2.2	Maintenance programs are developed in accordance with applicable regulations and CAMO procedures
		2.3	Variations to approved maintenance programs are developed in accordance with applicable regulations and CAMO procedures
		2.4	Maintenance schedules are developed in accordance with CAMO procedures for inclusion in the maintenance program
		2.5	A schedule of life-limited parts is developed in accordance with CAMO procedures for each maintenance program
		2.6	Maintenance program approval documentation is raised and processed in accordance with regulatory requirements and CAMO procedures
		2.7	Maintenance program variation approval documentation is raised and processed in accordance with regulatory requirements and CAMO procedures

		2.8	One-off extensions to maintenance task intervals are processed in accordance with CAMO procedures
		2.9	Maintenance program approval records are raised and maintained in accordance with CAMO procedures
3	Perform reliability program tasks	3.1	The requirement for a reliability program is determined
		3.2	The reliability program is developed and written in accordance with CAMO procedures
		3.3	Responsibilities for reliability program administration are determined and recorded in the program
		3.4	Reliability data sources are identified and data collection, recording, and analysis procedures and responsibilities are specified in the program details
		3.5	Performance standards are determined and recorded in the program details along with a process for regular review
		3.6	Procedures are developed for investigation when performance standards are exceeded and for the implementation and recording of corrective action
		3.7	Operation of the reliability program is monitored to ensure program effectiveness

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- communicating both verbally and in writing with CAMO staff, aircraft operators, aircraft type certificate holder and regulator staff
- writing and applying airworthiness review procedures
- determining aircraft airworthiness status and surveying aircraft for compliance with requirements
- raising and processing airworthiness review certificates
- developing and drafting maintenance programs
- revising maintenance programs
- maintaining maintenance program data

- obtaining and maintaining maintenance program approval
- setting up and operating a reliability program

Required knowledge

Required knowledge includes:

- continuing airworthiness management regulatory requirements
- the CAMO exposition and individual appointments and responsibilities
- aircraft design and design approval regulations
- aircraft type certificates and Maintenance Review Boards
- Airworthiness Directives
- manufacturer's maintenance data and flight manual
- aircraft weight and balance
- maintenance program development and review procedures
- reliability program design, data analysis methods and data presentation

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform tasks within a CAMO associated with airworthiness review, maintenance program development and review and reliability program development and operation.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways, including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not

	in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Method of assessment	This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with applying scientific principles and techniques in aeronautical engineering situations or other units requiring the exercise of the skills and knowledge covered by this unit.
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
CAMO authorisations	CAMO authorisations may be found in the CAMO Exposition
Regulations and associated standards and advisory material	Regulatory requirements, standards and advisory material relating to continuing airworthiness management may be found in: • Civil Aviation Safety Regulations (CASRs) • CASR Part 42 Manual of Standards • CASR Part 42 Guidance Material and Acceptable Means of Compliance • Users Guide CASR Part 42 • CAAP 42M-2(0) Reliability Programs • FAA AC 20-157 How to prepare Reliability

	Assessment Plans for Aircraft Systems and Equipment • FAR Part 23 Airworthiness Standards for Airplanes in the Normal, Utility, Aerobatic or Commuter Categories • FAR Part 25 Airworthiness Standards for Airplanes in the Transport Category • EASA CS-23 Certification Specifications for Aeroplanes in the Normal, Utility, Aerobatic or Commuter Categories • EASA CS-25 Certification Specifications for Airplanes in the Transport Category • AC 21-15 (1) Supplemental Type Certificates
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA201B Remove and install miscellaneous aircraft electrical hardware/components

Modification History

Minor formatting and editorial changes made. Prerequisite version code updated.

Unit Descriptor

This unit of competency is part of all Avionic Certificate IV training pathways and is also part of the Mechanical Aircraft Maintenance Engineer licensing pathway. It covers the competencies required for the removal and installation of miscellaneous electrical hardware and components found in various systems of both fixed and rotary wing aircraft. Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of skills in basic soldering and in crimping associated with the removal and installation of electrical hardware.

Applications include miscellaneous electrical hardware fitted to fixed or rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes

MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Remove aircraft electrical hardware	1.1. System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted where necessary to ensure personnel safety
	1.2. ***Removal of electrical hardware*** is carried out in accordance with the applicable maintenance manual
	1.3. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
	1.4. Removed components are tagged, packaged or discarded in accordance with specified procedures
2. Install aircraft electrical hardware	2.1. Electrical hardware components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life
	2.2. Physical installation of electrical hardware is carried out in accordance with the applicable maintenance manual
	2.3. System is reinstated to correct physical condition in preparation for testing, as necessary

2.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- the preparation and termination of electrical cables to aircraft industry standards, using crimping techniques, soldering techniques and solder sleeves joints
- the correct interpretation of aircraft wire markings, terminal block identification and plug/socket pin numbering systems
- inspection of electrical looms and harness pre and post removal and installation to ensure minimum bends are maintained, cable is not in tension, plugs are correctly aligned, security of route ensures no chaffing of insulation, adequate clipping and cable ties have been utilised and construction complies with aircraft industry standards
- positive identification of miscellaneous electrical hardware and/or components in all aircraft systems

Required knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- connection of hardware and plugs
- application of relevant OHS practices
- the use of approved maintenance documentation and aircraft publications relating to miscellaneous aircraft electrical hardware and components
- electrical wiring used in aircraft and wire marking
- plug/socket pin numbering and terminal block identification
- cable and loom installation requirements
- crimping tools and crimp terminals
- soldering techniques and the use of solder sleeve joints
- electrical fundamentals and related mathematical and physics principles

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must

	be able to apply hand skills, use specialist tools and use maintenance publications to remove and install miscellaneous items of aircraft electrical hardware/components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that applicable cleanliness requirements and OHS safety precautions are fully observed, including awareness of electrostatic discharge procedures. Evidence of transferability of skills and knowledge related to removal and installation is essential. An understanding of the attachment methods, connection of hardware and system operation as they relate to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on each of the connection methods 1, 2 and 3 listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility

of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Hardware connection methods	Removal and installation of electrical hardware involves one or more of the following connection methods: 1. Bolted 2. Soldered 3. Plug connectors
Types of electrical hardware	Electrical hardware includes: • switches, relays, lamps, terminal blocks, current limiters, circuit breakers, fuses, sockets, potentiometers, capacitors, inductors, magnetic amplifiers, transformers, rheostats, resistors and diodes, miscellaneous sensors and minor components hard mounted throughout the aircraft, busbars, lugs, ferrules, splices, connectors and electrical, electronic cables and looms
Basic soldering and crimping	The work will include the application of basic soldering and crimping skills associated with removal and installation of electrical hardware
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA202C Remove and install basic aircraft electrical system components

Modification History

Minor formatting and editorial changes made. Additional assessment advice provided in the Evidence Guide.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV AME training pathway. It covers the competencies required for the removal and installation of electrical system components in fixed and rotary wing aircraft types that have only DC electrical systems. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA. Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of maintenance documentation/publications in the removal and installation of aircraft DC electrical system components.

Applications include fixed and rotary wing aircraft that have only DC electrical systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA201B	Remove and install miscellaneous aircraft electrical hardware/components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Remove DC aircraft electrical system components	1.1. System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted where necessary to ensure personnel safety 1.2. ***Electrical component*** removal is carried out in accordance with the applicable maintenance manual 1.3. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures 1.4. Removed components are tagged and packaged in accordance with specified procedures
2. Install DC aircraft electrical system components	2.1. Electrical components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life 2.2. Physical installation of electrical components is performed in accordance with the applicable maintenance manual, ensuring appropriate adjustment/alignment with mechanical interface is carried out 2.3. System is reinstated to correct operational condition in preparation for testing, as necessary 2.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- identifying/locating:
  - DC power generation, regulation, distribution and control systems and components, i.e. regulators and bus bars
  - piston engine ignition systems and components, i.e. coils, magnetos, auxiliary starting devices (impulse couplings and inductors/vibrators)
  - gas turbine engine igniter and starting system components (where applicable to enterprise)
  - batteries (lead acid and nickel cadmium) and associated mounting equipment, including related anti-vibration aids
  - motors and actuators in basic DC electrical systems
  - specific components of DC electrical systems, such as flaps and landing gear
- correctly connecting DC generators and alternator/rectifier generators.
- applying relevant OHS practices

Required knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- connection of hardware and plugs
- relevant OHS practices
- the use of approved maintenance documentation and aircraft publications relating to DC electrical systems
- properties of permanent magnets
- precautions for the care and storage of permanent magnets
- general construction, operating characteristics and applications for:
  - aircraft DC generators
  - alternator/rectifier DC generators
  - DC starter/generators
  - DC motors, including starter motors
  - DC rotary and linear actuators
  - batteries
- how to locate and identify components of:
  - DC power regulation and distribution systems
  - piston engine ignition and starting systems
  - gas turbine engine igniter systems, including specific OHS precautions
  - gas turbine engine starting systems
  - DC electrical systems, such as flaps and landing gear retraction
  - lighting systems
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to remove and install components of DC electrical systems while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with, as well as work practices associated with electrostatic sensitive devices. Evidence of transferability of skills and knowledge related to removal and installation is essential. This is to be demonstrated by application across a range of aircraft major electrical system components encompassing electrical with mechanical interface, installations which require alignment and/or adjustment, mechanical or electrical. An understanding of the attachment methods, connection of hardware, and the need for adjustment or rigging and system operation as they relate to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the Unit of Competency are being achieved under routine supervision on at least one component from each of groups 1 to 8 in the Range Statement (group 8 may be omitted when not applicable to the enterprise). This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment

	found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained MEA274A Maintain basic light aircraft electrical systems and components, will have satisfied the requirements of this unit with regard to common Range Statement variables. Log of Industrial Experience and Achievement records relating to MEA274A Maintain basic light aircraft electrical systems and components may be accepted as also meeting the evidence requirements for this unit in the applicable common areas.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Electrical systems and components	Electrical systems and components include: 1. DC generators, and alternator/rectifier generators, and components of related single generator regulation and distribution systems 2. Motors 3. Actuators 4. Piston engine ignition and starting system components 5. Aircraft batteries 6. Specific components of DC electrical systems, such as flaps and landing gear 7. Aircraft lighting 8. Gas turbine engine igniter and starting systems

Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA203C Remove and install advanced aircraft electrical system components

Modification History

Release 3 - Emphasis on regulations regarding ozone depleting substances added in Skills and Knowledge, and in Range Statement. Revised wording regarding licensing - Equivalent

Release 2 - Minor formatting and editorial changes made. Additional assessment advice provided in the Evidence Guide.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV AME training pathway, and of the Mechanical Aircraft Maintenance Engineer licensing pathway. It covers the competencies required for the removal and installation of electrical system components of the more advanced types of both fixed and rotary wing aircraft that have both AC and DC electrical systems. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA. Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of maintenance documentation/publications in the removal and installation of advanced aircraft electrical AC and DC system components.

Applications include fixed and rotary wing aircraft that have both AC and DC electrical systems.

Licensing/Regulatory Information

See descriptor.

Pre-Requisites

MEA201B	Remove and install miscellaneous aircraft electrical hardware/components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Remove AC and DC aircraft electrical system components	1.1. System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted where necessary to ensure personnel safety 1.2. ***Electrical component*** removal is carried out in accordance with the applicable maintenance manual 1.3. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures 1.4. Removed components are tagged and packaged in accordance with specified procedures
2. Install AC and DC aircraft electrical system components	2.1. Electrical components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life 2.2. Physical installation of electrical components is performed in accordance with the applicable maintenance manual, ensuring appropriate adjustment/alignment with mechanical interface is carried out 2.3. System is reinstated to correct operational condition in preparation for testing, as necessary 2.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- identifying/locating:
  - DC power regulation, distribution and control systems and components, i.e. regulators and bus bars
  - AC power regulation, distribution and control systems and components, i.e. generator control units
  - various types of inverters and transformer rectifier units
  - gas turbine and piston engine ignition and starting systems and components
  - batteries (lead acid and nickel cadmium) and associated mounting equipment including related anti-vibration aids and battery temperature monitoring systems
  - flight control servo actuating devices, i.e. AC and DC electro-mechanical, electro-pneumatic, electro-hydraulic, duplex servomotors, power control units and trim control devices
  - electrical components of aircraft systems, such as air cycle air conditioning, anti-icing and de-icing, landing gear, anti-skid, flight control, master and central warning, fuel storage and distribution, external and internal lighting, fire warning and extinguishing and engine/propeller control
- correctly connecting:
  - DC generators
  - star or delta alternators to star and delta loads
  - starter generators
  - AC motors
  - polyphase motors
- observing regulations governing the handling and custody of fire extinguishers containing ozone depleting substances (ODS) or synthetic greenhouse gas (SGG) extinguishing agents (e.g. BCF)
- applying relevant OHS practices

Required knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- connection of hardware and plugs
- relevant OHS practices
- the use of approved maintenance documentation and aircraft publications relating to AC and DC electrical systems
- properties of permanent magnets
- precautions for the care and storage of permanent magnets
- bonding of aircraft components and lightning protection
- general construction, operating characteristics and applications for aircraft:

  - generators
  - alternators
  - AC and DC motors
  - transformer rectifier units
  - rotary and static inverters
  - batteries
  - linear and rotary actuators
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures including environmental protection regulatory requirements relating to fire extinguishers containing ODS or SGG extinguishing agents (e.g. BCF)

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to remove and install components of advanced DC and AC electrical systems while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with, as well as work practices associated with electrostatic sensitive devices. Evidence of transferability of skills and knowledge related to removal and installation is essential. This is to be demonstrated by application across a range of aircraft major electrical system components encompassing electrical with mechanical interface, installations that require alignment and/or adjustment, mechanical or electrical. An understanding of the attachment methods, connection of hardware, and the need for adjustment or rigging and system operation as they relate to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace

	assessor, that the relevant elements of the Unit of Competency are being achieved under routine supervision on at least one component from each of Groups 1 to 6 and on three components from Group 7, as listed in the Range Statement. This shall be established via records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, using tools and equipment specified in maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained MEA202C Remove and install basic aircraft electrical system components, will have covered a significant amount of the skill and knowledge requirements for this unit plus part of the Performance Criteria for Elements 1 and 2 and associated Range Statement items. Log of Industrial Experience and Achievement records relating to MEA202C Remove and install basic aircraft electrical system components may be accepted as also meeting the evidence requirements for this unit in the applicable areas. Guidance information in MEA202C Remove and install basic aircraft electrical system components, regarding MEA274A Maintain basic light aircraft electrical systems and components, should also be taken into consideration and the attainment of MEA277A Maintain twin engine aircraft electrical systems and components, would significantly increase the extent of coverage of Range Statement variables. Log of Experience and Achievement records relating to MEA274A Maintain basic light aircraft electrical systems and components and MEA277A Maintain twin engine aircraft electrical systems and components may also be accepted as meeting the evidence requirements for this unit in the applicable areas.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Electrical system components	Electrical components include: 1. DC and AC power generation and distribution system components, including generators and related multi-sourced DC power generation, starter generators alternators and regulation, control and distribution system components 2. Transformer rectifier units and/or inverters 3. Batteries and related bus tie or interlock system components and battery temperature monitoring systems 4. Motors and actuators 5. Components of gas turbine and/or piston engine ignition and starting systems (depending on enterprise requirements) 6. External/internal lights 7. Electrical components of specific electrical systems, such as air cycle air conditioning, combustion heaters, equipment cooling, anti-icing and de-icing, landing gear, anti-skid, flight control, master and central warning, fuel storage and distribution, fire warning and extinguishing (including BCF extinguishers where applicable to enterprise) and engine/propeller control
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Not applicable.

Co-requisite units

Not applicable

MEA204C Remove and install basic aircraft instrument system components

Modification History

Minor formatting and editorial changes made. Additional assessment advice provided in the Evidence Guide.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV AME training pathway. It covers the competencies required for the removal and installation of aircraft instrument system components in the types of both fixed and rotary wing aircraft that have only basic instrument systems. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of maintenance documentation/publications in the removal and installation of basic aircraft instrument system components.

Applications include fixed and rotary wing aircraft with basic instrument systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA201B	Remove and install miscellaneous aircraft electrical hardware/components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Remove basic aircraft instrument system components	1.1. System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted where necessary to ensure personnel safety 1.2. ***Instrument component*** removal is carried out in accordance with the applicable maintenance manual 1.3. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures 1.4. Removed components are tagged and packaged in accordance with specified procedures
2. Install basic aircraft instrument system components	2.1. Instrument components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life 2.2. Physical installation of instrument components is performed in accordance with the applicable maintenance manual and regulatory requirements, ensuring appropriate adjustment/alignment is carried out 2.3. System is reinstated to correct operational condition in preparation for testing, as necessary 2.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- locating and identifying flight instrument system components comprising:
  - engine system temperature, pressure, speed (including mechanical and electrical tachometers), manifold pressure/boost (including aneroid type, sylphon bellows and dual compartment type)
  - auxiliary direct reading systems, including hydraulic pressure, pneumatic pressure and vacuum, fuel storage quantities
  - flight systems, including attitude, altitude, air speed, outside air temperature (OAT)
- locating and identifying direct reading compasses.
- correct handling and observance of maintenance precautions relating to gyroscopes, gimbals, pitot/static systems (connections, heating and protrusions)
- applying relevant OHS practices

Required knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- connection of hardware and plugs
- handling precautions relating to:
  - electrostatic sensitive devices
  - gyroscopes and gimbals
- basic instrument system and component operating principles:
  - atmospherics and barometry
  - terminology and unit of measurement conversion
  - aircraft instrumentation requirements
  - instrument panel layout
  - pressure sensing elements
  - pitot static systems and testing requirements
  - gyroscopic principles
  - direct reading compasses
  - temperature sensors
  - fluid quantity indication systems
- general layout and components of the following systems:
  - flight systems, including:
    - altitude (direct reading altimeters)
    - attitude including directional gyros and artificial horizons (both air and electrically driven), turn and slip and turn coordinator
    - airspeed

    - OAT
  - engine indication systems, including:
    - direct reading temperature
    - direct reading pressure (e.g. oil pressure)
    - speed including mechanical and electric tachometers
    - manifold pressure/boost including aneroid, sylphon bellows and dual compartment types
  - auxiliary direct reading systems, including:
    - electrical
    - hydraulic pressure
    - pneumatic pressure and vacuum
    - basic fuel quantity indication
- relevant OHS practices
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to remove and install the components of aircraft basic instrument systems while observing all relevant safety and component handling precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with, as well as work practices associated with electrostatic sensitive devices. Evidence of transferability of skills and knowledge related to removal and installation is essential. This is to be demonstrated by application across a range of aircraft instrument system components as listed in the Range Statement. An understanding of the attachment methods, connection of hardware, and the need for adjustment or calibration and system operation as they relate to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety

	and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the Unit of Competency are being achieved under routine supervision on at least one component from each of Groups 1 to 8 as listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained MEA275A Maintain basic light aircraft instrument systems and components, will have met all of the criteria for this unit. Log of Industrial Experience and Achievement records relating to MEA275A Maintain basic light aircraft instrument systems and components, may be accepted as also meeting the evidence requirements for this unit.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Instrument components	Instrument components include: 1. Pitot/static system components, ASIs, VSIs and counter pointer altimeters

	2. DGs and AHs, both air and electrically driven 3. Turn and bank and slip/turn coordinators 4. Direct reading compasses 5. Piston engine indication system components (direct reading measuring instruments and temperature indication) 6. Electrical systems indication (voltage, current, power and frequency) 7. Basic fuel quantity indication system components 8. Pneumatic/vacuum indication system components
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenace

Competency field

Co-requisite units

Not applicable

MEA205C Remove and install advanced aircraft instrument system components

Modification History

Minor formatting and editorial changes made. Additional assessment advice provided in the Evidence Guide.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV AME training pathway. It covers the competencies required for the removal and installation of general instrument system components in the more advanced types of both fixed and rotary wing aircraft. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of maintenance documentation/publications in the removal and installation of components of advanced instrument systems.

Applications include fixed and rotary wing aircraft that have advanced instrument systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA201B	Remove and install miscellaneous aircraft electrical hardware/components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Remove advanced aircraft instrument system components	1.1. System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted where necessary to ensure personnel safety 1.2. ***Instrument component*** removal is carried out in accordance with the applicable maintenance manual 1.3. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures 1.4. Removed components are tagged and packaged in accordance with specified procedures
2. Install advanced aircraft instrument system components	2.1. Instrument components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life 2.2. Physical installation of instrument components is performed in accordance with the applicable maintenance manual and regulatory requirements, ensuring appropriate adjustment/alignment is carried out 2.3. System is reinstated to correct operational condition in preparation for testing, as necessary 2.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- locating and identifying flight instrument system components comprising:
  - engine system temperature, pressure (including thermocouples, sensor units and transmitters), speed (including mechanical and electrical tachometers), thrust (fan, propeller, jet), torque, fuel flow and vibration
  - auxiliary systems, including hydraulic pressure and temperature, transmission pressure and temperature, fuel storage quantities, fuel remaining/used, component position, i.e. flaps, landing gear, speed brakes and door/pylon locking
  - flight systems, including attitude, altitude, air speed, OAT and GPWS
- locating and identifying direct reading compasses, remote compass system components (flux valve, gyro, amplifier and indicator), and AHRS components
- locating and identifying FDR system components
- correct handling procedures and maintenance precautions relating to gyroscopes, gimbals, pitot/static systems (connections, heating and protrusions)
- applying relevant OHS practices

Required knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- connection of hardware and plugs
- handling precautions for electrostatic sensitive devices
- relevant OHS practices
- the use of approved maintenance documentation and aircraft publications relating to basic and advance instrument systems
- basic instrument system and component operating principles:
  - atmospherics and barometry
  - terminology and unit of measurement conversion
  - aircraft instrumentation requirements
  - instrument panel layout
  - pressure sensing elements
  - pitot static systems and testing requirements
  - gyroscopic principles
  - direct reading compasses
  - temperature sensors
  - fluid quantity indication systems
- general layout and components of the following systems:
  - flight systems, including:
    - altitude (direct reading, servo and encoding altimeters)

    - attitude, including DG and AH (both air and electrically driven) and turn and slip, and AHRS
    - airspeed, including ASI, machmeters and air data systems
    - VSI
    - angle of attack and stall warning/avoidance
    - OAT
    - GPWS
  - engine indication systems, including:
    - temperature and pressure (including thermocouples, sensors and transmitters)
    - speed including mechanical and electric tachometers
    - thrust including fan, propeller and jet
    - torque
    - fuel flow
    - vibration
  - auxiliary transmitter/indicator measuring systems, including:
    - hydraulic pressure and temperature
    - pneumatic pressure
    - transmission oil pressure and temperature
    - fuel remaining/used
    - fuel quantity indication
    - component position
- remote compass systems
- FDR systems
- relevant OHS practices

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to remove and install the components of aircraft basic and advanced instrument systems while observing all relevant safety and component handling precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with, as well as work practices associated with electrostatic sensitive devices.

	Evidence of transferability of skills and knowledge related to removal and installation is essential. This is to be demonstrated by application across a range of aircraft instrument system components as listed in the Range Statement. An understanding of the attachment methods, connection of hardware, and the need for adjustment or calibration and system operation as they relate to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the Unit of Competency are being achieved under routine supervision on at least one component from each of Groups 1 to 7 (Groups 6 and 7 may be omitted where not applicable to the enterprise) in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained MEA204C Remove and install basic aircraft instrument system components or MEA275A Maintain basic light aircraft instrument systems and components, will have covered a significant amount of the skill and knowledge requirements for this unit plus part of the Performance Criteria for Elements 1 and 2 and associated Range Statement items. Log of Industrial Experience and Achievement records relating to MEA204C Remove and install basic aircraft instrument system components or MEA275A Maintain basic light aircraft instrument systems and components, may be accepted as also meeting the evidence requirements for this unit in the applicable areas.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Instrument components	Instrument components may be: 1. Pitot/static system components, ASIs, VSIs, air data system components, machmeters, altimeters, including servo and encoding altimeters, angle of attack and stall warning/avoidance systems 2. Turn and slip, DGs, AHs, AHRS components (where applicable to enterprise), remote reading gyro compass system components and direct reading compasses 3. Turbine engine indication systems 4. Transmitter/indicator measuring instrument systems (pressure, temperature, position) 5. Fuel quantity indication and flow systems components 6. GPWS 7. FDR
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA206C Remove and install aircraft basic radio communication and navigation system components

Modification History

Minor formatting and editorial changes made. Additional assessment advice provided in the Evidence Guide.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV AME training pathway. It covers the competencies required for the removal and installation of basic communication and navigation system components of both fixed and rotary wing aircraft. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of maintenance documentation/publications in the removal and installation of basic radio communication and navigation system components.

Applications include fixed and rotary wing aircraft that are fitted with basic radio communication and navigation system components.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA201B	Remove and install miscellaneous aircraft electrical hardware/components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Remove basic radio communication and navigation system components	1.1. System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted where necessary to ensure personnel safety 1.2. ***Communication and navigation system component*** removal is carried out in accordance with the applicable maintenance manual 1.3. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures 1.4. Removed components are tagged and packaged in accordance with specified procedures
2. Install basic radio communication and navigation system components	2.1. Communication and navigation system components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life 2.2. Physical installation of components is performed in accordance with the applicable maintenance manual and regulatory requirements, ensuring appropriate adjustment/alignment is carried out 2.3. System is reinstated to correct operational condition in preparation for testing, as necessary 2.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- locating and identifying radio communication and navigation system components comprising:
  - HF and VHF communications
  - VOR and ADF navigation systems
  - ELT systems
- locating and identifying applicable radio system antennas
- removing and installing communication and navigation system components, including antennas
- applying relevant OHS practices

Required knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- connection of hardware, and plugs
- handling precautions for electrostatic sensitive devices
- relevant OHS practices
- the use of approved maintenance documentation and aircraft publications relating to radio communication and navigation systems and components
- basic layout and working principles to block diagram level of:
  - HF communication systems
  - VHF communication systems
  - ADF navigation systems
  - VOR navigation systems
  - ELT systems
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to remove and install the components of aircraft basic communication and navigation systems while observing all relevant safety and component handling

	precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with, as well as work practices associated with electrostatic sensitive devices. Evidence of transferability of skills and knowledge related to removal and installation is essential. This is to be demonstrated by application across a range of radio communication and navigation system components as listed in the Range Statement. An understanding of the attachment methods, connection of hardware, and the need for adjustment or calibration and system operation as they relate to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the Unit of Competency are being achieved under routine supervision on at least one item from each of Groups 1 to 3 listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, using tools and equipment specified in maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained MEA207C Remove and install aircraft electronic system components, will have covered a significant amount of the skill and knowledge requirements for this unit plus part of the Performance Criteria for Elements 1 and 2 and associated Range Statement items. Those who have attained MEA276A Maintain basic light aircraft communication and radio navigation systems and components, or MEA289A Maintain basic light aircraft

	avionic systems and components, will have fully covered the requirements for this unit in common Range Statement variables. Log of Industrial Experience and Achievement records relating to MEA207C Remove and install aircraft electronic system components, MEA276A Maintain basic light aircraft communication and radio navigation systems and components and MEA289A Maintain basic light aircraft avionic systems and components, may be accepted as also meeting the evidence requirements for this unit in the applicable areas.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Communication and navigation system components	Communication and navigation system components may include: 1. HF and VHF communication and applicable antennas 2. ADF and VOR navigation and applicable antennas 3. ELT
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA207C Remove and install aircraft electronic system components

Modification History

Minor formatting and editorial changes made. Additional assessment advice provided in the Evidence Guide.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV AME training pathway. It covers the competencies required for the removal and installation of electronic system components of both fixed and rotary wing aircraft. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of maintenance documentation/publications in the removal and installation of electronic system components and Line Replaceable Units.

Applications include fixed and rotary wing aircraft that are fitted with electronic systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA201B	Remove and install miscellaneous aircraft electrical hardware/components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Remove aircraft electronic system components	1.1. System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted where necessary to ensure personnel safety
	1.2. ***Electronic system component*** removal is carried out in accordance with the applicable maintenance manual
	1.3. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
	1.4. Removed components are tagged and packaged in accordance with specified procedures
2. Install aircraft electronic system components	2.1. Electronic system components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life
	2.2. Physical installation of electronic components is performed in accordance with the applicable maintenance manual and regulatory requirements, ensuring appropriate adjustment/alignment is carried out
	2.3. System is reinstated to correct operational condition in preparation for testing, as necessary
	2.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- locating and identifying electronic navigational system components, including altitude reporting systems (transponder, encoder and control unit), remote attitude displays and Inertial Navigation and Reference Systems
- locating and identifying multi function displays, including EFIS, EICAS, ECAM, FMCS and HUD
- locating and identifying radio communication and navigation system components comprising UHF, SATCOM communications, DME, ILS, GNS radio navigation, TCAS, RADALT, radio system antennas, including half dipole, slotted, loop and marconi
- locating and identifying primary and secondary radar system components including transmission lines, waveguide and antennas
- locating and identifying cockpit voice recorder system components, internal communications, passenger/cockpit audio/visual components
- applying relevant OHS practices

Required knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- connection of components and plugs
- printed circuit boards
- panel and rack mounting systems for electronic system components and LRUs
- relevant OHS practices
- the use of approved maintenance documentation and aircraft publications relating to the avionics systems and components being maintained
- handling and maintenance precautions relating to gyroscopes, gimbals, electronic displays, airborne radar systems (including pressurised waveguides), electrostatic sensitive devices, radio installations
- electromagnetic environment
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to remove and install aircraft electronic system components/LRUs while observing all relevant safety and component handling precautions.
Critical aspects for assessment and	It is essential that cleanliness requirements and safety

evidence required to demonstrate competency in this unit	precautions applicable to the system being maintained are fully observed, understood and complied with, as well as work practices associated with electrostatic sensitive devices. Evidence of transferability of skills and knowledge related to removal and installation is essential. This is to be demonstrated by application across a range of electronic system components as listed in the Range Statement. An understanding of the attachment methods, connection of hardware, and the need for adjustment or calibration and system operation as they relate to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on sufficient components/LRUs of systems in Groups 1 to 9 to establish competency (Groups 6 to 9 may be omitted where they are not applicable to the enterprise). This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained MEA206C Remove and install aircraft basic radio communication and navigation system components, will have covered a significant amount of the skill and knowledge requirements for this unit plus part of the Performance Criteria for Elements 1 and 2 and associated Range Statement items. Log of Industrial Experience and Achievement records relating to MEA206C Remove and install aircraft basic radio communication and navigation system components, may be accepted as also meeting the evidence requirements for this unit in the applicable areas.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Electronic system components	Electronic system components include panel and rack mounted electronic system components and LRUs of: 1. Instrument navigation systems 2. Communication systems 3. Radio navigation systems 4. Pulse operated systems 5. Antennas 6. Electronic instrument displays 7. Automatic flight control systems. 8. Cabin entertainment equipment 9. On-board maintenance systems
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA208C Remove and install aircraft pressurisation control system components

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV AME training pathway and is also part of the Mechanical Aircraft Maintenance Engineer licensing pathway. It covers the competencies required for the removal and installation of pressurisation control system components of fixed wing aircraft. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence or licence extension under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of maintenance documentation/publications in the removal and installation of pressurisation control system components.

Applications include fixed wing aircraft that have pressurisation systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA201B	Remove and install miscellaneous aircraft electrical hardware/components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Remove pressurisation control system components	1.1. System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted where necessary to ensure personnel safety 1.2. Pressurisation control system component removal is carried out in accordance with the applicable maintenance manual 1.3. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures 1.4. Removed components are tagged and packaged in accordance with specified procedures
2. Install aircraft pressurisation control system components	2.1. Pressurisation control system components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life 2.2. Physical installation of pressurisation control components is performed in accordance with the applicable maintenance manual 2.3. System is reinstated to correct operational condition in preparation for testing, as necessary 2.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved maintenance documentation and aircraft publications relating to the pressurisation control system and components being maintained
- locating and identifying the components of pressurisation control systems

Required knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- connection of components and plugs
- relevant OHS practices
- the layout and operation to block diagram level of mechanical and electronic pressurisation control systems
- handling precautions relating to electrostatic sensitive devices
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to remove and install the components of aircraft pressurisation control systems while observing all relevant safety and component handling precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with, as well as work practices associated with electrostatic sensitive devices. Evidence of transferability of skills and knowledge related to removal and installation is essential. An understanding of the attachment methods, connection of hardware, and the need for confirming correct system operation must be demonstrated before undertaking any action. The work plan should take account of applicable

	safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a representative range of pressurisation control system components. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA209C Remove and install aircraft oxygen system components

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV AME training pathway and is also part of the Mechanical Aircraft Maintenance Engineer licensing pathway. It covers the competencies required for the removal and installation of oxygen system components of both fixed and rotary wing aircraft. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of maintenance documentation/publications in the removal and installation of aircraft oxygen system components.

Applications include fixed or rotary wing aircraft that have oxygen systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance

	processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Remove oxygen system components	1.1. Oxygen system is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted where necessary to ensure personnel safety 1.2. Removal of ***oxygen system components*** is carried out in accordance with the applicable maintenance manual 1.3. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures 1.4. Removed components are tagged, packaged or discarded in accordance with specified procedures
2. Install aircraft oxygen system components	2.1. Oxygen system components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life 2.2. Oxygen system components to be installed are free from contamination and inspected for damaged flair ends and fittings

2.3. Component installation is physically carried out in accordance with the applicable maintenance manual

2.4. System is reinstated to correct physical condition in preparation for testing, as necessary

2.5. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying appropriate OHS practices and using approved maintenance documentation and aircraft publications relating to aircraft oxygen systems and components
- demonstrating the procedure to replenish a dry breathing oxygen system, including:
  - correct identification of oxygen ground trolleys
  - maximum charging pressures for low and high pressure systems
  - safety precautions to be adhered to during replenishment
  - correct order of procedural replenishment steps.
- demonstrating the procedure to purge a dry breathing oxygen system, including:
  - reasons for the requirement to undertake a purging operation
  - identification of acceptable system purging gases
  - safety precautions to be adhered to during purging
- employing correct techniques when purging oxygen storage cylinders or systems

Required knowledge

Look for evidence that confirms knowledge of:

- OHS practices relevant to oxygen system maintenance
- component attachment methods
- connection of hardware and couplings
- oxygen system isolation
- the properties of aircraft oxygen and requirements for aircrew/passengers.
- the layout of low and high-pressure dry breathing oxygen systems and components
- the methods by which gaseous dry breathing oxygen is stored in both the aircraft and within the workplace environment. Reference to storage trolleys, aircraft cylinders and chemical oxygen cylinders is required
- the methods used to locate, identify and access oxygen system components for removal and installation
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to remove and install the components of aircraft oxygen systems while observing all relevant safety and component handling precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that oxygen system cleanliness requirements and safety precautions applicable to system component handling are fully observed, understood and complied with. These cleanliness requirements extend to all tooling and hardware associated with oxygen system maintenance. Evidence of transferability of skills and knowledge related to removal and installation is essential. This is to be demonstrated by application across a range of aircraft oxygen system components listed in the Range Statement. An understanding of the attachment methods, connection hardware, and the need for adjustment or rigging and system operation as it relates to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one item from each of Groups 1 and 2 (Groups 3 and 4 may be omitted where they are not applicable to the enterprise). This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is expected that dedicated tools, test and ground support equipment is used in routine oxygen situations.

Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Oxygen system components	Oxygen system components may include: 1. Oxygen pressure cylinders, valves, gauges 2. Regulators, masks (including other integrated systems), pipes, hoses and fittings 3. Chemical generators 4. LDBO converters
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA210C Inspect, test and troubleshoot basic aircraft electrical systems and components

Modification History

Minor formatting and editorial changes made. Additional assessment advice provided in the Evidence Guide.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV AME training pathway. It covers the competencies required to inspect, test and troubleshoot DC electrical systems and components fitted to types of fixed and rotary wing aircraft that have only DC electrical systems. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable test equipment to inspect, test and troubleshoot DC aircraft electrical systems and components.

Applications include fixed and rotary wing aircraft that have only DC electrical systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA202C	Remove and install basic aircraft electrical system components
MEA246C	Fabricate and/or repair aircraft electrical components or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect DC aircraft electrical systems and components	1.1. Relevant maintenance documentation and modification status, including system defect reports where relevant, are used to identify specific inspection requirements 1.2. Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual 1.3. ***DC electrical system*** is visually or physically checked for external signs of defects in accordance with applicable maintenance manual 1.4. Defects are correctly identified and reported
2. Test/adjust DC aircraft electrical systems	2.1. Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation 2.2. Electrical system is functionally tested, in accordance with maintenance manual, for evidence of serviceability or malfunction 2.3. System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3. Troubleshoot DC aircraft electrical systems	3.1. Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination 3.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate ***troubleshooting*** 3.3. Specialist advice is obtained, where required, to assist with the troubleshooting process

3.4. System faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required and in accordance with standard enterprise procedures

3.5. Rectification requirements are determined

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) and security in:
  - DC power generation systems, including regulation, distribution and control
  - battery installations
  - piston engine ignition and starting systems and components:
    - magnetos or coils
    - starter motors
    - ignition switches/start switches
    - ignition harnesses
    - low tension wiring
    - spark plugs
    - auxiliary starting devices
  - gas turbine engine ignition and starting systems:
    - starter motors and starter/generators
    - high energy ignition units
    - control units
    - switches
  - batteries and associated mounting equipment, including related anti-vibration aids
  - motors and actuators in DC electrical systems
  - internal/external lighting systems, including controls
  - flap systems
  - landing gear systems
- applying logic processes, taking and interpreting electrical measurements, using test equipment and appropriate wiring diagrams and manuals to isolate malfunctions in the above systems
- performing system functional tests and checks to isolate system faults and assess post maintenance serviceability
- applying relevant OHS practices, including those relating to gas turbine engine high energy

ignition units

Required knowledge

Look for evidence that confirms knowledge of:

- DC circuit theory
- electrical system maintenance requirements and troubleshooting procedures
- the basic layout (block diagram level), function and operation of:
  - single generator DC power generation and distribution systems and components, including:
    - DC generators
    - alternator/rectifier generators
    - starter/generators
    - voltage regulators
    - circuit protection devices
    - bus bars
  - piston engine ignition and starting systems and components, including:
    - magnetos or coils
    - starter motors
    - ignition switches/start switches
    - ignition harnesses
    - low tension wiring
    - spark plugs
    - auxiliary starting devices
  - gas turbine igniter and starting systems and components, including specific OHS precautions:
    - starter motors and starter/generators
    - high energy ignition units
    - control units
    - switches
  - landing gear and flap systems and components, including:
    - motors
    - actuators
    - selector switches
    - micro switches
  - internal and external lighting systems and components
  - batteries and associated mounting equipment including related anti-vibration aids
- relevant OHS practices
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot basic DC electrical systems and components, including looms, cables and connection hardware, while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with aircraft electrical systems and components. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across a range of aircraft electrical systems and components listed in the Range Statement. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the Unit of Competency are being achieved under routine supervision on electrical looms, cables and connection hardware, and on each system in Range Statement Groups 1 to 5 (Group 4 may be omitted if not applicable to the enterprise) and on at least one major component/LRU in each case. For Group 6, competency may be demonstrated through the performance of a battery check. This shall be established via the records in

	the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that general and special purpose tools, test and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained MEA274A Maintain basic light aircraft electrical systems and components, will have satisfied the requirements of this unit with regard to common Range Statement variables. Log of Industrial Experience and Achievement records relating to MEA274A Maintain basic light aircraft electrical systems and components, may be accepted as also meeting the evidence requirements for this unit in the applicable common areas.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
DC electrical systems	DC electrical systems may include: 1. DC generators, and alternator/rectifier generators, and components of related single generator regulation and distribution systems 2. Piston engine ignition and starting system components 3. Specific components of DC electrical systems such as flaps and landing gear, including related motors and actuators

	4. Gas turbine engine igniter and starting systems and components 5 Aircraft lighting 6. Aircraft main batteries
Troubleshooting	Troubleshooting involves the use of fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA211C Inspect, test and troubleshoot advanced aircraft electrical systems and components

Modification History

Minor formatting and editorial changes made. Additional assessment advice provided in the Evidence Guide.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway and is also part of the Mechanical Aircraft Maintenance Engineer licensing pathway. It covers the competencies required to inspect, test and troubleshoot electrical systems and components fitted to the more advanced types of fixed and rotary wing aircraft. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot advanced aircraft electrical systems and components.

Applications include fixed and rotary wing aircraft that have advanced electrical systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA203C	Remove and install advanced aircraft electrical system components
MEA246C	Fabricate and/or repair aircraft electrical components or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect advanced aircraft electrical systems and components	1.1. Relevant maintenance documentation and modification status, including system defect reports where relevant, are used to identify specific inspection requirements
	1.2. Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual
	1.3. ***Electrical systems*** are visually or physically checked for external signs of defects in accordance with applicable maintenance manual
	1.4. Defects are correctly identified and reported
2. Test/adjust advanced aircraft electrical systems	2.1. Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation
	2.2. Electrical system is functionally tested, in accordance with maintenance manual, for evidence of serviceability or malfunction
	2.3. System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3. Troubleshoot advanced aircraft electrical systems	3.1. Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination
	3.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate ***troubleshooting***

3.3. Specialist advice is obtained, where required, to assist with the troubleshooting process

3.4. System faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures

3.5. Rectification requirements are determined

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) and security in:
  - DC and AC power generation systems including regulation, distribution and control
  - inverters (rotary and static)
  - battery installations including temperature monitoring systems
  - gas turbine and piston engine ignition and starting systems
  - propeller systems
  - internal/external lighting systems, including controls
  - landing gear systems, including anti-skid
  - flight controls
  - fire warning and extinguishing
  - air cycle air conditioning and combustion heating systems
  - equipment cooling and ventilation
  - fuel storage and distribution
  - master and central warning
- applying logic processes, taking and interpreting electrical measurements, using test equipment and appropriate wiring diagrams and manuals to isolate electrical system malfunctions in the above systems
- performing system functional tests and checks to isolate system faults and assess post maintenance serviceability
- applying OHS requirements applicable to the maintenance of aircraft electrical systems
- using approved maintenance documentation and aircraft publications relating to the electrical systems being maintained

Required knowledge

Look for evidence that confirms knowledge of:

- the basic layout (block diagram level), function and operation of the following systems:
  - DC and AC power multi-generator systems including regulation, distribution and control
  - inverters (rotary and static)
  - battery installations including temperature monitoring systems
  - gas turbine and piston engine ignition and starting systems
  - propeller systems
  - internal/external lighting systems, including controls
  - landing gear systems, including anti-skid
  - flight controls
  - fire warning and extinguishing
  - air cycle air conditioning and combustion heating systems
  - equipment cooling and ventilation
  - fuel storage and distribution
  - master and central warning
- explaining basic principles/functions, relating to the above systems and associated with:
  - basic DC and AC circuit theory
  - DC generator characteristics
  - alternator characteristics
  - starter generator characteristics
  - DC and AC motors
  - rotary and static inverter operation
- OHS requirements applicable to the maintenance of aircraft electrical systems, including gas turbine engine high energy ignition units
- electrical system maintenance requirements and troubleshooting procedures
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot DC and AC electrical systems and components, including looms, cables and connection hardware, while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and

competency in this unit	troubleshooting applications (including the timely involvement of supervisors or other trades) associated with aircraft electrical systems and components. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across a range of aircraft electrical systems and components listed in the Range Statement. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a system and at least one item from each of Groups 1 to 7 in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that general and special purpose tools, test and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained MEA210C Inspect, test and troubleshoot basic aircraft electrical systems and components, will have covered inspection, testing and troubleshooting of DC power generation and DC systems and components. Log of Industrial Experience and Achievement records relating to MEA210C Inspect, test and troubleshoot basic aircraft

	electrical systems and components, may be accepted as also meeting the evidence requirements for this unit in the applicable areas. Advice in MEA210C Inspect, test and troubleshoot basic aircraft electrical systems and components, regarding the coverage provided by MEA274A Maintain basic light aircraft electrical systems and components, should also be taken into consideration if the individual has attained that unit rather than MEA210C Inspect, test and troubleshoot basic aircraft electrical systems and components.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Electrical systems and their components	Electrical systems and their components include: 1. DC and AC power generation and distribution systems and components, including generators, alternators, starter generators and related control, regulation and distribution system components 2. Transformer rectifier units and inverters 3. Batteries and related bus tie or interlock system components and battery temperature monitoring systems 4. Motors and actuators 5. Components of gas turbine and/or piston engine ignition and starting systems (where applicable to the enterprise) 6. External/internal lights 7. Electrical components specific to systems such as air cycle air conditioning, combustion heating, equipment cooling, anti-icing and de-icing, landing gear, anti-skid, flight control, master and central warning, fuel storage and distribution, fire warning and extinguishing and

	engine/propeller control
Troubleshooting	Troubleshooting involves the use of fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA212C Inspect, test and troubleshoot basic aircraft instrument systems and components

Modification History

Minor formatting and editorial changes made. Additional assessment advice provided in the Evidence Guide.

Unit Descriptor

This unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to inspect, test and troubleshoot instrument systems and components fitted to the more basic types of fixed and rotary wing aircraft. he unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable test equipment to inspect, test and troubleshoot basic aircraft instrument systems and components.

Applications include fixed and rotary wing aircraft that have basic instrument systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA204C	Remove and install basic aircraft instrument system components
MEA246C	Fabricate and/or repair aircraft electrical components or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect aircraft basic instrument systems and components	1.1. Relevant maintenance documentation and modification status, including system defect reports where relevant, are used to identify specific inspection requirements 1.2. Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual 1.3. ***Instrument system components*** are visually or physically checked for external signs of defects in accordance with applicable maintenance manual 1.4. Defects are correctly identified and reported
2. Test/adjust aircraft basic instrument systems and components	2.1. Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation 2.2. Instrument system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction 2.3. System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3. Troubleshoot aircraft basic instrument systems and components	3.1. Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination 3.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate ***troubleshooting*** 3.3. Specialist advice is obtained, where required, to assist with the troubleshooting process

3.4. Instrument system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures

3.5. Rectification requirements are determined

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) and security in:
  - flight instruments
  - pitot/static systems
  - direct reading compasses
  - piston engine indication systems
  - electrical systems indication
  - basic fuel quantity indication systems
  - pneumatic/vacuum indication systems.
- applying logic processes, taking and interpreting system measurements, using test equipment and appropriate wiring diagrams and manuals to isolate instrument system malfunctions in the above systems
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability
- applying OHS requirements relevant to instrument system maintenance

Required knowledge

Look for evidence that confirms knowledge of:

- the basic layout (block diagram level), function and operation of:
  - flight systems, including:
    - altitude (direct reading altimeters)
    - attitude, including directional gyros and artificial horizons (both air and electrically driven), turn and slip and turn coordinator
    - airspeed
    - OAT
  - engine indication systems, including:
    - direct reading temperature
    - direct reading pressure (e.g. oil pressure)

    - speed including mechanical and electric tachometers
    - manifold pressure/boost including aneroid, sylphon bellows and dual compartment types
  - auxiliary direct reading systems, including:
    - electrical
    - hydraulic pressure
    - pneumatic pressure and vacuum
    - basic fuel quantity indication
- basic instrument system maintenance and testing requirements, and troubleshooting procedures
- OHS requirements relevant to instrument system maintenance
- the operating principles of the above systems and associated with:
  - atmospheric conditions; properties and effects on aircraft instruments and systems
  - pressure and temperature sensing elements and their use in aircraft instruments
  - gyroscopes and their use in aircraft instrument systems
  - electrical fundamentals
- direct reading compass installations and calibration
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot basic instrument systems and components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with aircraft basic instrument systems and components. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical.

	Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across a range of basic aircraft instrument systems and components listed in the Range Statement. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a system and at least one major system component/LRU from each of Groups 1 to 8 listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that general and special purpose tools, test and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained MEA275A Maintain basic light aircraft instrument systems and components, will have satisfied the requirements of this unit with regard to common Range Statement variables. Log of Industrial Experience and Achievement records relating to MEA275A Maintain basic light aircraft instrument systems and components, may be accepted as also meeting the evidence requirements for this unit in the applicable common areas.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide.
Instrument systems and components	Instrument systems and components include: 1. Pitot/static systems and components, ASIs, VSIs and counter-pointer altimeters 2. DGs and AHs (air and electrically driven) 3. Turn and bank and slip/turn coordinators 4. Direct reading compasses 5. Piston engine indication system components (direct reading measuring instruments and temperature indication) 6. Electrical systems indication (voltage, current, power and frequency) 7. Basic fuel quantity indication systems and components 8. Pneumatic/vacuum indication components
Troubleshooting	Troubleshooting involves the use of fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA213C Inspect, test and troubleshoot advanced aircraft instrument systems

Modification History

Minor formatting and editorial changes made. Additional assessment advice provided in the Evidence Guide.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aviation Maintenance Stream) training pathway. It covers the competencies required to inspect, test and troubleshoot instrument systems and components fitted to the more advanced types of fixed and rotary wing aircraft. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot aircraft advanced instrument systems and components.

Applications include fixed and rotary wing aircraft that have advanced instrument systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA205C	Remove and install advanced aircraft instrument system components

MEA246C Fabricate and/or repair aircraft electrical components or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect aircraft advanced instrument systems and components	1.1. Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements 1.2. Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual 1.3. ***Instrument system components*** are visually or physically checked for external signs of defects in accordance with applicable maintenance manual 1.4. Defects are correctly identified and reported
2. Test/adjust aircraft advanced instrument systems and components	2.1. Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation 2.2. Instrument system is functionally tested, in accordance with maintenance manual, for evidence of serviceability or malfunction 2.3. System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3. Troubleshoot aircraft advanced instrument systems	3.1. Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination 3.2. Maintenance manual fault diagnosis guides and logic

processes are used to ensure efficient and accurate ***troubleshooting***

3.3. Specialist advice is obtained, where required, to assist with the troubleshooting process

3.4. Instrument system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures

3.5. Rectification requirements are determined

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) and security in:
  - flight instruments
  - pitot/static systems
  - navigation systems - compasses and AHRS
  - GPWS
  - position indicators, engine/auxiliary system indication systems and system components
- applying logic processes, taking and interpreting system measurements, use test equipment and appropriate wiring diagrams and manuals to isolate instrument and display system malfunctions in the listed systems
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability
- applying relevant OHS practices
- using approved maintenance documentation and aircraft publications relating to the instrument and display systems being maintained

Required knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- connection of hardware
- instrument system maintenance requirements and testing and troubleshooting procedures
- the basic layout (block diagram level), function and operation of:
  - flight instruments including:
    - ASIs
    - VSIs

    - air data systems and components
    - machmeters
    - altimeters, including servo and encoding altimeters
    - turn and slip indicators
    - AHs
    - DGs
    - angle of attack and stall warning/avoidance systems
  - pitot/static systems
  - navigation systems:
    - direct reading compasses
    - gyro compasses
    - AHRS
  - GPWS
  - turbine engine instruments, including:
    - temperature and pressure (including thermocouples, sensors and transmitters)
    - speed including mechanical and electric tachometers
    - thrust including fan, propeller and jet
    - torque
    - fuel flow
    - vibration
  - auxiliary transmitter/indicator measuring systems, including:
    - hydraulic pressure and temperature
    - pneumatic pressure
    - transmission oil pressure and temperature
    - fuel remaining/used
    - fuel quantity indication
    - component position (e.g. doors, flaps, speed brakes, landing gear)
  - FDR systems
- explaining the operating principles of the above-listed systems and associated with:
  - atmospheric conditions; properties and effects on aircraft instruments and systems
  - pressure and temperature sensing elements and their use in aircraft instruments
  - gyroscopes and their use in aircraft instrument and reference systems
- explaining the various methods of navigation, and describing how they are used by both aircraft conventional and electronic navigational instruments and systems
- relevant OHS practices
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot advanced instrument systems and components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with aircraft advanced instrument systems and components. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across a range of advanced aircraft instrument systems and components listed in the Range Statement. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a system and at least one major system component/(LRU from each of Groups 1 to 7 (Groups 6 and 7 may be omitted where they are not applicable to the enterprise) listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.

Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that general and special purpose tools, test and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained MEA212C Inspect, test and troubleshoot basic aircraft instrument systems and components, will have covered inspection, testing and troubleshooting of a range of flight instruments and direct reading compass and measuring systems. Log of Industrial Experience and Achievement records relating to MEA212C Inspect, test and troubleshoot basic aircraft instrument systems and components, may be accepted as also meeting the evidence requirements for this unit in the applicable areas. Advice provided in MEA212C Inspect, test and troubleshoot basic aircraft instrument systems and components, regarding MEA275A Maintain basic light aircraft instrument systems and components, should also be considered where applicable.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Instrument systems and components	Instrument system and components include: 1. Pitot/static system components, ASIs, VSIs, air data systems and components, machmeters, altimeters, including servo and encoding altimeters, angle of attack and stall warning/avoidance systems 2. Turn and slip indicators, DGs, AHs, AHRS and components, remote reading gyro compass systems and

	components and direct reading compasses 3. Turbine engine indication systems and components (tachometers, pressure, temperature, engine performance, engine vibration) 4. Transmitter/indicator measuring instrument systems (pressure, temperature and position) 5. Fuel quantity indication and flow systems and components 6. GPWS 7. FDRs
Troubleshooting	Troubleshooting involves the use of fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA214C Inspect, test and troubleshoot aircraft basic communication and radio navigation systems and components

Modification History

Minor formatting and editorial changes made. Additional assessment advice provided in the Evidence Guide.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to inspect, test and troubleshoot basic communication and radio navigation systems and components of fixed and rotary wing aircraft. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot basic communication and radio navigation systems and components.

Applications include fixed and rotary wing aircraft that have basic communication and radio navigation systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA206C	Remove and install basic radio communication and navigation system components
MEA246C	Fabricate and/or repair aircraft electrical components or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect basic communication and radio navigation systems and components	1.1. Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements 1.2. Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual 1.3. ***Communication and radio navigation systems and components*** are visually or physically checked for external signs of defects in accordance with applicable maintenance manual 1.4. Defects are correctly identified and reported
2. Test/adjust basic communication and radio navigation systems and components	2.1. Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation 2.2. Communication and radio navigation systems are functionally tested, in accordance with maintenance manual, for evidence of serviceability or malfunction 2.3. System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3. Troubleshoot basic communication and radio navigation systems	3.1. Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination 3.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate

troubleshooting

3.3. Specialist advice is obtained, where required, to assist with the troubleshooting process

3.4. Communication and radio navigation system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard operating procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved maintenance documentation and aircraft publications relating to the radio frequency and communications system being maintained
- recognition of system and component defects/external damage, correct installation, attaching hardware (including cabling/harnesses/transmission lines) and security in:
  - HF and VHF communications systems
  - VOR and ADF navigation systems
  - ELT systems
- applying logic processes, taking and interpreting system measurements to accurately and effectively isolate malfunctions within the above systems
- testing listed systems to isolate system faults and assess post-maintenance serviceability

Required knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- the basic layout (block diagram level), function and operation of:
  - HF and VHF communications systems
  - VOR and ADF navigation systems
- ELT systems
- communication and radio frequency navigation system maintenance requirements and troubleshooting procedures
- relevant OHS practices
- basic principles/functions, relating to the above systems and associated with:
  - electromagnetic radiation and propagation
  - basic AC and DC circuit theory
  - printed circuit boards

  - digital fundamentals
  - analogue fundamentals
  - transmitter and receiver principles
  - antenna characteristics
  - transmission line characteristics
  - fibre optic communications
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot basic communication and radio navigation systems and components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with aircraft basic communication and radio navigation systems and components. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across a range of basic aircraft communication and radio navigation systems and components listed in the Range Statement. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of

	applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a system and at least one major system component/LRU from each of Groups 1 to 3 listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that general and special purpose tools, test and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have attained MEA276A Maintain basic aircraft communication and radio navigation systems and components or MEA289A Maintain basic light aircraft avionic systems and components, will have partially met the skill and knowledge requirements and elements/performance criteria for this unit. Log of Industrial Experience and Achievement records relating to MEA276A Maintain basic aircraft communication and radio navigation systems and components and MEA289A Maintain basic light aircraft avionic systems and components, may be accepted as also meeting the evidence requirements for this unit in the applicable areas.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in

	the Evidence Guide
Communication and radio navigation systems	Communication and radio navigation systems and components include: 1. HF and VHF 2. ADF and VOR 3. ELT
Troubleshooting	Troubleshooting involves the use of fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA215C Inspect, test and troubleshoot advanced aircraft communications systems and components

Modification History

Minor formatting and editorial changes made. Additional assessment advice provided in the Evidence Guide.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to inspect, test and troubleshoot advanced communications systems and components of fixed and rotary wing aircraft. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot advanced communication systems and components.

Applications include fixed and rotary wing aircraft that have advanced communication systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA206C	Remove and install basic radio communication and navigation system components
MEA246C	Manufacture and/or repair aircraft electrical components or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect advanced communications systems and components	1.1. Relevant maintenance documentation and modification status, including system defect reports where relevant, are used to identify specific inspection requirements 1.2. Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual 1.3. ***Communications system components*** are visually or physically checked for external signs of defects in accordance with applicable maintenance manual 1.4. Defects are correctly identified and reported
2. Test/adjust advanced communications systems and components	2.1. Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation 2.2. Communications system is functionally tested, in accordance with maintenance manual, for evidence of serviceability or malfunction 2.3. System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3. Troubleshoot advanced communications systems	3.1. Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination 3.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate ***troubleshooting***

3.3. Specialist advice is obtained, where required, to assist with the troubleshooting process

3.4. Communications system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures

3.5. Rectification requirements are determined

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures
- using approved maintenance documentation and aircraft publications relating to the communications system being maintained
- recognition of system and component defects/external damage, correct installation, attaching hardware (including cabling/harnesses/transmission lines) and security in:
  - external communications systems (UHF and SATCOM)
  - internal communications systems (intercommunication and CVR)
- applying logic processes, taking and interpreting system measurements to accurately and effectively isolate malfunctions within the above systems
- testing listed systems to isolate system faults and assess post-maintenance serviceability

Required knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- the basic layout (block diagram level), function and operation of:
  - external communications systems (UHF and SATCOM)
  - internal communications systems (intercommunication and CVR)
- maintenance requirements for the above systems and troubleshooting procedures
- relevant OHS practices
- basic principles/functions, relating to the above-listed systems and associated with:
  - electromagnetic radiation and propagation
  - basic AC and DC circuit theory
  - printed circuit boards
  - digital fundamentals
  - analogue fundamentals
  - transmitter and receiver principles
  - antenna characteristics

- transmission line characteristics
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot advanced communication systems and components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with advanced communication systems and components. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across a range of advanced communication systems and components listed in the Range Statement. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a system and at least one major system component/LRU from each of Groups 1 and 2 listed in

	the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that general and special purpose tools, test and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained MEA214C Inspect, test and troubleshoot aircraft basic communication and radio navigation systems and components, will have already covered a considerable amount of the skill and knowledge requirements for this unit and will have demonstrated capability in a number of tasks that also relate to the Performance Criteria for Elements 1, 2 and 3. Log of Industrial Experience and Achievement records relating to MEA214C Inspect, test and troubleshoot aircraft basic communication and radio navigation systems and components, may be accepted as also meeting some of the evidence requirements for this unit in the applicable areas.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Communications systems and components	Communications systems and components include: 1. UHF and SATCOM 2. Intercommunication and CVR systems
Troubleshooting	Troubleshooting involves the use of fault-finding charts or

	similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA216C Inspect, test and troubleshoot instrument landing systems and components

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to inspect, test and troubleshoot ILS and components of fixed and rotary wing aircraft. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot ILS systems and components.

Applications include fixed and rotary wing aircraft that have ILS systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA206C	Remove and install basic radio communication and navigation system components
MEA207C	Remove and install aircraft electronic system components

MEA246C Fabricate and/or repair aircraft electrical components or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect ILS and components	1.1. Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements
	1.2. Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual
	1.3. ILS components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual
	1.4. Defects are correctly identified and reported
2. Test/adjust ILS and components	2.1. Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation
	2.2. ILS is functionally tested, in accordance with maintenance manual, for evidence of serviceability or malfunction
	2.3. System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3. Troubleshoot ILS	3.1. Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination
	3.2. Maintenance manual fault diagnosis guides and logic processes

are used to ensure efficient and accurate ***troubleshooting***

3.3. Specialist advice is obtained, where required, to assist with the troubleshooting process

3.4. ILS faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures

3.5. Rectification requirements are determined

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved maintenance documentation and aircraft publications relating to the ILS being maintained
- recognition of system and component defects/external damage, correct installation, attaching hardware (including cabling/harnesses/transmission lines) and security in instrument landing systems
- applying logic processes, taking and interpreting system measurements to accurately and effectively isolate malfunctions within the system
- performing system testing to isolate system faults and assess post-maintenance serviceability

Required knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- the basic layout (block diagram level), function and operation of the system
- integration with other avionic systems
- the location and operation of ground:
  - marker beacons
  - localiser transmitter
  - glideslope transmitter
- ILS maintenance requirements and troubleshooting procedures
- relevant OHS practices
- basic principles/functions relating to the system and associated with:
  - electromagnetic radiation and propagation
  - basic AC and DC circuit theory
  - digital fundamentals
  - analogue fundamentals

  - transmitter and receiver principles
  - antenna characteristics
  - transmission line characteristics
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot ILS systems and components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with aircraft ILS systems and components. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across a range of ILS systems and components. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision

	on an ILS system and at least one major system component/LRU. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that general and special purpose tools, test and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Troubleshooting	Troubleshooting involves the use of fault finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA217C Inspect, test and troubleshoot fixed wing autopilot systems and components

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to inspect, test and troubleshoot multi-axis autopilot systems and components of fixed wing aircraft. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot fixed wing multi-axis autopilot systems and components.

Applications include fixed wing aircraft that have multi-axis autopilot systems, including those incorporating a radio-coupled flight director.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA207C	Remove and install aircraft electronic system components
MEA246C	Fabricate and/or repair aircraft electrical components or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect fixed wing autopilot systems and components	1.1. Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements 1.2. Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual 1.3. ***Autopilot systems and components*** are visually or physically checked for external signs of defects in accordance with applicable maintenance manual 1.4. Defects are correctly identified and reported
2. Test/adjust fixed wing autopilot systems and components	2.1. Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation 2.2. Autopilot systems are functionally tested, in accordance with maintenance manual, for evidence of serviceability or malfunction 2.3. System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3. Troubleshoot fixed wing autopilot systems	3.1. Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination 3.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate ***troubleshooting*** 3.3. Specialist advice is obtained, where required, to assist with the troubleshooting process

3.4. Autopilot system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures

3.5. Rectification requirements are determined

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved maintenance documentation and aircraft publications relating to the autopilot and flight director system being maintained
- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) and security in:
  - flight director components and interface
  - multi-axis autopilot system components
- applying logic processes, taking and interpreting system measurements, use test equipment and appropriate wiring diagrams and manuals, to accurately and effectively isolate malfunctions in the above systems
- testing listed systems to isolate system malfunctions and assess post-maintenance serviceability

Required knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- the basic layout (block diagram level), function and operation of:
  - flight director components and interface
  - multi-axis autopilot system components
- integration with other avionic systems, e.g. flight management systems and navigation systems
- flight director and autopilot system maintenance requirements and troubleshooting procedures
- relevant OHS practices
- basic principles/functions, relating to the listed systems and associated with:
  - basic AC and DC circuit theory
  - digital fundamentals
  - analogue fundamentals
  - fixed wing flight theory

  - inner and outer loop control
  - flight control modes/channels
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot fixed wing multi-axis autopilot systems and components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with fixed wing aircraft autopilot systems and components. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across an autopilot system and its components. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision

	on an autopilot system and its components. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that general and special purpose tools, test and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Autopilot systems and components	Autopilot systems and components may include: • three axis autopilot systems and components, including those incorporating a radio-coupled flight director
Troubleshooting	Troubleshooting involves the use of fault finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA218C Inspect, test and troubleshoot rotary wing autopilot systems and components

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to inspect, test and troubleshoot autopilot systems and components fitted to rotary wing aircraft. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot rotary wing autopilot systems and components.

Applications include rotary wing aircraft that have autopilot systems, including those incorporating a radio-coupled flight director.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA207C	Remove and install aircraft electronic system components
MEA246C	Fabricate and/or repair aircraft electrical components or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect rotary wing autopilot systems and components	1.1. Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements 1.2. Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual 1.3. ***Autopilot systems and components*** are visually or physically checked for external signs of defects in accordance with applicable maintenance manual 1.4. Defects are correctly identified and reported
2. Test/adjust rotary wing autopilot systems and components	2.1. Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation 2.2. Autopilot systems are functionally tested, in accordance with maintenance manual, for evidence of serviceability or malfunction 2.3. System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3. Troubleshoot rotary wing autopilot systems	3.1. Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination 3.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate ***troubleshooting*** 3.3. Specialist advice is obtained, where required, to assist with the troubleshooting process

3.4. Autopilot system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures

3.5. Rectification requirements are determined

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved maintenance documentation and aircraft publications relating to the autopilot and flight director systems being maintained
- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) and security in:
  - flight director components and interface
  - autopilot system components
- applying logic processes, taking and interpreting system measurements, using test equipment and appropriate wiring diagrams and manuals, to accurately and effectively isolate malfunctions in the listed systems
- testing to isolate system malfunctions and assess post-maintenance serviceability

Required knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- the basic layout (block diagram level), function and operation of:
  - flight director components and interface
  - autopilot system components
- integration with other avionic systems, e.g. flight management systems and navigation systems
- flight director and autopilot system maintenance requirements and troubleshooting procedures
- relevant OHS practices
- basic principles/functions, relating to the above-listed systems and associated with:
  - basic AC and DC circuit theory
  - digital fundamentals
  - analogue fundamentals
  - rotary wing flight theory
  - inner and outer loop control

  - flight control modes/channels
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot rotary wing autopilot systems and components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with rotary wing aircraft autopilot systems and components. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across an autopilot system and its components. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on an autopilot system and its components. This shall be established via the records in the Log of Industrial

	Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that general and special purpose tools, test and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Autopilot systems and components	Autopilot systems and components may include: • rotary wing aircraft autopilot systems, including those incorporating a radio-coupled flight director
Troubleshooting	Troubleshooting involves the use of fault finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA219C Inspect, test and troubleshoot aircraft pressurisation control systems and components

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit, coupled with MEA208C, is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway, and is also part of the Mechanical Aircraft Maintenance Engineer licensing pathway. It covers the competencies required to inspect, test and troubleshoot pressurisation control systems and components of fixed wing aircraft. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot fixed wing aircraft pressurisation control systems and components.

Applications include fixed wing aircraft that have pressurisation systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA208C	Remove and install pressurisation control system components
MEA246C	Fabricate and/or repair aircraft electrical components or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect pressurisation control systems and components	1.1. Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements 1.2. Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual 1.3. Pressurisation control systems and components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual 1.4. Defects are correctly identified and reported
2. Test/adjust pressurisation control systems and components	2.1. Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation 2.2. Pressurisation control systems are functionally tested, in accordance with maintenance manual, for evidence of serviceability or malfunction 2.3. System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3. Troubleshoot pressurisation control systems	3.1. Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination 3.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate ***troubleshooting*** 3.3. Specialist advice is obtained, where required, to assist with the troubleshooting process

3.4. Pressurisation control system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures

3.5. Rectification requirements are determined

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved maintenance documentation and aircraft publications relating to the pressurisation control system being maintained
- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) and security in:
  - cabin altimeters, differential pressure indicators and cabin rate of climb indicators
  - pressure controllers (manual and automatic)
  - safety switches
- applying logic processes, take and interpret system measurements, use test equipment and appropriate wiring diagrams and manuals to accurately and effectively isolate malfunctions in the listed system components
- assisting with the performance of pressurisation system testing to isolate system malfunctions and assess post-maintenance serviceability

Required knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- the basic layout (block diagram level), function and operation of the listed components and their operation and function within the aircraft pressurisation system, including applicable interface with the outflow and safety valves:
  - cabin altimeters
  - differential pressure indicators
  - cabin rate of climb indicators
  - pressure controllers (manual and automatic)
  - safety switches
- basic principles/functions, relating to the listed system components and associated with:
  - basic AC and DC circuit theory
  - digital fundamentals
  - analogue fundamentals

  - atmospheric conditions, properties and effect on humans
  - pressurisation terminology
- pressurisation control system maintenance requirements and troubleshooting procedures
- relevant OHS practices
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot fixed wing aircraft pressurisation control systems and components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with fixed wing aircraft pressurisation control systems and components. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across a pressurisation control system and its components. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace

	assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a pressurisation control system and its components. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that general and special purpose tools, test and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Troubleshooting	Troubleshooting involves the use of fault finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA220C Inspect, test and troubleshoot aircraft primary radar systems and components

Modification History

Minor formatting and editorial changes made. Required skills included due to a TGA transfer error.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to inspect, test and troubleshoot primary radar systems and components of fixed and rotary wing aircraft. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot primary radar systems and components.

Applications include fixed and rotary wing aircraft that have primary radar systems, such as weather radar.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA207C	Remove and install aircraft electronic system components
MEA246C	Fabricate and/or repair aircraft electrical components or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect primary radar systems and components	1.1. Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements 1.2. Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual 1.3. Primary radar system components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual 1.4. Defects are correctly identified and reported
2. Test/adjust primary radar systems and components	2.1. Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation 2.2. Primary radar system is functionally tested, in accordance with maintenance manual, for evidence of serviceability or malfunction 2.3. System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3. Troubleshoot primary radar systems	3.1. Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination 3.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate ***troubleshooting*** 3.3. Specialist advice is obtained, where required, to assist with the troubleshooting process

3.4. Primary radar system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures

3.5. Rectification requirements are determined

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved maintenance documentation and aircraft publications relating to the primary radar system being maintained
- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses/transmission lines/wave guides) and security in radar (navigation/weather) system components and interface
- applying logic processes, and taking and interpreting system measurements to accurately and effectively isolate malfunctions within the system and system components
- performing system testing to isolate system malfunctions and assess system's post-maintenance serviceability

Required knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- the basic layout (block diagram level), function and operation of primary radar systems
- basic principles/functions relating to the system components and associated with:
  - basic AC and DC circuit theory
  - digital fundamentals
  - analogue fundamentals
  - radar fundamentals
  - transmission lines, waveguide and antenna characteristics
- primary radar system maintenance requirements and troubleshooting procedures
- relevant OHS practices including those relating to ground functional testing of radar systems
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot primary radar systems and components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with primary radar systems and components. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across a primary radar system and its components. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a primary radar system and at least one major system component/LRU. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that

	general and special purpose tools, test and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Troubleshooting	Troubleshooting involves the use of fault finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA221C Inspect, test and troubleshoot aircraft secondary radar systems and components

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to inspect, test and troubleshoot secondary radar systems and components of fixed and rotary wing aircraft. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot secondary radar systems and components.

Applications include fixed and rotary wing aircraft that have secondary radar systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA207C	Remove and install aircraft electronic system components
MEA246C	Fabricate and/or repair aircraft electrical components or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect secondary radar systems and components	1.1. Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements 1.2. Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual 1.3. Secondary radar system components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual 1.4. Defects are correctly identified and reported
2. Test/adjust secondary radar systems and components	2.1. Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation 2.2. ***Secondary radar system*** is functionally tested, in accordance with maintenance manual, for evidence of serviceability or malfunction 2.3. System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3. Troubleshoot secondary radar systems	3.1. Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination 3.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate ***troubleshooting*** 3.3. Specialist advice is obtained, where required, to assist with the troubleshooting process

3.4. Secondary radar system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required

3.5. Rectification requirements are determined

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved maintenance documentation and aircraft publications relating to the pulse system being maintained
- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses/transmission lines) and security in:
  - DME components and interface
  - radio altimeters
  - ATC transponders
  - doppler navigation system
  - ACAS
- applying logic processes, taking and interpreting system measurements to accurately and effectively isolate malfunctions within the systems
- testing systems to isolate system malfunctions and assess post-maintenance serviceability

Required knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- the basic layout (block diagram level), function and operation of:
  - DME including components and interface
  - radio altimeters
  - ATC transponders
  - doppler navigation system
  - ACAS
- basic principles/functions, relating to the above-listed systems and associated with:
  - basic AC and DC circuit theory
  - digital fundamentals
  - analogue fundamentals
  - radar fundamentals
  - transmission lines, waveguide and antenna characteristics

- pulse system maintenance requirements and troubleshooting procedures
- relevant OHS practices
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot secondary radar systems and components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with secondary radar systems and components. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across secondary radar systems and components listed in the Range Statement. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one of the secondary radar systems in Groups 1 to 5 in the Range Statement and its major system

	components/LRU. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that general and special purpose tools, test and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Secondary radar systems	Secondary radar systems include: 1. ATC transponder 2. Radio altimeter 3. DME 4. Doppler navigation system 5. ACAS
Troubleshooting	Troubleshooting involves the use of fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by

	manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA222C Inspect, test and troubleshoot aircraft oxygen systems and components

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Avionic (Aircraft Maintenance Stream) training pathways and is also part of the Mechanical Aircraft Maintenance Engineer licensing pathway. It covers the competencies required to inspect, test and troubleshoot oxygen systems and components of fixed and rotary wing aircraft. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot aircraft oxygen systems and components.

Applications include fixed and rotary wing aircraft that have oxygen systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect oxygen system components	1.1. Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements
	1.2. Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual
	1.3. ***Oxygen system components*** are visually or physically checked for external signs of defects in accordance with applicable maintenance manual
	1.4. Defects are correctly identified and reported
2. Test/adjust oxygen systems	2.1. Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation
	2.2. Oxygen system is functionally tested, in accordance with maintenance manual, for evidence of serviceability or malfunction
	2.3. System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3. Troubleshoot oxygen systems	3.1. Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination
	3.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate ***troubleshooting***
	3.3. Specialist advice is obtained, where required, to assist with the troubleshooting process

3.4. Oxygen system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required

3.5. Rectification requirements are determined

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying appropriate OHS practices
- using approved maintenance documentation and aircraft publications relating to aircraft oxygen systems and components for the purpose of system testing
- general application of logical fault-finding and use of truth tables during troubleshooting
- interpreting oxygen system instruments, gauges, warning annunciators and test equipment, i.e. leak detectors
- applying the methods used to locate, identify and access oxygen system components for inspection, testing and troubleshooting
- demonstrating the procedure to replenish a dry breathing oxygen system, including:
  - correct identification of oxygen ground trolleys
  - maximum charging pressures for low and high pressure systems
  - safety precautions to be adhered to during replenishment
  - correct order of procedural replenishment steps
- demonstrating the procedure to purge a dry breathing oxygen system, including:
  - reasons for the requirement to undertake a purging operation
  - identification of acceptable system purging gases
  - safety precautions to be adhered to during purging
  - correct techniques to be employed when purging oxygen storage cylinders or systems

Required knowledge

Look for evidence that confirms knowledge of:

- component attachment methods, connection of hardware and couplings and their physical security within the aircraft
- oxygen system isolation
- properties of aircraft oxygen and requirements for aircrew/passengers
- properties of the atmosphere and how they vary.
- defining terms and units of measurement relating to aircraft altitude and system pressures
- layout of low and high-pressure dry breathing oxygen systems and components
- operation of oxygen systems and components, including:
  - pressure demand regulators

  - passenger service regulators
  - altitude sensing barometers
- methods by which gaseous dry breathing oxygen is stored in both the aircraft and within the workplace environment. Reference to storage trolleys, aircraft cylinders and chemical oxygen cylinders is required
- oxygen system maintenance requirements and troubleshooting procedures
- relevant OHS practices
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot aircraft oxygen systems and components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with aircraft oxygen systems and components. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across a range of aircraft oxygen systems and components listed in the Range Statement. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and

	regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one item from each of Groups 1 and 2 in the Range Statement (Groups 3 and 4 may be omitted where they are not applicable to the enterprise). This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that general and special purpose tools, test and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Oxygen system components	Oxygen system components include: 1. Oxygen pressure cylinders, valves and gauges 2. Regulators, masks (including other integrated systems), pipes, hoses and fittings 3. Chemical generators 4. LDBO converters
Troubleshooting	Troubleshooting involves the use of fault-finding charts or

	similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

MEA209C Remove and install aircraft oxygen system components

MEA223D Inspect aircraft electrical systems and components

Modification History

Knowledge statements expanded - equivalent to previous unit.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathways and is also part of the Mechanical Aircraft Maintenance Engineer licensing pathway. It covers the competencies required to inspect electrical systems and components of fixed and rotary wing aircraft. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen B1 or the B2 maintenance certification licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable maintenance publications to inspect aircraft electrical systems and components.

Applications include fixed and rotary wing aircraft.

Licensing/Regulatory Information

Refer to unit descriptor

Pre-Requisites

MEA246C Fabricate and/or repair aircraft electrical components or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and

	knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Inspect electrical systems and components	1.1 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual
	1.2 ***Electrical system components*** and hardware are visually or physically checked for external signs of defects in accordance with applicable maintenance manual
	1.3 Defects are correctly identified and recorded in accordance with standard enterprise procedures

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- component attachment methods and connection of hardware
- explaining the basic layout (block diagram level) and operation of:
  - AC and DC power generation systems including regulation, distribution, control and cooling
  - battery installations and inverters
  - flight control and/or electro-hydraulic systems
  - engine ignition, starting, fuel distribution and control systems
  - internal/external lighting systems, including controls
  - doors
  - landing gear systems
  - anti-skid braking systems
  - master caution and warning systems
  - auxiliary systems (including ice/rain protection, fire detection, environmental control and pressurisation, waste and water, equipment and furnishings)
- OHS requirements applicable to the maintenance of aircraft electrical systems, including gas turbine engine high-energy ignition units
- electrical system maintenance requirements
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved maintenance documentation and aircraft publications relating to the avionic system being maintained
- recognition of system and electrical component defects/external damage, correct installation, connection of plugs, terminations, and attaching hardware (including cabling/harnesses) and security in:
  - AC and DC power generation systems, including regulation, distribution, control and cooling
  - battery installations and inverters
  - flight control and/or electro-hydraulic systems
  - engine ignition, starting, fuel distribution and control systems
  - internal/external lighting systems, including controls
  - doors
  - landing gear systems
  - anti-skid braking systems
  - master caution and warning systems
  - auxiliary systems (including ice/rain protection, fire detection, environmental control and pressurisation, waste and water, equipment and furnishings)

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect aircraft electrical systems and components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection applications (including the timely involvement of supervisors or other trades) associated with aircraft electrical systems and components. It is essential that cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection is essential. This is to be demonstrated through application across a range of

	aircraft electrical systems, components and hardware listed in the Range Statement. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a system and related components in each Group 1 to 13 inclusive (Groups 14 to 17 may be omitted where they are not applicable to the enterprise) in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that general and special purpose tools, test and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained MEA211C Inspect, test and troubleshoot advanced aircraft electrical systems and components, will have covered a significant proportion of the Performance Criteria for Element 1 and will have covered many of the Range Statement variables. Log of Industrial Experience and Achievement records relating to MEA211C Inspect, test and troubleshoot advanced aircraft electrical systems and components may be accepted as also meeting the evidence requirements for this unit in the applicable areas. The relationship between MEA211C Inspect, test and troubleshoot advanced aircraft electrical systems and components and MEA210C Inspect, test and troubleshoot basic aircraft electrical systems and components may also be taken into account where MEA210C Inspect, test and troubleshoot basic aircraft electrical systems and components, has been attained, but not MEA211C Inspect, test and troubleshoot advanced aircraft electrical systems and components. Advice in MEA210C Inspect, test and troubleshoot basic aircraft electrical systems and components regarding the coverage of MEA274A Maintain basic light aircraft electrical systems and components, may also be taken

	into consideration where applicable.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Electrical systems and components	Electrical systems and components may include: 1. AC and/or DC power generation, regulation and distribution systems 2. Battery installations and bus ties/interlocks 3. Rotary and static inverters and TR units 4. Air cycle air conditioning and pressurisation systems 5. Flight and engine control systems 6. Ignition and starting systems 7. Fire/smoke detection and extinguishing 8. Lighting 9. Master and caution warning systems 10. Equipment and furnishing 11. Equipment cooling and ventilation 12. Position indicating systems 13. Fuel storage and distribution 14. Propeller control systems 15. Landing gear indication and anti-skid 16. Ice and rain protection 17. Wastewater
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities

	• individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

MEA203C Remove and install advanced aircraft electrical system components

MEA224C Inspect aircraft instrument systems and components

Modification History

Knowledge statements expanded - equivalent to previous unit.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathways. It covers the competencies required to inspect instrument systems and components of fixed and rotary wing aircraft. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the B2 maintenance certification licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable maintenance publications to inspect aircraft instrument systems and components.

Applications include fixed and rotary wing aircraft.

Licensing/Regulatory Information

Refer to unit descriptor

Pre-Requisites

MEA246C Fabricate and/or repair aircraft electrical components or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of

	performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Inspect instrument systems and components	1.1 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual
	1.2 ***Instrument system components*** are visually or physically checked for external signs of defects in accordance with applicable maintenance manual
	1.3 Defects are correctly identified and recorded in accordance with standard enterprise procedures

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- connection of hardware
- instrument system maintenance requirements
- the basic layout (block diagram level), function and operation of:
  - flight instruments, including:
    - ASIs
    - VSIs
    - air data systems and components
    - machmeters
    - altimeters, including servo and encoding altimeters
    - turn and slip indicators
    - AHs
    - DGs
    - angle of attack and stall warning/avoidance systems
  - pitot/static systems
  - navigation systems:
    - direct reading compasses
    - gyro compasses
    - AHRS
  - GPWS

- turbine engine instruments, including:
  - temperature and pressure, including thermocouples, sensors and transmitters
  - speed, including mechanical and electric tachometers
  - thrust, including fan, propeller and jet
  - torque
  - fuel flow
  - vibration
- auxiliary transmitter/indicator measuring systems, including:
  - hydraulic pressure and temperature
  - pneumatic pressure
  - transmission oil pressure and temperature
  - fuel remaining/used
  - fuel quantity indication
  - component position (e.g. doors, flaps, speed brakes and landing gear)
- FDR systems
- relevant OHS practices
- instrument system maintenance requirements
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved maintenance documentation and aircraft publications relating to the instrument system being maintained
- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, and attaching hardware (including cabling/harnesses) and security in:
  - pitot/static systems and associated instruments and systems
  - flight instruments
  - GPWS and FDR
  - stall warning, angle of attack and stall avoidance systems
  - navigation systems (compasses and AHRS)
  - pressure measurement, position indicators, engine/auxiliary system indication systems, including fuel quantity and flow

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot aircraft instrument systems and components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection applications (including the timely involvement of supervisors or other trades) associated with aircraft instrument systems and components. It is essential that cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection is essential. This is to be demonstrated through application across a range of aircraft instrument systems and components listed in the Range Statement. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a system and at least one major system component/LRU from each of Groups 1 to 7 (Group 7 may be omitted where it is not applicable to the enterprise) listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that general and special purpose tools, test and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained MEA213C Inspect, test and troubleshoot advanced aircraft instrument systems and components, will have covered a significant proportion of the Performance Criteria for Element 1 and will have covered many of the

	Range Statement variables. Log of Industrial Experience and Achievement records relating to MEA213C Inspect, test and troubleshoot advanced aircraft instrument systems and components, may be accepted as also meeting the evidence requirements for this unit in the applicable areas. The relationship between MEA213C Inspect, test and troubleshoot advanced aircraft instrument systems and components, and MEA212C Inspect, test and troubleshoot basic aircraft instrument systems and components may also be taken into account where MEA212C Inspect, test and troubleshoot basic aircraft instrument systems and components has been attained, but not MEA213C Inspect, test and troubleshoot advanced aircraft instrument systems and components. Advice in MEA212C Inspect, test and troubleshoot basic aircraft instrument systems and components regarding the coverage of MEA275A Maintain basic light aircraft instrument systems and components, may also be taken into consideration where applicable.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Instrument systems and components	Instrument systems and components may include: 1. Flight instruments, including pitot/static systems, ASIs, VSIs, altimeters, altitude alerting and reporting, turn and bank and slip/turn coordinators, DGs and AHs (air and electrically driven) 2. Machmeters, air data systems, angle of attack, stall warning and avoidance systems 3. FDRs 4. Engine indication systems

	5. Magnetic compasses and AHRS 6. Miscellaneous instrument systems, including pressure measurement, fuel quantity, fuel flow, position indication, voltage and frequency, current and power 7. GPWS
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Co-requisites

MEA205C Remove and install advanced aircraft general instrument system components

MEA225C Inspect fixed wing aircraft automatic flight control systems and components

Modification History

Knowledge statements expanded - equivalent to previous unit.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathways. It covers the competencies required to inspect automatic flight control systems and components of fixed wing aircraft. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the B2 maintenance certification licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable maintenance publications to inspect, aircraft automatic flight control systems and components.

Applications include fixed wing aircraft that have automatic flight control systems.

Licensing/Regulatory Information

Refer to unit descriptor

Pre-Requisites

MEA207C Remove and install aircraft electronic system components

MEA246C Fabricate and/or repair aircraft electrical components or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Inspect automatic flight control systems and components	1.1 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual
	1.2 ***Automatic flight control system components*** are visually or physically checked for external signs of defects in accordance with applicable maintenance manual
	1.3 Defects are correctly identified and recorded in accordance with standard enterprise procedures

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- the basic layout (block diagram level), and operation of the system, including the interface with:
  - flight management systems
  - navigation systems
  - flight control actuators
  - engine management systems
- relevant OHS practices
- maintenance requirements
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved maintenance documentation and aircraft publications relating to the automatic flight control system being maintained
- recognition of system and component defects/external damage, correct installation,

connection of plugs, terminations, and attaching hardware (including cabling/harnesses) and security in automatic fight control system and components

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect automatic flight control systems and components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection applications (including the timely involvement of supervisors or other trades) associated with aircraft automatic flight control systems and components. It is essential that cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection is essential. This is to be demonstrated through application across a range of aircraft automatic flight control systems and components listed in the Range Statement. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one item from each of Groups 1 to 4 (Group 5 may be omitted where it is not applicable to the enterprise) listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that

	general and special purpose tools, test and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Automatic flight control systems and components	Automatic flight control systems and components may include automatic pilots and associated integrated systems and components, including: 1. Automatic pilot 2. Flight director 3. Automatic trim 4. Yaw damper 5. Automatic throttle and automatic landing
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA226D Inspect aircraft electronic systems and components

Modification History

Knowledge statements expanded - equivalent to previous unit.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathways. It covers the competencies required to inspect electronic systems and components of fixed and rotary wing aircraft. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the B2 maintenance certification licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable maintenance publications to inspect aircraft electronic systems and components.

Applications include fixed and rotary wing aircraft.

Licensing/Regulatory Information

Refer to unit descriptor

Pre-Requisites

MEA246C Fabricate and/or repair aircraft electrical components or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of

	performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Inspect electronic systems and components	1.1 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual
	1.2 ***Electronic system components*** are visually or physically checked for external signs of defects in accordance with applicable maintenance manual
	1.3 Defects are correctly identified and recorded in accordance with standard enterprise procedures

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- component attachment methods and connection of hardware
- the basic layout (block diagram level) and operation of:
  - multi-function display systems (interface units, display generators and display units), i.e. HUD, ICAS, FMS, ACARS, EFIS and ECAM
  - integrated modular avionics
  - INS and IRS
  - external communications systems:
    - HF
    - UHF
    - VHF
    - SATCOM
    - ELT
  - internal communications systems:
    - intercommunication
    - cabin intercommunication data systems
    - cabin network services
    - CVR
  - information systems, such as air traffic and information management systems, and network server systems
  - RF navigation systems:

    - ILS
    - VOR
    - ADF
    - GNS
  - primary radar (navigation/weather) components and interface
  - ACAS components and interface
  - radio altimeter components and interface
  - DME components and interface
  - ATC transponders
- relevant OHS practices
- maintenance requirements
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved maintenance documentation and aircraft publications relating to the avionic system being maintained
- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, and attaching hardware (including cabling/harnesses) and security in:
  - multi-function display systems (interface units, display generators and display units), i.e. HUD, EICAS, FMS, ACARS, EFIS and ECAM
  - integrated modular avionics
  - INS and IRS
  - external communications systems:
    - HF
    - UHF
    - VHF
    - SATCOM
    - ELT
  - internal communications systems:
    - intercommunication
    - cabin intercommunication data systems
    - cabin network services
    - CVR
  - information systems, such as air traffic and information management systems, and network server systems
  - RF navigation systems:
    - ILS
    - VOR

  - ADF
  - GNS
- primary radar (navigation/weather) components and interface
- ACAS components and interface
- radio altimeter components and interface
- DME components and interface
- ATC transponders

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect aircraft electronic systems and components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection applications (including the timely involvement of supervisors or other trades) associated with aircraft electronic systems and components. It is essential that cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection is essential. This is to be demonstrated through application across a range of electronic systems and components listed in the Range Statement. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on each type of system listed in Groups 1 to 7 in the Range Statement and at least one component for each listed system type (Groups 6 and 7 may be omitted where they are not applicable to the enterprise). This shall be

	established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that general and special purpose tools, test and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained any of MEA214C Inspect, test and troubleshoot aircraft basic communication and radio navigation systems and components, MEA215C Inspect, test and troubleshoot advanced aircraft communications systems and components, MEA216C Inspect, test and troubleshoot instrument landing systems and components, MEA220C Inspect, test and troubleshoot Inspect, test and troubleshoot aircraft primary radar systems and components, and MEA221C Inspect, test and troubleshoot aircraft secondary radar systems and components, MEA233C Inspect, test and troubleshoot aircraft inertial navigation and reference systems and components, and MEA234C Inspect, test and troubleshoot aircraft global navigation systems and components, will have covered a significant proportion of the Performance Criteria for Element 1 and will have covered Range Statement variables applicable to the unit. Log of Industrial Experience and Achievement records relating to MEA214C Inspect, test and troubleshoot aircraft basic communication and radio navigation systems and components, MEA215C Inspect, test and troubleshoot advanced aircraft communications systems and components, MEA216C Inspect, test and troubleshoot instrument landing systems and components, MEA220C Inspect, test and troubleshoot Inspect, test and troubleshoot aircraft primary radar systems and components and MEA221C Inspect, test and troubleshoot aircraft secondary radar systems and components, MEA233C Inspect, test and troubleshoot aircraft inertial navigation and reference systems and components, MEA234C Inspect, test and troubleshoot aircraft global navigation systems and components, MEA276A Maintain basic aircraft communication and radio navigation systems and components, MEA278A Inspect, test and troubleshoot instrument display systems

	and components, and MEA289A Maintain basic light aircraft avionic systems and components, may be accepted as also meeting the evidence requirements for this unit in the applicable areas.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Electronic systems and components	Electronic systems and components include: 1. Electronic instrument displays – EFIS, EICAS, FMS, ECAM and HUD (where applicable to enterprise) 2. Instrument navigation systems – INS, IRS, compasses and AHRS 3. Communication systems – HF, VHF, UHF, SATCOM, intercom, data and cabin network services, ELT and CVR 4. Radio navigation systems – ADF, VOR, ILS and GNS 5. Pulse operated systems – weather radar, navigation radar, ATC transponder, RADALT, DME, doppler and ACAS (where applicable to enterprise) 6. Integrated modular avionics (where applicable to enterprise) 7. Information systems – air traffic and information management, network servers (where applicable to enterprise)
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Co-requisites

MEA207C Remove and install aircraft electronic system components

MEA227D Test and troubleshoot aircraft electrical systems and components

Modification History

Knowledge statements expanded - equivalent to previous unit.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathways and is also part of the Mechanical Aircraft Maintenance Engineer licensing pathway. It covers the competencies required to test and troubleshoot electrical systems and components of fixed and rotary wing aircraft. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen B1 or the B2 maintenance certification licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to test and troubleshoot aircraft electrical systems and components.

Applications include fixed and rotary wing aircraft.

Licensing/Regulatory Information

Refer to unit descriptor

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and

unit of competency.	knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Prepare for troubleshooting	1.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify an unserviceability
2 Test/adjust electrical systems	2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation
	2.2 ***Electrical system*** is functionally tested, in accordance with maintenance manual, for evidence of serviceability or malfunction
	2.3 System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3 Troubleshoot electrical systems	3.1 Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination
	3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate ***troubleshooting***
	3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process
	3.4 System faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required
	3.5 Rectification requirements are determined

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- connection of hardware
- explaining the basic layout (block diagram level), function and operation of:
  - AC and DC power generation systems, including regulation, distribution, control and

cooling
    - battery installations
    - flight control and/or electro-hydraulic systems
    - engine ignition, starting, fuel distribution and control systems
    - internal/external lighting systems, including controls
    - landing gear systems
    - anti-skid braking systems
    - auxiliary systems, including ice/rain protection, fire detection, environmental control and pressurisation, water and waste, doors, propeller control, equipment and furnishings
    - equipment cooling and ventilation systems
    - master caution and warning systems
- explaining basic principles/functions, relating to systems listed above and associated with:
    - basic AC and DC circuit theory
    - digital fundamentals
    - analogue fundamentals
    - AC and DC generator characteristics
    - single and polyphase AC motors and DC motors
    - rotary and static inverters
    - air cycle air conditioning
    - electrical sensing and transmitting devices
- OHS requirements applicable to the maintenance of aircraft electrical systems, including gas turbine engine high-energy ignition units
- electrical system maintenance requirements and troubleshooting procedures
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved maintenance documentation and aircraft publications relating to the electrical system being maintained
- recognition of system and electrical component defects/external damage, correct installation, connection of plugs, terminations, and attaching hardware (including cabling/harnesses) and security in:
    - AC and DC power generation systems, including regulation, distribution, control and cooling
    - battery installations
    - flight control and/or electro-hydraulic systems
    - engine ignition, starting, fuel distribution and control systems
    - internal/external lighting systems, including controls
    - landing gear systems
    - anti-skid braking systems

  - auxiliary systems, including ice/rain protection, fire detection, environmental control and pressurisation, water and waste, doors, propeller control, equipment and furnishings
  - equipment cooling and ventilation systems
  - master caution and warning systems
- applying logic processes, taking and interpreting electrical measurements, using test equipment and appropriate wiring diagrams and manuals to isolate electrical system malfunctions of the above components and systems
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to test and troubleshoot DC and AC electrical systems and components, including looms, cables and connection hardware, while observing all relevant safety precautions
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with aircraft electrical systems and components. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to testing and troubleshooting is essential. This is to be demonstrated through application across a range of aircraft electrical systems and components listed in the Range Statement. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance

	with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a system and at least one item from each of Groups 1 to 14, including a battery check in the case of Group 14 (Groups 15 to 17 may be omitted where they are not applicable to the enterprise) in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that general and special purpose tools, test and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained MEA211C Inspect, test and troubleshoot advanced aircraft electrical systems and components, will have covered a significant proportion of the Performance Criteria for Elements 1, 2 and 3 and will have covered many of the Range Statement variables. Log of Industrial Experience and Achievement records relating to MEA211C Inspect, test and troubleshoot advanced aircraft electrical systems and components, may be accepted as also meeting the evidence requirements for this unit in the applicable areas. The relationship between MEA211C Inspect, test and troubleshoot advanced aircraft electrical systems and components, and MEA210C Inspect, test and troubleshoot basic aircraft electrical systems and components, may also be taken into account where MEA210C Inspect, test and troubleshoot basic aircraft electrical systems and components, has been attained, but not MEA211C Inspect, test and troubleshoot advanced aircraft electrical systems and components. Advice in MEA210C Inspect, test and troubleshoot basic aircraft electrical systems and components, regarding the coverage of MEA274A Maintain basic light aircraft electrical systems and components, may also be taken into consideration where applicable.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Electrical systems and components	Electrical systems may include the following electrical systems and components, including all related electrical hardware, looms and cables: 1. AC and/or DC power generation, regulation and distribution systems 2. Rotary and static inverters and TR units 3. Air cycle air conditioning and pressurisation systems 4. Flight and engine control systems 5. Ignition and starting systems 6. Fire/smoke detection and extinguishing 7. Lighting (internal and external) 8. Master and caution warning systems 9. Equipment cooling and ventilation 10. Equipment and furnishing 11. Position indicating systems 12. Fuel storage and distribution 13. Landing gear indication and anti-skid 14. Main batteries and battery bus ties/interlocks 15. Propeller control systems 16. Ice and rain protection 17. Wastewater
Troubleshooting	Troubleshooting involves the use of fault-finding charts, or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities

	• individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Co-requisites

MEA223D Inspect aircraft electrical systems and components

MEA228D Test and troubleshoot aircraft instrument systems and components

Modification History

Knowledge statements expanded - equivalent to previous unit.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to test and troubleshoot aircraft instrument and display systems and components. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the B2 maintenance certification licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills, standard trade practices and systems knowledge in the testing and troubleshooting of aircraft instrument and display systems and components during both scheduled and unscheduled maintenance.

Applications include instrument and display systems and components fitted to both fixed and rotary wing aircraft.

Licensing/Regulatory Information

Refer to unit descriptor

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and

unit of competency.	knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Prepare for troubleshooting	1.1 Relevant maintenance documentation and modification status, including system defect/service difficulty reports where relevant, are interpreted to identify an unserviceability
2 Test/adjust instrument and display systems	2.1 The aircraft and systems are correctly prepared, in accordance with specified procedures, for the application of power and system operation
	2.2 ***Instrument or display system*** is functionally tested, in accordance with specified procedures, for evidence of serviceability or malfunction
	2.3 System calibration or adjustments are performed in accordance with specified procedures
3 Troubleshoot instrument and display systems	3.1 Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination
	3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate ***troubleshooting***
	3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process
	3.4 Instrument or display system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required
	3.5 Fault rectification requirements are determined to assist in planning the repair or adjustment

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- standard trade practices relating to tool and test equipment usage and installation/securing of system components

- the basic layout (block diagram level) of the systems listed in the Range Statement
- the operating principles of the systems listed in the Range Statement and associated with:
  - the properties and effects of atmospheric conditions on aircraft instruments and systems
  - pressure and temperature sensing elements and their use in aircraft instruments
  - gyroscopes and their use in aircraft instrument and reference systems
  - electrical fundamentals and display screen generation
- the various methods of navigation and how they are used by both conventional and electronic navigational instruments and systems
- maintenance requirements and troubleshooting procedures
- OHS procedures relating to instrument and display systems and components
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures, including software management control

Look for evidence that confirms skills in:

- using hand skills, tools and test equipment in the testing, adjustment and troubleshooting of instrument and display systems
- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, and attaching hardware (including cabling/harnesses) for the systems listed in Range Statement
- interpreting the information presented on instrument and display systems
- applying logic processes and using appropriate wiring diagrams and manuals to isolate instrument and display system malfunctions
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability
- effectively using maintenance documentation and relevant fault diagnosis guides in the troubleshooting process
- applying standard procedures
- observing all relevant OHS procedures

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to test and troubleshoot a range of instrument and display systems and components that is representative of the scope of the listed variables in accordance with relevant maintenance manual instructions while applying all relevant OHS procedures and standard processes.

	Coverage of display systems is required only where applicable to the enterprise.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with aircraft instrument and display systems and their components. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This may be demonstrated through application across a range of aircraft instrument and display systems (where display systems are applicable to the enterprise) listed in the Range Statement. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of this unit of competency are being achieved under routine supervision on a system and on at least one major system component of each Group 1 to 6 (Groups 5 and 6 may be omitted if not applicable to the enterprise), as listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment, using procedures, tools and equipment specified in maintenance documentation. It is also expected that general purpose tools, test and ground support equipment found in most routine situations would be used where appropriate. The level of troubleshooting is limited in its application to the use of fault diagnosis guides or other similar information to

	enable troubleshooting to line replaceable item level.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained MEA213C Inspect, test and troubleshoot advanced aircraft instrument systems, will have covered a significant proportion of the Performance Criteria for Elements 1, 2 and 3 and will have covered many of the Range Statement variables. Log of Industrial Experience and Achievement records relating to MEA213C Inspect, test and troubleshoot advanced aircraft instrument systems, may be accepted as also meeting the evidence requirements for this unit in the applicable areas. The relationship between MEA213C Inspect, test and troubleshoot advanced aircraft instrument systems and MEA212C Inspect, test and troubleshoot basic aircraft instrument systems and components, may also be taken into account where MEA212C Inspect, test and troubleshoot basic aircraft instrument systems and components has been attained, but not MEA213C Inspect, test and troubleshoot advanced aircraft instrument systems. Advice in MEA212C Inspect, test and troubleshoot basic aircraft instrument systems and components regarding the coverage of MEA275A Maintain basic light aircraft instrument systems and components, may also be taken into consideration where applicable.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Instrument or display systems	Instrument or display systems may include: 1. Flight instruments – pitot/static systems, ASIs, machmeters, air data systems and instruments, VSIs, altimeters, altitude alerting and reporting, turn and bank,

	DGs, AHs, angle of attack, stall warning/avoidance, GPWS and FDRs 2. Engine Instruments – engine speed, pressure, temperature, performance, vibration and torque 3. Instrument navigation systems – INS, IRS, compasses and AHRS 4. Miscellaneous – pressure, fuel quantity, fuel flow, position, voltage, frequency, current and power 5. Display systems – EFIS, EICAS, FMCS, ECAM and HUD 6. Integrated modular avionics
Troubleshooting	Troubleshooting involves the use of fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Co-requisites

MEA224C Inspect aircraft instrument systems and components

MEA226D Inspect aircraft electronic systems and components

MEA229D Test and troubleshoot aircraft radio frequency navigation and communications systems and components

Modification History

Knowledge statements expanded - equivalent to previous unit.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathways. It covers the competencies required to test and troubleshoot radio frequency (RF) navigation and communication systems and components of fixed and rotary wing aircraft. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the B2 maintenance certification licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to test and troubleshoot communication and RF navigation systems and components.

Applications include fixed and rotary wing aircraft.

Licensing/Regulatory Information

Refer to unit descriptor

Pre-Requisites

MEA226D Inspect aircraft electronic systems and components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the	Performance criteria describe the performance needed to

essential outcomes of a unit of competency.	demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Prepare for troubleshooting	1.1 Relevant maintenance documentation and modification status, including system defect reports where relevant, are used to identify an unserviceability
2 Test/adjust RF navigation and communications systems	2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation
	2.2 ***RF navigation or communication system*** is functionally tested, in accordance with maintenance manual, for evidence of serviceability or malfunction
	2.3 System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3 Troubleshoot RF navigation and communications systems	3.1 Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination
	3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate ***troubleshooting***
	3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process
	3.4 RF navigation or communication system faults are located and the causes are clearly identified and correctly recorded in maintenance documentation, where required
	3.5 Rectification requirements are determined

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- evidence of knowledge of component attachment methods

- explaining the basic layout (block diagram level), function and operation of:
  - external communications systems:
    - HF
    - UHF
    - VHF
    - SATCOM and microwave
  - internal communications systems:
    - intercommunication
    - cabin intercommunication data systems
    - cabin network services
    - CVR
  - information systems, such as air traffic and information management systems, and network server systems
  - RF navigation systems:
    - ILS
    - VOR
    - ADF
    - GNS
    - ACARS
  - ELT systems
- explaining basic principles/functions relating to the above systems and associated with:
  - electromagnetic radiation and propagation
  - basic AC and DC circuit theory
  - digital fundamentals
  - analogue fundamentals
  - antenna characteristics
  - transmission line characteristics
- OHS requirements
- system and component maintenance requirements and troubleshooting procedures
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved maintenance documentation and aircraft publications relating to the RF and communications system being maintained
- recognition of system and component defects/external damage, correct installation, and attaching hardware (including cabling/harnesses/transmission lines) and security in:
  - external communications systems:
    - HF
    - UHF

    - VHF
    - SATCOM and microwave
  - internal communications systems:
    - intercommunication
    - cabin intercommunication data systems
    - cabin network services
    - CVR
  - information systems, such as air traffic and information management systems, and network server systems
  - RF navigation systems:
    - ILS
    - VOR
    - ADF
    - GNS
    - ACARS
  - ELT systems
- applying logic processes, taking and interpreting system measurements to accurately and effectively isolating malfunctions within the systems
- performing system testing to isolate system faults and assess post-maintenance serviceability

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to test and troubleshoot communication and RF navigation systems and components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with aircraft communication and RF navigation systems and components. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and

	specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to testing and troubleshooting is essential. This is to be demonstrated through application across a range of aircraft communication and RF navigation systems and components listed in the Range Statement. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one system and its major components from each of Groups 1 to 4 (Groups 2 and 3 may be omitted where the listed systems are not applicable to the enterprise) and the general associated components in Group 5, as listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that general and special purpose tools, test and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained any of MEA214C Inspect, test and troubleshoot aircraft basic communication and radio navigation systems and components, MEA215C Inspect, test and troubleshoot advanced aircraft communications systems and components, MEA216C Inspect, test and troubleshoot instrument landing systems and components, MEA234C Inspect, test and troubleshoot aircraft global navigation systems and components, MEA276A Maintain basic aircraft communication and radio navigation systems and components and MEA289A Maintain basic light aircraft avionic systems and components, will have covered

	Element 1 plus a significant proportion of the Performance Criteria for Elements 2 and 3 and will have covered common Range Statement variables. Log of Industrial Experience and Achievement records relating to MEA214C Inspect, test and troubleshoot aircraft basic communication and radio navigation systems and components, MEA215C Inspect, test and troubleshoot advanced aircraft communications systems and components, MEA216C Inspect, test and troubleshoot instrument landing systems and components, and MEA234C Inspect, test and troubleshoot aircraft global navigation systems and components, may be accepted as also meeting the evidence requirements for this unit in the applicable areas.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
RF navigation or communication systems	RF navigation or communication systems may include: 1. Control and sensing associated with cockpit radio, ground and flight crew communications and may comprise FM and AM modes of operation in the HF, UHF, and VHF bands, microwave systems and SATCOM 2. Passenger communications, cockpit voice recorder, audio integration system, cabin intercommunication data systems and cabin network services 3. Information systems, such as air traffic and information management systems, and network server systems 4. ILS, VOR, ADF, GNS, emergency beacons and ACARS 5. Antennae, impedance audio matching devices,

	microphones and headphones, transmission lines, computer controls, line replaceable units, transmitters/receivers and indicators
Troubleshooting	Troubleshooting involves the use of fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA230C Test and troubleshoot fixed wing aircraft automatic flight control systems and components

Modification History

Knowledge statements expanded - equivalent to previous unit.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathways and is an alternative unit to MEA231C Inspect, test and troubleshoot rotary wing aircraft automatic flight control systems and components. It covers the competencies required to test and troubleshoot automatic flight control systems and components of fixed wing aircraft. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the B2 maintenance certification licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable maintenance publications to test and troubleshoot aircraft automatic flight control systems and components.

Applications include fixed wing aircraft that have automatic flight control systems.

Licensing/Regulatory Information

Refer to unit descriptor

Pre-Requisites

MEA246C Fabricate and/or repair aircraft electrical components or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Prepare for troubleshooting	1.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify an unserviceability
2 Test/adjust automatic flight control system	2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation
	2.2 ***Automatic flight control system*** is functionally tested, in accordance with maintenance manual, for evidence of serviceability or malfunction
	2.3 System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3 Troubleshoot automatic flight control system	3.1 Available information from maintenance documents and inspection and test results is used, where necessary, to assist in fault determination
	3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate ***troubleshooting***
	3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process
	3.4 Automatic flight control system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required
	3.5 Rectification requirements are determined

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- explaining the basic layout (block diagram level), function and operation of:
  - flight director components and interface
  - flight control components and interface
  - automatic throttle components and interface
  - automatic pilot system and interface
  - flight management system interface
  - navigation system interfaces
- explaining basic principles/functions, relating to the above systems and associated with:
  - basic AC and DC circuit theory
  - digital fundamentals
  - analogue fundamentals
  - fixed wing flight theory
  - inner and outer loop control
  - fixed wing flight control system (mechanical, hydraulic and electro-mechanical types, trim and stabilisation)
  - flight control modes/channels
- OHS requirements
- system and component maintenance requirements and troubleshooting procedures
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved maintenance documentation and aircraft publications relating to the automatic flight control system being maintained
- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, and attaching hardware (including cabling/harnesses) and security in:
  - flight director components and interface
  - flight control components and interface
  - automatic throttle components and interface
  - automatic pilot system and interface
- applying logic processes, taking and interpreting system measurements, using test equipment and appropriate wiring diagrams and manuals to accurately and effectively isolate malfunctions in the above systems
- performing system testing to isolate system malfunctions and assess post-maintenance serviceability

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to test and troubleshoot automatic flight control systems and components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with fixed wing aircraft automatic flight control systems and components. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to testing and troubleshooting is essential. This is to be demonstrated through application across a range of aircraft automatic flight control systems and components listed in the Range Statement. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one item from each of Groups 1 to 4 listed in the Range Statement (Group 5 may be omitted where it is not applicable to the enterprise). This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources	Competency should be assessed in the workplace or

for assessment	simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that general and special purpose tools, test and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Automatic flight control systems	Automatic flight control systems may include: 1. Automatic pilot 2. Flight director 3. Automatic trim 4. Yaw damper 5. Automatic throttle and automatic landing
Troubleshooting	Troubleshooting involves the use of fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Co-requisites

MEA225C Inspect fixed wing aircraft automatic flight control systems and components

MEA231C Inspect, test and troubleshoot rotary wing aircraft automatic flight control systems and components

Modification History

Knowledge statements expanded - equivalent to previous unit.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway and is an alternative unit to MEA225C Inspect fixed wing aircraft automatic flight control systems and components and MEA230C Test and troubleshoot fixed wing aircraft automatic flight control systems and components. It covers the competencies required to inspect, test and troubleshoot automatic flight control systems and components fitted to rotary wing aircraft. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the B2 maintenance certification licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot rotary wing automatic flight control systems and components.

Applications include rotary wing aircraft that have automatic flight control systems.

Licensing/Regulatory Information

Refer to unit descriptor

Pre-Requisites

MEA207C Remove and install aircraft electronic system components

MEA246C Fabricate and/or repair aircraft electrical components or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Inspect automatic flight control system and components	1.1 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual
	1.2 ***Automatic flight control system*** is visually or physically checked for external signs of defects in accordance with applicable maintenance manual
	1.3 Defects are correctly identified and reported
2 Test/adjust automatic flight control system	2.1 Aircraft and system are prepared, in accordance with applicable maintenance manual, for the application of power/system operation
	2.2 Automatic flight control system is functionally tested, in accordance with maintenance manual, for evidence of serviceability or malfunction
	2.3 System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3 Prepare for troubleshooting	3.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify an unserviceability
4 Troubleshoot automatic flight control system	4.1 Available information from maintenance documents and inspection and test results is used, where necessary, to assist in fault determination
	4.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate ***troubleshooting***
	4.3 Specialist advice is obtained, where required, to assist with the troubleshooting process

4.4 Automatic flight control system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required

4.5 Rectification requirements are determined

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- explaining the basic layout (block diagram level), function and operation of:
  - flight director components and interface
  - flight control components and interface
  - flight data recorders and interface
- explaining basic principles/functions relating to the above systems and associated with:
  - basic AC and DC circuit theory
  - digital fundamentals
  - analogue fundamentals
  - rotary wing flight theory
  - inner and outer loop control
  - rotary wing flight control system (mechanical, hydraulic and electro-mechanical types, trim and stabilisation)
  - flight control modes/channels
- OHS requirements
- system and component maintenance requirements and troubleshooting procedures
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved maintenance documentation and aircraft publications relating to the automatic flight control and data system being maintained
- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, and attaching hardware (including cabling/harnesses) and security in:
  - flight director components and interface
  - flight control components and interface
  - flight data recorders and interface
- applying logic processes, taking and interpreting system measurements, using test equipment and appropriate wiring diagrams and manuals to accurately and effectively

isolate malfunctions in the above systems
- testing systems to isolate system malfunctions and assess post-maintenance serviceability

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot rotary wing automatic flight control systems and components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with rotary wing aircraft automatic flight control systems and components. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across a range of rotary wing automatic flight control systems and components listed in the Range Statement. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one item from each of Groups 1 to 3 listed in the Range Statement. This shall be established via the

	records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that general and special purpose tools, test and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Automatic flight control system	Automatic flight control system may include: 1. Flight director – includes indicators, computers, control boxes and interfaces with other systems 2. Flight controls – includes servo actuators (roll, pitch, yaw and trim) computers and sensors 3. Autopilot system – includes computers, sensors (gyros and/or accelerometers), controllers, mode selectors and system interface, CWS, disconnect, go around and trim switches
Troubleshooting	Troubleshooting involves the use of fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities

Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA232C Test and troubleshoot aircraft pulse systems and components

Modification History

Knowledge statements expanded - equivalent to previous unit.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathways. It covers the competencies required to troubleshoot pulse systems and components fitted to fixed and rotary wing aircraft. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the B2 maintenance certification licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to test and troubleshoot pulse systems and components.

Applications include fixed and rotary wing aircraft.

Licensing/Regulatory Information

Refer to unit descriptor

Pre-Requisites

MEA226D Inspect aircraft electronic systems and components

MEA246C Fabricate and/or repair aircraft electrical components or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Prepare for troubleshooting	1.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify an unserviceability
2 Test/adjust pulse systems	2.1 Aircraft and system are prepared, in accordance with applicable maintenance manual, for the application of power/system operation
	2.2 ***Pulse system*** is functionally tested, in accordance with maintenance manual, for evidence of serviceability or malfunction
	2.3 System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3 Troubleshoot pulse systems	3.1 Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination
	3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate ***troubleshooting***
	3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process
	3.4 Pulse system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required
	3.5 Rectification requirements are determined

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- explaining the basic layout (block diagram level), function and operation of:
  - radar (navigation/weather) components and interface
  - ACAS components and interface
  - radio altitude components and interface
  - distance measuring equipment components and interface
  - ATC transponders
  - doppler navigation system
- explaining basic principles/functions relating to the above systems and associated with:
  - basic AC and DC circuit theory
  - digital fundamentals
  - analogue fundamentals
  - radar fundamentals
  - transmission lines, waveguide and antenna characteristics
  - pulse system maintenance requirements and troubleshooting procedures
- relevant OHS practices, including those relating to ground functional testing of radar systems
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved maintenance documentation and aircraft publications relating to the pulse system being maintained
- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, and attaching hardware (including cabling/harnesses/ transmission lines) and security in:
  - radar (navigation/weather) components and interface
  - ACAS components and interface
  - radio altitude components and interface
  - distance measuring equipment components and interface
  - ATC transponders
  - doppler navigation system
- applying logic processes, taking and interpreting system measurements to accurately and effectively isolate malfunctions within the systems
- performing system testing to isolate system malfunctions and assess systems post-maintenance serviceability

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to test and troubleshoot aircraft pulse systems and components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with aircraft pulse systems and components. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to testing and troubleshooting is essential. This is to be demonstrated through application across a range of aircraft pulse systems and components listed in the Range Statement. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least three of the systems in Groups 1 to 7 and at least one item from Group 8, as listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that general and special purpose tools, test and ground

	support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained either or both of MEA220C Inspect, test and troubleshoot aircraft primary radar systems and components, and MEA221C Inspect, test and troubleshoot aircraft secondary radar systems and components, will have covered Element 1 and will also have covered a significant proportion of the Performance Criteria for Elements 2 and 3 and will have covered Range Statement variables applicable to the unit. Log of Industrial Experience and Achievement records relating to MEA220C Inspect, test and troubleshoot aircraft primary radar systems and components, and MEA221C Inspect, test and troubleshoot aircraft secondary radar systems and components, may be accepted as also meeting the evidence requirements for this unit in the applicable areas.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Pulse systems and components	Pulse systems and components may include: 1. Navigation radar 2. Weather radar 3. RADALT 4. DME 5. ATC transponder 6. Doppler 7. ACAS 8. Displays, indicators, control boxes, antennae,

	waveguides, transmitters and receivers, and line replaceable units
Troubleshooting	Troubleshooting involves the use of fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA233C Inspect, test and troubleshoot aircraft inertial navigation and reference systems and components

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to inspect, test and troubleshoot inertial navigation and reference systems and components of fixed and rotary wing aircraft. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot inertial navigation and reference systems and components.

Applications include fixed and rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA207C	Remove and install aircraft electronic system components
MEA246C	Fabricate and/or repair aircraft electrical components or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect inertial navigation and reference systems and components	1.1. Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual 1.2. Inertial navigation and reference system components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual 1.3. Defects are correctly identified and reported
2. Test/adjust inertial navigation and reference systems and components	2.1. Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation 2.2. Inertial navigation and reference system is functionally tested, in accordance with maintenance manual, for evidence of serviceability or malfunction 2.3. System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3. Prepare for troubleshooting	3.1. Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify an unserviceability
4. Troubleshoot inertial navigation and reference systems	4.1. Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination 4.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate ***troubleshooting*** 4.3. Specialist advice is obtained, where required, to assist

with the troubleshooting process

4.4. Inertial navigation and reference system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required

4.5. Rectification requirements are determined

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved maintenance documentation and aircraft publications relating to inertial navigation and reference systems being maintained
- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) and security in inertial navigation and reference system components
- applying logic processes, take and interpret system measurements, use test equipment and appropriate wiring diagrams and manuals to isolate system malfunctions
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability

Required knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- connection of hardware
- the basic layout (block diagram level), function and operation of inertial navigation and reference systems
- the operating principles of inertial navigation and reference systems:
  - terminology
  - fundamental principles of inertial navigation
  - two degree of freedom systems
  - semi-analytical systems
  - strapdown systems
  - ring laser gyroscopes
- the various methods of navigation and how they are used by both aircraft conventional and electronic navigational instruments and systems.
- maintenance requirements and troubleshooting procedures
- relevant OHS practices
- relevant maintenance manuals

- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot inertial navigation and reference systems and components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with inertial navigation and reference systems and components. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across an inertial navigation and reference system and its components. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on an inertial navigation system and at least one major system component/LRU. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent

	Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that general and special purpose tools, test and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Troubleshooting	Troubleshooting involves the use of fault finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA234C Inspect, test and troubleshoot aircraft global navigation systems and components

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to inspect, test and troubleshoot global navigation systems (GNS) and components of fixed and rotary wing aircraft. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot global navigation systems and components.

Applications include fixed and rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA206C	Remove and install basic radio communication and navigation system components
MEA207C	Remove and install aircraft electronic system components
MEA246C	Fabricate and/or repair aircraft electrical components or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect GNS and components	1.1. Relevant maintenance documentation and modification status, including system defect reports where relevant, are used to identify specific inspection requirements 1.2. Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual 1.3. GNS components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual 1.4. Defects are correctly identified and reported
2. Test/adjust GNS and components	2.1. Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation 2.2. GNS is functionally tested, in accordance with maintenance manual, for evidence of serviceability or malfunction 2.3. System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3. Troubleshoot GNS	3.1. Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination 3.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate ***troubleshooting*** 3.3. Specialist advice is obtained, where required, to assist with the

troubleshooting process

3.4. GNS faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures

3.5. Rectification requirements are determined

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved maintenance documentation and aircraft publications relating to the GNS being maintained
- Recognition of system and component defects/external damage, correct installation, attaching hardware (including cabling/harnesses/transmission lines) and security in GNS
- applying logic processes, taking and interpreting system measurements to accurately and effectively isolate malfunctions within GNS
- performing system testing to isolate system faults and assess post-maintenance serviceability

Required knowledge

Look for evidence that confirms knowledge of:

- GNS principles, including the use of satellites for navigation
- component attachment methods
- the basic layout (block diagram level), function and operation of GNS, including interpretation of indicators and operation of controls
- basic principles/functions relating to the system and associated with:
  - electromagnetic radiation and propagation
  - basic AC and DC circuit theory
  - digital fundamentals
  - analogue fundamentals
  - transmitter and receiver principles
  - antenna characteristics
  - transmission line characteristics
- interface with other avionic systems, e.g. flight management systems
- maintenance requirements and troubleshooting procedures
- relevant OHS practices
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot GNS and components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with global navigation systems and components. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the Unit of Competency are being achieved under routine supervision on a global navigation system and, in cases where the system is not replaced as a single unit, at least one major system component/LRU. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that general and special purpose tools, test and ground

	support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Troubleshooting	Troubleshooting involves the use of fault finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA235B Perform advanced troubleshooting in aircraft avionic maintenance

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit covers competencies required to progress from an Aircraft Maintenance Engineer at Certificate IV to the granting of a B2 Aircraft Maintenance Engineer Licence or Aircraft Maintenance Specialist Certificate under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Assessment Guidelines.

The skills and knowledge covered by the units of competency listed in the Aeroskills Training Package for Aircraft Maintenance Engineer (Avionics or Mechanical as applicable) at Certificate IV are pre-requisite to the attainment of the elements of competency specified in this unit. This includes full coverage of the CASR Part 66 Avionics or Mechanical Syllabus subjects/topics listed in the Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of fundamental system/component knowledge and applicable maintenance publications and test equipment to troubleshoot faults in avionic systems that are beyond the bounds of maintenance manual fault diagnosis guides.

Applications include fixed and rotary wing aircraft

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Verify the defect	1.1. Available information from flight crew, such as flight phase, aircraft configuration, and so on, maintenance documentation both current and previous history, is used as necessary, to assist in fault determination
	1.2. Inspection of the affected ***system*** is carried out to check both physical integrity and correct operation
	1.3. Information gained from Central Maintenance Systems is verified against physical integrity and correct operation, where applicable
	1.4. The effects on a system from interfaces/integration with other systems are taken into account
2. Isolate the defect	2.1. Logical processes including the application of basic principles and system knowledge and known facts are used to augment maintenance manual fault diagnosis guides to ensure efficient and accurate ***troubleshooting***
	2.2. Specialist advice is obtained, where required and/or available, to assist with the troubleshooting process
	2.3. Faults are located and the causes of the defects are clearly identified and correctly recorded in maintenance documentation including any other systems disturbed, where required
3. Determine defect rectification requirements	3.1. Defect rectification requirements are determined and the necessary repair action initiated once verification and isolation of the defect are confirmed
4. Verify defect rectification	4.1. Defect is rectified in accordance with approved maintenance data
	4.2. All systems disturbed or accessed during troubleshooting are

restored as applicable using maintenance manuals, repair schemes or approved maintenance data

4.3. All check(s) required by approved maintenance data to ensure correct operation of all disturbed systems are performed

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- the diagnosis of faults that are beyond the coverage of maintenance manual fault diagnosis guides in simulated applications in the training environment and/or in the workplace across a representative range of systems and components.=

Required knowledge

For systems and components relevant to the scope of the licence/ratings sought as per CASR Part 43 Manual of Standards, look for evidence that confirms knowledge of:

- theory related to system operation and interfaces between systems and with electrical/electronic control media to a level that will facilitate the diagnosis of faults beyond the level of maintenance manual fault diagnosis guides using reported symptoms and functional test results
- component construction and theory of operation to a level that will facilitate the diagnosis of faults beyond the level of maintenance manual fault diagnosis guides using reported symptoms and functional test results
- advanced fault diagnostic techniques
- condition monitoring and trend analysis techniques

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to diagnose a range of system faults that are beyond the bounds of maintenance manual fault diagnosis guides while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications related to avionic systems,

competency in this unit	and where applicable other system interfaces/integration. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical, as is the demonstrated ability to apply fundamental system theory in the logical diagnosis of complex faults. Evidence of transferability of skills and knowledge related to performance and supervision of inspection, testing and troubleshooting is essential. This must be demonstrated through application across a number of aircraft avionic systems, including system interfaces/integration. The troubleshooting approach should clearly demonstrate an in-depth knowledge of underpinning theory of a system, with this knowledge being used in a logical process to augment and extend the scope of the aircraft/system fault finding guide. The fault rectification work plan should take account of applicable safety (including safe handling of heavy components) and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the Unit of Competency are being achieved under supervision without intervention and the ability has been demonstrated to identify the causes of defects not covered fully by maintenance manual fault diagnosis guides. Competency shall be assessed via simulated activities at the CASR Part 147 Maintenance Training Organisation and through performance during observed workplace activities.
Context of and specific resources for assessment	Competency is assessed in the workplace or simulated workplace and shall involve successfully dealing with a number of maintenance and fault scenarios across a range of avionic systems listed as Groups 1 to 5 in the Range Statement and related system components.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Systems and related components	Systems and related components to be covered include: 1. Electrical systems 2. Electronic systems 3. Instrument systems 4. Radio communication and navigation systems 5. Autoflight systems
Troubleshooting	Troubleshooting, for the purpose of this unit, is defined as: • the troubleshooting from first principles, of defects beyond available maintenance data in the systems of fixed or rotary wing aircraft types Troubleshooting must be demonstrated across a range of typical systems and system components that includes, but is not limited to: • airframes, engine(s) and other systems (and parts thereof) operated by inherently electrical, electronic, instrument or radio principles or means. Coverage is not required of specific type systems that are included in type training and PCT activities leading to a specific type licence rating
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual activities or troubleshooting tasks performed during the supervision of other personnel
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA238B Perform routine removal and installation of miscellaneous aircraft electrical hardware_components

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit of competency is part of the Avionic Certificate II training pathway. It covers the competencies required for the removal and installation under qualified person guidance of a range of aircraft electrical components and items of hardware that can have bolted, soldered or plug connections. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills and relevant maintenance publications and documentation to remove and install a range of electrical components and electrical hardware under the guidance of a qualified person.

Applications include both on and off-aircraft work.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications

MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Prepare to remove aircraft electrical hardware	1.1. The removal task is planned under qualified person guidance using applicable maintenance documentation and enterprise procedures
	1.2. System safety is confirmed with the qualified person
2. Remove aircraft electrical hardware	2.1. Physical removal of ***electrical hardware*** is carried out in accordance with enterprise procedures and applicable maintenance documentation
3. Complete aircraft electrical hardware removal process	3.1. Required documentation is accurately completed and correctly processed in accordance with enterprise procedures
	3.2. Removed components are tagged, packaged or discarded in accordance with specified procedures
4. Prepare to install aircraft electrical hardware	4.1. The installation task is planned under qualified person guidance using applicable maintenance documentation and enterprise procedures
	4.2. Electrical hardware components to be installed are checked to confirm correct part numbers
5. Install aircraft electrical	5.1. Physical installation of electrical hardware is carried out in accordance with enterprise procedures and applicable

hardware	maintenance documentation
6. Complete aircraft electrical hardware installation process	6.1. Required documentation is accurately completed and correctly processed in accordance with enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using enterprise procedures, applicable maintenance documentation and aircraft publications relating to the electrical system and components being worked on
- the preparation and termination of electrical cables to aircraft industry standards, using:
  - crimping techniques
  - soldering techniques
  - solder sleeve joints
- the correct identification of aircraft wire markings, terminal block identification and plug/socket pin numbering systems.
- electrical loom and harness installation ensuring minimum bends are maintained, cable is not in tension, plugs are correctly aligned, security of route ensures no chaffing of insulation, adequate clipping and cable ties have been utilised and construction complies with aircraft industry standards.
- positive identification of miscellaneous electrical hardware and/or components

Required knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- electrostatic discharge procedures
- connection of hardware, plugs and terminals points
- wire marking, terminal block identification and plug/socket numbering systems

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to remove and install a range of electrical

	components/hardware while observing electrostatic discharge precautions and all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable into other units that require similar techniques. It is essential that applicable cleanliness requirements and OHS safety precautions are fully observed, and an awareness of electrostatic discharge procedures. Evidence of transferability of skills and knowledge related to enterprise procedures associated with removal and installation is essential. An understanding of the attachment methods, connection of hardware and system operation as they relate to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under qualified person guidance on a range of the electrical components/hardware listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, using tools and equipment specified in maintenance manuals. It is also expected that general purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with

training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance involving aircraft electrical hardware/components that is performed under qualified person guidance in accordance with enterprise procedures and applicable maintenance documentation • work undertaken either autonomously or as part of a team and under the guidance of a qualified person. Routine work is carried out using basic operational knowledge and a defined range of skills ('routine' work is that which follows a customary or regular course of procedure). All work outcomes are achieved by applying known solutions chosen from a limited range of pre-determined options consistent with enterprise procedures. This includes accepting responsibility for own work in terms of quality of outcomes using pre-determined specifications of quality • the application of enterprise procedures associated with basic soldering and crimping skills required for the removal and installation of electrical hardware • the demonstration of competency in groups that include bolted, soldered, and plug connections
Electrical hardware may include:	Electrical hardware may include: • switches, relays, lamps, terminal blocks, current limiters, circuit breakers, fuses, sockets, potentiometers, capacitors, inductors, magnetic amplifiers, transformers, rheostats, resistors and diodes, miscellaneous sensors and minor components hard mounted throughout the aircraft, busbars, lugs, ferrules, splices, connectors and electrical, electronic cables and looms. Oxygen systems and components, and fuel tank components and integrated hardware are not included

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA239B Fabricate aircraft electrical looms and harnesses

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit of competency is part of the Avionic Certificate II training pathway. It covers the competencies required to fabricate and test, under qualified person guidance, a range of aircraft electrical looms and harnesses. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills and maintenance publications to fabricate aircraft electrical looms and harnesses under qualified person guidance for general use in electrical systems.

Applications include aircraft hangars and workshops.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation

MEA109B Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Prepare to fabricate aircraft electrical looms and harnesses	1.1. Appropriate materials, tools and equipment are selected and prepared for the particular task in accordance with applicable maintenance documentation, enterprise procedures and under qualified person guidance
	1.2. Assembly or fabrication jigs, where applicable, are aligned to ensure accurate fabrication of components
2. Fabricate aircraft electrical looms and harnesses	2.1. ***Components or parts*** are fabricated in accordance with qualified person guidance, applicable maintenance documentation and enterprise procedures
3. Perform routine tests on aircraft electrical looms and harnesses	3.1. Under qualified person guidance test equipment and rigs are used, where applicable, to confirm serviceability of finished components
4. Complete the fabrication process with regard to aircraft electrical looms and harnesses	4.1. Fabricated components are tagged, sealed and packaged within specified procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved fabrication procedures and processes relating to electrical looms, cables and harnesses
- recognising the integrity/security of electrical component crimps, joints and plug/connector pins
- fabrication of cables, harnesses and looms, including wire marking, to approved industry standards
- under qualified person guidance performing testing to assess post construction serviceability according to enterprise procedures

Required knowledge

Look for evidence that confirms knowledge of:

- electrical wire gauges and standards
- wire marking conventions and procedures
- wire terminations, soldering and crimping

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to fabricate aircraft electrical looms, harnesses and cables for general electrical system use while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable into other areas that require similar techniques. It is essential that the general aspects of material specification and selection, measurement and fabrication be related to specific aircraft component applications to the extent necessary to unambiguously understand expert guidance. Evidence of knowledge about individual components and their links with systems will be necessary to supplement evidence of ability to interpret qualified person guidance and enterprise procedures to fabricate looms, harnesses

	and cables before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. Safety precautions applicable to the manufacturing of electrical looms, harnesses and cables are to be fully observed. An understanding of system operation as it relates to the work must be demonstrated before undertaking any action, to ensure safety and quality issues are addressed. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under qualified person guidance on a representative range of electrical loom, cable and harness fabrication tasks as provided for in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, using tools and equipment specified by aircraft in the maintenance manuals. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Application	Application of this unit may relate to: • routine scheduled or unscheduled maintenance activities performed under qualified person guidance in accordance with enterprise procedures and applicable

	maintenance documentation • work undertaken either autonomously or as part of a team and under the guidance of a qualified person. Routine work is carried out using basic operational knowledge and a defined range of skills ('routine' work is that which follows a customary or regular course of procedure). All work outcomes are achieved by applying known solutions chosen from a limited range of pre-determined options consistent with enterprise procedures. This includes accepting responsibility for own work in terms of quality of outcomes using pre-determined specifications of quality • note that the scope of any fabrication and the procedure to be followed will be provided by the qualified person, and be within the scope of the skills and knowledge included in unit MEA109B Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Components or parts	Components or parts include:
	• electrical looms, harnesses and cables except for:
	  • data bus cables
	  • co-axial cables
	  • fibre optic cables
	  • fire detection/extinguishing systems
	  • oxygen systems
	  • fuel tanks and integrated hardware

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA240B Use electrical test equipment to perform basic electrical tests

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit of competency is part of the Avionic Certificate II training pathway. It covers the competencies required, under qualified person guidance, to select, set up and use a range of test equipment to measure voltage and current, and to test continuity, insulation and bonding. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of skills in the use of electrical test equipment under qualified person guidance to measure voltage and current, and to test continuity, insulation and bonding.

Applications include aircraft and components both in the hangar and workshop.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and

	specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Prepare test equipment to perform basic electrical tests	1.1. Appropriate electrical test equipment is selected and confirmed with a qualified person 1.2. Test equipment is checked for serviceability and applicable leads are fitted, where required 1.3. Applicable function and range of measurement is set and confirmed with a qualified person
2. Test component in accordance with enterprise procedures using electrical test equipment	2.1. Test points and polarity are determined 2.2. ***Required parameters*** are measured with the test equipment 2.3. Results are recorded in accordance with enterprise procedures, under qualified person guidance

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices
- setting up applicable test equipment
- determining test points and polarity
- measuring required parameters
- recording results under qualified person guidance

Required knowledge

Look for evidence that confirms knowledge of:

- the range of relevant electrical test equipment used to measure or test:
  - volts and amps
  - continuity, resistance and insulation
  - bonding.
- identification methods used to confirm test equipment is serviceable and current regarding calibration
- use of selectors and scale adjustment of each item of test equipment to ensure accurate measurement of applicable parameter
- methods of connection of test equipment to components being tested
- methods used to determine polarity and applicable connection points for measurement or testing

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to use electrical test equipment to perform a range of basic measurements and tests while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable into all areas that require the use of basic electrical test equipment. It is essential that the general aspects of electrical test equipment identification, preparation for use and safe application to a representative range of measurement and testing tasks are

	clearly demonstrated. Evidence of knowledge about the preparation and use, in accordance with enterprise procedures, of the range of test equipment used for the measurement and testing tasks listed in the Range of Variables, and of the methods used to identify applicable polarity and connection to components and circuits for required measurement or testing. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under qualified person guidance on a representative range of electrical measurement and testing tasks as provided for in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, using relevant electrical test equipment as specified in maintenance documentation for a given task, and in accordance with enterprise procedures under expert guidance.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Application	Application of this unit may relate to: • routine scheduled or unscheduled maintenance activities performed under qualified person guidance in accordance with enterprise procedures and applicable maintenance documentation • work undertaken either autonomously or as part of a

	team and under the guidance of a qualified person or direction as required. Routine work is carried out using basic operational knowledge and a defined range of skills ('routine' work is that which follows a customary or regular course of procedure). All work outcomes are achieved by applying known solutions chosen from a limited range of pre-determined options consistent with enterprise procedures. This includes accepting responsibility for own work in terms of quality of outcomes using pre-determined specifications of quality
Required parameters	Required parameters may include measurement/testing of: • volts and amps • continuity, resistance and insulation • bonding

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA241C Perform aircraft weight and balance calculations as a result of modifications

Modification History

References to CASR requirements updated - equivalent to previous unit.

Unit Descriptor

This unit of competency covers competencies required to progress from an Aircraft Maintenance Engineer at Certificate IV to the granting of a B2 Aircraft Maintenance Engineer Licence in the Avionics category under CASR Part 66, in accordance with the licensing provisions in the Assessment Guidelines.

The skills and knowledge covered by the units of competency listed in the MEA11 Aeroskills Training Package for Aircraft Maintenance Engineer (Avionics or Mechanical as applicable) at Certificate IV are prerequisite to the attainment of the elements of competency specified in this unit.

Application of the Unit

This unit requires application of mathematical formulae to calculate the weight and balance effect of components installed in aircraft during modification incorporation.

Applications include fixed and rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of

	performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1	Calculate the weight and balance impact of a modification	1.1	The requirement for aircraft weighing is determined
		1.2	The new empty weight of the aircraft is determined and it is ensured that the weight is within the predetermined limits set by the CAMO
		1.3	The new empty weight centre of gravity of the aircraft is calculated and it is ensured that the centre of gravity is within the predetermined limits set by the CAMO
		1.4	Maintenance records are updated with new figures

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- mathematical formulae used to calculate centre of gravity of an aircraft

Look for evidence that confirms skills in:

- calculating the effect on aircraft weight and centre of gravity of components installed during modification incorporation using weight and moment arm data

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to use mathematical formulae to calculate aircraft weight and balance given weight and moment arm data and correctly update maintenance records.
Critical aspects for assessment and	The underlying skills inherent in this unit should be

evidence required to demonstrate competency in this unit	transferable across a range of aircraft types. Ability to interpret the instructions for configuring and weighing aircraft is critical. Evidence of transferability of skills and knowledge related to aircraft weight and calculation of centre of gravity is essential. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under supervision without intervention. This shall be established via simulated activities at the CASR Part 147 Maintenance Training Organisation and performance during observed workplace activities.
Context of and specific resources for assessment	Competency may be assessed in the workplace or simulated workplace.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Aircraft centre of gravity	Aircraft centre of gravity is determined: • using the weight and moment arm data for a modification
Application	The work can relate to: • scheduled or unscheduled maintenance and may involve individual activities or supervision of other personnel
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA246C Fabricate and/or repair aircraft electrical hardware or parts

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of all Avionic Certificate IV training pathways. It is also part of the Mechanical Aircraft Maintenance Engineer licensing pathway. It covers the competencies required to fabricate and repair aircraft electrical hardware or parts. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and knowledge of wiring standards and specifications to fabricate aircraft electrical looms, harnesses and cables.

Applications include aircraft maintenance hangars and workshops.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA201B	Remove and install miscellaneous aircraft electrical hardware/components
MEA260B	Use electrical test equipment

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Interpret specifications and organise materials	1.1. Specifications are interpreted to determine the dimensions and procedure for fabrication 1.2. Appropriate materials, tools and equipment are selected and prepared for the particular specification requirements
2. Fabricate/repair electrical components or parts	2.1. Assembly or fabrication jigs, where applicable, are aligned to ensure accurate fabrication of components 2.2. ***Components or parts*** are fabricated in accordance with required specifications
3. Test fabricated/repaired components or parts	3.1. Test equipment and rigs are used, where applicable, to confirm serviceability of finished components 3.2. Fabricated components are tagged, sealed and packaged within specified procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices, including the use of PPE and reference to MSDS
- using approved repair/fabrication procedures and processes relating to electrical cables, harnesses, antenna leads and aerial components
- recognising the integrity/security of electrical component crimps, wire wrapping, joints and plug/connector pins

- constructing cables, harnesses and looms, including wire marking, to approved industry standards
- performing component testing to assess post construction serviceability

Required knowledge

Look for evidence that confirms knowledge of:

- component and system operation
- aircraft wiring specifications and standards
- standard repair methods for:
  - electrical cables
  - ignition harnesses
  - fire warning system harnesses
  - coaxial cables, such as antenna leads
  - aerial components
- electrical plugs and connectors
- soldering methods
- fabrication methods for the above wiring and cables
- wire marking methods
- assembly of electrical cables into wiring looms
- relevant OHS procedures
- how to obtain relevant MSDS
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to fabricate aircraft electrical looms, cables and harnesses in accordance with applicable standards and specifications while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable into other areas that require similar techniques. It is essential that the general aspects of material specification and selection, measurement and fabrication/manufacture are related to specific aircraft component applications.

	Evidence of knowledge about individual components and their links with systems will be necessary to supplement evidence of ability to interpret requirements and fabricate components before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a representative range of tasks from Groups 1 to 4 in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified by aircraft in the maintenance manuals. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Components or parts	Components or parts may include electrical looms, harnesses and cables associated with: 1. Power distribution

	2. Ignition 3. Control circuits 4. Signal circuits
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA252B Test, align and troubleshoot aircraft synchro and servo system components

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Component Maintenance Workshop Stream) training pathways. It covers the competencies required to test, align and troubleshoot aircraft synchro and servo system components. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills, test equipment and knowledge of analogue theory to test, align and troubleshoot synchro and servo components.

Applications include synchro and servo system components from fixed and rotary wing aircraft that are repaired or overhauled in aviation maintenance workshops

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA201B	Remove and install miscellaneous aircraft electrical hardware/components
MEA260B	Use electrical test equipment
MEA261C	Use electronic test equipment

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Test synchro and servo system components	1.1. ***Synchro and servo system components*** are correctly prepared and connected to the appropriate test equipment/rig in accordance with approved procedures
	1.2. Components are functionally tested or cycled through the prescribed test procedures in accordance with maintenance manual for evidence of serviceability or malfunction
	1.3. Faults or unserviceabilities are correctly identified and recorded on appropriate maintenance documentation
2. Align synchro and servo system components	2.1. Synchro and servo system components are adjusted in accordance with approved procedures and maintenance manuals until operating within prescribed limits/tolerances
3. Troubleshoot synchro and servo system components	3.1. Available information from maintenance records and inspection and test results is used, where necessary, to assist in fault determination
	3.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting
	3.3. Synchro and servo system component faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required
	3.4. Fault rectification requirements are determined

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved repair procedures and processes relating to synchro and servo system components
- recognising the serviceability state and repair requirements for:
  - synchro/servo system error detection devices
  - DC and AC synchronous components
  - gyroscopic instruments (mechanical, electro-mechanical, vacuum/pressure types)
  - flight control servo devices
- performing component testing to isolate/confirm faults and assessing post repair/overhaul serviceability
- correctly aligning synchro and servo system components to prescribed specifications
- applying logic processes to isolate synchro and servo system component faults

Required knowledge

Look for evidence that confirms knowledge of:

- component and system operation
- explaining the basic function and operation of synchro and servo system components to enable testing for fault isolation/confirmation, to determine repair or overhaul requirements and serviceability status post-repair or overhaul
- explaining basic principles/functions, relating to synchro and servo system components and associated with:
  - advanced analogue fundamentals
  - synchronous systems
  - gyroscopes

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to test, align and troubleshoot synchro and servo system components circuitry in accordance with maintenance manuals and regulatory/industry procedures while observing all relevant safety precautions.

Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of testing, aligning and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with synchro and servo system components. Ability to interpret inspection and testing procedures and specifications (allowable limits) and apply them in practice is critical. It is essential that testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Evidence of transferability of skills and knowledge related to testing, aligning and troubleshooting is essential. This may be demonstrated through application across a range of the synchro and servo system components listed in the Range Statement. The application of testing procedures should also clearly indicate knowledge of system operation. System operation knowledge, the relationship of individual components and the links with other systems (if applicable) will be necessary to supplement evidence of ability to troubleshoot the component within the limits of the fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a representative range of components from each of Group 1 and 2 as listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, using tools and equipment specified in maintenance documentation. It is also expected that general and special purpose tools and test equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Component testing, **alignment and troubleshooting**	Component testing, alignment and troubleshooting is assessed in the following Groups: 1. Synchro system components 2. Servo system components
Synchro and servo system components	Synchro and servo system components may come from: • air data computers, auto pilot servos, remote position indicators and other similar applications
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities • complex testing and adjusting of components, and when undertaken, this will be carried out under supervision
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA260B Use electrical test equipment

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit of competency is part of all Avionic Certificate IV training pathways. It is also part of the Mechanical Aircraft Maintenance Engineer licensing pathway. It covers the competencies required to correctly use electrical test equipment. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of skills in the use of electrical test equipment to measure voltage, current, frequency and phase angle, and to test continuity, resistance, insulation and bonding.

Applications include aircraft and components both in the hangar and workshop.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance

	processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Select required test equipment	1.1. ***System*/*component test requirements*** are identified 1.2. Appropriate test equipment is selected
2. Prepare test equipment for use	2.1. Test equipment is checked for serviceability and applicable leads are fitted, where required 2.2. Applicable function and range of measurement is selected, as required
3. Test system or component	3.1. Test points and polarity are determined 3.2. Required parameters are measured with the test equipment

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices
- use of selectors and scale adjustment of each item of test equipment to ensure accurate measurement of applicable parameter
- connection of test equipment to components or circuits
- determination of polarity and applicable connection points for measurement or testing

Required knowledge

Look for evidence that confirms knowledge of:

- the range of electrical test equipment used to measure or test:
  - volts, amps and power
  - frequency
  - phase angle
  - continuity, resistance and insulation
  - bonding
- test equipment construction and calibration, and testing for serviceability

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to use electrical test equipment to perform a range of electrical measurements and tests while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable into all areas which require the use of electrical test equipment. It is essential that the general aspects of electrical test equipment selection, preparation for use and safe application to a representative range of measurement and testing tasks are clearly understood. Evidence of knowledge about the selection and use of the range of test equipment used for the measurement and testing tasks listed in the Range Statement, and of the methods used to identify applicable polarity and connection to components and circuits for required measurement or testing. A person cannot be assessed as competent until it can be

	demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision in the selection of appropriate items of test equipment and their use to perform the measurements and test in Groups 1 to 5, as listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, or simulated work environment, using electrical test equipment specified in maintenance documentation. It is also expected that applicable test equipment can be selected on the basis of general trade knowledge where specific test equipment is not specified.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
System/component test requirements	System/component test requirements may include measurement of or testing: 1. Volts, amps and power 2. Frequency 3. Phase angle 4. Continuity, resistance and insulation 5. Bonding

Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA261C Use electronic test equipment

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit of competency is part of Avionic Certificate IV training pathways. It covers the competencies required to correctly use electronic test equipment. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of skills in the use of electronic test equipment to measure electronic circuit parameters and test performance.

Applications include aircraft components both in the hangar and workshop.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation

MEA109B Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Select required test equipment	1.1. System/component test requirements are identified 1.2. Appropriate test equipment is selected
2. Prepare test equipment for use	2.1. ***Test equipment*** is checked for serviceability and applicable leads are fitted, where required 2.2. Applicable function and range of measurement is selected, as required
3. Test system or component	3.1. Test points and polarity are determined 3.2. Required parameters are measured with the test equipment

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices
- methods of connection of test equipment to components or circuits
- methods used to determine polarity and applicable connection points for measurement or testing

Required knowledge

Look for evidence that confirms knowledge of:

- the construction, calibration for use and testing for seviceability of:
  - electronic multimeters
  - phase-angle voltmeters
  - oscilloscopes (dual differential, differential, delayed time base and storage)
  - current probes
  - logic and discrete component testers
  - electronic component substitution boxes and miscellaneous test adapters
- use of selectors and scale adjustment of each item of test equipment to ensure accurate measurement of applicable parameters
- high speed oscilloscope techniques, probe calibration and CRO safety precautions

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to use electronic test equipment to measure electronic circuit parameters while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable into all areas that require the use of electronic test equipment as listed in the Range Statement. It is essential that the general aspects of electronic test equipment selection, preparation for use and safe application to a representative range of measurement and testing tasks are clearly understood. Evidence of knowledge about the selection and use of the range of test equipment listed in the Range Statement, and of the methods used to identify applicable polarity and connection to components and circuits for required measurement or testing. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision, with each item of test equipment in Groups 1 to 6 in the Range Statement having been used to

	measure electronic circuit parameters and test performance (Group 2 may be omitted if not applicable to enterprise). This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, or simulated work environment, using electronic test equipment specified in maintenance documentation. It is also expected that applicable test equipment can be selected on the basis of general trade knowledge where specific test equipment is not specified.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Electronic test equipment	Test equipment includes: 1. Electronic multimeters 2. Phase-angle voltmeters (where applicable to enterprise) 3. Oscilloscopes (dual differential, differential, delayed time base, storage) 4. Current probes 5. Logic and discrete component testers 6. Electronic component substitution boxes and miscellaneous test adapters

Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA262B Modify/repair aircraft component single layer printed circuit boards

Modification History

Minor formatting and editorial changes made. Missing knowledge requirements reinstated.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV training pathways. It covers the competencies required to modify or repair single layer printed circuit boards. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills including high reliability hand soldering and knowledge of standard practices and techniques in the repair of single layer printed circuit boards.

Applications include circuit boards from aircraft avionic components that are repaired in aviation workshops.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA260B	Use electrical test equipment
MEA261C	Use electronic test equipment

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect single layer printed circuit cards and associated components	1.1. Relevant maintenance documentation, including component defect reports where applicable, is interpreted and matched by part and serial number 1.2. Preparation of work area and circuit card assemblies is appropriate to allow for effective detailed inspection of all substrate, circuit tracks, edge connectors and ***attached components***, taking into account any static discharge procedures 1.3. Circuit card assemblies are visually or physically inspected for physical integrity of substrate, circuit tracks, edge connectors and attached components 1.4. Modification status is established to assist in determining repair requirements 1.5. Defects are correctly identified and reported
2. Test single layer printed circuit cards and associated components	2.1. Circuit card assemblies are correctly prepared and connected to the appropriate test facility in accordance with approved procedures, or circuit card assemblies are correctly prepared and connected in situ to allow required test procedures to be performed 2.2. Circuit card assemblies are functionally tested in accordance with normal trade practice and approved maintenance documentation for evidence of serviceability or malfunction 2.3. Circuit card assemblies, attached hardware and electronic components are electronically and/or physically adjusted/aligned in accordance with maintenance manuals or other prescribed procedures
3. Troubleshoot single layer printed circuit cards and associated components	3.1. Maintenance documentation, physical inspection and test results are used, where applicable, to assist in fault determination 3.2. Maintenance manual fault diagnosis guides, logical processes and test equipment are used appropriately to

	ensure efficient and accurate troubleshooting
	3.3. Component faults are located and the causes of the faults are clearly identified and recorded in maintenance documentation, where required
	3.4. Rectification requirements are determined
4. Dismantle single layer printed circuit cards and associated components	4.1. Conformal/protective coatings are removed from the circuit card assembly to the extent required to effect necessary repairs and in accordance with maintenance manuals, industry or enterprise standards as applicable
	4.2. Appropriate OHS precautions are observed at all times during maintenance procedure
	4.3. Circuit card assembly is dismantled to the extent necessary to allow repair of all identified faults
	4.4. Parts for processing are correctly tagged and despatched
	4.5. Parts for retention and re-fitment are correctly packaged and stored in accordance with approved procedures to avoid physical and electrostatic damage
	4.6. Parts for disposal are correctly packaged and processed to accord with statutory requirements pertaining to dangerous goods
5. Assemble single layer printed circuit cards and associated components	5.1. Parts removed for access, and replacement parts, are collected ensuring appropriate modification status, component tolerances and assembly configuration is maintained
	5.2. Printed circuit card and associated components are assembled in accordance with maintenance manuals, and all electrical joints meet the approved standard of the equipment manufacturer, or industry standard, as appropriate
	5.3. Circuit substrate material, circuit tracks, edge connectors and through-hole eyelets are reworked, as necessary, to restore printed circuit card to a serviceable condition
	5.4. Any conformal/protective coatings removed are replaced to the approved standard of the equipment manufacturer, or industry standard, as appropriate
	5.5. Rework techniques are in accordance with industry approval procedures and relevant OHS requirements are observed

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved repair procedures and processes relating to single and double sided circuit cards
- recognising unacceptable soldered connections, damage circuit card components, circuit tracks integrity, substrate damage and edge connector condition
- applying static-safe work area practices
- reworking unacceptable PCB soldered connections, via acceptable de-soldering and soldering techniques
- disassembling and assembling PCB cards to approved industry standards and prescribed specifications
- performing PCB tests using relevant test equipment and processes to isolate PCB track faults and assess serviceability state post-repair
- correctly disassembling, preparing repair area, reworking the card to industry standards, replacing faulted components and assembling card for post-repair inspection and testing

Required knowledge

Look for evidence that confirms knowledge of:

- component operation
- basic principles/functions relating to electrical and electronic components on PCBs
- substrate materials
- types of conformal coating
- types of soldering equipment and solders used in track repair and component assembly
- how to obtain MSDS
- OHS procedures
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to repair single layer circuit boards in accordance with procedures and standards while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate	It is essential that substrate abrasion and rebuilding techniques, and precautions associated with handling and assembly of electrostatic and temperature sensitive

competency in this unit	devices are fully observed, understood and complied with. A high level of awareness of safety precautions associated with beryllium materials and use of fluxes and solvents is to be demonstrated. Evidence of transferability of skills and knowledge related to single layer printed circuit card assembly and repair is essential before undertaking any action. This may be demonstrated through application of the techniques involved across a representative range of circuit card substrate materials and attached components. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. Use of high precision, high reliability soldering techniques and handling of components, including application of anti-static equipment, must be demonstrated. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a representative range of cards with various substrate materials and components. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified in maintenance manuals. It is also expected that general and special purpose test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility

of the item, and local industry and regional contexts) may also be included.	
Circuit card components	Attached components include: • capacitors, resistors, wires, semiconductors, inductors, transformers, switches, connectors, multi-pin ICs, terminal posts and heat-sink materials and will include electrostatic sensitive devices
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities • single layer printed circuit card assemblies with substrates made from fibreglass, phenolic, composite fibre and epoxy resins and coatings that are from a wide range of aircraft systems
Procedures and standards	Procedures and standards for repair of printed circuit card assemblies include: • a range of general engineering hand skills in addition to specific high reliability soldering skills • standards applicable in a given situation will be defined by equipment manufacturers and/or regulatory authorities and the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA263B Modify/repair aircraft component multi-layer printed circuit boards

Modification History

Minor formatting and editorial changes made. Missing knowledge requirements reinstated.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV training pathways. It covers the competencies required to modify or repair multi-layer printed circuit boards. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills (including those required to gain access to inner layers and repair outer layers after track repair), including high reliability hand soldering and knowledge of standard practices and techniques in the repair of multi-layer printed circuit boards.

Applications include circuit boards from aircraft avionic components that are repaired in aviation workshops.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA260B	Use electrical test equipment
MEA261C	Use electronic test equipment

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect multi-layer printed circuit cards and associated components	1.1. Relevant maintenance documentation, including component defect reports where applicable, is interpreted and matched by part and serial number 1.2. Preparation of work area and circuit card assemblies is appropriate to allow for effective detailed inspection of all substrate, circuit tracks, edge connectors and ***attached components***, taking into account any static discharge procedures 1.3. Circuit card assemblies are visually or physically inspected for physical integrity of substrate, circuit tracks, edge connectors and attached components 1.4. Modification status is established to assist in determining repair requirements 1.5. Defects are correctly identified and reported
2. Test multi-layer printed circuit cards and associated components	2.1. Circuit card assemblies are correctly prepared and connected to the appropriate test facility in accordance with approved procedures, or circuit card assemblies are correctly prepared and connected in situ to allow required test procedures to be performed 2.2. Circuit card assemblies are functionally tested in accordance with normal trade practice and approved maintenance documentation for evidence of serviceability or malfunction 2.3. Circuit card assemblies, attached hardware and electronic components are electronically and/or physically adjusted/aligned in accordance with maintenance manuals or other prescribed procedures
3. Troubleshoot multi-layer printed circuit cards and associated	3.1. Maintenance documentation, physical inspection and test results are used, where applicable, to assist in fault determination

components	3.2. Maintenance manual fault diagnosis guides, logical processes and test equipment are used appropriately to ensure efficient and accurate troubleshooting 3.3. Component faults are located and the causes of the faults are clearly identified and recorded in maintenance documentation, where required 3.4. Rectification requirements are determined
4. Dismantle multi-layer printed circuit cards and associated components	4.1. Conformal/protective coatings are removed from the circuit card assembly to the extent required to effect necessary repairs and in accordance with maintenance manuals, industry or enterprise standards as applicable 4.2. Appropriate OHS precautions are observed at all times during maintenance procedure 4.3. Circuit card assembly is dismantled to the extent necessary to allow repair of all identified faults 4.4. Parts for processing are correctly tagged and despatched 4.5. Parts for retention and re-fitment are correctly packaged and stored in accordance with approved procedures to avoid physical and electrostatic damage 4.6. Parts for disposal are correctly packaged and processed to accord with statutory requirements pertaining to dangerous goods
5. Assemble multi-layer printed circuit cards and associated components	5.1. Parts removed for access, and replacement parts, are collected ensuring appropriate modification status, component tolerances and assembly configuration is maintained 5.2. Any conformal/protective coatings removed are replaced to the approved standard of the equipment manufacturer, or industry standard, as appropriate 5.3. Rework techniques are in accordance with industry approval procedures and relevant OHS requirements are observed 5.4. Printed circuit card and associated components are assembled in accordance with maintenance manuals, and all electrical joints meet the approved standard of the equipment manufacturer, or industry standard, as appropriate 5.5. Circuit substrate material, circuit tracks, edge connectors and through-hole eyelets are reworked, as necessary, to restore printed circuit card to a serviceable condition

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved repair procedures and processes relating to multi-layer circuit cards
- recognising unacceptable soldered connections, damage circuit card components, circuit tracks integrity, substrate damage and edge connector condition
- applying static-safe work area practices
- reworking unacceptable PCB soldered connections, via acceptable de-soldering and soldering techniques
- disassembling and assembling PCB cards to approved industry standards and prescribed specifications
- performing PCB tests using relevant test equipment and processes to isolate PCB track faults and assess serviceability state post repair
- correctly disassembling, preparing repair area, reworking the card to industry standards, replacing faulted components and assembling card for post-repair inspection and testing

Required knowledge

Look for evidence that confirms knowledge of:

- component operation
- basic principles/functions relating to electrical and electronic components on PCBs
- substrate materials
- types of conformal coating
- types of soldering equipment and solders used in track repair and component assembly
- de-soldering techniques
- optical equipment and tools used in multi-layer PCB repair
- how to obtain MSDS
- OHS procedures
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must

	be able to repair multi-layer circuit boards in accordance with procedures and standards while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that substrate abrasion and rebuilding techniques, and precautions associated with handling and assembly of electrostatic and temperature sensitive devices are fully observed, understood and complied with. A high level of awareness of safety precautions associated with beryllium materials and use of fluxes and solvents is to be demonstrated. Evidence of transferability of skills and knowledge related to single layer printed circuit card assembly and repair is essential before undertaking any action. This may be demonstrated through application of the techniques involved across a representative range of circuit card substrate materials and attached components. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. Use of high precision, high reliability soldering techniques and handling of components, including application of anti-static equipment, must be demonstrated. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a representative range of cards with various substrate materials and components. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified in maintenance manuals. It is also expected that general and special purpose test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Circuit card components	Attached components include: • capacitors, resistors, wires, semiconductors, inductors, transformers, switches, connectors, multi-pin ICs, terminal posts and heat-sink materials and will include electrostatic sensitive devices
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities • multi-layer printed circuit card assemblies with substrates made from fibreglass, phenolic, composite fibre and epoxy resins and coatings that are from a wide range of aircraft systems
Procedures and standards	Procedures and standards for repair of printed circuit card assemblies include: • a range of general engineering hand skills in addition to specific high reliability soldering skills and hand skills relating to gaining access to inner layers and progressive rebuilding of outer layers after track repair • standards applicable in a given situation will be defined by equipment manufacturers and/or regulatory authorities and the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA264A Remove and install aircraft electrical_avionic components during line maintenance

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit covers the competencies required to remove and install a limited range of aircraft electrical and avionic system components that are within the privileges of the Aircraft Maintenance Engineer A Licence. It is one of the units required for the granting of the chosen Aircraft Maintenance Engineer A Licence under CASR Part 66, in accordance with the licensing provisions in Section 3 Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of maintenance documentation/publications in the removal and installation of a limited range of aircraft electrical and avionic system components.

Applications include fixed and rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA265A	Remove and install general aircraft electrical hardware

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Remove aircraft electrical system components	1.1. System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted where necessary to ensure personnel safety. 1.2. ***Electrical component*** removal is carried out in accordance with the applicable maintenance manual. 1.3. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures. 1.4. Removed components are tagged and packaged in accordance with specified procedures.
2. Remove avionic system components	2.1. System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety 2.2. ***Avionic component*** removal is carried out in accordance with the applicable maintenance manual 2.3. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures 2.4. Removed components are tagged and packaged in accordance with specified procedures
3. Install aircraft electrical system components	3.1. Electrical components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life 3.2. Physical installation of electrical components is performed in accordance with the applicable maintenance manual, ensuring appropriate adjustment/alignment with mechanical interface is carried out 3.3. System is reinstated to correct operational condition in preparation for testing, as necessary 3.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
4. Install avionic system components	4.1. Avionic components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life

4.2. Physical installation of electrical components is performed in accordance with the applicable maintenance manual, ensuring appropriate adjustment/alignment with mechanical interface is carried out

4.3. System is reinstated to correct operational condition in preparation for testing, as necessary

4.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures
- using maintenance publications in identifying/locating:
  - ovens, boilers and beverage makers
  - aircraft main and APU batteries (lead acid and nickel cadmium) and associated mounting equipment including related anti-vibration aids and battery temperature monitoring systems
  - aircraft internal and external lights
  - static wicks
  - passenger entertainment system components
- correctly connecting:
  - ovens, boilers and beverage makers
  - aircraft main and APU batteries (lead acid and nickel cadmium) and associated mounting equipment including related anti-vibration aids and battery temperature monitoring systems
  - aircraft internal and external lights
  - passenger entertainment system components
- applying standard procedures, including handling of electrostatic sensitive devices

Required knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- connection of hardware and plugs
- procedures for handling electrostatic sensitive devices
- relevant OHS practices
- the use of applicable maintenance documentation and aircraft publications relating to electrical and passenger entertainment systems
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to remove and install specified aircraft electrical and avionic components in accordance with applicable maintenance publications while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with, as well as work practices associated with electrostatic sensitive devices. Evidence of transferability of skills and knowledge related to removal and installation is essential. This is to be demonstrated by application across the range of applicable components listed in the Range Statement. An understanding of the attachment methods, connection of hardware, and the need for functional testing as they relate to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under supervision but without intervention on at least one component from each of Groups 1 to 5 as listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, using tools and equipment specified in maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.

Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Electrical components	Electrical components include: 1. Ovens, boilers and beverage makers 2. Aircraft internal and external lights, filaments and flash tubes 3. Aircraft main and APU batteries 4. Static wicks
Avionic components	Avionic components include: 5. Passenger entertainment system components but excluding public address
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA265A Remove and install general aircraft electrical hardware

Modification History

Minor formatting and editorial changes made. Prerequisite version code updated.

Unit Descriptor

This unit covers the competencies required for the removal and installation of a range of general electrical hardware and components found in various systems of both fixed and rotary wing aircraft that are within the privileges of the Aircraft Maintenance Engineer A Licence. This unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer A Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills in the removal and installation of electrical hardware.

Applications include items of general electrical hardware fitted to fixed or rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes

MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Remove general aircraft electrical hardware	1.1. System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted where necessary to ensure personnel safety
	1.2. ***Removal of electrical hardware*** is carried out in accordance with the applicable maintenance manual
	1.3. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
	1.4. Removed components are tagged, packaged or discarded in accordance with specified procedures
2. Install general aircraft electrical hardware	2.1. Electrical hardware components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life
	2.2. Physical installation of electrical hardware is carried out in accordance with the applicable maintenance manual
	2.3. System is reinstated to correct physical condition in preparation for testing, as necessary

2.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures
- using approved maintenance documentation and aircraft publications relating to miscellaneous aircraft electrical hardware and components
- recognising defects in and deterioration of electrical cables to aircraft industry standards, including crimped and soldered joints
- correctly interpreting aircraft wire markings, terminal block identification and plug/socket pin numbering systems
- inspecting electrical looms and harness pre and post-removal and installation to ensure minimum bends are maintained, cable is not in tension, plugs are correctly aligned, security of route ensures no chaffing of insulation, adequate clipping and cable ties have been utilised and construction complies with aircraft industry standards
- positively identifying miscellaneous electrical hardware and/or components in all aircraft systems
- plug connector pin removal and insertion

Required knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- connection of hardware and plugs
- relevant OHS procedures
- electrical wiring used in aircraft and wire marking
- plug/socket pin numbering and terminal block identification
- cable and loom installation requirements
- crimping tools and crimp terminals
- procedures for removal and insertion of plug connector pins
- electrical fundamentals and related mathematical and physics principles

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills, use specialist tools and use maintenance publications to remove and install items of general aircraft electrical hardware that are within the privileges of the CASA Aircraft Maintenance Engineer A Licence while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that applicable cleanliness requirements and OHS safety precautions are fully observed, including awareness of electrostatic discharge procedures. Evidence of transferability of skills and knowledge related to removal and installation is essential. An understanding of the attachment methods, connection of hardware and system operation as they relate to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under supervision but without intervention on each of the connection methods 1 and 2 listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work

environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Removal and installation of electrical hardware	Removal and installation of electrical hardware involves one or more of the following connection methods: 1. Bolted 2. Plug connectors
Electrical hardware	Electrical hardware includes: • switches, relays, lamps, terminal blocks, current limiters, circuit breakers, fuses, sockets, potentiometers, capacitors, inductors, magnetic amplifiers, transformers, rheostats, miscellaneous sensors and minor components hard mounted throughout the aircraft, busbars, lugs, ferrules, splices, connectors and electrical, electronic cables and looms
Application	Application of this unit may relate to: • scheduled maintenance up to the level of a weekly check, or to unscheduled maintenance involving component removal and installation
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA270A Lay out avionic systems

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit is part of Diploma and Advanced Diploma training pathways. It covers the basic design and layout to block diagram level of avionic systems.

Application of the Unit

This unit requires application of basic knowledge of avionic system function, design and layout.

Applications include typical electrical and instrument systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Lay out to block diagram level an aircraft electrical system	1.1. The ***functions of aircraft electrical systems*** are identified 1.2. ***Aircraft electrical system components*** are identified 1.3. A typical aircraft electrical system is sketched at block diagram level 1.4. Aircraft electrical system maintenance requirements are identified
2. Lay out to block diagram level an instrument measuring system	2.1. The various ***instrument measuring systems*** are identified 2.2. ***Measuring system components*** are identified 2.3. A typical instrument measuring system is sketched at block diagram level 2.4. Measuring system maintenance requirements are identified
3. Lay out to block diagram level a pressurisation control system	3.1. ***Pressurisation control system components*** are identified 3.2. A typical pressurisation control system is sketched at block diagram level 3.3. Pressurisation control system maintenance requirements are identified
4. Lay out to block diagram level an aircraft oxygen system	4.1. The various ***types of oxygen system*** are identified 4.2. ***Oxygen system components*** are identified 4.3. A typical oxygen system is sketched at block diagram level 4.4. Oxygen system maintenance requirements are identified

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- sketching typical avionic systems at block diagram level

Required knowledge

Look for evidence that confirms knowledge of:

- DC and AC power generation, control and distribution
- aircraft electrical systems and their components
- aircraft electrical system maintenance requirements
- the atmosphere
- use of synchros and servos
- basics of analogue electronics
- aircraft instrument measuring systems and their components
- aircraft instrument measuring system maintenance requirements
- air conditioning and pressurisation systems
- air conditioning and pressurisation system maintenance requirements
- types of aircraft oxygen systems and their applications
- oxygen system maintenance requirements and related cleanliness and safety precautions

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to identify avionic systems and their components, lay out typical systems at block diagram level and identify related maintenance requirements. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.

	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
Context of and specific resources for assessment	This unit may be assessed off the job in a training environment equipped to provide exposure to the range of system types and components. The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Application	Application of this unit may relate to individual or team-related activities
Functions of aircraft electrical systems	Functions of aircraft electrical systems may include: • power generation, control and distribution • lighting • electrically operated systems, such as doors, flap and landing gear systems • system control (e.g. hydraulic, pneumatic, air conditioning, propeller control and anti-skid) • warning systems • ice and rain protection • engine systems

Aircraft electrical system components	Aircraft electrical system components may include: • the major components of each of the above systems that would be shown in a block diagram or schematic
Instrument measuring systems	Instrument measuring systems may include: • engine indication • transmitter/indicator measuring (pressure, temperature and position) • fuel quantity indication and flow indication
Measuring system components	Measuring system components may include: • the major components of each of the above systems that would be shown in a block diagram or schematic
Pressurisation control system components	Pressurisation control system components may include: • the major components of a pressurisation control system that would be shown in a block diagram or schematic
Types of oxygen system	Types of oxygen system may include: • gaseous • liquid • chemical
Oxygen system components may include:	Oxygen system components may include: • the major components of each of the above systems that would be shown in a block diagram or schematic

Unit Sector(s)

Avionic engineering

Competency field

Co-requisite units

Not applicable

MEA271A Lay out avionic flight management systems

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit is part of Diploma and Advanced Diploma training pathways. It covers the basic design and layout to block diagram level of avionic flight management systems.

Application of the Unit

This unit requires application of basic knowledge of avionic flight management systems function, design and layout.

Applications include typical instrument, radio and electronic systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
MEA270A	Lay out avionic systems

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Lay out to block diagram level a flight instrument system	1.1. The various ***aircraft flight instrument systems*** are identified 1.2. ***Flight instrument system components*** are identified 1.3. A typical advanced flight instrument system is sketched at block diagram level 1.4. Flight instrument system maintenance requirements are identified
2. Lay out to block diagram level an instrument navigation system	2.1. The various ***instrument navigation systems*** are identified 2.2. ***Instrument navigation system components*** are identified 2.3. A typical instrument navigation system is sketched at block diagram level 2.4. Instrument navigation system maintenance requirements are identified
3. Lay out to block diagram level an aircraft communication system	3.1. ***Aircraft communication systems*** are identified 3.2. ***Communication system components*** are identified 3.3. A typical communication system is sketched at block diagram level 3.4. Communication systems maintenance requirements are identified
4. Lay out to block diagram level an	4.1. ***Aircraft pulse systems*** are identified

aircraft pulse system	4.2. ***Pulse system components*** are identified 4.3. A typical pulse system is sketched at block diagram level 4.4. Pulse system maintenance requirements are identified
5. Lay out to block diagram level an aircraft radio navigation system	5.1. ***Aircraft radio navigation systems*** are identified 5.2. ***Radio navigation system components*** are identified 5.3. A typical radio navigation system is sketched at block diagram level 5.4. Radio navigation system maintenance requirements are identified
6. Lay out to block diagram level an aircraft electronic system	6.1. ***Aircraft electronic systems*** are identified 6.2. ***Electronic system components*** are identified 6.3. A typical electronic system is sketched at block diagram level 6.4. Electronic system maintenance requirements are identified

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- sketching typical avionic systems at block diagram level

Required knowledge

Look for evidence that confirms knowledge of:

- the atmosphere
- pitot static systems
- magnetism
- function of gyroscopes
- use of synchros and servos
- basics of analogue electronics
- aircraft instrument systems and their components
- aircraft instrument system maintenance requirements
- radio, navigation and radar basics
- aircraft communication, pulse and radio navigation systems and their components
- communication, pulse and radio navigation system maintenance requirements

- basics of digital electronics
- basic computer architecture
- use of data buses
- automatic flight control systems and their components
- automatic engine control systems and their components
- flight management systems and their components
- display systems and their components
- aircraft electronic system maintenance requirements

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to identify avionic systems and their components, lay out typical systems at block diagram level and identify related maintenance requirements. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
Context of and specific resources for assessment	This unit may be assessed off the job in a training environment equipped to provide exposure to the range of system types and components. The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.

Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Application	Application of this unit may relate to: • individual or team-related activities
Aircraft flight instrument systems	Aircraft flight instrument systems may include: • airspeed indication • pitot static systems • vertical speed indication • air data • machmeter • altimeters, including servo and encoding • angle of attack and stall warning/avoidance • turn and slip • directional gyros • artificial horizons • attitude heading reference
Flight instrument system components	Flight instrument system components may include: • the major components of each of the above systems that would be shown in a block diagram or schematic
Instrument navigation systems	Instrument navigation systems may include: • remote reading gyro compass • direct reading compass • ground proximity warning • flight data recording • inertial navigation
Instrument navigation system components	Instrument navigation system components may include: • the major components of each of the above systems

	that would be shown in a block diagram or schematic
Aircraft communication systems	Aircraft communication systems may include: • HF radio • VHF radio • UHF radio • satellite communications • communications addressing and reporting • audio integration and intercommunications • cockpit voice recording • emergency location
Communication system components	Communication system components may include: • the major components of each of the above systems that would be shown in a block diagram
Aircraft pulse systems	Aircraft pulse systems may include: • navigation radar • search radar • weapons system radar • radar altimeter • air traffic control transponder • distance measuring equipment • tactical air navigation • doppler • collision avoidance
Pulse system components	Pulse system components may include: • the major components of each of the above systems that would be shown in a block diagram
Aircraft radio navigation systems	Aircraft radio navigation systems may include: • instrument landing • automatic direction finding • VHF omni range • global navigation
Radio navigation system components	Radio navigation system components may include: • the major components of each of the above systems that would be shown in a block diagram
Aircraft electronic systems	Aircraft electronic systems may include: • automatic flight control • automatic engine control • electronic instrument display

	• flight management
Electronic system components	Electronic system components may include: • the major components of each of the above systems that would be shown in a block diagram

Unit Sector(s)

Avionic engineering

Competency field

Co-requisite units

Not applicable

MEA272B Apply basic scientific principles and techniques in avionic engineering situations

Modification History

Additional knowledge requirements - equivalent to previous unit.

Unit Descriptor

This unit of competency covers the application of basic scientific principles and techniques to appropriate avionic engineering situations involving component and system design, modification and engineering support of maintenance.

Application of the Unit

This unit requires application of basic avionic scientific principles and techniques as a member of a design and development team or similar in support of the design and development of avionic applications, or as a member of a maintenance organisation engineering department.

Applications include identifying the range of basic avionic scientific principles and techniques relevant to avionic engineering, selecting avionic principles and techniques for particular applications, applying avionic principles and techniques appropriately to engineering tasks, and quoting results appropriately.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of

	performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Research and identify the range of basic scientific principles and techniques relevant to avionic engineering	1.1 Appropriate ***sources of information*** are researched, applications examined and the basic scientific principles relating to avionic engineering reported
	1.2 Basic avionic techniques and associated technologies, software and hardware required to implement scientific principles relating to avionic engineering situations are identified
2 Select basic avionic scientific principles and techniques relevant to particular avionic engineering applications	2.1 The relevant basic avionic scientific techniques and principles for particular ***avionic engineering*** situations are selected
	2.2 The relevant basic aeronautical techniques and associated technologies, software and hardware for particular avionic engineering situations are selected
3 Apply the relevant basic avionic scientific principles and techniques	3.1 The ***basic avionic scientific principles*** are applied in a consistent and appropriate manner to obtain any required solution
	3.2 Appropriate calculations and coherent units are used in the solution of engineering calculations
	3.3 Significant figures are used in engineering calculations
	3.4 The basic avionic techniques and associated technologies, software and hardware are applied in a consistent and appropriate manner to obtain required solutions
4 Quote the results of the application of the basic avionic scientific principles and basic techniques	4.1 An appropriate style is used to quote solutions for applications involving engineering calculations
	4.2 An appropriate style is used to quote solutions for applications not involving engineering calculations

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- physics for electronics:
  - units and measurements
  - magnetic force
  - vectors
  - electric fields and potential
  - electric current and resistance
  - capacitance
  - work, power and energy
- analogue electronics:
  - negative feedback amplifiers
  - differential amplifiers
  - operational amplifiers
  - amplifier frequency response
  - thermal circuits/heat exchangers
  - active filters
  - fault-finding
- digital electronics:
  - characteristics of digital systems
  - number systems
  - Boolean algebra
  - logic circuits
  - logic families
  - construction and testing techniques
  - flip flop circuits
  - analogue to digital conversion
  - digital to analogue conversion
  - timing and control
  - combinational logic circuits
- circuit theory:
  - Kirchhoff’s Current and Voltage Laws
  - Thevenin’s Network Theorem
  - Norton’s Network Theorem
  - Superposition Network Theorem
  - inductance, capacitance and resistance (LCR) series circuit analysis
  - LCR parallel circuit analysis
  - series and parallel resonance
- electrical systems:

    - DC and AC circuit design principles
    - generators and motors
    - inverters
    - power supply, transformer, rectifier, filter and regulator
    - solenoids
    - circuit protection
    - wiring cables and looms
- aerodynamics:
    - Bernoulli's Theorem
    - the atmosphere
    - aerodynamic forces (lift, drag, weight and thrust)
    - stability and control (to a level not requiring the application of calculus)
- thermodynamics – heat transfer principles (conduction, convection and radiation)
- instruments:
    - airspeed measurement
    - altitude measurement
    - attitude indication
    - measurement of quantity, flow, temperature, pressure and position
- control concepts and data communications:
    - servo and synchronous systems and components
    - data communication definitions and terminology
- communications:
    - radio transmission and modulation
    - radio reception
    - microphones, amplifiers and speakers
    - transmission lines and antennas
- pulse:
    - antennas
    - waveguides
    - transmitters/receivers
    - displays
- light, sound and vibration:
    - wave behaviour – standing vs travelling waves, transverse and longitudinal
    - light – reflection, absorption, refraction, diffraction, spectrum, infrared, visible, ultraviolet, transmission medium and engineering applications
    - sound – pitch, frequency, intensity (power), decibel scale, 'noise dose', spectrum, infrasound, audible, ultrasound, speed, natural frequency, resonance, transmission medium and engineering applications
    - vibration – sources, balancing, shaft alignment, measurement, damping and engineering applications

- appropriateness of calculations
- fundamental and derived quantities
- the procedure for carrying out dimensional analysis
- the concept of significant figures
- the uncertainty of computations based on experimental data
- the procedures for determining the significance of figures in calculations
- the procedures for estimating errors in derived quantities

Look for evidence that confirms skills in:

- selecting appropriate basic avionic scientific principles to suit specific applications
- selecting appropriate basic avionic techniques and associated technologies, software and hardware to suit specific applications
- applying basic avionic scientific principles to particular engineering situations
- applying and manipulating appropriate formulas for applications involving engineering calculations
- applying appropriate calculations to engineering situations
- checking the validity of equations using dimensional analysis
- applying basic avionic techniques and associated technologies, software and hardware in a manner appropriate to the application and identified scientific principles
- referring solutions to the original aim of the application
- quoting solutions in appropriate units, using appropriate significant figures
- quoting limitations of solutions, due to assumptions, scientific principles and techniques used
- presenting solutions referring to the original aim of the application

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply basic scientific principles and techniques in avionic engineering situations. This includes working individually and as part of a team and recognising and complying with normal control procedures on engineering projects.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.

	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Method of assessment	This unit could be assessed in conjunction with any other units associated with applying basic scientific principles and techniques in avionic engineering situations.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Sources of information	Sources of information include: • reference texts • manufacturer catalogues and industrial magazines • international aerospace organisation publications • websites • use of phone, email and fax information gathering

Avionic engineering	Avionic engineering refers to: • the engineering discipline concerned with the conceptual development, research, design, manufacture, implementation, installation, commissioning and maintenance of aerospace electrical, instrument, radio and electronic systems and components and related test equipment for civil and military applications
Basic avionic scientific techniques and principles	Candidates should apply appropriate basic techniques supported by their mathematical skills and introductory knowledge of scientific principles to design, manufacturing, commissioning and maintenance-related tasks and projects relating to: • electrical systems and related wiring and components (power generation, distribution, control interfaces with hydraulic and pneumatic systems, and caution and warning systems) • mechanical and electro-mechanical flight instruments and indication systems (quantity, pressure, temperature and position) and components • electronic systems and components (communications, radio navigation, pulse, display, automatic flight control, flight management and engine management) • automatic test stations, adapters and software The applications may require the use of one or two basic avionic scientific principles together with a fundamental mathematical calculation leading to process, resources and system choices from a limited range of options. Basic techniques include: • basic hand and power tool operations • machining • fitting • welding • moulding • fabricating • wiring and programming techniques

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA273A Select and test avionic engineering materials

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency covers selecting appropriate materials and materials and components tests for avionic engineering applications.

Application of the Unit

Applications of this unit include selecting engineering materials and materials tests; sourcing materials data; ensuring appropriate performance and physical standards for avionic applications; documenting materials tests; ensuring calibration standards; and interpreting and documenting materials data sheets, as appropriate for mass production, batch production, jobbing shop and prototyping applications.

Activities may be performed as a member of a design and development or engineering support team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applcable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Identify classes of materials, based on properties and materials tests relevant to avionic engineering	1.1. *C**lasses of materials**, **based on properties***, required for particular ***avionic engineering*** applications are identified 1.2. Material properties are related to common production and construction methods and processes 1.3. Common characteristics, faults or flaws in materials and components or product in particular engineering applications are identified 1.4. Test methods for materials and components or product in particular engineering applications are identified 1.5. Specific industrial test standards/codes, calibration requirements, regulations and authorities related to selection of materials and products for particular engineering applications are identified 1.6. The role of ***Australia's national measurement system*** is investigated
2. Identify and use sources of information on engineering materials, materials tests and test equipment, including manufacturers' catalogues and websites	2.1. Appropriate ***sources of information*** on materials are identified and used 2.2. Appropriate sources of information on methods of testing of properties of materials are identified and used to ensure suitability for a particular application 2.3. Appropriate sources of information on materials, materials tests, test calibration, test certificates, regulations, standards, ***standards councils**/**societies**/**authorities**/**regulatory bodies*** are identified and used 2.4. The use of ***standards and codes*** are investigated and reported on 2.5. Appropriate sources of information on MSDS are identified and used
3. Specify and implement materials for particular avionic engineering	3.1. Methods used to test or obtain the properties of engineering materials are specified and implemented

applications	
4. Specify and implement methods used to test or obtain the properties of engineering materials	4.1. ***Tests of materials*** are specified and implemented to ensure quality, safety or suitability for a range of applications 4.2. ***Traceability*** of measurement standard is ensured 4.3. Test sheets/certificates for appropriate materials are obtained for applications in accordance with organisational procedures and/or codes and regulations 4.4. Appropriate MSDS are obtained for applications in accordance with organisational procedures and/or codes and regulations
5. Report on and record materials design data and methods and results of materials tests	5.1. Materials selections are reported and recorded against design functional requirements in accordance with organisational procedures, codes and regulations including environmental impact and sustainability assessment 5.2. Materials tests and test sheets/certificates are reported and recorded in accordance with organisational procedures, codes and regulations 5.3. Appropriate calibration and traceability are ensured 5.4. Appropriate MSDS are reported and recorded for applications in accordance with organisational procedures, codes and regulations

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- selecting class of materials for an application based on comparison of properties for a significant range of materials classes
- selecting class of materials for an application suitable to production and construction methods and processes
- identifying, overcoming or compensating for common characteristics, faults or flaws in materials or product
- obtaining appropriate test sheets/certificates for applications
- obtaining appropriate MSDS for application
- completing reports, records and design documentation
- addressing environmental impact and sustainability issues
- reporting, recording and filing test reports and documentation
- implementing materials tests and test sheets/certificates, test calibration and traceability
- identifying test methods for materials and components, specific industrial test standards

and regulations for particular engineering applications
- identifying test methods for faults or flaws in materials and components or product
- selecting materials following an extensive search of appropriate sources of information including manufacturer's catalogues and websites
- selecting appropriate tests from a range of possible tests, following an extensive search of appropriate sources of information including manufacturer's catalogues and websites
- satisfying applicable standards and regulations for materials and components
- sourcing materials test certificates and using the material properties information from them
- sourcing and implementing MSDS
- implementing tests correctly for materials and component faults and properties of materials
- selecting testing methods appropriate to applications

Required knowledge

Look for evidence that confirms knowledge of:

- properties of materials classes
- the effect of material properties on production and construction methods and processes
- the effect of characteristics, faults or flaws in materials on product and processes
- test methods for materials and components, specific industrial test standards, regulations and authorities related to particular engineering applications
- test methods for faults or flaws in materials and components or product
- methods of accessing and using alternative information sources
- test procedures and typical applications for tests
- sources and uses of information on materials, materials tests, test certificates, regulations, standards, regulatory bodies and industrial authorities
- methods of accessing MSDS
- identification of materials for an application based on comparison of properties of materials
- identification of test for an application based on an understanding of its ability to measure specific material or product properties
- significance of test sheets/certificates to applications
- the need for obtaining and filing test sheets/certificates
- significance of MSDS and relevance of procedures
- materials selections in relation to design functional requirements
- environmental impact and sustainability assessment
- significance of test reports and documentation to applications
- significance of reporting and recording procedures
- significance of materials tests and test sheets/certificates, test calibration and traceability
- significance of MSDS to applications
- significance of reporting and recording procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to select and test avionic engineering materials.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Method of assessment	This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with selecting and testing aeronautical engineering materials or other units requiring the exercise of the skills and knowledge covered by this unit.
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Classes of materials, based on properties	Classes of materials include: • non-ferrous metals and alloys (copper, aluminium, zinc, lead, tin and their alloys), ferrous metals (carbon steels, alloy steels, cast irons), non-metallic composite materials, bearing materials, lubricants, non-metals (timber, ceramics, polymers and fabrics, adhesives, electrical insulation materials), thermal conductors and insulators, electrical conductors, semiconductors and insulators Properties of materials include: • strength, elasticity, plasticity, malleability, toughness, brittleness, fatigue endurance, mouldability, weldability, machinability, formability, resistance to creep and stress relaxation, resistance to degradation (e.g. use of plastic fillers to enhance UV resistance), adhesion (electrical, magnetic, thermal, chemical and optical), material structure and effect on properties Other factors include: • corrosion and corrosion protection methods • the effect of manufacturing and construction processes on material properties • the effect of property enhancement on design (e.g. adhesives plus sintering replacing some forging and machining of gears on shafts) Cost includes: • manufacture of material and source of material, typical applications and possibilities
Avionic engineering	Avionic engineering refers to: • the engineering discipline concerned with the conceptual development, research, design, manufacture, implementation, installation, commissioning and maintenance of aerospace electrical, instrument, radio and electronic systems and components and related test equipment for civil and

	military applications
Australia's national measurement system	Australia's national measurement system includes: • National Standards Commission (legal metrology) • Commonwealth Scientific and Research Organisation (physical standards) • National Association of Testing Authorities, Aust. (Laboratory accreditation) • Standards Australia International Ltd (AS standards specifications)
Sources of information	Sources of information includes: • reference texts, manufacturer's catalogues and industrial magazines • websites, use of phone, email and fax information gathering
Standards councils/societies/authorities/ regulatory bodies	Standards councils/societies/authorities include: • Australian Standards • ASTM • MIL Spec. • ASME • ISO Regulatory bodies include: • CASA • ADF • United States FAA • European Joint Aviation Authority
Standards and codes	Standards and codes include: • NDT and mechanical test standards • chemical test standards • electrical test standards • compliance test standards for components
Tests of materials	Tests of materials include: • destructive, including tensile, compression, impact, hardness, fatigue, corrosion, stress relaxation and creep,and peel resistance (adhesives) • non-destructive, including hardness, ultrasonics, X-ray, dye penetrant, eddy current, surface friction, conductivity, heat expansion, photoelastic, heat capacity refractive index, and magnetic hysteresis loop
Traceability	Traceability ensures:

	• test calibrations can be traced back to the relevant base unit in the relevant measurement system

Unit Sector(s)

Engineering science

Competency field

Co-requisite units

Not applicable

MEA274A Maintain basic light aircraft electrical systems and components

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required for the maintenance of electrical systems of the more basic types of both fixed and rotary wing aircraft. Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the applicable Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of maintenance documentation/publications in the maintenance of basic aircraft electrical systems and components involving inspection, limited testing and troubleshooting and component removal and installation.

Applications include fixed wing aircraft with fixed undercarriage and basic rotary wing aircraft with skids or floats and no powered flight controls powered by either a normally aspirated piston engine or small gas turbine.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA246C	Fabricate and/or repair aircraft electrical components or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect basic aircraft electrical systems and components	1.1. Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements 1.2. Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual 1.3. ***DC electrical system*** is visually or physically checked for external signs of defects in accordance with applicable maintenance manual 1.4. Defects are correctly identified and reported
2. Test/adjust basic aircraft electrical systems	2.1. Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation 2.2. Electrical system is functionally tested, in accordance with maintenance manual, for evidence of serviceability or malfunction 2.3. System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3. Troubleshoot basic aircraft electrical systems	3.1. Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination 3.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate ***troubleshooting*** 3.3. Specialist advice is obtained, where required, to assist with the troubleshooting process

	3.4. System faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, and in accordance with standard enterprise procedures 3.5. Rectification requirements are determined
4. Remove and install basic aircraft electrical system components	4.1. System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted where necessary to ensure personnel safety 4.2. ***Electrical component*** removal is carried out in accordance with the applicable maintenance manual 4.3. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures 4.4. Removed components are tagged and packaged in accordance with specified procedures 4.5. Electrical components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life 4.6. Physical installation of electrical components is performed in accordance with the applicable maintenance manual, ensuring appropriate adjustment/alignment with mechanical interface is carried out 4.7. System is reinstated to correct operational condition in preparation for testing, as necessary 4.8. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices, including those relating to gas turbine engine high energy ignition units
- using approved maintenance documentation and aircraft publications relating to DC electrical systems
- identifying/locating:
  - DC power generation, regulation, distribution and control systems and components:
    - generators and starter/generators
    - regulators
    - bus bars

    - circuit breakers and fuses
    - wiring
  - piston engine ignition and starting systems and components:
    - magnetos or coils
    - starter motors
    - ignition switches/start switches
    - ignition harnesses
    - low tension wiring
    - spark plugs
    - auxiliary starting devices
  - gas turbine engine ignition and starting systems:
    - starter motors and starter/generators
    - high energy ignition units
    - control units
    - switches
  - batteries and associated mounting equipment, including related anti-vibration aids
  - motors and actuators in basic DC electrical systems
- correctly connecting DC generators, alternator/rectifier generators and starter/generators
- recognising system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) and security in:
  - DC power generation systems including regulation, distribution and control
  - battery installations
  - piston engine ignition and starting systems
  - gas turbine engine ignition and starting systems (where applicable to the enterprise)
  - internal/external lighting systems, including controls
  - motors and actuators in basic DC electrical systems
- applying logic processes, taking and interpreting electrical measurements, using test equipment and appropriate wiring diagrams and manuals to isolate malfunctions in the above systems
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability

Required knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- connection of hardware and plugs
- DC electrical principles:
  - properties of permanent magnets
  - precautions for the care and storage of permanent magnets
  - properties of electromagnets

  - primary and secondary cells
  - aircraft battery types, construction, care and safety
  - resistor characteristics
  - fuses and circuit breakers
  - fundamental DC circuits
  - inductive circuits
  - capacitive circuits
  - basic fault-finding principles
- general construction, operating characteristics and applications for aircraft:
  - DC generators
  - alternator/rectifier generators
  - DC motors including starter motors
  - starter/generators
  - DC actuators (linear and rotary)
  - gas turbine high energy ignition system components and related safety precautions
  - lighting systems
- the basic layout (block diagram level), function and operation of the systems listed in the Range Statement
- electrical system maintenance requirements and troubleshooting procedures
- relevant OHS practices, including those relating to gas turbine engine high energy ignition units
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot basic DC electrical systems and remove and install components, including looms, cables and connection hardware, while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with basic aircraft DC electrical systems and components. It is essential that system testing

	procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with, as well as work practices associated with electrostatic sensitive devices. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting and component removal and installation is essential. This is to be demonstrated through application across a range of aircraft electrical systems and components listed in the Range Statement. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on electrical looms, cables and connection hardware, and on each system in Range Statement Groups 1 to 4 and on at least one major component/LRU in each case. For Group 5, competency may be demonstrated through the performance of a battery check. Component removal and installation competencies are to be demonstrated on at least one component from each of groups 6 to 11. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Applicable electrical systems	Electrical systems may include: 1. DC power generation, regulation and distribution systems 2. Piston engine and gas turbine engine ignition and starting systems (as applicable to the enterprise) 3. DC electrical systems, such as flaps, including related motors and actuators 4. Aircraft lighting 5. Aircraft main battery
Troubleshooting	Troubleshooting involves the use of fault-finding charts or similar, to line replacement level
Applicable electrical components	Electrical components include: 6. DC generators, and alternator/rectifier generators, and components of related single generator regulation and distribution systems 7. Motors 8. Actuators 9. Piston engine ignition and starting system components 10. Aircraft batteries 11. Aircraft lighting components, such as bulbs, lenses, switches and rheostats
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by

	manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA275A Maintain basic light aircraft instrument systems and components

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway It covers the competencies required for the maintenance of instrument systems of the more basic types of both fixed and rotary wing aircraft. Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the applicable Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable test equipment to inspect, test and troubleshoot basic aircraft instrument systems and to remove and install components.

Applications include light fixed wing aircraft with fixed undercarriage and basic rotary wing aircraft with skids or floats and no powered flight controls powered by either a normally aspirated piston engine or small gas turbine.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA246C	Fabricate and/or repair aircraft electrical components or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect basic aircraft instrument systems and components	1.1. Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements 1.2. Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual 1.3. ***Instrument system components*** are visually or physically checked for external signs of defects in accordance with applicable maintenance manual 1.4. Defects are correctly identified and reported
2. Test/adjust basic aircraft instrument systems and components	2.1. Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation 2.2. Instrument system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction 2.3. System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3. Troubleshoot basic aircraft instrument systems and components	3.1. Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination 3.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate ***troubleshooting*** 3.3. Specialist advice is obtained, where required, to assist with the troubleshooting process

	3.4. Instrument system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures 3.5. Rectification requirements are determined
4. Remove and install basic aircraft instrument system components	4.1. System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety 4.2. Instrument component removal is carried out in accordance with the applicable maintenance manual 4.3. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures 4.4. Removed components are tagged and packaged in accordance with specified procedures 4.5. Instrument components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life 4.6. Physical installation of instrument components is performed in accordance with the applicable maintenance manual and regulatory requirements, ensuring appropriate adjustment/alignment is carried out 4.7. System is reinstated to correct operational condition in preparation for testing, as necessary 4.8. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- using approved maintenance documentation and aircraft publications relating to basic instrument systems
- locating and identifying flight instrument system components comprising:
  - engine system temperature, speed (including mechanical and electrical tachometers)
  - auxiliary direct reading systems including vacuum, fuel storage quantities
  - flight systems including attitude, altitude, air speed and OAT
- locating and identifying direct reading compasses
- correct handling and observance of maintenance precautions relating to gyroscopes, gimbals and pitot/static systems (connections, heating and protrusions)

- recognising system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) and security in:
  - flight instruments
  - pitot/static systems
  - direct reading compasses
  - piston engine and gas turbine engine indication systems
  - electrical systems indication
  - basic fuel quantity indication systems
  - vacuum indication systems
- applying logic processes, taking and interpreting system measurements, using test equipment and appropriate wiring diagrams and manuals to isolate malfunctions in the above systems
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability
- applying OHS requirements relevant to instrument system maintenance

Required knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- connection of hardware and plugs
- handling precautions for electrostatic sensitive devices
- relevant OHS practices
- the basic layout (block diagram level), function and operation of the following systems as listed in the Range Statement:
  - pitot/static systems
  - piston engine and gas turbine engine direct reading indication systems
  - basic fuel quantity measurement systems
- the operating principles of the above systems and associated with:
  - atmospheric conditions; properties and effects on aircraft instruments and systems
  - pressure and temperature sensing elements and their use in aircraft instruments
  - gyroscopes and their use in aircraft instrument systems
  - electrical fundamentals
- instrument construction and operation:
  - instrument groupings, panel layout and construction
  - pitot static instruments (ASI, VSI and counter-pointer altimeters), their operation, calibration safe handling and related terminology
  - pitot pressure
  - static pressure
  - altimeter Q code settings:
    - QNH
    - QNE
    - QFE

- IAS
- TAS
- vacuum system indication component construction and operation
- air and electrically powered artificial horizon construction and operation
- directional gyro construction and operation
- construction and operation of direct reading engine instruments
- turn and bank and slip/turn coordinator construction and operation
- direct reading compass construction and compass calibration
- piston and gas turbine engine direct reading measuring instruments and temperature indication instruments construction and operation
- voltage and current measuring instrument construction and operation
- volumetric fluid quantity system components, construction and operation

- instrument system maintenance requirements and troubleshooting procedures, including pitot/static system leak testing
- relevant maintenance documentation and maintenance publications
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot basic instrument systems and remove and install components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) and component removal and installation associated with aircraft basic instrument systems and components. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application

	across a range of basic aircraft instrument systems and components listed in the Range Statement. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a system and at least one major system component/LRU from each of Groups 1 to 8 listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide

Applicable instrument systems and system components	Instrument systems and system components include: 1. Pitot/static systems and components, ASI, VSI and counter-pointer altimeters 2. DGs and AHs (air and electrically driven) 3. Turn and bank and slip/turn coordinators 4. Direct reading compasses 5. Piston engine and gas turbine engine indication system components (direct reading measuring instruments and temperature indication) 6. Electrical systems indication (voltage and current) 7. Basic fuel quantity indication systems and components 8. Vacuum indication components
Troubleshooting	Troubleshooting involves the use of fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA276A Maintain basic aircraft communication and radio navigation systems and components

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required for the limited maintenance of communication and radio navigation systems of the more basic types of both fixed and rotary wing aircraft. Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the applicable Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, functionally test and troubleshoot basic communication and radio navigation systems and to remove and install components.

Applications include communication and radio navigation systems of fixed wing aircraft with fixed undercarriage and basic rotary wing aircraft with skids or floats and no powered flight controls powered by either a normally aspirated piston engine or small gas turbine.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA246C	Fabricate and/or repair aircraft electrical components or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect basic communication and radio navigation systems and components	1.1. Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements 1.2. Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual 1.3. ***Communication and radio navigation systems and components*** are visually or physically checked for external signs of defects in accordance with applicable maintenance manual 1.4. Defects are correctly identified and reported
2. Functionally test basic communication and radio navigation systems and components	2.1. Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation 2.2. Communication and radio navigation systems are functionally tested, in accordance with maintenance manual, for evidence of serviceability or malfunction 2.3. Deficiencies are correctly identified and reported
3. Troubleshoot basic communication and radio navigation systems	3.1. Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination 3.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate ***troubleshooting*** 3.3. Specialist advice is obtained, where required, to assist

	with the troubleshooting process 3.4. Communication and radio navigation system faults are located and are correctly recorded in maintenance documentation in accordance with standard operating procedures
4. Remove and install basic radio communication and navigation system components	4.1. System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety 4.2. Communication and navigation system component removal is carried out in accordance with the applicable maintenance manual 4.3. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures 4.4. Removed components are tagged and packaged in accordance with specified procedures 4.5. Communication and navigation system components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life 4.6. Physical installation of components is performed in accordance with the applicable maintenance manual and regulatory requirements, ensuring appropriate adjustment/alignment is carried out 4.7. System is reinstated to correct operational condition in preparation for testing, as necessary 4.8. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved maintenance documentation and aircraft publications relating to the radio frequency and communications system being maintained
- locating and identifying radio communication and navigation system components comprising:
  - HF and VHF communications

    - VOR, ADF and GNS
    - ATC transponders
    - ELT systems
- locating and identifying applicable radio system antennas
- recognising system and component defects/external damage, correct installation, attaching hardware (including cabling/harnesses/transmission lines) and security in:
    - HF and VHF communications systems
    - VOR, ADF and GNS navigation systems
    - air traffic control (ATC) transponders
    - ELT systems
- applying logic processes, functional testing and visual inspections to isolate malfunctions within the above systems
- functionally testing listed systems to assess post-maintenance serviceability

Required knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- connection of hardware and plugs
- printed circuit boards
- semiconductors
- fibre optics
- handling precautions for electrostatic sensitive devices
- relevant OHS practices
- the use of approved maintenance documentation and aircraft publications relating to radio communication and navigation systems and components
- the general working principles of communication and navigation systems
- explaining the basic system layout (block diagram level), function and operation of:
    - HF and VHF communications systems
    - VOR, ADF and GNS navigation systems
    - ATC transponders
    - ELT systems
- radio frequency and communication system maintenance requirements and basic troubleshooting procedures
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, functionally test and visually troubleshoot basic communication and radio navigation systems and remove and install components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, functional testing and visual troubleshooting applications (including the timely involvement of supervisors or other trades) associated with aircraft basic communication and radio navigation systems and components. It is essential that system functional testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, functional testing and visual troubleshooting is essential. This is to be demonstrated through application across a range of basic aircraft communication and radio navigation systems and components listed in the Range Statement. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a system and at least one major system component/LRU from each of Groups 1 to 4 listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent

	Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Applicable systems and components	Communication and radio navigation systems and components include: 1. HF and VHF communication system LRUs, transmission lines and antennas 2. ADF, VOR and GNS navigation system LRUs, transmission lines and antennas 3. ATC transponders, transmission lines and antennas 4. ELT
Troubleshooting	Troubleshooting involves the use of fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by

	manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA277A Maintain twin engine aircraft electrical systems and components

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies additional to those of MEA202C Remove and install basic aircraft electrical system components and MEA210C Inspect, test and troubleshoot basic aircraft electrical systems and components that are required for the maintenance of the electrical systems of twin piston engine aircraft. Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the applicable Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit extends the competencies developed in units MEA202C Remove and install basic aircraft electrical system components and MEA210C Inspect, test and troubleshoot basic aircraft electrical systems and components to include the maintenance of additional electrical systems found in twin engine aircraft.

Applications include twin piston engine fixed wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect twin engine aircraft electrical systems and components	1.1. Relevant maintenance documentation and modification status, including system defect reports where relevant, are used to identify specific inspection requirements 1.2. Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual 1.3. ***DC electrical system*** is visually or physically checked for external signs of defects in accordance with applicable maintenance manual 1.4. Defects are correctly identified and reported
2. Test/adjust twin engine aircraft electrical systems	2.1. Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation 2.2. Electrical system is functionally tested, in accordance with maintenance manual, for evidence of serviceability or malfunction 2.3. System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3. Troubleshoot twin engine aircraft electrical systems	3.1. Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination 3.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate ***troubleshooting*** 3.3. Specialist advice is obtained, where required, to assist with the troubleshooting process

	3.4. System faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required and in accordance with standard enterprise procedures 3.5. Rectification requirements are determined
4. Remove and install twin engine aircraft electrical system components	4.1. System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety 4.2. ***Electrical component*** removal is carried out in accordance with the applicable maintenance manual 4.3. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures 4.4. Removed components are tagged and packaged in accordance with specified procedures 4.5. Electrical components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life 4.6. Physical installation of electrical components is performed in accordance with the applicable maintenance manual, ensuring appropriate adjustment/alignment with mechanical interface is carried out 4.7. System is reinstated to correct operational condition in preparation for testing, as necessary 4.8. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved maintenance documentation and aircraft publications relating to twin engine aircraft electrical systems
- identifying/locating:
  - DC multi-generator power generation, regulation, distribution and control systems and components, i.e. regulators and bus bars
  - electrical propeller control systems and components, such as feathering and synchronising systems
  - batteries in dual battery installations and associated mounting equipment, including

related anti-vibration aids
    - fire warning and extinguishing systems and components
    - identification of halogen (e.g. BCF) fire-extinguishers
    - combustion heating systems
    - equipment cooling and ventilation
    - fuel storage and distribution system electrical components
    - master and central warning systems
- correctly connecting DC generators and alternator/rectifier generators in multi-generator systems and paralleling generator output
- recognising system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) and security in the above systems and system components
- applying logic processes, taking and interpreting electrical measurements, using test equipment and appropriate wiring diagrams and manuals to isolate malfunctions in the above systems
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability

Required knowledge

Look for evidence that confirms knowledge of:

- system testing procedures and paralleling of generator output
- the basic layout (block diagram level), function and operation of:
    - DC multi-generator and alternator/rectifier generator regulation and distribution systems and components
    - electrical propeller control systems, such as feathering and synchronising systems and system components
    - dual battery systems and associated mounting equipment, including related anti-vibration aids
    - fire warning and extinguishing systems and system components, including regulatory requirements relating to halogen (e.g. BCF) fire-extinguishers
    - combustion heating systems and system components
    - equipment cooling and ventilation systems and system components
    - fuel storage and distribution systems and system components
    - master and central warning systems and system components
- maintenance requirements and troubleshooting procedures for the above electrical systems
- relevant OHS practices
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot the DC electrical systems and components of twin piston engine aircraft and remove and install components, including looms, cables and connection hardware, while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with twin piston engine aircraft DC electrical systems and components. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with, as well as work practices associated with electrostatic sensitive devices. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting and component removal and installation is essential. This is to be demonstrated through application across a range of aircraft electrical systems and components listed in the Range Statement. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on electrical looms, cables and connection hardware, and on each system in Range Statement Groups 1 to 8 and on at least one major component/LRU in each case (Groups 2, 4, 5 and/or 8 may be omitted if they are not applicable

	to the enterprise). For Group 3, competency may be demonstrated through the performance of a battery check. Component removal and installation competencies are to be demonstrated on at least one component from each of Groups 9 to 16 (Groups 10, 12, 13 and/or 16 may be omitted if they are not applicable to the enterprise). This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
DC electrical systems	DC electrical systems may include: 1. DC multi-generator and alternator/rectifier generator regulation and distribution systems and components 2. Electrical propeller control systems, such as feathering systems (where applicable to the enterprise) 3. Batteries in dual battery installations and associated mounting equipment, including related anti-vibration aids 4. Fire warning and extinguishing systems, including

	handling of halogen fire extinguishers (where applicable to the enterprise) 5. Combustion heating systems (where applicable to enterprise) 6. Equipment cooling and ventilation 7. Fuel storage and distribution systems 8. Master and central warning systems (where applicable to enterprise)
Troubleshooting	Troubleshooting involves the use of fault-finding charts or similar, to line replacement level
Electrical components	Electrical components include: 9. Components of multi-generator regulation and distribution systems 10. Electrical propeller control system components (where applicable to the enterprise) 11. Batteries in dual battery installations and associated mounting equipment, including related anti-vibration aids 12. Fire warning and extinguishing system components (where applicable to the enterprise) 13. Combustion heaters and associated components (where applicable to enterprise) 14. Equipment cooling and ventilation components 15. Fuel storage and distribution system electrical components 16. Master and central warning system components (where applicable to enterprise)
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

MEA210C	Inspect, test and troubleshoot basic aircraft electrical systems and components

MEA278A Inspect, test and troubleshoot instrument display systems and components

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to inspect, test and troubleshoot electronic instrument display systems and components. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the applicable Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot electronic instrument display systems and components.

Applications include fixed and rotary wing aircraft that have electronic instrument display systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA246C Fabricate and/or repair aircraft electrical hardware or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect electronic aircraft instrument display systems and components	1.1. Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements 1.2. Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual 1.3. ***Electronic instrument display system*** components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual 1.4. Defects are correctly identified and reported
2. Test/adjust electronic aircraft instrument display systems and components	2.1. Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation 2.2. Electronic instrument display system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction 2.3. System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3. Troubleshoot electronic aircraft instrument display systems	3.1. Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination 3.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate ***troubleshooting*** 3.3. Specialist advice is obtained, where required, to assist

with the troubleshooting process

3.4. Electronic instrument display system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures

3.5. Rectification requirements are determined

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- using hand skills, tools and test equipment in the testing, adjustment and troubleshooting of instrument display systems
- recognising system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) for the range of systems listed in the Range Statement
- interpreting the information presented on instrument display systems
- applying logic processes and using appropriate wiring diagrams and manuals to isolate instrument display system malfunctions
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability
- effectively using maintenance documentation and relevant fault diagnosis guides in the troubleshooting process
- applying standard procedures
- observing all relevant occupational health and safety (OHS) procedures

Required knowledge

Look for evidence that confirms knowledge of:

- standard trade practices relating to tool and test equipment usage and installation/securing of system components
- the basic layout (block diagram level) of the systems listed in the Range Statement
- the operating principles of the systems listed in the Range Statement and associated with:
  - electrical and instrument fundamentals relating to multi-function display systems
  - interpretation of display information and display screen symbol generation
  - the operation of each listed system and system components
- OHS procedures relating to instrument display systems and components
- relevant ARINC specifications
- relevant maintenance manuals
- maintenance requirements and troubleshooting procedures

- relevant regulatory requirements and standard procedures, including software management control

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot a range of electronic instrument display systems and components that is representative of the scope of the listed variables in accordance with relevant maintenance manual instructions while applying all relevant OHS procedures and standard processes.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with aircraft electronic instrument display systems and their components. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This may be demonstrated through application across a range of aircraft instrument and display systems (where display systems are applicable to the enterprise) listed in the Range Statement. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of this unit of

	competency are being achieved under routine supervision on a system and on at least one major system component of each Groups 1 to 4 (Group 4 may be omitted if not applicable to the enterprise), as listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Electronic instrument display systems	Electronic instrument display systems may include: 1. EFIS 2. EICAS 3. ECAM 4. HUD
Troubleshooting	Troubleshooting involves the use of fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance

	• individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

MEA207C Remove and install aircraft electronic system components

MEA279A Inspect, test and troubleshoot full authority digital engine control systems

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to inspect, test and troubleshoot full authority digital engine control (FADEC) systems and components.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the applicable Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of maintenance documentation/publications and test sets in the inspection, testing and troubleshooting of FADEC systems.

Applications include fixed and rotary wing aircraft with engines that are controlled by FADEC systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA246C	Fabricate and/or repair aircraft electrical hardware or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect FADEC systems and components	1.1. Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements
	1.2. Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual
	1.3. ***FADEC system*** is visually or physically checked for external signs of defects in accordance with applicable maintenance manual
	1.4. Defects are correctly identified and reported
2. Test FADEC systems	2.1. Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation
	2.2. FADEC system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction
3. Troubleshoot FADEC systems	3.1. Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination
	3.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate ***troubleshooting***
	3.3. Specialist advice is obtained, where required, to assist with the troubleshooting process
	3.4. System faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required and in accordance with

standard enterprise procedures

3.5. Rectification requirements are determined

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices, including those relating to engine ground running
- using approved maintenance documentation and aircraft publications relating to the applicable FADEC system
- using test sets to download maintenance data from the FADEC system and interpreting the data
- identifying/locating airframe and engine (including propeller/rotor)-mounted FADEC system components
- recognising system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) and security in airframe and engine-mounted FADEC system components
- correctly handling electrostatic sensitive devices
- applying logic processes, using test equipment and appropriate wiring diagrams and manuals to isolate FADEC system malfunctions
- using built-in test features to confirm post-maintenance serviceability

Required knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- connection of hardware and plugs
- digital electronic theory
- open and closed loop control
- the basic layout (block diagram level), function and operation of FADEC systems
- architecture of FADEC system computers, software and software management
- operation of sensors that input data to FADEC system computers
- built-in test system operation and downloading and interpretation of system data
- relevant regulatory requirements and standard procedures, including software management control
- maintenance requirements and troubleshooting procedures
- relevant maintenance manuals

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot FADEC systems while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with FADEC systems and components. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with, as well as work practices associated with electrostatic sensitive devices. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting and component removal and installation is essential. This is to be demonstrated through application on FADEC systems and components as defined in the Range Statement. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on FADEC systems and system components as defined in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and

	equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
FADEC systems	FADEC systems may include: • computers, sensors, interfaces, cockpit controls, data cables and wiring looms that comprise the electronic control system Other engine-mounted related components, such as spark plugs, ignition units, injectors and fuel control units are covered by the applicable engine maintenance units (e.g. MEA313C Inspect, test and troubleshoot piston engine systems and components, MEA314C Inspect, test and troubleshoot gas turbine engine systems and components or MEA353A Maintain basic light aircraft engines and propellers)
Troubleshooting	Troubleshooting involves the use of test sets, downloaded maintenance data and fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

MEA207C Remove and install aircraft electronic system components

MEA280A Inspect, test and troubleshoot flight management systems and components

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to inspect, test and troubleshoot flight management systems and components.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the applicable Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot flight management system computers, control display units, database units and the interface with flight control and navigation systems.

Applications include fixed and rotary wing aircraft that have flight management systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA246C	Fabricate and/or repair aircraft electrical hardware or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect flight management systems and components	1.1. Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements 1.2. Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual 1.3. ***Flight management system*** components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual 1.4. Defects are correctly identified and reported
2. Test flight management systems and components	2.1. Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation 2.2. Flight management system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction
3. Troubleshoot flight management systems	3.1. Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination 3.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate ***troubleshooting*** 3.3. Specialist advice is obtained, where required, to assist with the troubleshooting process 3.4. Flight management system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance

with standard enterprise procedures

3.5. Rectification requirements are determined

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- using hand skills, tools and test equipment in the testing and troubleshooting of flight management systems
- recognising system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) for the system components listed in the Range Statement
- interpreting the information presented on control display units
- applying logic processes and using appropriate wiring diagrams and manuals to isolate flight management system malfunctions
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability
- effectively using maintenance documentation and relevant fault diagnosis guides in the troubleshooting process
- applying standard procedures
- observing all relevant OHS procedures

Required knowledge

Look for evidence that confirms knowledge of:

- standard trade practices relating to tool and test equipment usage and installation/securing of system components
- electrical principles and digital electronic theory
- the basic layout (block diagram level) of flight management systems
- the operating principles of flight management computers, control display units and database units, including the interface with flight control, engine control and navigation systems
- the interface with Aircraft Communication Addressing and Reporting System and relevant ARINC specifications
- the operation of integral GPS sensors
- OHS procedures relating to flight management systems and components
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures, including software management control
- maintenance requirements and troubleshooting procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to test and troubleshoot a flight management system and components that is representative of the scope of the listed variables in accordance with relevant maintenance manual instructions while applying all relevant OHS procedures and standard processes.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with flight management systems and their components. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This may be demonstrated through application across the components of a flight management system as listed in the Range Statement. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards, including software management control. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of this unit of competency are being achieved under routine supervision on a system and on at least one major system component of each Group 1 to 5 (Groups 4 and 5 may be omitted if not applicable to the enterprise), as listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where

	appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	Where the flight management system includes integral GPS, consideration may be given to concurrent assessment of MEA234C Inspect, test and troubleshoot aircraft global navigation systems and components.
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Flight management systems	Flight management systems may include: 1. Flight management computer 2. Control display unit 3. Database unit 4. GPS sensor (where applicable to enterprise) 5. GPS antenna (where applicable to enterprise)
Troubleshooting	Troubleshooting involves the use of test sets, downloaded maintenance data and fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities

Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

MEA207C Remove and install aircraft electronic system components

MEA281A Maintain light aircraft AC powered instrument systems and components

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required for the maintenance of AC powered instrument systems of both fixed and rotary wing light aircraft.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable test equipment to inspect, test and troubleshoot AC powered aircraft instrument systems, including the power supply, and to remove and install components.

Applications include light fixed wing and rotary wing aircraft with piston or turbine engines.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA246C	Fabricate and/or repair aircraft electrical components or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect light aircraft AC instrument systems, power supplies and components	1.1. Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements 1.2. Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual 1.3. ***AC*** instrument ***system and AC power supply components*** are visually or physically checked for external signs of defects in accordance with applicable maintenance manual 1.4. Defects are correctly identified and reported
2. Test/adjust light aircraft AC instrument systems, power supplies and components	2.1. Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation 2.2. Instrument system and AC power supply is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction 2.3. System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3. Troubleshoot light aircraft AC instrument systems, power supplies and components	3.1. Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination 3.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate ***troubleshooting*** 3.3. Specialist advice is obtained, where required, to assist

	with the troubleshooting process
	3.4. Instrument system or power supply faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures
	3.5. Rectification requirements are determined
4. Remove and install light aircraft AC instrument system, and power supply components	4.1. System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted where necessary to ensure personnel safety
	4.2. Instrument or power supply component removal is carried out in accordance with the applicable maintenance manual
	4.3. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
	4.4. Removed components are tagged and packaged in accordance with specified procedures
	4.5. Instrument or power supply components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life
	4.6. Physical installation of instrument or power supply components is performed in accordance with the applicable maintenance manual and regulatory requirements, ensuring appropriate adjustment/alignment is carried out
	4.7. System is reinstated to correct operational condition in preparation for testing, as necessary
	4.8. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- using approved maintenance documentation and aircraft publications relating to AC instrument systems and related AC power supplies
- locating and identifying AC powered instrument system components, including:
  - AH, DG, AHRS, servo and encoding altimeters

  - engine system temperature, speed, oil pressure, torque and manifold pressure
  - auxiliary systems, including vacuum, fuel storage quantities and fuel flow
  - remote reading gyro compasses
- locating and identifying AC instrument power supply system components, including:
  - inverters
  - transformer/rectifier units
  - voltage and frequency indication
- correctly handling and observing maintenance precautions for gyroscopes and gimbals
- recognising system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) and security in AC powered instruments and related power supply, including:
  - flight instruments
  - remote reading gyro compasses
  - piston engine and gas turbine engine indication systems (indicators and transmitters/sensors)
  - fuel quantity and flow indication systems (indicators, probes and transmitters)
  - transmitter/indicator measuring instrument systems (pressure, temperature and vacuum)
  - AC power supply, including inverters and transformer/rectifier units
- applying logic processes, taking and interpreting system measurements, using test equipment and appropriate wiring diagrams and manuals to isolate malfunctions in the above systems
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability
- applying OHS requirements relevant to instrument and electrical system maintenance

Required knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- connection of hardware and plugs
- handling precautions for electrostatic sensitive devices
- relevant OHS practices
- AC theory:
  - calculations and measurement in AC circuits
  - inductors and inductive reactance
  - transformer operation
  - capacitors and capacitive reactance
  - LCR circuits and resonance
  - passive filters
  - power relationship in reactive circuits
- the basic layout (block diagram level), function and operation of AC powered:
  - flight instruments

  - remote reading gyro compasses
  - piston engine and gas turbine engine indication systems (indicators and transmitters/sensors)
  - fuel quantity and flow indication systems (indicators, probes and transmitters)
  - transmitter/indicator measuring instrument systems (pressure, temperature, vacuum)
  - AC power supply including AC generators, inverters and transformer/rectifier units
- the operating principles of the above systems and associated with:
  - atmospheric conditions - properties and effects on aircraft instruments and systems
  - pressure and temperature sensing elements and their use in aircraft instrument systems
  - gyroscopes and their use in aircraft instrument systems
  - electrical fundamentals
- relevant maintenance documentation and maintenance publications
- maintenance requirements and troubleshooting procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot AC powered instrument systems and related power supplies, and remove and install components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) and component removal and installation associated with aircraft instrument systems and components. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across a range of AC powered aircraft instrument systems, AC power supplies and components listed in the

	Range Statement. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a system and at least one major system component/LRU from each of Groups 1 to 5 listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
AC instrument systems and AC power supply components	AC instrument system and AC power supply components may include:

	1. DG, AH, AHRS and components, servo and encoding altimeters, remote reading gyro compasses and components 2. Piston engine and gas turbine engine indication system components 3. Fuel quantity indication and flow indication systems and components 4. Transmitter/indicator measuring instrument systems (pressure, temperature, vacuum) and components 5. Inverters and transformer/rectifier units
Troubleshooting	Troubleshooting involves the use of test sets, downloaded maintenance data and fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA282A Repair or overhaul aircraft pulse system components

Modification History

Minor formatting and editorial changes made. Minor clarification made to the unit descriptor.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Component Workshop Maintenance Stream) training pathway. It covers the competencies required to repair or overhaul components of aircraft pulse systems. Repair of circuit boards is covered by MEA262B Modify/repair single layer printed circuit boards and MEA263B Modify/repair multi-layer printed circuit boards. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills, test equipment and knowledge of pulse, analogue and digital theory to repair or overhaul components from aircraft pulse systems.

Applications include pulse system components from fixed and rotary wing aircraft that are repaired or overhauled in aviation maintenance workshops.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Determine requirements	1.1. ***Pulse system*** component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers
	1.2. Circuitry is correctly prepared and connected to the applicable test equipment and is functionally tested or cycled through the prescribed test procedures in accordance with the maintenance documentation for evidence of serviceability or malfunction
	1.3. Modification status is clearly established to assist in determining the overhaul requirements for the components
	1.4. Extent of overhaul or repair is correctly identified and documented
2. Troubleshoot pulse system components	2.1. Available information from maintenance records and inspection and test results is used, where necessary, to assist in fault determination
	2.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting
	2.3. Faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required
	2.4. Fault rectification requirements are determined
3. Dismantle and inspect pulse system components	3.1. Component parts are dismantled in accordance with maintenance manuals
	3.2. Component parts are assessed for serviceability in accordance with the relevant maintenance documentation
	3.3. Parts requiring specialist repair are tagged and repair instructions are accurately specified
	3.4. Parts lists are compiled and processed in accordance with standard enterprise procedures
4. Repair and/or modify pulse system components	4.1. Component parts are repaired or replaced in accordance with the relevant maintenance documentation
	4.2. Modification of components or parts is undertaken, where

	required, by relevant manufacturers' bulletins or procedures
5. Assemble, test and adjust pulse system components	5.1. Assembly of component parts is carried out in accordance with specified tolerances and the applicable maintenance documents 5.2. Assembled components are tested and adjusted/aligned in accordance with the applicable maintenance documentation using the appropriate test equipment 5.3. Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying OHS practices
- using approved repair/overhaul manuals, procedures and processes relating to pulse system components
- recognising the serviceability state and repair or overhaul requirements for pulse system components
- applying logic processes, using test equipment and appropriate wiring diagrams and manuals to isolate component faults
- performing component testing to isolate/confirm component fault and assess post-repair/overhaul serviceability
- correctly aligning components listed above to operate within prescribed specifications

Required knowledge

Look for evidence that confirms knowledge of:

- component and system operation
- explaining the basic function and operation of components of pulse systems to enable testing for fault isolation/confirmation, to determine repair or overhaul requirements and serviceability status post-repair or overhaul
- explaining basic principles/functions relating to pulse system components and associated with:
  - advanced analogue fundamentals
  - digital fundamentals
  - AC and DC electrical systems
  - electromagnetic radiation
  - antenna and transmission line (including waveguide) characteristics
  - pulsed radar system operation

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test, troubleshoot and align/adjust circuitry of components from aircraft pulse systems in accordance with maintenance manuals and regulatory/industry procedures while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of testing, aligning and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with aircraft pulse system component repair and overhaul. Ability to interpret inspection and testing procedures and specifications (allowable limits) and apply them in practice is critical. It is essential that testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Evidence of transferability of skills and knowledge related to testing, aligning and troubleshooting is essential. This may be demonstrated through application across a representative range of the components listed in Groups 1 to 6 in the Range Statement. The application of testing procedures should also clearly indicate knowledge of system operation before undertaking any action. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. Use of high precision, high reliability soldering techniques and handling of components, including application of anti-static equipment, must be demonstrated. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a representative range of components from two or

	more of Groups 1 to 6 in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, using tools and equipment specified in maintenance documentation. It is also expected that general and special purpose tools and test equipment would be used where appropriate.
Method of assessment	Assessment should be made across a sufficient number of components to establish the ability to apply attained skills and knowledge across the full range of pulse system components with the aid of applicable maintenance manuals and data.
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Pulse system components	Pulse system components may be from the following aircraft systems: 1. Weather radar, search radar and weapons system radar 2. DME and TACAN 3. Doppler navigation 4. Air traffic transponder 5. Radio altimeter 6. ACAS
Application	Application of this unit may relate to:

	• scheduled or unscheduled maintenance • individual or team-related activities • complex testing and adjusting of components, and where this is undertaken, may be carried out under supervision at the appropriate level
Procedures and requirements	Procedures and requirements refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

MEA260B Use electrical test equipment

MEA261C Use electronic test equipment

MEA283A Repair or overhaul aircraft display, control and distribution system components

Modification History

Minor formatting and editorial changes made. Minor clarification made to the unit descriptor.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Component Workshop Maintenance Stream) training pathway. It covers the competencies required to repair or overhaul components of aircraft control and distribution systems. Repair of circuit boards is covered by MEA262B Modify/repair aircraft component single layer printed circuit boards and MEA263B Modify/repair aircraft component multi-layer printed circuit boards. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills, test equipment and knowledge of pulse, analogue and digital theory to repair or overhaul pulse system components from aircraft control and distribution systems.

Applications include control and distribution system components from fixed and rotary wing aircraft that are repaired or overhauled in aviation maintenance workshops.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Determine requirements	1.1. ***Display***, ***control and distribution system*** component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers
	1.2. Circuitry is correctly prepared and connected to the applicable test equipment and is functionally tested or cycled through the prescribed test procedures in accordance with the maintenance documentation for evidence of serviceability or malfunction
	1.3. Modification status is clearly established to assist in determining the overhaul requirements for the components
	1.4. Extent of overhaul or repair is correctly identified and documented
2. Troubleshoot display, control and distribution system components	2.1. Available information from maintenance records and inspection and test results is used, where necessary, to assist in fault determination
	2.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting
	2.3. Faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required
	2.4. Fault rectification requirements are determined
3. Dismantle and inspect display, control and distribution system components	3.1. Component parts are dismantled in accordance with maintenance manuals
	3.2. Component parts are assessed for serviceability in accordance with the relevant maintenance documentation
	3.3. Parts requiring specialist repair are tagged and repair instructions are accurately specified
	3.4. Parts lists are compiled and processed in accordance with standard enterprise procedures

4. Repair and/or modify display, control and distribution system components	4.1. Component parts are repaired or replaced in accordance with the relevant maintenance documentation 4.2. Modification of components or parts is undertaken, where required, by relevant manufacturers' bulletins or procedures
5. Assemble, test and adjust display, control and distribution system components	5.1. Assembly of component parts is carried out in accordance with specified tolerances and the applicable maintenance documents 5.2. Assembled components are tested and adjusted/aligned in accordance with the applicable maintenance documentation using the appropriate test equipment 5.3. Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved repair/overhaul manuals, procedures and processes relating to aircraft display, control and distribution system components
- recognising the serviceability state and repair or overhaul requirements for components from:
  - digital electronic instruments/display systems
  - digital flight controllers and directors
  - digital AFCS/autopilot systems
  - flight management systems
  - analogue components of control and distribution systems
- applying logic processes, using test equipment and appropriate wiring diagrams and manuals to isolate component faults
- performing component testing to isolate/confirm component fault and assess post-repair/overhaul serviceability
- correctly aligning components listed above to operate within prescribed specifications
- correctly interpreting digital instrument display indications, information and symbols

Required knowledge

Look for evidence that confirms knowledge of:

- component and system operation
- explaining the basic function and operation of components as follows to enable testing for

fault isolation/confirmation, to determine repair or overhaul requirements, and serviceability status post-repair or overhaul:

- digital electronic instruments/display system components
- digital flight controllers and directors
- digital AFCS/autopilot system components
- flight management system components
- analogue components of control and distribution systems

- explaining basic principles/functions, relating to the above systems/components and associated with:
  - advanced analogue fundamentals including video display generation techniques
  - digital fundamentals
- AC and DC electrical systems

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test, troubleshoot and align/adjust circuitry of components from aircraft display, control and distribution systems in accordance with maintenance manuals and regulatory/industry procedures while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of testing, aligning and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with aircraft display, control and distribution system component repair and overhaul. Ability to interpret inspection and testing procedures and specifications (allowable limits) and apply them in practice is critical. It is essential that testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Evidence of transferability of skills and knowledge related to testing, aligning and troubleshooting is essential. This may be demonstrated through application across a representative range of the components listed in Groups 1 to 5 in the Range Statement. The application of

	testing procedures should also clearly indicate knowledge of system operation before undertaking any action. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. Use of high precision, high reliability soldering techniques and handling of components, including application of anti-static equipment, must be demonstrated. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a representative range of components from systems listed in Groups 1 to 5 in the Range Statement that are applicable to the enterprise. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, using tools and equipment specified in maintenance documentation. It is also expected that general and special purpose tools and test equipment would be used where appropriate.
Method of assessment	Assessment should be made across a sufficient number of components to establish the ability to apply attained skills and knowledge across the full range of display, control and distribution system components with the aid of applicable maintenance manuals and data.
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Display, **control and distribution system components**	Display, control and distribution system components may be from the following aircraft systems: 1. Display systems, including EFIS, EICAS and ECAM 2. Automatic flight control 3. Autopilots (digital and analogue) 4. Flight director (digital and analogue) 5. Flight management
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities • complex testing and adjusting of components, and where this is undertaken, may be carried out under supervision at the appropriate level
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

MEA260B Use electrical test equipment

MEA261C Use electronic test equipment

MEA284A Repair or overhaul aircraft instrument system components

Modification History

Minor formatting and editorial changes made. Minor clarification made in the unit descriptor.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Component Workshop Maintenance Stream) training pathway. It covers the competencies required to repair or overhaul aircraft instrument system components. Repair of circuit boards is covered by MEA262B Modify/repair aircraft component single layer printed circuit boards and MEA263B Modify/repair aircraft multi-layer printed circuit boards. This unit is used in workplace that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills and knowledge of component repair and overhaul procedures relating to aircraft instrument system components.

Applications include fixed and rotary wing aircraft instrument system components repaired or overhauled in aviation maintenance workshops.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Determine requirements	1.1. Component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers 1.2. ***System components*** are inspected and/or operated through prescribed test procedures to establish serviceability or confirm defects, as required 1.3. Modification status is clearly established to assist in determining the overhaul requirements for the components 1.4. Extent of overhaul or repair is correctly identified and documented
2. Troubleshoot instrument system components	2.1. Available information from maintenance records and test results is used, where necessary, to assist in fault determination 2.2. Logical processes are used to ensure efficient and accurate troubleshooting 2.3. Specialist advice is obtained, where required, to assist with, or confirm, the fault and rectification requirement 2.4. System component faults are located and the causes of the faults are clearly identified 2.5. Fault rectification requirements are determined to assist in planning the repair
3. Dismantle and inspect instrument system components	3.1. System component parts are dismantled in accordance with maintenance manuals 3.2. Component parts are assessed for serviceability in accordance with the relevant maintenance documentation 3.3. Parts requiring specialist repair are tagged and repair instructions are accurately specified 3.4. Parts lists are compiled and processed in accordance with standard enterprise procedures

4. Repair and/or modify instrument system components	4.1. System component parts are repaired or replaced in accordance with the relevant maintenance documentation 4.2. Modification of components or parts is undertaken, where required, by relevant manufacturer's bulletins or procedures
5. Assemble, test and adjust instrument system components	5.1. Assembly of component parts is carried out within specified tolerances and in accordance with the appropriate maintenance documents 5.2. System components are adjusted or calibrated to operate within prescribed specifications 5.3. Finished components are tagged, sealed and packaged in accordance with specified procedures 5.4. Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved repair/overhaul procedures and processes relating to instrument system components
- recognising the serviceability state and repair or overhaul requirements for:
  - mechanical instruments
  - electro-mechanical instruments
  - instrument sensors
- applying logic processes, and using test equipment and appropriate wiring diagrams and manuals to isolate components faults
- performing component testing to isolate/confirm component fault and assess post-repair/overhaul serviceability
- correctly disassembling, inspecting component parts, repairing/ replacing/modifying component parts and assembling components listed above
- correctly interpreting instrument and display information, symbols and readings

Required knowledge

Look for evidence that confirms knowledge of:

- component and system operation
- explaining the basic function and operation of the following components to enable testing for

fault isolation/confirmation, to determine repair or overhaul requirements, and serviceability status post-repair or overhaul:
  - mechanical instruments
  - electro-mechanical instruments
  - instrument sensors
- explaining basic principles/functions relating to the above components and associated with:
  - AC and DC synchronous systems
  - servomechanisms
  - gyroscopes
  - vacuum and pressure-based indication methods (pitot/static and pressurisation)
  - advanced analogue fundamentals
  - electro-mechanical sensor signal generation

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to repair and overhaul instrument system components in accordance with maintenance manuals and regulatory/industry procedures while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of repair or overhaul applications associated with instrument system components. It is essential that the maintenance procedures are interpreted and applied to ensure quality and safety standards are fully observed, understood and complied with. Capability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to repair is essential. This may be demonstrated through application across a representative range from within the components listed in the Range Statement. Ability to assess component serviceability and interpret parts requirements will be necessary to supplement the required evidence. The application of testing procedures should also clearly indicate knowledge of system operation before undertaking any action. The work plan

	should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a representative range of the components listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general and special purpose tools and test equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

System components	System components may include: • general instrument components, including mechanical instruments, electro-mechanical instruments and sensors
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities • complex testing and adjusting of components, and where this is undertaken, may be carried out under supervision at the appropriate level
Procedures and requirements	Refer to industry standard procedures specified by

	manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

MEA260B	Use electrical test equipment
MEA261C	Use electronic test equipment

MEA285A Repair or overhaul aircraft radio frequency communication and navigation system components

Modification History

Minor formatting and editorial changes made. Minor clarification made to the unit descriptor.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Component Workshop Maintenance Stream) training pathway. It covers the competencies required to repair or overhaul components of aircraft radio frequency (RF) communication and navigation systems. Repair of circuit boards is covered by MEA262B Modify/repair aircraft component single layer printed circuit boards and MEA263B Modify/repair aircraft component multi-layer printed circuit boards. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills, test equipment and knowledge of analogue and digital theory to repair or overhaul RF components from aircraft communication and navigation systems.

Applications include RF communications and navigation system components from fixed and rotary wing aircraft that are repaired or overhauled in aviation maintenance workshops.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Determine requirements	1.1. ***Communication and navigation system*** component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers
	1.2. Circuitry is correctly prepared and connected to the applicable test equipment and is functionally tested or cycled through the prescribed test procedures in accordance with the maintenance documentation for evidence of serviceability or malfunction
	1.3. Modification status is clearly established to assist in determining the overhaul requirements for the components
	1.4. Extent of overhaul or repair is correctly identified and documented
2. Troubleshoot RF communication and navigation system components	2.1. Available information from maintenance records and inspection and test results is used, where necessary, to assist in fault determination
	2.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting
	2.3. Faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required
	2.4. Fault rectification requirements are determined
3. Dismantle and inspect RF communication and navigation system components	3.1. Component parts are dismantled in accordance with maintenance manuals
	3.2. Component parts are assessed for serviceability in accordance with the relevant maintenance documentation
	3.3. Parts requiring specialist repair are tagged and repair instructions are accurately specified
	3.4. Parts lists are compiled and processed in accordance with

	standard enterprise procedures
4. Repair and/or modify RF communication and navigation system components	4.1. Component parts are repaired or replaced in accordance with the relevant maintenance documentation 4.2. Modification of components or parts is undertaken, where required, by relevant manufacturers' bulletins or procedures
5. Assemble, test and adjust RF communication and navigation system components	5.1. Assembly of component parts is carried out in accordance with specified tolerances and the applicable maintenance documents 5.2. Assembled components are tested and adjusted/aligned in accordance with the applicable maintenance documentation using the appropriate test equipment 5.3. Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved repair/overhaul manuals, procedures and processes relating to analogue circuitry
- recognising the serviceability state and repair or overhaul requirements for aircraft RF communication and navigation system components
- applying logic processes, and using test equipment and appropriate wiring diagrams and manuals to isolate component faults
- performing component testing to isolate/confirm component fault and assess post-repair/overhaul serviceability
- correctly aligning components listed above to operate within prescribed specifications

Required knowledge

Look for evidence that confirms knowledge of:

- component and system operation
- explaining the basic function and operation of components of RF communication and navigation systems to enable testing for fault isolation/confirmation, to determine repair or overhaul requirements, and serviceability status post-repair or overhaul
- explaining basic principles/functions relating to RF communication and navigation system components and associated with:
  - advanced analogue fundamentals

- digital fundamentals
- AC and DC electrical systems
- electromagnetic radiation
- antenna and transmission line (including waveguide) characteristics
- radio transmission/signal propagation and frequency modulation
- GPS
- satellite communications (industry specific)

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test, troubleshoot and align/adjust circuitry of components from aircraft RF communication and navigation systems in accordance with maintenance manuals and regulatory/industry procedures while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of testing, aligning and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with aircraft RF communication and navigation system component repair and overhaul. Ability to interpret inspection and testing procedures and specifications (allowable limits) and apply them in practice is critical. It is essential that testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Evidence of transferability of skills and knowledge related to testing, aligning and troubleshooting is essential. This may be demonstrated through application across a representative range of the components listed in Groups 1 to 11 in the Range Statement. The application of testing procedures should also clearly indicate knowledge of system operation before undertaking any action. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults. The work plan should take account of

	applicable safety and quality requirements in accordance with the industry and regulatory standards. Use of high precision, high reliability soldering techniques and handling of components, including application of anti-static equipment, must be demonstrated. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a representative range of components from systems listed in Groups 1 to 11 in the Range Statement that are applicable to the enterprise. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, using tools and equipment specified in maintenance documentation. It is also expected that general and special purpose tools and test equipment would be used where appropriate.
Method of assessment	Assessment should be made across a sufficient number of components to establish the ability to apply attained skills and knowledge across the full range of RF components with the aid of applicable maintenance manuals and data.
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Communication and navigation system components	Communication and navigation system components may be from the following aircraft systems:

	1. VHF communications 2. HF communications 3. UHF communications 4. Satellite communications 5. ELT 6. ARINC Communication Addressing and Reporting System 7. Intercommunication and public address 8. ADF navigation 9. VOR navigation 10. ILS 11. GPS
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities • complex testing and adjusting of components, and where this is undertaken, may be carried out under supervision at the appropriate level
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

MEA260B Use electrical test equipment

MEA261C Use electronic test equipment

MEA286A Repair or overhaul aircraft electrical/electro-mechanical components

Modification History

Release 3 – Specific reference to magnetos and distributor blocks added to Skill and Knowledge requirements, and to Range Statement - equivalent.

Release 2 - Minor formatting and editorial changes made. Minor clarification made to the unit descriptor.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Component Workshop Maintenance Stream) training pathway. It covers the competencies required to repair or overhaul aircraft electrical and electro-mechanical components. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills and knowledge of component repair and overhaul procedures relating to electrical and electro-mechanical components.

Applications include fixed and rotary wing aircraft components repaired or overhauled in aviation maintenance workshops

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Determine requirements	1.1. Component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers 1.2. ***Components*** are inspected and/or operated through prescribed test procedures to establish serviceability or confirm defects, as required 1.3. Modification status is clearly established to assist in determining the overhaul requirements for the components 1.4. Extent of overhaul or repair is correctly identified and documented
2. Troubleshoot electrical/electro-mechanical components	2.1. Available information from maintenance records and test results is used, where necessary, to assist in fault determination 2.2. Logical processes are used to ensure efficient and accurate troubleshooting 2.3. Specialist advice is obtained, where required, to assist with, or confirm, the fault and rectification requirement 2.4. Electrical/electro-mechanical component faults are located and the causes of the faults are clearly identified 2.5. Fault rectification requirements are determined to assist in planning the repair
3. Dismantle and inspect electrical/electro-mechanical components	3.1. Component parts are dismantled in accordance with maintenance manuals 3.2. Component parts are assessed for serviceability in accordance with the relevant maintenance documentation 3.3. Parts requiring specialist repair are tagged and repair instructions are accurately specified 3.4. Parts lists are compiled and processed in

	accordance with standard enterprise procedure
4. Repair and/or modify electrical/electro-mechanical components	4.1. Component parts are repaired or replaced in accordance with the relevant maintenance documentation 4.2. Modification of components or parts is undertaken, where required, by relevant manufacturer's bulletins or procedures
5. Assemble, test and adjust electrical/electro-mechanical components	5.1. Assembly of component parts is carried out within specified tolerances and in accordance with the appropriate maintenance documents 5.2. Components are adjusted or calibrated to operate within prescribed specifications 5.3. Finished components are tagged, sealed and packaged in accordance with specified procedures 5.4. Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved repair/overhaul procedures and processes relating to electrical and electro-mechanical components
- recognising the serviceability state and repair or overhaul requirements for:
  - AC and DC motors, generators, alternators and magnetos (including distributor blocks)
  - static inverters
  - TRU
  - regulators/control units
  - actuators
  - solenoids and shutoff valves
  - engine ignition/starting components
- applying logic processes, and using test equipment and appropriate wiring diagrams and manuals to isolate component faults
- performing component testing to isolate/confirm component fault and assess post-repair/overhaul serviceability
- correctly disassembling, inspecting component parts, repairing/replacing/modifying

component parts and assembling components listed above

Required knowledge

Look for evidence that confirms knowledge of:

- component and system operation
- explaining the basic function and operation of components listed below to enable testing for fault isolation/confirmation, to determine repair or overhaul requirements, and serviceability status post-repair or overhaul:
  - AC and DC motors, generators, alternators and magnetos
  - static inverters
  - TRU
  - regulators/control units
  - actuators
  - solenoids and shutoff valves
  - engine ignition/starting components
- explaining basic principles/functions, relating to components listed above and associated with:
  - AC and DC power generation
  - circuit theory
  - analogue fundamentals
  - electro-mechanical interface

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to repair and overhaul a range of electrical and electro-mechanical components in accordance with applicable maintenance manuals and regulatory/industry procedures while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of repair or overhaul applications associated with electrical/electro-mechanical components listed in the Range Statement. It is essential that the maintenance procedures are interpreted and applied to ensure quality and safety standards are fully observed, understood and complied with. Capability to

	interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to repair is essential. This may be demonstrated through application across a range of aircraft electrical/electro-mechanical components. Ability to assess component serviceability and interpret parts requirements will be necessary to supplement the required evidence. The application of testing procedures should also clearly indicate knowledge of system operation before undertaking any action. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one component from each Group 1 to 4 as listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general and special purpose tools and test equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility

of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Electrical/electro-mechanical components	Components may include: 1. Motors, generators, alternators and magnetos (including distributor blocks) 2. Static inverters, TRU and regulators 3. Actuators, solenoids and shutoff valves 4. Bus bars, circuit breakers, connectors, electrical looms and fans
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities • complex testing and adjusting of components, and where this is undertaken, may be carried out under supervision at the appropriate level
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Not applicable.

Co-requisite units

MEA201B	Remove and install miscellaneous aircraft electrical hardware
MEA260B	Use electrical test equipment

MEA287A Repair or overhaul aircraft oxygen system components

Modification History

Minor formatting and editorial changes made. Minor clarification made in the unit descriptor. Prerequisite unit version code updated.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Component Workshop Maintenance Stream) training pathway. It covers the competencies required for the repair or overhaul of aircraft oxygen system components. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills, maintenance publications, test equipment and knowledge of oxygen component maintenance and hygiene requirements to repair and overhaul aircraft oxygen system components.

Applications include oxygen system components from fixed and rotary wing aircraft that are repaired or overhauled in aviation maintenance workshops.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes

MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Determine requirements	1.1. Component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers
	1.2. ***System components*** are inspected and/or operated through prescribed test procedures to establish serviceability or confirm defects, as required
	1.3. Modification status is clearly established to assist in determining the overhaul requirements for the components
	1.4. Extent of overhaul or repair is correctly identified and documented
2. Troubleshoot oxygen system components	2.1. Available information from maintenance records and test results is used, where necessary, to assist in fault determination
	2.2. Logical processes are used to ensure efficient and accurate troubleshooting
	2.3. Specialist advice is obtained, where required, to assist

	with, or confirm, the fault and rectification requirement 2.4. System component faults are located and the causes of the faults are clearly identified 2.5. Fault rectification requirements are determined to assist in planning the repair
3. Dismantle and inspect oxygen system components	3.1. System component parts are dismantled in accordance with maintenance manuals 3.2. Component parts are assessed for serviceability in accordance with the relevant maintenance documentation 3.3. Parts requiring specialist repair are tagged and repair instructions are accurately specified 3.4. Parts lists are compiled and processed in accordance with standard enterprise procedures
4. Repair and/or modify oxygen system components	4.1. System component parts are repaired or replaced in accordance with the relevant maintenance documentation 4.2. Modification of components or parts is undertaken, where required, by relevant manufacturer's bulletins or procedures
5. Assemble, test and adjust oxygen system components	5.1. Assembly of component parts is carried out within specified tolerances and in accordance with the appropriate maintenance documents 5.2. System components are adjusted or calibrated to operate within prescribed specifications 5.3. Finished components are tagged, sealed and packaged in accordance with specified procedures 5.4. Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved repair/overhaul procedures and processes relating to oxygen components
- recognising the serviceability state and repair or overhaul requirements for oxygen pressure cylinders, valves, gauges, chemical generators, regulators, masks, pipes, hoses and fittings, and LDBO converters
- applying logic processes, and using test equipment and appropriate wiring diagrams and

manuals to isolate component faults
- performing component testing to isolate/confirm component fault and assess post-repair/overhaul serviceability
- correctly disassembling, inspecting component parts, repairing/replacing/modifying component parts and assembling oxygen components
- applying product hygiene procedures

Required knowledge

Look for evidence that confirms knowledge of:

- component and system operation
- explaining the basic function and operation of oxygen components to enable testing for fault isolation/confirmation, to determine repair or overhaul requirements, and serviceability status post-repair or overhaul
- explaining basic principles/functions relating to oxygen components and associated with:
  - pressure sensitive devices (bellows and controllers)
  - vacuum system generation
  - atmosphere and its properties

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to repair and overhaul aircraft oxygen system components in accordance with maintenance manuals and regulatory/industry procedures while observing all relevant safety precautions and product hygiene requirements.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of repair or overhaul applications associated with oxygen system components. It is essential that the maintenance procedures are interpreted and applied to ensure quality and safety standards are fully observed, understood and complied with. Capability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to repair is essential. This may be demonstrated through application across a representative range of

	oxygen components. Ability to assess component serviceability and interpret parts requirements will be necessary to supplement the required evidence. The application of testing procedures should also clearly indicate knowledge of system operation before undertaking any action. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision across Groups 1 to 4 as listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance manuals. It is also expected that general and special purpose tools and test equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Oxygen system components	System components and related activities may include:

	1. Pressure vessels (testing and charging) 2. Regulators, control valves and indicators 3. Chemical oxygen generators 4. Product hygiene
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities • complex testing and adjusting of components, and where this is undertaken, may be carried out under supervision at the appropriate level
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA288A Repair or overhaul aircraft audio and visual systems and reproducers

Modification History

Minor formatting and editorial changes made. Minor clarification made in the unit descriptor.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Component Workshop Maintenance Stream) training pathway. It covers the competencies required to repair or overhaul in-flight passenger entertainment audio and video systems and reproducers. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills and knowledge of component repair and overhaul procedures relating to aircraft analogue and digital passenger entertainment electronic equipment components.

Applications include fixed and rotary wing aircraft components repaired or overhauled in aviation maintenance workshops.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Determine requirements	1.1. ***Audio and video system and reproducer*** component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers 1.2. Circuitry is correctly prepared and connected to the applicable test equipment and is functionally tested or cycled through the prescribed test procedures in accordance with the maintenance documentation for evidence of serviceability or malfunction 1.3. Modification status is clearly established to assist in determining the overhaul requirements for the components 1.4. Extent of overhaul or repair is correctly identified and documented
2. Dismantle and inspect audio and video system and reproducer components	2.1. Component parts are dismantled in accordance with maintenance manuals 2.2. Component parts are assessed for serviceability in accordance with the relevant maintenance documentation 2.3. Parts requiring specialist repair are tagged and repair instructions are accurately specified 2.4. Parts lists are compiled and processed in accordance with standard enterprise procedures
3. Repair and/or modify audio and video system and reproducer components	3.1. Component parts are repaired or replaced in accordance with the relevant maintenance documentation 3.2. Modification of components or parts is undertaken, where required, by relevant manufacturers' bulletins or procedures
4. Assemble, test and adjust audio and video system and reproducer components	4.1. Assembly of component parts is carried out in accordance with specified tolerances and the applicable maintenance documents 4.2. Assembled components are tested and adjusted in accordance with the applicable maintenance documentation using the appropriate test equipment 4.3. Required maintenance documentation and modification records are completed and processed in accordance with

standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved repair/overhaul procedures and processes relating to analogue and digital circuitry
- recognising the serviceability state and repair or overhaul requirements for digital electronic interface systems:
  - VCRs
  - video display systems
  - CRT display systems
  - symbol generators
  - audio amplifiers
  - audio selectors
  - voice recorders
  - microphones
  - head sets
  - PCUs
  - tape reproducers (and tape reproduction)
- applying logic processes, and using test equipment and appropriate wiring diagrams and manuals to isolate component faults
- performing component testing to isolate/confirm component fault and assess post-repair/overhaul serviceability

Required knowledge

Look for evidence that confirms knowledge of:

- component and system operation
- explaining the basic function and operation of audio and visual and reproducer components to enable testing for fault isolation/confirmation to determine repair or overhaul requirements, and serviceability status post-repair or overhaul
- explaining basic principles/functions relating to audio and visual and reproducer components and associated with:
  - advanced analogue fundamentals
  - basic logic and semiconductor theory
  - digital fundamentals
  - ESD precautions

- AC and DC electrical systems
- video display theory
- video recorder theory
- cleaning and maintenance techniques for video and recorder heads
- aircraft display systems
- symbol generation
- vector and raster graphics
- audio circuit theory
- sound measurement
- dB level standards
- audio tape control signals and recording techniques
- basic logic and semiconductor theory
- cleaning and maintenance techniques for audio recorder heads

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to repair and overhaul audio and video system and tape reproducer components in accordance with maintenance manuals and regulatory/industry procedures while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of repair or overhaul applications associated with audio and video system and tape reproducer components. It is essential that the maintenance procedures are interpreted and applied to ensure quality and safety standards are fully observed, understood and complied with. Capability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to repair, modification and overhaul is essential. This may be demonstrated through application across a range of components of the systems listed in the Range Statement. The application of testing procedures should also clearly indicate knowledge of system operation before undertaking any action. Knowledge of system operation and the relationship of individual components

	will be necessary to supplement evidence of ability to troubleshoot component faults. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. Use of high precision, high reliability soldering techniques and handling of components, including application of anti-static equipment, must be demonstrated. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on an item from each of Groups 1 to 11, as listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general and special purpose tools and test equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Audio and video systems and reproducers	Audio and video systems and reproducers may include: 1. VCRs 2. Video display systems

	3. CRT display systems 4. Symbol generators 5. Audio amplifiers 6. Audio and video selectors 7. Voice recorders 8. Microphones 9. Head sets 10. PCUs 11. Tape reproducers (and tape reproduction)
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities • complex testing and adjusting of components, and where this is undertaken, may be carried out under supervision at the appropriate level
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

MEA260B Use electrical test equipment

MEA261C Use electronic test equipment

MEA289A Maintain basic light aircraft avionic systems and components

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required for the maintenance of avionic systems of the more basic types of both fixed and rotary wing aircraft. Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the applicable Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of maintenance documentation/publications in the maintenance of basic aircraft avionic systems and components involving inspection, testing and troubleshooting and component removal and installation.

Applications include basic fixed wing and rotary wing aircraft where the avionic systems are limited to VHF communications, basic audio system, ADF and VOR radio navigation systems, stand-alone GNS and ATC transponder.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA246C	Fabricate and/or repair aircraft electrical components or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect basic aircraft avionic systems and components	1.1. Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements 1.2. Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual 1.3. ***Avionic systems*** are visually or physically checked for external signs of defects in accordance with applicable maintenance manual 1.4. Defects are correctly identified and reported
2. Test/adjust basic aircraft avionic systems	2.1. Aircraft and systems are prepared in accordance with applicable maintenance manual for the application of power/system operation 2.2. Avionic systems are functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction 2.3. System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3. Troubleshoot basic aircraft avionic systems	3.1. Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination 3.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate ***troubleshooting*** 3.3. Specialist advice is obtained, where required, to assist with the troubleshooting process

	3.4. System faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required and in accordance with standard enterprise procedures
	3.5. Rectification requirements are determined
4. Remove and install basic aircraft avionic system components	4.1. System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted where necessary to ensure personnel safety
	4.2. ***Avionic component*** removal is carried out in accordance with the applicable maintenance manual
	4.3. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
	4.4. Removed components are tagged and packaged in accordance with specified procedures
	4.5. Avionic components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life
	4.6. Physical installation of avionic components is performed in accordance with the applicable maintenance manual
	4.7. System is reinstated to correct operational condition in preparation for testing and calibration or adjustment, as necessary
	4.8. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved maintenance documentation and aircraft publications relating to the avionic system being maintained
- locating and identifying avionic system components comprising:
  - VHF communications systems
  - VOR and ADF navigation systems
  - basic audio systems
  - stand-alone GNS systems
  - ATC transponders

    - ELT systems
- locating and identifying applicable antennas
- recognising system and component defects/external damage, correct installation, attaching hardware (including cabling/harnesses/transmission lines) and security in the systems listed above
- applying logic processes, taking and interpreting system measurements to accurately and effectively isolate malfunctions within the above systems
- testing listed systems to isolate system faults and assess post-maintenance serviceability

Required knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- connection of hardware, and plugs
- handling precautions for electrostatic sensitive devices
- the basic layout (block diagram level), function and operation of:
    - VHF communications systems
    - VOR and ADF navigation systems
    - basic audio systems
    - stand-alone GPS systems
    - ATC transponders
    - ELT systems
- basic principles/functions, relating to the above systems and associated with:
    - electromagnetic radiation and propagation
    - basic AC and DC circuit theory
    - printed circuit boards
    - digital fundamentals
    - analogue fundamentals
    - transmitter and receiver principles
    - pulse
    - antenna characteristics
    - transmission line characteristics
    - fibre optic communications
- maintenance requirements and troubleshooting procedures
- applicable maintenance data and manuals
- relevant OHS practices
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot basic aircraft avionic systems and remove and install system components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with basic aircraft avionic systems and components. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with, as well as work practices associated with electrostatic sensitive devices. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting and component removal and installation is essential. This is to be demonstrated through application across a range of avionic systems and components listed in the Range Statement. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on each system in Range Statement Groups 1 to 7 and on at least one major component/LRU in each case. Component removal and installation competencies are to be demonstrated on at least one component from each of Groups 8 to 12. This shall be established via the records in the Log of Industrial Experience and Achievement or,

	where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Avionic systems	Avionic systems may include: 1. VHF communication 2. Basic audio systems, such as intercom and audio selection 3. ADF 4. VOR 5. Stand-alone GPS 6. ATC transponder 7. ELT
Troubleshooting	Troubleshooting involves the use of test sets, maintenance data and fault-finding charts or similar, to line replacement level
Avionic components	Avionic components include:

	8. Transmitters and receivers 9. Antennas and antenna cables 10. Control boxes and frequency selectors 11. Speakers 12. Switches
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA290A Fit avionic modification sheetmetal components

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required for the performance of sheetmetal work associated with the incorporation of avionic modifications on small aircraft.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the applicable Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of maintenance publications and modification documentation to perform sheetmetal work associated with avionic modifications being incorporated on small aircraft.

Applications include small fixed and rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes

MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Prepare to fit avionic modification sheetmetal components	1.1. Applicable sheetmetal components are identified in accordance with applicable modification instructions and maintenance documentation
	1.2. All required materials and equipment are selected and organised in accordance with the applicable modification instructions and maintenance documentation
2. Fit avionic modification sheetmetal components	2.1. ***Sheetmetal components*** are fitted in accordance with the modification instructions, ensuring that aircraft standard practices are used and standard process requirements are carried out
	2.2. Work area is cleaned of all waste material
3. Complete modification activities	3.1. Required documentation is accurately completed and correctly processed in accordance with enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures, including the use of MSDS and PPE
- using enterprise procedures, approved maintenance documentation and aircraft publications relating to aircraft sheetmetal components
- identifying various aircraft metals used for sheetmetal components and their basic metallurgy properties by interpretation of markings, numbering systems or visual, chemical or mechanical means
- handling and storing aircraft metals used for sheetmetal components, including sealing agents, to industry standards
- identifying aircraft sheetmetal assembly fasteners (metal and non-metallic) by interpretation of markings, numbering systems, size, shape and colour
- correctly interpreting, modification drawings and hand sketches
- using appropriate hand tools and machines to fit avionic modification sheetmetal components to the aircraft
- freehand precision hole generation
- applying corrosion prevention techniques during component fitment
- restoring sealing and surface finishes

Required knowledge

Look for evidence that confirms knowledge of:

- aircraft sheetmetal component construction principles
- identification of primary, secondary and tertiary structure
- aircraft sheetmetal assembly fasteners, their characteristics and identification
- fits and clearances for fasteners
- fitting methods for fasteners
- use of grip pins
- corrosion of aircraft structure and its prevention
- application of surface finishes
- relevant OHS procedures
- how to obtain MSDS
- use of PPE

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and use maintenance publications and modification instructions to correctly fit small aircraft avionic modification sheetmetal components while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable into other areas that require similar techniques. It is essential that procedures take into account all safety precautions and quality requirements, standards and practices, and processes associated with assembly. Evidence of knowledge about enterprise procedures relating to avionic modification incorporation and practices relating to associated sheetmetal component installation will be necessary to supplement evidence of ability to fit a range of sheetmetal components in a specific application. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under qualified person guidance on the range of sheetmetal components listed in Groups 1 to 4 in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work

environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Sheetmetal components	Sheetmetal components may include: 1. Doublers for the installation of antennas 2. Brackets for the installation of avionic system components 3. Racks for components, such as transmitters/receivers 4. Hardware for the support of antenna cables and system electrical wiring
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA291A Inspect, test and troubleshoot fixed wing single axis autopilot systems and components

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to inspect, test and troubleshoot single axis autopilot systems and components of fixed wing aircraft.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot fixed wing single axis autopilot systems and components.

Applications include fixed wing aircraft that have single axis autopilot systems, including those with radio navigation system interfaces.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA207C	Remove and install aircraft electronic system components
MEA246C	Fabricate and/or repair aircraft electrical components or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect fixed wing single axis autopilot systems and components	1.1. Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements 1.2. Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual 1.3. Single axis autopilot system and components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual 1.4. Defects are correctly identified and reported
2. Test/adjust fixed wing single axis autopilot systems and components	2.1. Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation 2.2. Autopilot systems are functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction 2.3. System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3. Troubleshoot fixed wing single axis autopilot systems	3.1. Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination 3.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate ***troubleshooting*** 3.3. Specialist advice is obtained, where required, to assist with the troubleshooting process

3.4. Autopilot system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures

3.5. Rectification requirements are determined

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved maintenance documentation and aircraft publications relating to the single axis autopilot system being maintained
- recognising system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) and security in:
  - autopilot system components
  - radio navigation system interfaces
- applying logic processes, taking and interpreting system measurements, and using test equipment and appropriate wiring diagrams and manuals, to accurately and effectively isolate system malfunctions
- testing the system to isolate system malfunctions and assess post-maintenance serviceability

Required knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- the basic layout (block diagram level), function and operation of:
  - autopilot system components
  - interface with radio navigation systems
- autopilot system maintenance requirements and troubleshooting procedures
- relevant OHS practices
- basic principles/functions, relating to the listed systems and associated with:
  - basic AC and DC circuit theory
  - digital fundamentals
  - analogue fundamentals
  - fixed wing flight theory
  - inner and outer loop control
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot fixed wing single axis autopilot systems and components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with fixed wing aircraft single axis autopilot systems and components. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across an autopilot system and its components. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on an autopilot system and its components. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that

	general and special purpose tools, test and ground support equipment, would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Troubleshooting	Troubleshooting involves the use of fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA301C Perform aircraft flight servicing

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit of competency is part of Avionic and Mechanical Certificate IV (Aircraft Maintenance Stream) training pathways. It covers the competencies required to perform maintenance and system replenishment activities associated with flight servicing. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and standard trade practices in the performance of pre and post-flight servicing activities and the application of aircraft ground handling procedures.

Applications include the performance of flight servicing on both fixed and rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance

	processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Prepare for flight	1.1. Aircraft is positioned as required
	1.2. Ground locks, aircraft support and safety devices and covers are removed and stowed in accordance with ***maintenance documentation***
	1.3. Aircraft tie-down devices are removed and stowed/stored
2. Inspect aircraft and systems	2.1. Preparation of the aircraft and systems is appropriate to allow for proper inspection
	2.2. Aircraft and systems are visually or physically checked for external signs of defects in accordance with maintenance documentation
3. Replenish aircraft systems	3.1. Fluid level checks and replenishments are carried out in accordance with maintenance documentation requirements
	3.2. Maintenance of gaseous levels (nitrogen and compressed air) is carried out in accordance with maintenance documentation requirements

3.3. Role equipment/components requiring pre-flight replacement are changed as required by maintenance documentation

3.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- ground handling of aircraft
- using hand skills and tools to perform flight servicing activities
- correctly installing and securing of aircraft hardware
- locating, using and correctly stowing aircraft safety and security equipment (including ground locks, covers, support and safety devices and tie-down devices)
- applying ground power (where applicable)
- inspecting structure for damage and deterioration
- recognising external signs of component damage, leakage and security in aircraft systems
- recognising visual signs of damage, leakage and security with regard to engines and propellers (where applicable)
- refuelling the aircraft with the correct type, quantity and distribution of fuel
- checking and replenishing fluid level using the correct fluids
- recharging of gaseous levels using the correct support equipment and procedures
- checking fire protection systems (where applicable) for correct gas charge levels and portable fire-extinguishers for serviceability and correct stowage
- replacing role equipment requiring pre-flight replacement
- using maintenance data and manuals to determine flight servicing requirements and procedures
- applying standard procedures
- observing all relevant OHS procedures, including the use of MSDS and items of PPE

Required knowledge

Look for evidence that confirms knowledge of:

- standard trade practices relating to tool usage and installation/securing of aircraft hardware
- the aircraft structure to the extent required to be able to recognise typical types of structural damage and deterioration during flight servicing activities
- system layout, operation and typical external signs of faults to the extent required to perform flight servicing activities
- aircraft flight servicing requirements
- ground de-icing of aircraft
- aircraft ground handling procedures including towing and marshalling

- aircraft safety and security equipment including:
  - ground locks
  - wheel chocks
  - covers
  - support and safety devices
  - tie-down devices and picketing
- types and characteristics of fuels and fuel additives
- types and characteristics of lubricants
- types and characteristics of hydraulic fluids
- OHS procedures relating to flight servicing activities
- how to obtain MSDS
- selection and use of PPE
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform flight servicing activities on the occasions as listed in the variables that are relevant to the organisation in accordance with relevant maintenance documentation, while applying all relevant OHS procedures and standard processes.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that the specific aspects of the aircraft flight servicing are checked to ensure quality and safety standards are fully observed, understood and complied with. Safety precautions applicable to the system being maintained are to be fully observed. An understanding of system operation as it relates to the work must be demonstrated before undertaking any action. Evidence of knowledge of system operation, recognition of defects and completion of documentation, the relationship of individual components and the links with other systems will be necessary to the extent required for completion of flight servicing before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.

	A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of this unit of competency are being achieved under routine supervision on the flight servicings listed in Groups 1 to 4 of the Range Statement that are applicable to the enterprise. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment using procedures, tools and equipment specified in maintenance documentation. It is also expected that general purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Flight servicing activities	Flight servicing activities may be performed during: 1. Preparation for flight following maintenance 2. Before flight servicing 3. After flight servicing 4. Turn around servicing
Maintenance documentation	Maintenance documentation may include: • maintenance manuals • servicing schedules

	• applicable airworthiness regulations • aircraft maintenance program
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA302C Remove and install aircraft hydro-mechanical and landing gear system components

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway and may also be part of a Structures Certificate IV training pathway. It covers the competencies required to remove and install aircraft hydro-mechanical system and landing gear components. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and standard trade practices in the removal and installation of aircraft hydro-mechanical system and landing gear components.

Applications include hydro-mechanical system components and landing gear components fitted to both fixed and rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes

MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Remove hydro-mechanical system components	1.1. ***Hydro-mechanical system*** is rendered safe and prepared in accordance with the applicable maintenance manual, including fitment of isolation tags, where necessary, to ensure personal safety 1.2. Removal of ***hydro-mechanical components*** is carried out in accordance with the applicable maintenance manual 1.3. Required maintenance documentation is accurately completed and correctly processed 1.4. Removed components are tagged, sealed and packaged in accordance with specified procedures
2. Remove landing gear components	2.1. The aircraft is jacked as specified in the maintenance manual for ***landing gear component*** removal 2.2. Removal of components is carried out in accordance with the applicable maintenance manual 2.3. Required maintenance documentation is accurately completed and correctly processed

	2.4. Removed components are tagged, sealed and packaged in accordance with specified procedures
3. Install hydro-mechanical system components	3.1. Components to be installed are checked to confirm correct part numbers, serviceability and modification status 3.2. Component installation is carried out in accordance with the applicable maintenance manual 3.3. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
4. Install landing gear components	4.1. Components to be installed are checked to confirm correct part numbers, serviceability and modification status 4.2. Component installation is carried out in accordance with the applicable maintenance manual 4.3. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- using hand skills and tools to remove and install hydraulic and fuel system components
- jacking of the aircraft, as required, for landing gear component removal and installation
- correctly installing and securing of aircraft hardware
- using hand skills and tools to remove and install landing gear components and the correct handling of heavy components
- using maintenance manuals to prepare the aircraft for component removal and installation and correct interpretation of removal and installation instructions
- applying standard procedures
- observing all relevant OHS procedures, including the use of MSDS and relevant items of PPE

Required knowledge

Look for evidence that confirms knowledge of:

- standard trade practices relating to tool usage and installation/securing of aircraft hardware
- hydraulic fluids (mineral and synthetic) and handling precautions
- hydraulic seal types and applications
- how to locate and correctly remove and install components of hydraulic systems
- aircraft fuels and handling precautions
- fuel seal types and applications

- how to locate and correctly remove and install fuel system components
- electrical circuit isolation and plug removal and installation
- how to jack the aircraft for landing gear component removal and installation
- how to locate and correctly remove and install landing gear components, including the handling of heavy components
- OHS procedures relating to hydraulic systems, fuel systems and landing gear components
- how to obtain MSDS
- the selection and use of items of PPE
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to remove and install a range of hydraulic and fuel system and landing gear components in accordance with relevant maintenance manual instructions while applying all relevant OHS procedures and standard processes.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable into other units that require similar techniques. It is essential that system cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Evidence of transferability of skills and knowledge related to removal and installation is essential. This may be demonstrated through application across a number of aircraft systems or aircraft types, but must cover a sufficient range of tasks to demonstrate familiarity with attachment methods, connection hardware and couplings peculiar to each type of system, and of safe handling of heavy components. An understanding of system operation as it relates to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be

	demonstrated to the satisfaction of the workplace assessor that the relevant elements of this unit of competency are being achieved under routine supervision on each type of system and on at least one component of each Group listed in the Range Statement, as follows: • Hydraulic systems - preparation of a system for safe component removal and replacement of at least one component from each of hydro-mechanical system components 3 and 5 • Fuel systems - preparation of a system for safe component removal and replacement of at least one component from each of 4 and 5 • Landing gear components - one each of 6 to 8. Coverage of brakes and struts/oleos are not required where the aircraft is rotary wing and is fitted with skids or floats. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment, using procedures, tools and equipment specified in maintenance documentation. It is also expected that general purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide

Hydro-mechanical systems and components	Hydro-mechanical systems include: 1. Hydraulic systems 2. Fuel systems Components of hydro-mechanical systems include: 3. Hydraulic accumulators, filters, reservoirs, valves, pumps, motors, actuators, regulators, direct reading gauges 4. Fuel system filters, valves, pumps, rigid and flexible storage cells/tanks 5. Rigid and flexible pipelines, hoses and fittings
Landing gear components	Landing gear components include: 6. Wheel assemblies or skids 7. Brake units 8. Struts/oleos
Electrical interface	The work can include associated electrical loom terminations and/or plugs
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA303D Remove and install pneumatic system components

Modification History

Release 2 – Additional wording has been added in Knowledge, Skills and Range Statement regarding ozone-depleting substances - equivalent.

Release 1 - Range statement revised regarding fire-extinguisher components - equivalent to previous unit.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathways and may also be part of a Structures Certificate IV training pathway. It covers the competencies required for the removal and installation of components in pneumatic systems of both fixed and rotary wing aircraft. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of maintenance publications to remove and install aircraft pneumatic system components.

Applications include fixed and rotary wing aircraft.

Licensing/Regulatory Information

Refer to unit descriptor

Pre-Requisites

MEA101B Interpret occupational health and safety practices in aviation maintenance

MEA103B Plan and organise aviation maintenance work activity

MEA105C Apply quality standards applicable to aviation maintenance processes

MEA107B Interpret and use aviation maintenance industry manuals and specifications

MEA108B Complete aviation maintenance industry documentation

MEA109B Perform basic hand skills, standard trade practices and fundamentals in aviation

maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Remove pneumatic system components	1.1 Pneumatic system is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety
	1.2 Removal of ***components*** is carried out in accordance with the applicable maintenance manual
	1.3 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
	1.4 Removed components are tagged, sealed and packaged in accordance with specified procedures
2 Install pneumatic system components	2.1 Components to be installed are checked to confirm correct part numbers, serviceability and modification status
	2.2 Installation is carried out to pneumatic system in accordance with the applicable maintenance manual
	2.3 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- connection hardware and couplings
- standard trade practices relating to tool usage and installation/securing of aircraft hardware
- how to locate and correctly remove and install components of:
  - pneumatic systems
  - fire-extinguishers, including the effect of ODS or SGG extinguishing agents and regulations covering special precautions and handling requirements for BCF fire-extinguishers
  - air cycle air conditioning system components
  - pressurisation system components
  - fire-extinguishers, including the ozone-depleting properties of halons and special precautions and handling requirements for BCF fire-extinguishers
- electrical circuit isolation and plug removal and installation
- OHS procedures relating to pneumatic, air conditioning and pressurisation systems
- how to obtain MSDS
- the selection and use of items of PPE
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures, including those relating to the handling and control of halon fire-extinguishers

Look for evidence that confirms skills in:

- applying relevant OHS practices, including the use of MSDS and PPE
- using relevant maintenance documentation and aircraft manuals to:
  - locate and correctly remove and install components in pneumatic systems
  - observe regulations governing the handling and custody of fire-extinguishers containing ozone depleting substances (ODS) or synthetic greenhouse gas (SGG) extinguishing agents (e.g. BCF)
  - locate and correctly remove and install components in air cycle air conditioning systems
  - locate and correctly remove and install components in pressurisation systems
  - correctly remove and install rigid and flexible pipelines
  - correctly remove and install ducting

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment

Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and use maintenance publications to remove and install aircraft pneumatic system components while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable into other units that require similar techniques. It is essential that system cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Evidence of transferability of skills and knowledge related to removal and installation is essential. This may be demonstrated through application across a number of aircraft systems or aircraft types, but must cover a sufficient range of tasks to demonstrate familiarity with attachment methods, connection hardware and couplings peculiar to each type of system, and of safe handling of heavy components. An understanding of system operation as it relates to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on one item from each of Groups 1 to 6 (Group 6 may be omitted where not applicable to enterprise) in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance manuals. It is also expected that general purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for	Individuals being assessed who have already attained MEA355A Maintain light aircraft air cycle air

assessment	conditioning systems, and/or MEA356A Maintain light piston engine aircraft pressurisation systems, will have satisfied the requirements of this unit with regard to common Range Statement variables. Log of Industrial Experience and Achievement records relating to MEA355A Maintain light aircraft air cycle air conditioning systems and MEA356A Maintain light piston engine aircraft pressurisation systems, may be accepted as also meeting the evidence requirements for this unit in the applicable common areas.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Pneumatic components	Pneumatic components may include: 1. Filters, valves, pumps, motors, actuators and regulators 2. Gauges (direct reading), temperature sensors, pressurisation controllers and temperature controllers 3. Heat exchangers, pressure vessels, condensers, compressors, expansion turbines and humidifiers 4. Rigid and flexible pipelines, hoses and fittings 5. Ducting 6. Fire-extinguishers, including those containing ODS or SGG extinguishing agents (e.g. BCF) (where applicable to enterprise)
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities • pneumatic systems, including pressurisation, air cycle air conditioning systems and fire-extinguishing systems

Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA304C Remove and install non-pressurised aircraft structural and non-structural components

Modification History

Minor formatting and editorial changes made. Unit codes referred to in the Range Statement updated. Additional assessment advice provided in the Evidence Guide.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It may also be part of a Structures Maintenance Certificate IV training pathway. This unit covers the competencies required for the removal and installation of both structural and non-structural components of non-pressurised fixed and rotary wing aircraft. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and maintenance publications to remove and install structural and non-structural components from non-pressurised aircraft.

Applications include both fixed and rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA302C	Remove and install aircraft hydro-mechanical and landing gear system components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Remove components	1.1. Structure is supported and prepared in accordance with the applicable maintenance manual to ensure personnel safety and freedom from damage to aircraft or component during ***component*** removal
	1.2. Component removal is carried out in accordance with the applicable maintenance manual
	1.3. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
	1.4. Where applicable, removed components are tagged and prepared for transport in accordance with specified procedures
2. Install components	2.1. Structural and/or non-structural components to be installed are checked to confirm correct part numbers, serviceability and modification status
	2.2. Component installation is carried out in accordance with the applicable maintenance manual
	2.3. Support/safety equipment is removed at an appropriate time to ensure personnel safety and freedom from structural damage
	2.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices, including the use of MSDS and PPE
- using relevant maintenance documentation and aircraft manuals to:
  - remove and install structural and non-structural components
  - remove and install aircraft interior fittings
  - remove and install doors, door seals, windows and transparent panels
  - checking and adjusting all doors and access panels including locking mechanisms
  - remove and install emergency equipment

Required knowledge

Look for evidence that confirms knowledge of:

- structural and non-structural component methods of construction and attachment, faying surface treatment and fuel tank sealing
- non-pressurised fuselage aircraft doors, related seals and window and transparent panel construction, attachment methods and sealing
- aircraft interior fittings (trim, linings, seats, floor panels, and so on) construction and attachment methods
- the location and attachment or stowage methods for emergency equipment
- relevant OHS practices
- how to obtain MSDS
- use of PPE
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to use maintenance manuals and applicable tools to remove and install removable structural and non-structural components from non-pressurised aircraft while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable into other units that require similar techniques. It is essential that shoring, trestling and lifting requirements and safety precautions applicable to the structure being maintained are fully observed, understood and complied with. Evidence of transferability of skills and knowledge

	related to removal and installation is essential. This may be demonstrated through application across a representative range of the areas listed in the Range Statement. An understanding of component handling, attachment methods, adjustment and sealing as it relates to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one item from each Group 1 to 6, as listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained MEA363B Inspect, repair and maintain structures and related components of non-pressurised small aircraft, will have met most of the requirements for this unit. Log of Industrial Experience and Achievement records relating to MEA363B Inspect, repair and maintain structures and related components of non-pressurised small aircraft, may be accepted as also meeting the evidence requirements for this unit in the applicable areas.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility

of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Removable components of structure	Removable components of structure are those that are installed using bolts and/or screws. Where component removal and installation requires the removal and installation of rivets the applicable unit is either: • MEA311D Inspect and repair/modify aircraft structures, • MEA339C Inspect, repair and maintain aircraft structures, or • MEA423A Aircraft structure major disassembly and reassembly Components may include: 1. Removable components of wings, tail booms, pylons, empennage, skids, fairings and nacelles 2. Removable components or sections of non-pressurised fuselages 3. Non-pressurised fuselage entry, cargo, access doors and associated seals (including checking and adjustment of all doors and access panels and associated locking mechanisms) 4. Non-pressurised fuselage windows and transparent panels 5. Where applicable, trim panels, linings, seats, cabin equipment and consoles, floor panels and coverings 6. Applicable emergency equipment (including passenger escape systems, life jackets, rafts, location transmitters, beacons, crew and passenger seat restraints)
Sealant removal and application	The removal and application of faying (contact or overlapping) surface and fuel tank sealants is included, where applicable
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA305C Remove and install aircraft fixed wing flight control system components

Modification History

Minot formatting and editorial changes made. Additional assessment advice provided in the Evidence Guide.

Unit Descriptor

This unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It may also be part of a Structures Maintenance Certificate IV training pathway. It covers the competencies required for the removal and installation of flight control system components fitted to fixed wing aircraft. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of maintenance publications to remove and install aircraft flight control system components.

Applications include fixed wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA302C	Remove and install aircraft hydro-mechanical and landing gear system components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Remove fixed wing flight control system components	1.1. System is rendered safe in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety 1.2. Fixed wing ***flight control system component*** removal is carried out in accordance with the applicable maintenance manual 1.3. Required maintenance documentation is accurately completed and correctly processed 1.4. Removed components are tagged, sealed and packaged in accordance with specified procedures
2. Install fixed wing flight control system components	2.1. Components to be installed are checked to confirm correct part numbers, serviceability and modification status 2.2. Mass balance of control surfaces to be installed is checked in accordance with the applicable maintenance manual, if required 2.3. Installation is carried out in accordance with the applicable maintenance manual 2.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using relevant maintenance documentation and aircraft manuals to:
  - remove flight control surfaces
  - check the mass balance of control surfaces where required
  - install flight control surfaces
  - remove power flight control system components
  - install power flight control system components
  - remove mechanical flight control system components
  - install mechanical flight control system components

Required knowledge

Look for evidence that confirms knowledge of:

- flight control surface and system component attachment methods
- connection hardware and couplings
- electrical circuit isolation and plug removal and installation
- requirements for balancing of control surfaces
- flight control system rigging requirements
- requirements for independent inspection of work performed on flight control systems and components
- relevant OHS practices
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and use maintenance publications to remove and install fixed wing aircraft flight control system components while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable into other units that require similar techniques. It is essential that safety precautions applicable to the fixed wing flight control system being maintained are fully observed, understood and complied

	with (especially flight control system interrelationships with other systems where applicable). An awareness of dual inspection requirements associated with work on flight controls and systems must also be demonstrated. Evidence of transferability of skills and knowledge related to removal and installation is essential. This may be demonstrated through removal and installation of a representative range of the fixed wing flight control system components listed in the Range Statement. An understanding of component attachment methods and the need for adjustment or rigging and system operation as it relates to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one item from each of Groups 1 to 3 listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained MEA351A Maintain airframe systems of basic light fixed wing aircraft, will have satisfied the requirements of this unit with regard to common Range Statement variables. Log of Industrial Experience and Achievement records relating to MEA351A Maintain airframe systems of basic light fixed wing aircraft, may be accepted as also meeting the evidence requirements for this unit in the applicable common areas.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Flight control system components	Flight control system components may include: 1. Ailerons, elevators, rudders, trim tabs, speed brakes, spoilers, flaps and slats 2. Actuators - mechanical, hydraulic, pneumatic or electric 3. Mechanical flight control components (cables, pulleys, guides, fairleads, tension regulators, control rods, bellcranks, torque tubes, chains, sprockets, control sticks, wheels or columns, trim wheels or handles, and rudder pedals)
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA306C Remove and install engines and engine system components

Modification History

Minor formatting and editorial changes made. Additional assessment advice provided in the Evidence Guide.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required for the removal and installation of both fixed and rotary wing aircraft engines and engine system components. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of maintenance publications to remove and install gas turbine or piston engines and engine system components.

Applications include fixed and rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA302C	Remove and install aircraft hydro-mechanical and landing gear system components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Remove engine	1.1. Aircraft is prepared and supported and rendered safe in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure the safety of personnel and freedom from damage during ***engine*** removal
	1.2. Removal is carried out in accordance with the applicable maintenance manual
	1.3. Engine is tagged and prepared for transport or storage in accordance with the specified procedures
	1.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
2. Remove engine system components	2.1. Aircraft and/or engine system is prepared and rendered safe in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure the safety of personnel
	2.2. Removal is carried out in accordance with the applicable maintenance manual
	2.3. ***Engine system component*** is tagged and prepared for transport or storage in accordance with the specified procedures
	2.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
3. Install engine	3.1. Engine to be installed is checked to confirm correct part or model numbers, modification status and serviceability
	3.2. Installation is carried out in accordance with the applicable maintenance manual
	3.3. Support/safety equipment is removed at the appropriate time to ensure personnel safety and freedom from structural damage
	3.4 Required maintenance documentation is completed and processed

	in accordance with standard enterprise procedures
4. Install engine system components	4.1. Engine components to be installed are checked to confirm correct part or model numbers, modification status and serviceability 4.2. Installation is carried out in accordance with the applicable maintenance manual 4.3. Support/safety equipment is removed at the appropriate time to ensure personnel safety and freedom from structural damage 4.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices, including lifting and handling heavy components
- using MSDS and PPE
- using relevant maintenance documentation and aircraft manuals to:
  - correctly remove and install engines, engine change units and APUs
  - prepare removed engines for transportation and/or storage
  - locate and correctly remove and install the range of engine system components listed in the Range Statement
- identifying the requirement for adjustment and rigging of systems and controls after the installation of engines or system components

Required knowledge

Look for evidence that confirms knowledge of:

- removal and installation procedures for aircraft:
  - engines
  - engine change units
  - APUs
- engine inhibiting and de-inhibiting procedures
- layout, installation and connection of components of:
  - fuel systems
  - lubrication systems
  - air systems
  - super and turbo charging systems
  - exhaust systems
  - ignition and igniter systems
  - starting systems

  - fire protection systems
- accessories and associated drives
- engine control system component removal and installation including the requirement for rigging and for the independent inspection of work performed
- engine maintenance documentation and manuals
- relevant OHS practices, including those relating to the lifting and handling of heavy items
- how to obtain MSDS
- use of PPE
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and use maintenance publications to remove and install engines and engine system components on fixed or rotary wing aircraft while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable into other units that require similar techniques. It is essential that safety precautions applicable to engines and engine systems being maintained are fully observed, understood and complied with, including allowance for the effect on aircraft centre of gravity when engines are removed. Awareness must be demonstrated of dual inspection requirements associated with work on engine control systems. Evidence of transferability of skills and knowledge related to removal and installation is essential. This may be demonstrated through removal and installation of a representative range of engines and engine system components. An understanding of component attachment methods and the need for adjustment, rigging and system operation as it relates to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be

	demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one item from each of Groups 1 to 7 listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, or by the use of simulated activities, using tools and equipment specified in aircraft maintenance manuals. It is also expected that general purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained MEA353A Maintain basic light aircraft engines and propellers, will have satisfied the requirements of this unit with regard to common Range Statement variables. Log of Industrial Experience and Achievement records relating to MEA353A Maintain basic light aircraft engines and propellers, may be accepted as also meeting the evidence requirements for this unit in the applicable common areas.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Engines and engine system components:	Engines and engine system components may include: 1. Engine change unit or auxiliary power unit (turbo-prop, turbofan, turboshaft, turbojet and piston) 2. Fuel, oil and air system (or induction and super/turbo

	charger systems in the case of piston engine) components 3. Engine control system components 4. Ignition or igniter system components 5. Starting system components 6. Fire protection system components 7. Accessories and associated drives
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA307C Remove and install propeller systems and components

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required for the removal and installation of fixed wing aircraft propellers and propeller system components. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of maintenance publications to remove and install propellers and propeller system components

Applications include propeller-driven fixed wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes

MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Remove propellers and components	1.1. System is rendered safe and prepared in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices
	1.2. Isolation and warning signs are installed/fitted to ensure personnel safety and freedom from damage during component removal
	1.3. ***Propeller system component*** removal is carried out in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices
	1.4. Required aircraft maintenance documentation is accurately completed and correctly processed
	1.5. Removed components are labelled, sealed and packaged in accordance with relevant aircraft publications/ maintenance regulations/orders and standards and practices
2. Install propellers and components	2.1. Propeller system components to be installed are checked to confirm correct part numbers, serviceability and modification status

2.2. Component installation is carried out in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices

2.3. Support/safety equipment is removed at an appropriate time to ensure personnel safety and freedom from structural damage

2.4. Required aircraft maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices, including lifting and handling heavy components
- using MSDS and PPE
- using relevant maintenance documentation and aircraft manuals to:
  - correctly remove and install propellers and related components such as spinners
  - locate and correctly remove and install pitch control system components
  - locate and correctly remove and install propeller de-icing system components
- identifying requirements for adjustment and rigging of systems and controls

Required knowledge

Look for evidence that confirms knowledge of:

- propeller attachment methods and removal and installation procedures
- propeller system component attachment methods for:
  - spinners
  - governors
  - beta control systems
  - de-ice and anti-ice systems
- controls and control linkages, including the requirement for rigging and for independent inspection of work performed
- electrical circuit isolation, plug removal and installation
- relevant OHS practices, including those relating to lifting and handling of heavy items
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the

performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and use maintenance publications to remove and install propellers and propeller system components on propeller-driven fixed wing aircraft while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable into other units that require similar techniques. It is essential that shoring, trestling and lifting requirements and safety precautions applicable to propeller system maintenance are fully observed, understood and complied with, and that an awareness is demonstrated of dual inspection requirements. Evidence of transferability of skills and knowledge related to removal and installation is essential. This may be demonstrated through application across a representative range of propeller system components. An understanding of component attachment methods, the need for adjustment or rigging and system operation as it relates to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one item from each of Groups 1 to 4 in the Range Statement (Group 5 may be omitted where it is not applicable to the enterprise). This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in aircraft maintenance manuals. It is also expected that general purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
Method of assessment	

Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Propeller system components	Propeller system components may include: 1. Propellers, including spinners, where fitted 2. Constant speed, feathering and reversing propeller drives 3. Beta control systems and governors 4. Controls and linkages 5. De-ice/anti-ice equipment
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA308C Remove and install rotary wing rotor and flight control system components

Modification History

Minor formatting and editorial changes made. Additional assessment advice provided in the Evidence Guide.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required for the removal and installation of rotary wing aircraft rotors and flight control system components. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of maintenance publications to remove and install rotors and associated flight control system components.

Applications include rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA302C	Remove and install aircraft hydro-mechanical and landing gear system components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Remove rotary wing rotor	1.1. System is rendered safe and prepared in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices 1.2. Isolation and warning signs are installed/fitted to ensure personnel safety 1.3. ***Rotary wing rotor*** removal is carried out in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices 1.4. Required aircraft maintenance documentation is completed and processed in accordance with standard enterprise procedures 1.5. Removed components are labelled, sealed and packaged in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices
2. Remove rotary wing flight control system components	2.1. System is rendered safe and prepared in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices 2.2. Isolation and warning signs are installed/fitted to ensure personnel safety 2.3. Rotary wing ***flight control system component*** removal is carried out in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices 2.4. Required aircraft maintenance documentation is completed and processed in accordance with standard enterprise procedures 2.5. Removed components are labelled, sealed and packaged in

	accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices
3. Install rotary wing rotor	3.1. Rotor to be installed is checked to confirm correct part or model numbers, modification status and serviceability 3.2. Mass balance of rotor blades/head is checked in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices 3.3. Installation is carried out in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices 3.4. Support/safety equipment is removed at the appropriate time to ensure personnel safety and freedom from structural damage
4. Install rotary wing flight control system components	4.1. Rotary wing flight control system components to be installed are checked to confirm correct part or model numbers, modification status and serviceability 4.2. Installation is carried out in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices 4.3. Support/safety equipment is removed at the appropriate time to ensure personnel safety and freedom from structural damage 4.4. Required aircraft maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices, including lifting and handling heavy components
- using relevant maintenance documentation and aircraft manuals to:
  - correctly remove and install main rotors and rotor heads
  - check the mass balance of rotor blades and heads
  - correctly remove and install tail rotor blades and pitch control assemblies
  - locate and correctly remove and install mechanical flight control system components
  - locate and correctly remove and install drive train components, such as gearboxes and drive shafts and couplings
  - identify the requirements for component balancing
- identifying the requirements for adjustment and rigging of systems after component

removal and installation

Required knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- removal and installation procedures for:
  - main rotors and rotor blades
  - rotor heads
  - tail rotors and tail rotor blades
  - swash plates
  - tail rotor pitch control assemblies
- requirements for the checking and adjustment of blade tracking after rotor maintenance
- control system layout, linkages and operation (operation only to the extent necessary for the specified tasks) including the requirement for rigging and the independent inspection of work performed
- power train layout and assembly:
  - main rotor gearboxes
  - intermediate gearboxes
  - tail rotor gearboxes
  - drive shafts
  - couplings
- relevant OHS practices, including those relating to lifting and handling of heavy items
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and use maintenance publications to remove and install rotary wing aircraft rotors and flight control system components while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable into other units that require similar techniques. It is essential that safety precautions applicable to the rotary wing rotor and flight control system components being maintained, including

	allowance for the effect on weight and balance (i.e. cg) when heavy components are removed, are fully observed, understood and complied with. Evidence of transferability of skills and knowledge related to removal and installation is essential. This may be demonstrated through removal and installation of a representative range of the rotary wing rotor and flight control system components. An understanding of component attachment methods, the need for adjustment or rigging and system operation as it relates to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one item from each of Groups 1 to 6 in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in aircraft maintenance manuals. It is also expected that general purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained MEA352A Maintain basic rotary wing aircraft systems, will have satisfied the requirements of this unit with regard to common Range Statement variables. Log of Industrial Experience and Achievement records relating to MEA352A Maintain basic rotary wing aircraft systems, may be accepted as also meeting the evidence requirements for this unit in the applicable common areas.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Rotary wing rotors and flight control system components	Rotary wing rotors and flight control system components may include: 1. Main rotor blades and tail rotor blades 2. Rotor heads 3. Swash plates, tail rotor pitch control assemblies 4. Mechanical flight control components (i.e. cables, pulleys, guides, fairleads, tension regulators, control rods, bellcranks, torque tubes, control sticks or columns, tail rotor pedals) and mechanical components of powered flight control systems 5. Main rotor, intermediate or tail rotor gearboxes 6. Drive shafts, couplings
Powered flight controls	In the case of hydraulically powered rotor control system components and related plumbing, maintenance work should be assessed against MEA302C Remove and install aircraft hydro-mechanical and landing gear system components
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA309C Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills, standard trade practices and systems knowledge in the inspection, testing and troubleshooting of aircraft hydro-mechanical and landing gear systems and components.

Applications include hydro-mechanical and landing gear systems and components fitted to both fixed and rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA302C	Remove and install aircraft hydro-mechanical system and landing gear components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect hydro-mechanical systems and components	1.1. Isolation tags already attached to the system or related systems are checked and aircraft configured for safe system inspection and operation in accordance with specified procedures
	1.2. ***Hydro-mechanical system and system components*** are visually or physically checked for external signs of defects in accordance with specified procedures
2. Inspect landing gear systems and components	2.1. Isolation tags already attached to the system or related systems are checked and aircraft configured, including jacking, where necessary, for safe system inspection and operation in accordance with specified procedures
	2.2. ***Landing gear system and system components*** are visually or physically checked for external signs of defects in accordance with specified procedures
3. Test hydro-mechanical and landing gear systems	3.1. The aircraft and hydro-mechanical systems are correctly prepared in accordance with specified procedures for the application of power
	3.2. Power is applied and system functionally tested in accordance with specified procedures for evidence of malfunction or leaks
	3.3. System calibration or adjustments are performed in accordance with specified procedures
4. Prepare for troubleshooting	4.1. Relevant maintenance documentation and modification status, including system defect/ service difficulty reports where relevant, are interpreted to identify an unserviceability

5. Troubleshoot hydro-mechanical and landing gear systems	5.1. Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination 5.2. Maintenance manual fault diagnosis guide and logical processes are used to ensure efficient and accurate ***troubleshooting*** 5.3. Specialist advice is obtained, where required, to assist with the troubleshooting process 5.4. Hydro-mechanical and landing gear system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required 5.5. Fault rectification requirements are determined to assist in planning the repair or adjustment

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- using hand skills and tools in the inspection, adjustment and troubleshooting of hydraulic, fuel and landing gear systems
- using hand skills and tools in the inspection, adjustment and troubleshooting of hydraulic and fuel system components
- jacking of the aircraft as required for landing gear system inspection, testing and troubleshooting
- using hand skills and tools in the inspection, adjustment and troubleshooting of landing gear components
- using of maintenance manuals to prepare the aircraft for inspection, testing and troubleshooting of hydro-mechanical and landing gear systems and components
- effectively using maintenance documentation and relevant fault diagnosis guides in the troubleshooting process
- recognising external defects in hydro-mechanical and landing gear systems and components
- applying standard procedures
- observing all relevant OHS practices, including the use of MSDS and PPE

Required knowledge

Look for evidence that confirms knowledge of:

- standard trade practices relating to tool usage and installation/securing of aircraft hardware
- fluid power theory
- hydraulic system layout, operation and characteristics (including electrical system interfaces) and system component construction and operation for:

  - flight control systems including primary controls, flaps, speed brakes and spoilers
  - landing gear retraction systems
  - brake and anti-skid systems
  - nosewheel steering systems
- fuel system and component layout, operation and characteristics (including electrical system interfaces) and system component operation and construction
- construction and operation of landing gear components, including:
  - wheel assemblies
  - skids
  - floats
  - struts/oleos
  - uplocks and downlocks
  - mechanical linkages
- how to configure the aircraft for inspection, testing and troubleshooting of hydraulic, fuel and landing gear systems and components
- maintenance requirements and troubleshooting procedures
- relevant OHS practices relating to hydraulic systems, fuel systems and landing gear components, including lifting and handling of heavy items
- how to obtain MSDS
- selection and use of PPE
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot a range of hydraulic and fuel system and landing gear components that are representative of the scope of the listed variables in accordance with relevant maintenance manual instructions while applying all relevant OHS procedures and standard procedures. Coverage of brakes and struts/oleos are not required where the aircraft is rotary wing and is fitted with skids or floats.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely

	involvement of supervisors or other trades) associated with aircraft hydro-mechanical and landing gear systems and their components. It is essential that system test procedures take into account all safety precautions applicable to the system being maintained, especially where system operation/switching inter-relates to other systems being maintained. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This may be demonstrated through application across a number of aircraft systems or aircraft types. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety (including safe handling of heavy components) and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of this unit of competency are being achieved under routine supervision on: • each type of system (Groups 1, 2, 6, 7, 8) • on at least one component of each group listed in the Range Statement against hydro-mechanical system components 3 to 5 • landing gear system components 9 to 11 Where the aircraft is rotary wing and is fitted with skids or floats coverage of Groups 6, 7, 8, 10 and 11 is not required and where a rotary wing aircraft is fitted with a fixed undercarriage with wheels coverage of Groups 6 and 7 is not required. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment, using procedures, tools and equipment specified in maintenance documentation.

	It is also expected that general purpose tools, test and ground support equipment found in most routine situations would be used where appropriate. The level of troubleshooting is limited in its application to the use of fault diagnosis guides or other similar information.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Systems and system components	Hydro-mechanical systems include: 1. Hydraulic systems 2. Fuel systems Components of hydro-mechanical systems include: 3. Hydraulic accumulators, filters, reservoirs, valves, pumps, motors, actuators, regulators and direct reading gauges 4. Fuel system filters, valves, pumps, rigid and flexible storage cells/tanks 5. Rigid and flexible pipelines, hoses and fittings Landing gear systems include: 6. Retraction systems 7. Steering systems 8. Brake systems, including anti-skid, where applicable Landing gear components include: 9. Wheel assemblies, skids and floats

	10. Brake units 11. Struts/oleos (Additional components of landing gear systems are included in hydro-mechanical system components)
Troubleshooting	Troubleshooting involves the use of fault finding charts or similar, to line replacement level
Application	Application of this unit of competency may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise
Electrical interface	The work can include associated electrical loom terminations and/or plugs

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA310C Inspect, test and troubleshoot aircraft pneumatic systems and components

Modification History

Release 3 – Range of Variables Group 3 and assessment requirements amended to allow omission where pressurisation systems are not applicable to the enterprise - equivalent.

Release 2 - Minor formatting and editorial changes made. Prerequisite unit version code updated. Additional assessment advice provided in the Evidence Guide.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to inspect, test and troubleshoot aircraft pneumatic systems and components. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer licence extension under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills, standard trade practices and systems knowledge in the inspection, testing and troubleshooting of aircraft pneumatic systems and components.

Applications include pneumatic systems and components fitted to both fixed and rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA303D	Remove and install aircraft pneumatic system components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect pneumatic systems and components	1.1. Isolation tags already attached to the system or related systems are checked and aircraft configured for safe system inspection and operation in accordance with specified procedures
	1.2. ***Pneumatic system*** is visually or physically checked for external signs of defects in accordance with specified procedures
2. Test pneumatic systems	2.1. The aircraft and pneumatic systems are correctly prepared in accordance with specified procedures for the application of power
	2.2. Power is applied and system functionally tested in accordance with specified procedures for evidence of malfunction or leaks
	2.3. System calibration or adjustments are performed in accordance with specified procedures
3. Prepare for troubleshooting	3.1. Relevant maintenance documentation and modification status, including system defect/service difficulty reports, where relevant, are interpreted to identify an unserviceability
4. Troubleshoot pneumatic systems	4.1. Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination
	4.2. Maintenance manual fault diagnosis guide and logical processes are used to ensure efficient and accurate ***troubleshooting***
	4.3. Specialist advice is obtained, where required, to assist with

the troubleshooting process

4.4. Pneumatic system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required

4.5. Fault rectification requirements are determined to assist in planning the repair or adjustment

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- using hand skills and tools in the inspection, adjustment and troubleshooting of pneumatic systems
- using hand skills and tools in the inspection, adjustment and troubleshooting of pneumatic system components
- using maintenance manuals to prepare the aircraft for inspection, testing and troubleshooting of pneumatic systems and components
- effectively using maintenance documentation and relevant fault diagnosis guides in the troubleshooting process
- recognising external defects in pneumatic systems and components
- applying standard procedures
- observing all relevant OHS practices

Required knowledge

Look for evidence that confirms knowledge of:

- standard trade practices relating to tool usage and installation/securing of aircraft hardware
- pneumatic system:
  - layout
  - operation and characteristics
  - component operation and construction
  - electrical and instrument system interfaces
- how to configure the aircraft for inspection, testing and troubleshooting of pneumatic systems and components
- pneumatic system maintenance requirements and troubleshooting procedures
- OHS procedures relating to pneumatic systems and components
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures, including those relating to the handling and control of halon fire-extinguishers

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and use maintenance publications to inspect, test and troubleshoot a range of pneumatic systems and components while applying all relevant OHS procedures.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with aircraft pneumatic systems and their components. It is essential that system test procedures take into account all safety precautions applicable to the system being maintained, especially where system operation/switching interrelates to other systems being maintained. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This may be demonstrated through application across a number of aircraft systems or aircraft types. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of this unit of competency are being achieved under routine supervision on each type of system (Groups 1 to 4 - Group 3 may be omitted where it is not applicable to the enterprise)) and on at least one component from each of Groups 5 to 9, as listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.

Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment, using procedures, tools and equipment specified in maintenance documentation. It is also expected that general purpose tools, test and ground support equipment found in most routine situations would be used where appropriate. The level of troubleshooting is limited in its application to the use of fault diagnosis guides or other similar information.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained MEA355A Maintain light aircraft air cycle air conditioning systems, and/or MEA356A Maintain light piston engine aircraft pressurisation systems, will have satisfied the requirements of this unit with regard to common Range Statement variables. Log of Industrial Experience and Achievement records relating to MEA355A Maintain light aircraft air cycle air conditioning systems, and MEA356A Maintain light piston engine aircraft pressurisation systems, may be accepted as also meeting the evidence requirements for this unit in the applicable common areas.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Pneumatic systems and components	Pneumatic systems include: 1. De-icing 2. Air cycle air conditioning 3. Pressurisation (may be omitted if not applicable to enterprise) 4. Fire-extinguishing Components of pneumatic systems include:

	5. Filters, valves, pumps, motors, actuators, regulators 6. Gauges (direct reading), temperature sensors, pressurisation controllers, temperature controllers 7. Heat exchangers, pressure vessels, condensers, compressors, expansion turbines, humidifiers 8. Rigid and flexible pipelines, hoses and fittings 9. Ducting
Troubleshooting	Troubleshooting involves the use of fault-finding charts or similar, to line replacement level
Electrical interface	The work can include associated electrical loom terminations and/or plugs
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Not applicable.

Co-requisite units

Not applicable

MEA311D Inspect and repair/modify aircraft structures

Modification History

Knowledge requirements and Range Statement revised to include additional inspection coverage - equivalent to previous version.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to inspect, repair and modify aircraft structure and structural components. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills, applicable tools, maintenance publications and repair drawings to inspect and repair/modify aircraft structure, including the replacement of primary structure components.

Applications include both fixed and rotary wing aircraft.

Licensing/Regulatory Information

Refer to unit descriptor

Pre-Requisites

MEA304C Remove and install non-pressurised aircraft structural and non-structural components

OR

MEA317C Remove and install pressurised aircraft structural and non-structural components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Inspect aircraft structure	1.1 Relevant maintenance documentation and modification status, including defect reports, where relevant, are used to identify ***specific inspection requirements***
	1.2 Appropriate preparation and access to the aircraft structure is undertaken to allow for proper inspection in accordance with maintenance documentation
	1.3 Aircraft structure is visually or physically checked for signs of deformation defects or damage in accordance with maintenance documentation and approved procedures
	1.4 Damage or defects are assessed against damage or wear limits specified by structural repair manual or other approved data to determine if repair or replacement is required
2 Prepare to undertake repair	2.1 Extent of damage is correctly assessed to assist in determining ***repair*** procedure
	2.2 Structure is supported and prepared, in accordance with the applicable maintenance manual, to ensure personnel safety and freedom from damage
	2.3 Jigs, fixtures or bracing are used, as required, to maintain shape and/or alignment
	2.4 Appropriate modification or repair scheme is identified in accordance with structural repair manual and/or approved data
	2.5 Specialist advice is obtained in establishing an approved repair scheme where a standard repair scheme cannot be identified or where damage is beyond specified limits
	2.6 All materials and equipment required are organised
3 Repair/modify	3.1 Required maintenance/repair documentation is accurately

aircraft structure	completed and correctly processed

3.2 Structural repairs/modifications are performed, in accordance with approved repair scheme, ensuring that aircraft standard practices are used and process requirements are carried out

3.3 Work area is cleaned of all waste material or contaminants

3.4 Required mensuration/alignment checks are completed and components are adjusted, where necessary, to operate within prescribed specifications

3.5 Repaired components or assemblies are tagged, sealed and packaged or cradled in accordance with specified procedures, where required

3.6 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- aircraft construction principles and structural component attachment methods:
  - types of aircraft structure
  - structural loads
  - loads under various conditions of flight
  - causes of structural failure
  - attachment methods:
    - bolts and screws
    - solid and blind rivets
    - close tolerance fasteners
    - bonding
- the construction methods used in:
  - fuselage sections
  - wing sections
  - engine nacelles and mounts
  - windows and window frames
  - doors, locks and access panels in pressurised and non-pressurised aircraft
- describing various aircraft metals and their basic properties:
  - ferrous
  - non-ferrous

- aircraft plastic transparency construction methods and common defects
- glass windscreen basic constructional features and common defects
- composite materials:
  - terminology
  - materials used for minor repairs
  - OHS requirements
- aircraft structure inspection requirements:
  - metallic structure
  - non-metallic/composite structure (other than wood and fabric)
  - ageing aircraft inspection requirements
  - safe life structure
  - damage tolerant structure
  - fail safe structure
- NDT methods and application of the various techniques
- assessment of structural damage:
  - types and classes of mechanical damage
  - types of corrosion and determining the extent of damage
  - relevant documentation and manuals
  - damage limits and repair schemes for metallic and non-metallic structure
- procedures for the fabrication and fitment of metal repairs:
  - scab patch
  - flush patch
  - splice
  - lap
  - formed section
- corrosion removal and passivation
- procedures for performing composite repairs:
  - external patch
  - scarf patch
  - stepped repairs
- procedures for replacement of primary structure components, such as:
  - fuselage frames and longerons
  - wing spars or spar caps
  - wing-to-fuselage attachment fittings
  - tailplane attachment fittings
- aircraft mensuration checks – when required and methodology
- repair of integral fuel tanks and sealing of faying surfaces, including specific OHS and PPE requirements
- surface finishes and methods of restoration
- how to obtain MSDS

- relevant maintenance and structural repair manuals
- relevant regulatory requirements and standard procedures

Look for evidence that confirms skills in:

- applying relevant OHS regulations and practices, including the use of MSDS and PPE
- using approved maintenance documentation and aircraft publications relating to aircraft structure
- demonstrating appropriate cleaning procedures to enable structure inspection
- demonstrating correct inspection procedures, in particular pressurised aircraft, in accordance with aircraft and procedures manuals
- identifying damage to aircraft metallic (ferrous and non-ferrous) structures and/or components by way of:
  - impact
  - fatigue
  - corrosion
- identifying the various forms of structural corrosion, stating the causes and structural effects of corrosion on aircraft
- identifying composite materials used in aircraft construction, associated safety precautions and hazard
- inspecting damage and assessing composite components/structures
- handling and storing aircraft metals and composite materials, including sealing agents, to industry standards
- identifying aircraft structural assembly fasteners (metal and composite) by interpretation of markings, numbering systems, size, shape and colour
- correctly interpreting and/or producing repair scheme/modification drawings, including third angle projection, isometric, sectional formats and hand sketches
- using appropriate hand tools and machines to remove and assemble aircraft structural components, parts, sections and skin, including riveting equipment, drilling equipment, aligning tools and material fasteners (grip pins)
- applying correct removal, installation and repair techniques for:
  - a range of rivets (blind and solid) using hand, squeeze and pneumatic situations
  - a range of close tolerance fasteners (standard and oversize – hillocks and taper locks), including hole preparation
  - threaded devices, including internal and external thread cutting, Helicoil inserts and damaged stud replacement
  - hardware assembled by close tolerance fits using heat, cooling and force methods, including bearings, bushes and inserts
- correctly supporting the aircraft structure by jacking, trestling and/or jigging methods
- performing a range of metal structure and composite material repair techniques, including:
  - metal scab patch, flush, splice, lap and formed section repair
  - composite external patch, scarf and stepped repairs
  - metal to metal and metal to composite bonding
- applying structural corrosion removal/treatment techniques

- restoring aircraft structure sealing and surface finishes

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to use maintenance manuals, repair scheme drawings and applicable tools to inspect and repair/modify aircraft structure while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and repair applications associated with aircraft maintenance. It is essential that the procedures take into account all aircraft and personal safety precautions relating to aircraft structure. Evidence of transferability of skills and knowledge related to inspection, testing and repair of aircraft structure is essential. This may be demonstrated through application across a number of aircraft systems or aircraft types. Ability to interpret inspection and repair procedures and specifications and apply them in practice is critical. The application of the procedures should also clearly indicate knowledge of structural flight loads and aerodynamic requirements. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one inspection task from each of Groups 1 to 8 and at least one repair task from each of Groups 9 to 17, as listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be

	used where appropriate.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained MEA339C Inspect, repair and maintain aircraft structures or MEA363B Inspect, repair and maintain structures and related components of non-pressurised small aircraft, will have met the requirements of the Performance Criteria and Range Statement variables for Elements 1 to 3 for common Range Statement variables. Those who have attained MEA401C Inspect aircraft structures, will have met the Performance Criteria and Range Statement variables requirements for Element 1. Log of Industrial Experience and Achievement records relating to MEA339C Inspect, repair and maintain aircraft structures, MEA363B Inspect, repair and maintain structures and related components of non-pressurised small aircraft, and MEA401C Inspect aircraft structures, may be accepted as also meeting the evidence requirements for this unit in the applicable areas.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Specific inspection requirements and repair tasks	Specific inspection requirements may cover: 1. Non-ferrous and ferrous alloys and composite (FRP) materials used in aircraft construction 2. Structural fastening and attachment hardware and/or devices 3. Seals and sealants 4. Glass and moulded plastics 5. Application of NDT techniques

	6. Doors, hinges and locking mechanisms for damage/misalignment 7. Inspections applicable to each of safe life, damage tolerant and fail safe structure relevant to enterprise 8. Ageing aircraft inspection programs Repair tasks may include: 9. Removing corrosion by chemical and mechanical methods 10. Restoring protective coatings 11. Applying sealants and jointing compounds 12. Freehand precision hole generation 13. Removing and installing structural hardware and fastening devices 14. Removing and replacing bushes, bearings and bearing surfaces 15. Removing and repairing damaged sections and reinstalling 16. Repairing by replacement major load-carrying structural members, i.e. skins, longerons, spars, frames and bulkheads 17. Minor repairs to non-metallic materials
Inspection techniques	Inspection techniques may include: • visual inspection • physical checks • mensuration and alignment
Assembly stress defects	Assembly stress defects can refer to: • oil canning • buckling • contour misalignment
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities, and includes special inspections required after events, such as heavy landings, overstress or flight through heavy turbulence • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA312C Inspect, test and troubleshoot aircraft fixed wing flight control systems and components

Modification History

Minor formatting and editorial changes made. Additional assessment advice provided in the Evidence Guide.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to inspect, test and troubleshoot fixed wing aircraft flight control systems and components. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of maintenance publications and knowledge of system theory to inspect, test and troubleshoot aircraft flight control system components.

Applications include fixed wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA305C	Remove and install aircraft fixed wing flight control system components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect fixed wing flight control systems and components	1.1. Isolation tags already attached to the system or related systems are checked and aircraft configured for safe system inspection and operation in accordance with applicable maintenance manual 1.2. Fixed wing ***flight control systems and components*** are visually or physically checked for signs of defects in accordance with applicable maintenance manual
2. Test fixed wing flight control systems	2.1. Powered controls of the aircraft and system are prepared in accordance with maintenance manual for the application of electrical and hydraulic power 2.2. Power is applied, if necessary, and system is functionally tested in accordance with applicable maintenance manual for malfunction or evidence of incorrect rigging 2.3. System rigging is performed in accordance with applicable maintenance manual
3. Prepare for troubleshooting	3.1. Relevant maintenance documentation and modification status, including system defect reports, where relevant, are interpreted to identify an unserviceability
4. Troubleshoot fixed wing flight control systems	4.1. Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination 4.2. Maintenance manual fault diagnosis guide and logical processes are used to ensure efficient and accurate ***troubleshooting*** 4.3. Specialist advice is obtained, where required, to assist with the troubleshooting process

4.4. Fixed wing flight control system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required

4.5. Fault rectification requirements are determined to assist in planning the repair

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures
- using relevant maintenance documentation and aircraft manuals to:
  - recognise defects during visual inspection of fixed wing flight control systems and system components
  - rig fixed wing flight control systems
  - functionally test the operation of fixed wing flight control systems and recognise system/component malfunction or evidence of incorrect rigging
- to the extent permitted by applicable fault diagnosis guides, troubleshooting unserviceabilities in fixed wing flight control systems and clearly recording the causes of the unserviceabilities

Required knowledge

Look for evidence that confirms knowledge of:

- OHS precautions relevant to flight control system maintenance
- standard trade practices relating to tool and test/rigging equipment usage and installation/securing of system components
- flight control system layout and operation
- theory of flight:
  - airflow
  - conditions of flight
  - lift and forces
  - drag
  - wings, tailplane and vertical stabiliser
  - lift augmentation (flaps, slats and slots)
  - aircraft control surfaces and their function (elevator, ailerons, rudder, elevons and trim tabs)
  - spoilers and speed brakes
  - flight control balancing and flutter
  - stability and control and flight control rigging

- mechanical system layout and operation:
  - cockpit controls
  - cables and cable tensioning
  - pulleys and fairleads
  - bellcranks
  - levers
  - control surface horns
  - screwjacks
  - push/pull rods
- powered flight controls:
  - system layout and operation
  - component construction and operation
  - electrical and instrument interfaces:
    - flaps
    - trim
    - position indication
- flight control system maintenance procedures and troubleshooting methods
- flight control system interfaces with automatic pilot systems
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and use maintenance publications to inspect, test and troubleshoot fixed wing aircraft flight control systems and components while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with the aircraft fixed wing flight systems. It is essential that testing procedures take into account all safety precautions associated with flight control system operation, in particular where system operation/switching inter-relates to other systems being maintained, and that

	an awareness be demonstrated of dual inspection requirements associated with work on flight controls and systems. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This may be demonstrated through application across a number of aircraft types. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. In addition, knowledge of dual inspection requirements must be demonstrated. The application of ground testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one item from each of Groups 1 to 5 in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified in aircraft maintenance manuals. It is also expected that general purpose tools, test and ground support equipment found in most routine situations would be used where appropriate. The level of troubleshooting is limited in its application to the use of fault diagnosis guides or other similar information.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained MEA351A Maintain airframe systems of light fixed wing aircraft, will have satisfied the requirements of this unit with regard to common Range Statement variables. Log of Industrial Experience and Achievement records relating to MEA351A Maintain airframe systems of light fixed wing aircraft, may be accepted as also meeting the

	evidence requirements for this unit in the applicable common areas.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Flight control systems and system components	Flight control systems and system components may include: 1. Elevator, aileron and rudder primary flight control systems and associated trim systems 2. Speed brake, spoiler, flap and high lift systems 3. Ailerons, elevators, rudders, trim tabs, speed brakes, spoilers, flaps and slats 4. Actuators - mechanical, hydraulic, pneumatic or electric 5. Mechanical flight control components (cables, pulleys, guides, fairleads, tension regulators, control rods, bellcranks, torque tubes, chains, sprockets, control sticks, wheels or columns, trim wheels or handles, and rudder pedals)
Troubleshooting	Troubleshooting involves the use of fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA313C Inspect, test and troubleshoot piston engine systems and components

Modification History

Release 3 – The relationship between this unit and MEA353A has been clarified in the Descriptor and in the assessment requirements - equivalent.

Release 2 - Minor formatting and editorial changes made. Additional assessment advice provided in the Evidence Guide.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to inspect, test and troubleshoot the systems and components of the larger and more advanced piston engines. For smaller naturally aspirated piston engines unit MEA353A should be taken.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills, the use of maintenance publications and knowledge of piston engine and system theory to inspect, test and troubleshoot piston engines and engine system components.

Applications include fixed and rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA306C Remove and install engine systems and components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect piston engine system and components	1.1. Isolation tags already attached to the system or related systems are checked and aircraft/engine configured for safe system inspection and operation in accordance with applicable maintenance manual
	1.2. *Piston engine* and/or components are visually or physically checked for external and internal signs of defects in accordance with applicable maintenance manual
2. Test piston engine system	2.1. Aircraft and ***engine system*** are correctly prepared in accordance with applicable maintenance manual and connected to appropriate test equipment
	2.2. Built-in system test functions and status displays are activated, where applicable, outputs recorded and interpreted
	2.3. Assistance is provided with engine and/or system operation during prescribed test procedures to establish serviceability and correct function in accordance with applicable maintenance manual
3. Prepare for troubleshooting	3.1. Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify an unserviceability
4. Troubleshoot piston engine system	4.1. Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination
	4.2. Maintenance manual fault diagnosis guide and logical processes are used to ensure efficient and accurate ***troubleshooting***
	4.3. Specialist advice is obtained, where required, to assist with

the troubleshooting process

4.4. Piston engine system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required

4.5. Fault rectification requirements are determined to assist in planning the repair

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures, including the use of MSDS and PPE
- using relevant maintenance documentation and aircraft manuals
- through visual/physical inspection, recognising external and internal signs of defects in piston engines, components and system components
- assisting with testing of piston engine and engine system operation, be able to operate systems, monitor indications, record parameters and recognise correct function
- compiling engine condition monitoring records
- rigging and adjusting engine controls and systems
- using fault diagnosis guides and equivalent data to accurately and efficiently troubleshoot the causes of unserviceabilities in piston engines and engine systems, clearly recording details and identifying the required rectification actions

Required knowledge

Look for evidence that confirms knowledge of:

- OHS procedures associated with piston engine maintenance, including lifting and handling of heavy objects
- how to obtain MSDS
- use of PPE
- fault diagnosis techniques
- piston engine and engine system layout and operation:
  - four stroke engine theory of operation and performance
  - cylinder configurations
  - construction - components and materials
  - carburettors and air induction systems
  - fuel injection systems
  - fuels and their characteristics
  - ignition systems
  - lubricating systems and lubricants

  - cooling systems
  - exhaust systems
  - superchargers and turbochargers
  - accessory drives and mounts
  - controls and rigging of controls
  - piston engine maintenance requirements and troubleshooting procedures, including ground running of engines
- system component operation, including electrical and instrument system interfaces:
  - magnetos and ignition harnesses
  - spark plugs
  - fuel pumps
  - fuel filters
  - oil pumps
  - oil filters
  - oil tanks
  - vacuum pumps and air pumps
  - generators
  - starter motors
  - oil pressure gauges (direct reading)
  - temperature gauges (direct reading)
  - tachometers
  - manifold pressure gauges
  - system and component maintenance requirements and troubleshooting procedures
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills, use maintenance publications and engine and system theory knowledge to inspect, test and troubleshoot piston engines and engine system components on fixed or rotary wing aircraft while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and

competency in this unit	troubleshooting applications (including the timely involvement of supervisor or other trades) associated with engine systems. It is essential that system testing procedures take into account all safety precautions associated with piston engine system operation, and that awareness be demonstrated of dual inspection requirements associated with work on engine controls. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This may be demonstrated through application across a number of engine systems or types. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. The application of testing procedures and functional rigging checks should also indicate knowledge of system operation. Engine system operation knowledge, the relationship of individual components and the links with other systems will be necessary to supplement evidence of ability to carry out rigging checks and troubleshoot the system within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on the items listed in Groups 1 to 5 of the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in aircraft maintenance manuals. It is also expected that general purpose tools, test and ground support equipment found in most routine situations would be used where appropriate. The level of troubleshooting is limited in its application to the use of fault diagnosis guides or other similar information.
Method of assessment	Testing of engines fitted to helicopters (where auxiliary drive is not available) may be carried out through the applicant directing a pilot qualified on type.
Guidance information for	Individuals being assessed who have already attained

assessment	MEA353A Maintain basic light aircraft engines and propellers, will have satisfied the requirements of this unit with regard to common Range Statement variables. Log of Industrial Experience and Achievement records relating to MEA353A Maintain basic light aircraft engines and propellers, may be accepted as also meeting the evidence requirements for this unit in the applicable common areas.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Piston engines and engine systems	Piston engines and engine systems may include: 1. Engine (all types), main components and accessories/drives 2. Control system 3. Ignition and starter systems 4. Fuel, air systems and super/turbo chargers 5. Oil system
Troubleshooting	Troubleshooting involves the use of fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Not applicable.

Co-requisite units

Not applicable

MEA314C Inspect, test and troubleshoot gas turbine engine systems and components

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to inspect, test and troubleshoot the systems and components of gas turbine engines. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills, the use of maintenance publications and knowledge of gas turbine engine and system theory to inspect, test and troubleshoot gas turbine engines and engine system components.

Applications include fixed and rotary wing aircraft

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA306C Remove and install engine systems and components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect gas turbine engine system and components	1.1. Isolation tags already attached to the system or related systems are checked and aircraft/engine configured for safe system inspection and operation in accordance with applicable maintenance manual
	1.2. Gas turbine engine and/or component are visually or physically checked for external and internal signs of defects in accordance with applicable maintenance manual
2. Test gas turbine engine system	2.1. Aircraft and gas turbine engine system are correctly prepared in accordance with applicable maintenance manual and connected to appropriate test equipment
	2.2. Built-in system test functions and status displays are activated, where applicable, outputs recorded and interpreted
	2.3. Assistance is provided with ***gas turbine engine and/or system*** operation during prescribed test procedures to establish serviceability and correct function in accordance with applicable maintenance manual
3. Prepare for troubleshooting	3.1. Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify an unserviceability
4. Troubleshoot gas turbine engine system	4.1. Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination
	4.2. Maintenance manual fault diagnosis guide and logical processes are used to ensure efficient and accurate ***troubleshooting***
	4.3. Specialist advice is obtained, where required, to assist with

the troubleshooting process

4.4. Gas turbine engine system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required

4.5. Fault rectification requirements are determined to assist in planning the repair

Required Skills and Knowledge

Required skills

Required Skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures, including lifting and handling of heavy components
- using MSDS and PPE
- using relevant maintenance documentation and aircraft manuals to:
  - through visual/physical inspection, recognise external and internal signs of defects in gas turbine engines, components and system components
  - assist with testing of gas turbine engine and engine system operation, be able to operate systems, monitor indications, record parameters and recognise correct function
  - compile engine condition monitoring records
  - rig and adjust engine controls and systems
- using fault diagnosis guides and equivalent data, accurately and efficiently to troubleshoot the causes of unserviceabilities in gas turbine engines and engine systems, clearly recording details and identifying the required rectification actions

Required knowledge

Look for evidence that confirms knowledge of:

- fault diagnosis techniques
- gas turbine engine layout and operation:
  - types of gas turbine
  - operating principles and power output
  - gas path
  - intakes
  - compressors
  - combustion chambers
  - turbines
  - exhaust
  - thrust reversers
  - accessory drives

    - bearings and seals
    - maintenance requirements and troubleshooting procedures
- system and component operation, including electrical and instrument system interfaces:
    - fuel control and fuels
    - lubrication and lubricants
    - air distribution
    - starting
    - ignition
    - power augmentation
    - instrumentation:
        - performance indication
        - condition indication
        - warning
        - presentation and interpretation of electronic displays
    - fire warning and extinguishing
    - control system and rigging of engine controls
- engine spin/run procedures, including the operation of APUs
- engine condition monitoring
- relevant OHS practices, including the requirements for the lifting and handling of heavy components
- how to obtain MSDS
- selection and use of PPE
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills, use maintenance publications and engine and system theory knowledge to inspect, test and troubleshoot gas turbine engines and engine system components on fixed or rotary wing aircraft while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely

	involvement of supervisor or other trades) associated with engine systems. It is essential that system test procedures take into account all safety precautions associated with gas turbine engine system operation, especially with regard to high energy ignition units, and that awareness be demonstrated of dual inspection requirements associated with work on engine control systems. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This may be demonstrated through application across a number of engine systems or engine types. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. The application of testing procedures and functional rigging checks should also indicate knowledge of system operation. Engine system operation knowledge, the relationship of individual components and the links with other systems will be necessary to supplement evidence of ability to carry out rigging checks and troubleshoot the system within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one item from each of Groups 1 to 6 in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement, or where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified in aircraft maintenance manuals. It is also expected that general purpose tools, test and ground support equipment found in most routine situations would be used where appropriate. The level of troubleshooting is limited in its application to the use of fault diagnosis guides or other similar information.
Method of assessment	Testing of engines fitted to helicopters (where auxiliary drive is not available) may be carried out through the

	applicant directing a pilot qualified on type.
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Gas turbine engine and/or systems	Gas turbine engine and/or systems may include: 1. Engine change unit, main components and accessories/drives 2. Control system 3. Ignition and starter systems 4. Fuel system 5. Oil system 6. Air system
Troubleshooting	Troubleshooting involves the use of fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA315C Inspect, test and troubleshoot propeller systems and components

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to inspect, test and troubleshoot propeller systems and components. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills, the use of maintenance publications and knowledge of propeller and propeller system theory to inspect, test and troubleshoot propellers and propeller system components.

Applications include propeller driven fixed wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA307C Remove and install propeller systems and components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect propeller systems and components	1.1. Isolation tags already attached to the system or related systems are checked and aircraft configured for safe system inspection and operation in accordance with applicable maintenance manual
	1.2. Propeller system is visually or physically checked for rigging and external signs of defects in accordance with applicable maintenance manual
2. Test propeller systems	2.1. Aircraft and system are correctly prepared in accordance with maintenance manual for the operation of engine and propeller system
	2.2. ***Propeller and system*** are functionally tested in accordance with applicable maintenance manual for evidence of malfunction or defects
	2.3. System calibration or adjustments are performed in accordance with applicable maintenance manual
3. Prepare for troubleshooting	3.1. Relevant maintenance documentation and modification status, including system defect reports, where relevant, are interpreted to identify an unserviceability
4. Troubleshoot propeller systems	4.1. Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination
	4.2. Maintenance manual fault diagnosis guide and logical processes are used to ensure efficient and accurate ***troubleshooting***
	4.3. Specialist advice is obtained, where required, to assist with the troubleshooting process

4.4. Propeller system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required

4.5. Fault rectification requirements are determined to assist in planning the repair

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices, including the lifting and handling of heavy components
- using relevant maintenance documentation and aircraft manuals to:
  - through visual/physical inspection, recognise external signs of defects or rigging abnormalities in propellers and propeller system components
  - functionally test propellers and propeller systems and recognise any indication of malfunction or incorrect rigging or adjustment
  - rig and adjust propeller controls and systems
- using fault diagnosis guides and equivalent data, to accurately and efficiently troubleshoot the causes of unserviceabilities in propellers and propeller systems, clearly record details and identify the required rectification actions

Required knowledge

Look for evidence that confirms knowledge of:

- fault diagnosis techniques
- propeller system layout and operation:
  - propeller types
  - propeller terminology
  - forces acting on a propeller
  - propeller construction
  - propeller operation
  - pitch changing mechanisms
  - governors and beta control
  - controls and rigging of propeller controls
  - maintenance requirements and troubleshooting procedures
- ancillary systems and system component operation, including electrical and instrument system interfaces:
  - de-icing and anti-icing
  - multi-engine synchronising and synchrophasing
  - feathering and unfeathering, including auto feathering

  - pitch reversal
  - negative torque sensing and protection
  - de-coupling
  - braking
  - thrust and torque measuring and indication
  - maintenance requirements and troubleshooting procedures
- relevant OHS practices, including the requirements for the lifting and handling of heavy components
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills, use maintenance publications and propeller and propeller system theory knowledge to inspect, test and troubleshoot propellers and their systems on propeller driven fixed wing aircraft while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with propeller systems. It is essential that system test procedures take into account all safety precautions associated with propeller system operation, and that awareness be demonstrated of dual inspection requirements associated with work on propeller control systems. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This may be demonstrated through application across a number of aircraft systems or aircraft types. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. The application of testing procedures should also clearly indicate knowledge of system operation. System operation knowledge, the relationship of individual components and the links with other

	systems will be necessary to supplement evidence of ability to troubleshoot the system within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one item from each of Groups 1 to 4 listed in the Range Statement (Group 5 may be omitted where it is not applicable to the enterprise). This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance manuals. It is also expected that general purpose tools, test and ground support equipment found in most routine situations would be used where appropriate. The level of troubleshooting is limited in its application to the use of fault diagnosis guides or other similar information.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Propeller and propeller systems	Propeller and systems may include:

	1. Propellers, including spinners, where fitted 2. Constant speed, feathering and reversing propeller drives 3. Beta control systems and governors 4. Controls and linkages 5. De-ice/anti-ice equipment
Troubleshooting	Troubleshooting involves the use of fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA316C Inspect, test and troubleshoot rotary wing rotor and control systems and components

Modification History

Minor formatting and editorial changes made. Additional assessment advice provided in the Evidence Guide.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to inspect, test and troubleshoot the rotor and control systems and components of rotary wing aircraft. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills, the use of maintenance publications and knowledge of rotors and rotor control system theory to inspect, test and troubleshoot rotors and rotor control systems.

Applications include rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA308C	Remove and install rotary wing rotor and flight control system components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect rotor and rotor control systems and components	1.1. Isolation and warning signs are fitted/installed to the system or related systems and the aircraft configured for safe system inspection and operation in accordance with relevant aircraft publications/maintenance regulations orders and standards and practices
	1.2. ***Rotor and rotor control system*** is visually or physically checked/inspected for external signs of defects in accordance with relevant aircraft publications maintenance regulations/orders and standards and practices
	1.3. Defects are identified and recorded in accordance with standard enterprise procedures
2. Ground test rotor and rotor control systems	2.1. Aircraft and system prepared in accordance with relevant aircraft publications/maintenance regulations orders and standards and practices for the operation of engine and rotor system
	2.2. Rotor and rotor control system are functionally tested in accordance with relevant aircraft publications maintenance regulations/orders and standards and practices for evidence of malfunction
	2.3. System calibration or adjustments are performed in accordance with relevant aircraft publications/ maintenance regulations/orders and standards and practices
3. Prepare for troubleshooting	3.1. Relevant aircraft publications and modification status, including system defect reports, are interpreted to identify an unserviceability
4. Troubleshoot rotor and rotor control	4.1. Available information from aircraft maintenance documentation, inspection and test results is used to assist in

systems	fault determination 4.2. Relevant aircraft publication fault diagnosis guide and logical processes are used to ensure efficient and accurate ***troubleshooting*** 4.3. Specialist advice is obtained to assist with the troubleshooting process 4.4. Rotor and rotor control system faults are located and the causes of the faults are clearly identified and recorded in aircraft maintenance documentation in accordance with standard enterprise procedures 4.5. Fault rectification requirements are determined

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures
- using relevant maintenance documentation and aircraft manuals to:
  - recognise through visual/physical inspection external signs of defects in the rotor, rotor head, tail rotor and flight control mechanical system components
  - ground test the rotor and control system and recognise correct function
  - rig and adjust rotor controls and systems
- using fault diagnosis guides and equivalent data, to accurately and efficiently troubleshoot the causes of unserviceabilities in rotor control systems, clearly record details and identify the required rectification actions

Required knowledge

Look for evidence that confirms knowledge of:

- fault diagnosis techniques
- standard trade practices relating to tool and test/rigging equipment usage
- theory of flight:
  - airflow
  - conditions of flight
  - lift and forces
  - drag
- rotary flight principles:
  - terminology relating to:
    - aerofoils
    - main rotor blades

        - rotor discs
        - rotors - main and tail
    - aerodynamic characteristics:
        - aerofoil design
        - forces
        - rotor thrust and power requirements
        - vortex ring
        - autorotation
    - helicopter stability
- helicopter dynamic components:
    - main rotors:
        - blades
        - heads
        - linkages
    - tail rotors
    - swash plates
    - transmissions and drive shafts
    - clutches and freewheeling units
- system and component operation, including electrical and instrument system interfaces:
    - cyclic pitch control
    - collective pitch control
    - tail rotor control
    - mechanical and powered control systems
    - engine control interface
    - torque reaction and anti-torque devices
    - engine indication
    - vibration monitoring
- helicopter maintenance procedures and troubleshooting
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures, including requirements for engine and rotor system operation
- relevant OHS practices

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills, use maintenance publications and rotor and rotor control system theory knowledge to inspect, test and troubleshoot rotors and their control systems on rotary wing aircraft while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with the rotor control systems. It is essential that testing procedures take into account all safety precautions associated with ground testing of rotor and rotor control systems, and that awareness be demonstrated of dual inspection requirements associated with work on control systems. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This may be demonstrated through application across a number of aircraft types. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. The application of ground testing procedures should also clearly indicate knowledge of system operation. System operation knowledge, the relationship of individual components and the links with other systems will be necessary to supplement evidence of ability to troubleshoot the system within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one item from each of Groups 1 to 5, as listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified in aircraft maintenance manuals. It is also expected that general purpose tools, test and

	ground support equipment found in most routine situations would be used where appropriate. The level of troubleshooting is limited in its application to the use of fault diagnosis guides or other similar information.
Method of assessment	Functional testing of rotors and rotor control systems with engine/s running may be carried out with the applicant directing a pilot qualified on type.
Guidance information for assessment	Individuals being assessed who have already attained MEA352A Maintain basic rotary wing aircraft systems, will have satisfied the requirements of this unit with regard to common Range Statement variables. Log of Industrial Experience and Achievement records relating to MEA352A Maintain basic rotary wing aircraft systems, may be accepted as also meeting the evidence requirements for this unit in the applicable common areas.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Rotor and rotor control system	Rotor and rotor control system may include: 1. Main rotor blades, tail rotor blades 2. Rotor heads, swash plates, tail rotor pitch control assemblies 3. Mechanical, powered flight control components 4. Main rotor, intermediate or tail rotor gearboxes 5. Drive shafts and couplings
Troubleshooting	Troubleshooting involves the use of fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to:

	• scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA317C Remove and install pressurised aircraft structural and non-structural components

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated. Reference to relevant units in the Range Statement corrected.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway and may also be part of a Structures Maintenance Certificate IV training pathway. It covers the competencies required to remove and install a range of pressurised aircraft structural and non-structural components. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines

Application of the Unit

This unit requires application of hand skills and maintenance publications to remove and install structural and non-structural components from pressurised aircraft.

Applications include fixed wing aircraft with pressurised cabins.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA302C	Remove and install aircraft hydro-mechanical and landing gear system components
MEA303D	Remove and install aircraft pneumatic system components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Remove components	1.1. Structure is supported and prepared in accordance with the applicable maintenance manual to ensure personnel safety and freedom from damage to aircraft or component during component removal
	1.2. Component removal is carried out in accordance with the applicable maintenance manual
	1.3. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
	1.4. Removed components are tagged and prepared for transport in accordance with specified procedures
2. Install components	2.1. ***Structural components*** to be installed are checked to confirm correct part numbers, serviceability and modification status
	2.2. Component installation is carried out in accordance with the applicable maintenance manual
	2.3. Support/safety equipment is removed at an appropriate time to ensure personnel safety and freedom from structural damage
	2.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices, including the use of MSDS and PPE

- using relevant maintenance documentation and aircraft manuals to:
  - remove structural components
  - install structural components
  - remove doors, door seals, windows and transparent panels
  - install doors, door seals, windows and transparent panels
- checking and adjusting all doors and access panels, including locking mechanisms and ensuring effective sealing

Required knowledge

Look for evidence that confirms knowledge of:

- structural component methods of construction and attachment
- faying surface treatment and fuel tank and pressure hull sealing
- aircraft doors and related seals
- window and transparent panel construction, attachment methods and sealing
- aircraft interior fittings (trim, linings, seats, floor panels, and so on) construction and attachment methods
- the location and attachment or stowage methods for emergency equipment:
  - passenger escape systems
  - inflatable slides
  - life jackets
  - life rafts
  - location transmitters, beacons
  - crew and/or passenger seat restraints
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures
- relevant OHS practices
- how to obtain MSDS
- use of PPE
- relevant maintenance manuals

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to use maintenance manuals and applicable tools to remove and install removable structural and non-structural components from pressurised aircraft

	while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable into other units that require similar techniques. It is essential that shoring, trestling and lifting requirements and safety precautions applicable to the structure being maintained are fully observed, understood and complied with. Evidence of transferability of skills and knowledge related to removal and installation is essential. This may be demonstrated through application across a representative range of the areas listed in the Range Statement. An understanding of component handling, attachment methods, adjustment and sealing as it relates to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one item from each of Groups 1 to 6, as listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance manuals. It is also expected that general purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present

with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Removable components of structure	Removable components are those that are installed using bolts and/or screws. Where component removal and installation requires the removal and installation of rivets the applicable unit is either: • MEA311D Inspect and repair/modify aircraft structures, or • MEA423A Aircraft structure major disassembly and reassembly Structural components may include: 1. Removable components of wings, pylons, empennage, landing gear support structure, fairings, nacelles and thrust reversers 2. Removable components or sections of pressurised aircraft fuselage 3. Pressurised fuselage entry, cargo, access doors and associated pressure seals 4. Pressurised fuselage windows, transparent panels and associated seals 5. Where applicable, trim panels, linings, seats, cabin equipment and consoles, floor panels and coverings 6. Applicable emergency and safety equipment, including passenger escape systems, inflatable, slides, life jackets, rafts, location transmitters, beacons, crew and/or passenger seat restraints
Installation	Installation includes: • checking and adjustment of all doors and access panels, including locking mechanisms, for correct fit and sealing
Sealant removal and application	The removal and application of faying (contact or overlapping) surface, pressure hull and fuel tank sealants is included, where applicable
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities

Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA318C Inspect aircraft hydro-mechanical, mechanical, gaseous and landing systems and components

Modification History

References to test and troubleshoot removed from skill and knowledge requirements - equivalent to previous version.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathways. It covers the competencies required to inspect aircraft hydro-mechanical, gaseous and landing gear systems and components. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen B1 maintenance certification licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills, standard trade practices and systems knowledge in the inspection of aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components.

Applications include hydro-mechanical, mechanical, gaseous and landing gear systems and components fitted to fixed wing aircraft.

Licensing/Regulatory Information

Refer to unit descriptor

Pre-Requisites

MEA302C	Remove and install aircraft hydro-mechanical system and landing gear components
MEA303D	Remove and install aircraft pneumatic system components
MEA305C	Remove and install aircraft fixed wing flight control system components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Inspect hydro-mechanical systems and components	1.1 Isolation tags already attached to the system or related systems are checked and aircraft configured for safe system inspection and operation in accordance with specified procedures
	1.2 ***Hydro-mechanical system and system components*** are visually or physically checked for external signs of defects in accordance with specified procedures
2 Inspect landing gear systems and components	2.1 Isolation tags already attached to the system or related systems are checked and aircraft configured, including jacking, where necessary, for safe system inspection and operation in accordance with specified procedures
	2.2 ***Landing gear system and system components*** are visually or physically checked for external signs of defects in accordance with specified procedures
3 Inspect gaseous systems and components	3.1 Isolation tags already attached to the system or related systems are checked and aircraft configured for safe system inspection and operation in accordance with specified procedures
	3.2 ***Gaseous system and system components*** are visually or physically checked for external signs of defects in accordance with specified procedures
4 Inspect mechanical systems and components	4.1 Isolation tags already attached to the system or related systems are checked and aircraft configured for safe system inspection and operation in accordance with specified procedures

4.2 ***Mechanical system and system components*** are visually or physically checked for external signs of defects in accordance with specified procedures

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- how to recognise external defects in hydraulic, fuel, gaseous, flight control, landing gear and mechanical system components
- how to configure the aircraft for inspection of hydraulic, fuel, gaseous, flight control, landing gear and mechanical systems and components
- inspection and testing requirements for gears, springs and bearings
- standard trade practices relating to tool usage and installation/securing of aircraft hardware
- maintenance requirements
- relevant OHS practices relating to hydraulic, fuel, gaseous, flight control, landing gear and mechanical system components, including lifting and handling of heavy items
- how to obtain MSDS
- selection and use of PPE
- maintenance requirements
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Look for evidence that confirms skills in:

- applying all relevant OHS practices, including the use of MSDS and PPE
- using maintenance manuals and documentation to prepare the aircraft and identify requirements for inspection of hydraulic, fuel, gaseous, flight control, landing gear and mechanical systems and components
- use of hand skills and tools in the inspection of hydraulic, fuel, flight control, gaseous and mechanical system components
- jacking of the aircraft, as required, for landing gear system inspection
- use of hand skills and tools in the inspection of landing gear components
- the recognition of external defects in hydraulic, fuel, gaseous, flight control, landing gear and mechanical systems and components

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	A person who demonstrates competency in this unit must be able to inspect a range of hydraulic, fuel, gaseous and mechanical system and landing gear components in accordance with relevant maintenance manual instructions while applying all relevant OHS procedures and standard processes.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection applications (including the timely involvement of supervisors or other trades) associated with aircraft hydro-mechanical, gaseous, mechanical and landing gear systems and their components. It is essential that system/component inspection procedures take into account all safety precautions applicable to the system being maintained, especially where system operation/switching interrelates to other systems being maintained. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection is essential. This may be demonstrated through application across a number of aircraft systems or aircraft types. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of this unit of competency are being achieved under routine supervision on each type of system and on at least one component of each group listed in the Range Statement, as follows: • Hydraulic systems – a system and at least one component from each of hydro-mechanical system components 3 and 5 • Fuel systems – a system and at least one component from each of hydro-mechanical system components 4 and 5 • Landing gear systems – each listed system 6 to 8 • Landing gear components – one each of 9 to 11 • Gaseous systems – each listed system 12 to 15 and at least one component from each of gaseous system components 16 to 19 • Mechanical systems – a system applicable to each of system types 20 and 21 and at least one component from each of mechanical system components 22 to

	24. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment, using procedures, tools and equipment specified in maintenance documentation. It is also expected that general purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained the following related units will have met the Performance Criteria and Range Statement variables for Elements listed: • MEA309C Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components, for Element 1 • MEA309C Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components, for Element 2, provided that the unit was attained on aircraft with retractable landing gear • MEA310C Inspect, test and troubleshoot aircraft pneumatic systems and components, for Element 3 • MEA312C Inspect, test and troubleshoot aircraft fixed wing flight control systems and components, for Element 4. Log of Industrial Experience and Achievement records relating to the listed units may be accepted as also meeting the evidence requirements for this unit in the applicable Elements. Advice in MEA310C Inspect, test and troubleshoot aircraft pneumatic systems and components regarding MEA355A Maintain light aircraft air cycle air conditioning systems, and MEA356A Maintain light piston engine aircraft pressurisation systems, may also be taken into consideration where applicable.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Hydro-mechanical systems and system components	Hydro-mechanical systems include: 1. Hydraulic systems 2. Fuel systems Components of hydro-mechanical systems include: 3. Hydraulic accumulators, filters, reservoirs, valves, pumps, motors, actuators, regulators and direct reading gauges 4. Fuel system filters, valves, pumps, and rigid and flexible storage cells/tanks 5. Rigid and flexible pipelines, hoses and fittings
Landing gear systems and system components (components of landing gear retraction, steering and braking systems are covered by hydro-mechanical and mechanical system components)	Landing gear systems include: 6. Retraction systems 7. Steering systems 8. Brake systems, including anti-skid, where applicable Landing gear components include: 9. Wheel assemblies 10. Brake units 11. Struts/oleos
Gaseous systems and system components	Gaseous systems include: 12. Pneumatic 13. Air cycle air conditioning 14. Pressurisation 15. Fire-extinguishing Gaseous system components include: 16. Gauges (direct reading), temperature sensors,

	pressurisation controllers and temperature controllers 17. Heat exchangers, pressure vessels, condensers, compressors, expansion turbines, humidifiers, valves and actuators 18. Rigid and flexible pipelines and fittings 19. Ducting
Mechanical systems and system components	Mechanical systems include: 20. Mechanical operating and locking systems 21. Mechanical flight control systems or the mechanical elements of power-assisted flight control systems Mechanical system components include: 22. Cables, pulleys, guides, fairleads, tension regulators, chains and sprockets 23. Control rods, torque tubes, bellcranks, screwjacks, clutches, springs, bearings and gears 24. Control sticks, wheels, columns, trim wheels or handles, and rudder pedals
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA319C Inspect gas turbine engine systems and components

Modification History

Knowledge statements expanded - equivalent to previous version.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathways. It covers the competencies required to inspect the systems and components of gas turbine engines. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen B1 maintenance certification licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills, the use of maintenance publications and knowledge of gas turbine engine and system theory to inspect gas turbine engines and engine system components.

Applications include fixed and rotary wing aircraft.

Licensing/Regulatory Information

Refer to unit descriptor

Pre-Requisites

MEA306C Remove and install engine system and components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and

	knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Inspect gas turbine engine systems and components	1.1 Isolation tags already attached to the system or related systems are checked and aircraft configured for safe system inspection and operation in accordance with applicable maintenance manual
	1.2 ***Gas turbine engine*** and/or components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- gas turbine engine layout and operation:
  - intakes
  - compressors
  - combustion chambers
  - turbines
  - exhaust
  - thrust reversers
  - accessory drives
  - bearings and seals
  - maintenance requirements
- system and component operation, including electrical and instrument system interfaces:
  - fuel control and fuels
  - lubrication and lubricants
  - air distribution
  - starting
  - ignition
  - power augmentation
  - instrumentation:
    - performance indication
    - condition indication
    - warning

    - presentation and interpretation of electronic displays
  - fire warning and extinguishing
  - control system
- engine spin/run procedures, including the operation of APUs
- engine condition monitoring
- relevant OHS practices, including the requirements for the lifting and handling of heavy components
- how to obtain MSDS
- selection and use of PPE
- maintenance requirements
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Look for evidence that confirms skills in:

- applying relevant OHS procedures, including lifting and handling of heavy components
- using MSDS and PPE
- using relevant maintenance documentation and aircraft manuals to:
  - recognise through visual/physical inspection external and internal signs of defects/damage to gas turbine engine, components and system components
  - assist with testing of gas turbine engine and engine system operation

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills, use maintenance publications and engine and system theory knowledge to inspect gas turbine engines and engine system components on fixed or rotary wing aircraft while applying all relevant safety precautions, in particular those relating to high-energy ignition units.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection applications (including the timely involvement of supervisors or other trades) associated with gas turbine engines, components and systems. It is essential that inspection procedures take into account all safety precautions applicable to the system/component being maintained. Ability to interpret inspection procedures and specifications (allowable

	limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection is essential. This may be demonstrated through application across a number of engine systems. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on each of the systems listed in Range Statement Groups 1 to 6 and at least one component of each system. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance manuals. It is also expected that general purpose tools, test and ground support equipment found in most routine situations and used to assist in the inspection process would be used where appropriate.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained MEA 314C Inspect, test and troubleshoot gas turbine engine systems and components, will have fully met the criteria for this unit. Log of Industrial Experience and Achievement records relating to MEA314C Inspect, test and troubleshoot gas turbine engine systems and components, may be accepted as also meeting the evidence requirements for this unit.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Gas turbine engine and components	Gas turbine engine may include: 1. Engine change unit, main components and accessories/drives 2. Control system 3. Ignition and starter systems 4. Fuel system 5. Oil system 6. Air system
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA320C Test and troubleshoot aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components

Modification History

References to flight controls removed from Range Statement - equivalent to previous version.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathways and must be taken with MEA318C Inspect aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components. It covers the competencies required to test and troubleshoot hydro-mechanical, mechanical, gaseous and landing gear systems and components. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirements for the granting of the chosen B1 maintenance certification licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills, standard trade practices and systems knowledge in the testing and troubleshooting of aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components.

Applications include hydro-mechanical, mechanical, gaseous and landing gear systems and components fitted to fixed wing aircraft.

Licensing/Regulatory Information

Refer to unit descriptor

Pre-Requisites

MEA318C	Inspect aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Prepare for troubleshooting	1.1 Relevant maintenance documentation and modification status, including system defect/service difficulty reports where relevant, are interpreted to identify an unserviceability
2 Test hydro-mechanical, mechanical, gaseous and landing gear systems and components	2.1 The aircraft and hydro-mechanical, mechanical, gaseous and landing gear systems are correctly prepared, in accordance with specified procedures, for the application of power
	2.2 Power is applied and system and components functionally tested, in accordance with specified procedures, for evidence of malfunction or leaks
	2.3 System calibration or adjustments are performed in accordance with specified procedures
3 Troubleshoot hydro-mechanical, mechanical, gaseous and landing gear systems and components	3.1 Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination
	3.2 Maintenance manual fault diagnosis guide and logical processes are used to ensure efficient and accurate ***troubleshooting***
	3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process
	3.4 ***Hydro-mechanical, mechanical, gaseous and landing gear system and component*** faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required
	3.5 Fault rectification requirements are determined to assist in planning the repair or adjustment

Required Skills and Knowledge

- hydraulic, fuel, gaseous, mechanical and landing gear system layout, operation and characteristics and system component operation and construction, including electrical system interfaces
- how to configure the aircraft for testing and troubleshooting of hydraulic, fuel, gaseous, mechanical and landing gear systems and components
- standard trade practices relating to tool usage and installation/securing of aircraft hardware
- fluid power theory
- hydraulic system layout, operation and characteristics (including electrical and instrument system interfaces) and system component construction and operation for:
  - flight control systems, including primary controls, flaps, speed brakes and spoilers
  - landing gear retraction systems
  - brake and anti-skid systems
  - nose wheel steering systems
- fuel system and component layout, operation and characteristics (including electrical system interfaces) and system component operation and construction
- gaseous (pneumatic, air conditioning, pressurisation and fire-extinguishing system and component layout, operation and characteristics (including electrical and instrument interfaces) and system component operation and construction
- construction and operation of landing gear components, including:
  - wheel assemblies
  - struts/oleos
  - uplocks and downlocks
- mechanical systems and linkages, including those related to the above systems
- how to configure the aircraft for inspection, testing and troubleshooting of hydraulic, fuel and landing gear systems and components
- maintenance requirements and troubleshooting procedures
- relevant OHS practices relating to hydraulic, fuel, gaseous, mechanical and landing gear systems and components, including lifting and handling of heavy items
- how to obtain MSDS
- selection and use of PPE
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Look for evidence that confirms skills in:

- applying all relevant OHS procedures, including selection and use of PPE and MSDS
- using maintenance manuals to prepare the aircraft for testing and troubleshooting of hydraulic, fuel, gaseous, flight control, landing gear and mechanical systems and components
- use of hand skills, tools and systems knowledge in the testing, adjustment and

troubleshooting of hydraulic, fuel, gaseous, mechanical and landing gear systems
- use of hand skills, tools and component knowledge in the adjustment and troubleshooting of hydraulic, fuel, gaseous and mechanical system components
- jacking of the aircraft, as required, for landing gear system testing, rigging and troubleshooting
- use of hand skills, tools and system/component knowledge in the adjustment and troubleshooting of landing gear components
- the effective use of maintenance documentation and relevant fault diagnosis guides in the troubleshooting process
- the recognition of external defects in hydro-mechanical, gaseous, mechanical and landing gear systems and components

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to test and troubleshoot a range of hydraulic, fuel, gaseous and mechanical system and landing gear components in accordance with relevant maintenance manual instructions while applying all relevant OHS procedures and standard processes.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with aircraft hydro-mechanical, gaseous, mechanical and landing gear systems and their components. It is essential that system test procedures take into account all safety precautions applicable to the system being maintained, especially where system operation/switching interrelates to other systems being maintained. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to testing and troubleshooting is essential. This may be demonstrated through application across a number of aircraft systems or aircraft types. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system

	fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of this unit of competency are being achieved under routine supervision on each type of system and on at least one component of each group listed in the Range Statement, as follows: • Hydraulic systems – a system and at least one component from each of hydro-mechanical system components 3 and 5 • Fuel systems – a system and at least one component from each of 4 and 5 • Landing gear systems – each listed system 6 to 8 • Landing gear components – one each of 9 to 11 • Gaseous systems – each listed system 12 to 15 and at least one component from each of gaseous system components 16 to 19 • Mechanical systems – a system applicable to 20 and at least one component from each of mechanical system components 21 and 22. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment, using procedures, tools and equipment specified in maintenance documentation. It is also expected that general purpose tools, test and ground support equipment found in most routine situations would be used where appropriate. The level of troubleshooting is limited in its application to the use of fault diagnosis guides or other similar information.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained the following related units will have met the Performance Criteria and Range Statement variables for Elements listed: • Element 1 – any one of MEA309C Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear system and components, or MEA310C Inspect, test and troubleshoot aircraft pneumatic systems and

	components • Elements 2 and 3 – MEA309C Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear system and components, for hydro-mechanical system variables, and MEA310C Inspect, test and troubleshoot aircraft pneumatic systems and components, for gaseous system variables Log of Industrial Experience and Achievement records relating to the listed units may be accepted as also meeting the evidence requirements for this unit in the applicable Elements for systems and components as listed in the Range Statement variables. Advice in MEA310C Inspect, test and troubleshoot aircraft pneumatic systems and components, regarding MEA355A Maintain light aircraft air cycle air conditioning systems, and MEA356A Maintain light piston engine aircraft pressurisation systems, may also be taken into consideration where applicable.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Hydro-mechanical systems and components	Hydro-mechanical systems include: 1. Hydraulic systems 2. Fuel systems Components of hydro-mechanical systems include: 3. Hydraulic accumulators, filters, reservoirs, valves, pumps, motors, actuators, regulators and direct reading gauges 4. Fuel system filters, valves, pumps, rigid and flexible storage cells/tanks 5. Rigid and flexible pipelines, hoses and fittings

Landing gear systems and components (components of landing gear retraction, steering and braking systems are covered by hydro-mechanical and mechanical system components)	Landing gear systems include: 6. Retraction systems 7. Steering systems 8. Brake systems, including anti-skid, where applicable Landing gear components include: 9. Wheel assemblies 10. Brake units 11. Struts/oleos
Gaseous systems and components	Gaseous systems include: 12. Pneumatic 13. Air cycle air conditioning 14. Pressurisation 15. Fire-extinguishing Gaseous system components include: 16. Gauges (direct reading), temperature sensors, pressurisation controllers and temperature controllers 17. Heat exchangers, pressure vessels, condensers, compressors, expansion turbines, humidifiers, valves and actuators 18. Rigid and flexible pipelines and fittings 19. Ducting
Mechanical systems and components	Mechanical systems include: 20. Mechanical operating and locking systems Mechanical system components include: 21. Cables, pulleys, guides, fairleads, tension regulators, chains and sprockets 22. Push/pull rods, torque tubes, bellcranks, screwjacks, clutches, springs, bearings and gears
Troubleshooting	Troubleshooting involves the use of fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities

Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA321C Test and troubleshoot aircraft fixed wing flight control systems and components

Modification History

Release 2 – Additional information in Range Statement and change to Assessment Requirements - equivalent.

Release 1 - Knowledge statements expanded - equivalent to previous version.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathways and must be taken with MEA318C Inspect aircraft hydro-mechanical, mechanical gaseous and landing gear systems and components. It covers the competencies required to test and troubleshoot fixed wing aircraft flight control systems and components. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen B1 maintenance certification licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of maintenance publications and knowledge of system theory to test and troubleshoot aircraft flight control systems and components.

Applications include fixed wing aircraft.

Licensing/Regulatory Information

Refer to unit descriptor

Pre-Requisites

MEA318C	Inspect aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Prepare for troubleshooting	1.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are interpreted to identify an unserviceability
2 Test fixed wing flight control systems	2.1 Powered controls of the aircraft and system are prepared, in accordance with maintenance manual, for the application of electrical and hydraulic power
	2.2 Power is applied, if necessary, and system is functionally tested, in accordance with applicable maintenance manual, for malfunction or evidence of incorrect rigging
	2.3 System rigging is performed in accordance with applicable maintenance manual
3 Troubleshoot fixed wing flight control systems	3.1 Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination
	3.2 Maintenance manual fault diagnosis guide and logical processes are used to ensure efficient and accurate ***troubleshooting***
	3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process
	3.4 ***Fixed wing flight control system*** faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required
	3.5 Fault rectification requirements are determined to assist in planning the repair or adjustment

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- OHS precautions relevant to flight control system maintenance
- standard trade practices relating to tool and test/rigging equipment usage and installation/securing of system components
- flight control system layout and operation
- theory of flight:
  - airflow
  - conditions of flight
  - lift and forces
  - drag
  - wings, tailplane and vertical stabiliser
  - lift augmentation (flaps, slats and slots)
  - aircraft control surfaces and their function (elevator, ailerons, rudder, elevons and trim tabs)
  - spoilers and speed brakes
  - flight control balancing and flutter
  - stability and control and flight control rigging
- mechanical system layout and operation:
  - cockpit controls
  - cables and cable tensioning
  - pulleys and fairleads
  - bellcranks
  - levers
  - control surface horns
  - screwjacks
  - push/pull rods
- powered flight controls:
  - system layout and operation
  - component construction and operation
  - electrical and instrument interfaces:
    - flaps
    - trim
    - position indication
- flight control system maintenance procedures and troubleshooting methods
- flight control system rigging equipment and procedures
- flight control system interfaces with automatic pilot systems and automatic flight control systems
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Look for evidence that confirms skills in:

- applying all relevant OHS procedures
- using relevant maintenance documentation and aircraft manuals to:
  - recognise defects during visual inspection of fixed wing flight control systems and system components
  - rig fixed wing flight control systems
  - functionally test the operation of fixed wing flight control systems and recognise system/component malfunction or evidence of incorrect rigging
  - to the extent permitted by applicable fault diagnosis guides, troubleshoot unserviceabilities in fixed wing flight control systems and clearly record the causes of the unserviceabilities

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and use maintenance publications and system theory knowledge to test and troubleshoot fixed wing aircraft flight control systems and components while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with the aircraft fixed wing flight systems. It is essential that testing procedures take into account all safety precautions associated with flight control system operation, in particular where system operation/switching interrelates with other systems being maintained, and that knowledge be demonstrated of dual inspection requirements associated with work on flight controls and systems. Evidence of transferability of skills and knowledge related to testing and troubleshooting is essential. This may be demonstrated through application across a number of aircraft types. The application of ground testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system

	fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one item from each of Groups 1 to 5 in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in aircraft maintenance manuals. It is also expected that general purpose tools, test and ground support equipment found in most routine situations would be used where appropriate. The level of troubleshooting is limited in its application to the use of fault diagnosis guides or other similar information.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained MEA312C Inspect, test and troubleshoot aircraft fixed wing flight control systems and components, will have met the requirements for the Performance Criteria for Element 1. The requirements for Elements 2 and 3 will also be met if recorded experience for MEA312C Inspect, test and troubleshoot aircraft fixed wing flight control systems and components, involved aircraft with powered flight controls. If experience was gained on aircraft types with only mechanical flight controls the recorded experience will partially meet the requirements for this unit. Log of Industrial Experience and Achievement records relating to MEA312C Inspect, test and troubleshoot aircraft fixed wing flight control systems and components, may be accepted as also meeting the evidence requirements for this unit in the applicable areas.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Fixed wing flight control system and components	Flight control systems and system components may include: 1. Elevator, aileron and rudder primary flight control systems and associated trim systems 2. Speed brake, spoiler, flap and high lift systems 3. Ailerons, elevators, rudders, trim tabs, speed brakes, spoilers, flaps, slats 4. Actuators – mechanical, hydraulic, pneumatic or electric 5. Mechanical flight control components including cables, pulleys, guides, fairleads, tension regulators, control rods, bellcranks, torque tubes, chains, sprockets, control sticks (or wheels or columns), trim wheels or handles, and rudder pedals.
Troubleshooting	Troubleshooting involves the use of fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA322C Test and troubleshoot gas turbine engine systems and components

Modification History

Knowledge statements expanded - equivalent to previous version.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathways and must be taken with MEA319C Inspect gas turbine engine systems and components. This unit covers the competencies required to test and troubleshoot the systems and components of gas turbine engines. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen B1 maintenance certification licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills, the use of maintenance publications and knowledge of gas turbine engine and system theory to test and troubleshoot gas turbine engines and engine system components.

Applications include fixed and rotary wing aircraft.

Licensing/Regulatory Information

Refer to unit descriptor

Pre-Requisites

MEA319C Inspect gas turbine engine systems and components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the	Performance criteria describe the performance needed to

essential outcomes of a unit of competency.	demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Prepare for troubleshooting	1.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are interpreted to identify an unserviceability
2 Test gas turbine engine system	2.1 Aircraft and ***gas turbine engine system*** are correctly prepared in accordance with applicable maintenance manual and connected to appropriate test equipment
	2.2 Built-in system test functions and status displays are activated, where applicable, outputs recorded and interpreted
	2.3 Assistance is provided with gas turbine engine and/or system operation during prescribed test procedures to establish serviceability and correct function in accordance with applicable maintenance manual
3 Troubleshoot gas turbine engine system	3.1 Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination
	3.2 Maintenance manual fault diagnosis guide and logical processes are used to ensure efficient and accurate ***troubleshooting***
	3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process
	3.4 Gas turbine engine system faults are located and causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required
	3.5 Fault rectification requirements are determined to assist in planning the repair or adjustment

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- fault diagnosis techniques
- gas turbine engine layout and operation:
  - types of gas turbine
  - operating principles and power output
  - gas path
  - intakes
  - compressors
  - combustion chambers
  - turbines
  - exhaust
  - thrust reversers
  - accessory drives
  - bearings and seals
  - maintenance requirements and troubleshooting procedures
- system and component operation, including electrical and instrument system interfaces:
  - fuel control and fuels
  - lubrication and lubricants
  - air distribution
  - starting
  - ignition
  - power augmentation
  - instrumentation:
    - performance indication
    - condition indication
    - warning
    - presentation and interpretation of electronic displays
  - fire warning and extinguishing
  - control system and rigging of engine controls
- engine spin/run procedures including the operation of APUs
- engine condition monitoring
- relevant OHS practices, including the requirements for the lifting and handling of heavy components
- how to obtain MSDS
- selection and use of PPE
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Look for evidence that confirms skills in:

- applying relevant OHS procedures, including lifting and handling of heavy components
- using MSDS and PPE
- using relevant maintenance documentation and aircraft manuals to:

- recognise through visual/physical inspection external and internal signs of defects in gas turbine engines, components and system components
- assist with testing of gas turbine engine and engine system operation, be able to operate systems, monitor indications, record parameters and recognise correct function
- compile engine condition monitoring records
- rig and adjust engine controls and systems

- using fault diagnosis guides and equivalent data, to accurately and efficiently troubleshoot the causes of unserviceabilities in gas turbine engines and engine systems, clearly record details and identify the required rectification actions

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills, use maintenance publications and engine and system theory knowledge to test and troubleshoot gas turbine engines and engine system components on fixed or rotary wing aircraft while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisor or other trades) associated with engine systems. It is essential that system test procedures take into account all safety precautions associated with gas turbine engine system operation, especially with regard to high-energy ignition units, and that awareness be demonstrated of dual inspection requirements associated with work on engine control systems. Evidence of transferability of skills and knowledge related to testing and troubleshooting is essential. This may be demonstrated through application across a number of engine systems or engine types. The application of testing procedures and functional rigging checks should also indicate knowledge of system operation. Engine system operation knowledge, the relationship of individual components and the links with other systems will be necessary to supplement evidence of ability to carry out rigging checks and troubleshoot the system within the limits of the aircraft/system

	fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one item from each of Groups 1 to 6 in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in aircraft maintenance manuals. It is also expected that general purpose tools, test and ground support equipment found in most routine situations would be used where appropriate. The level of troubleshooting is limited in its application to the use of fault diagnosis guides or other similar information.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained MEA314C Inspect, test and troubleshoot gas turbine engine systems and components, will have fully met the criteria for this unit. Log of Industrial Experience and Achievement records relating to MEA314C Inspect, test and troubleshoot gas turbine engine systems and components, may be accepted as also meeting the evidence requirements for this unit.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide

Gas turbine engine systems	Gas turbine engine systems may include: 1. Engine change unit, main components and accessories/drives 2. Control system 3. Ignition and starter systems 4. Fuel system 5. Oil system 6. Air system
Troubleshooting	Troubleshooting involves the use of fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA323B Perform advanced troubleshooting in aircraft mechanical maintenance

Modification History

Minor formatting and editorial changes made. Missing skill requirements reinstated.

Unit Descriptor

This unit covers competencies required to progress from an Aircraft Maintenance Engineer at Certificate IV to the granting of a chosen B1 Aircraft Maintenance Engineer Licence or Aircraft Maintenance Specialist Certificate under CASR Part 66, in accordance with the licensing provisions in the Assessment Guidelines.

The skills and knowledge covered by the units of competency listed in the MEA11 Aeroskills Training Package for Aircraft Maintenance Engineer (Avionics or Mechanical as applicable) at Certificate IV are prerequisite to the attainment of the elements of competency specified in this unit. This includes full coverage of the CASR Part 66 Avionics or Mechanical Syllabus subjects/topics listed in the Assessment Guidelines.

Application of the Unit

This unit requires application of system theory knowledge and advanced fault diagnostic skills to identify the cause of defects that are beyond the bounds of maintenance manual fault diagnosis guides.

Applications include fixed and rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Verify the defect	1.1. Available information from flight crew, such as flight phase, aircraft configuration, etc., maintenance documentation both current and previous history, is used as necessary, to assist in fault determination
	1.2. Inspection of the ***affected system*** is carried out to check both physical integrity and correct operation
	1.3. Information gained from Central Maintenance Systems is verified against physical integrity and correct operation, where applicable
	1.4. The effects on a system from interfaces/ integration with other systems are taken into account
2. Isolate the defect	2.1. Logical processes, including the application of basic principles and system knowledge and known facts are used to augment maintenance manual fault diagnosis guides to ensure efficient and accurate troubleshooting
	2.2. Specialist advice is obtained, where required and/or available, to assist with the troubleshooting process.
	2.3. Faults are located and the causes of the defects are clearly identified and correctly recorded in maintenance documentation, including any other system(s) disturbed, where required
3. Determine defect rectification requirements	3.1. Defect rectification requirements are determined and the necessary repair action initiated once verification and isolation of the defect are confirmed
4. Verify defect rectification	4.1. Defect is rectified in accordance with approved maintenance data

4.2. All systems disturbed or accessed during troubleshooting are restored as applicable using maintenance manuals, repair schemes or approved maintenance data

4.3. All checks required by approved maintenance data to ensure correct operation of all disturbed systems are performed

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures
- the diagnosis of faults that are beyond the coverage of maintenance manual fault diagnosis guides in simulated applications in the training environment and/or in the workplace across a representative range of systems and components

Required knowledge

For systems and components relevant to the scope of the licence/ratings sought knowledge is required of:

- theory related to system operation and interfaces between systems and with electrical/electronic control media to a level that will facilitate the diagnosis of faults beyond the level of maintenance manual fault diagnosis guides using reported symptoms and functional test results
- component construction and theory of operation to a level that will facilitate the diagnosis of faults beyond the level of maintenance manual fault diagnosis guides using reported symptoms and functional test results
- advanced fault diagnostic techniques
- condition monitoring and trend analysis techniques

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply system theory knowledge and advanced fault diagnostic skills to identify the causes of defects not covered fully by maintenance manual fault diagnosis guides while observing all relevant safety precautions.

Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications related to mechanical systems, and where applicable other system interfaces/integration. It is essential that system test procedures take into account all safety precautions applicable to the system being maintained. Ability to interpret inspection procedures and specifications (allowable limits) and ensure that they are applied in practice is critical, as is the demonstrated ability to apply fundamental system theory in the logical diagnosis of complex faults. Evidence of transferability of skills and knowledge related to performance and supervision of inspection, testing and troubleshooting is essential. This must be demonstrated through application across a number of aircraft mechanical systems, including system interfaces/integration. The troubleshooting approach should clearly demonstrate an in-depth knowledge of underpinning theory of a system, with this knowledge being used in a logical process to augment and extend the scope of the aircraft/ system fault-finding guide. The fault rectification work plan should take account of applicable safety (including safe handling of heavy components) and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved and the ability to identify the causes of defects not covered fully by maintenance manual fault diagnosis guides has been demonstrated under supervision without intervention. This shall be established via simulated activities at the CASR Part 147 Maintenance Training Organisation and performance during observed workplace activities.
Context of and specific resources for assessment	Competency is assessed in the workplace or simulated workplace and shall involve successfully dealing with a number of maintenance and fault scenarios across a range of systems listed in the Range Statement and related system components.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Troubleshooting	The competency applies to the troubleshooting from first principles, of defects beyond available maintenance data in the systems of fixed or rotary wing aircraft types. Troubleshooting must be demonstrated across a range of typical systems and system components that includes, but is not limited to: • airframes, their engines and all systems (and parts thereof) operated by inherently mechanical or hydro-mechanical principles or means Coverage is not required of specific type systems that are included in type training and PCT activities leading to a specific type licence rating
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual activities or troubleshooting tasks that would be performed during supervision of other personnel
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise
Applicable systems	Affected systems may include: • hydro-mechanical systems • pneumatic systems • flight control systems • engines and engine systems • propeller and rotor systems

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA325B Weigh aircraft and perform aircraft weight and balance calculations as a result of modifications

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit covers competencies required to progress from an Aircraft Maintenance Engineer at Certificate IV to the granting of a chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

The skills and knowledge covered by the units of competency listed in the MEA11 Aeroskills Training Package for Aircraft Maintenance Engineer (Avionics or Mechanical as applicable) at Certificate IV are prerequisite to the attainment of the elements of competency specified in this unit. This includes full coverage of the CASR Part 66 Syllabus subjects/topics listed in Section 3.

Application of the Unit

This unit requires application of knowledge regarding aircraft weighing and the use of relevant maintenance publications and modification data (where applicable) to weigh an aircraft and use the results to calculate centre of gravity and confirm that it is within limits.

Applications include fixed and rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Weigh aircraft	1.1. The requirement for aircraft weighing is determined 1.2. Aircraft is weighed in accordance with the specified procedure 1.3. Aircraft weighing results are provided to the CAMO
2. Calculate the weight and balance impact of a modification	2.1. The new empty weight of the aircraft is determined and it is ensured that the weight is within the predetermined limits set by the CAMO 2.2. The new empty weight ***centre of gravity of the aircraft is calculated*** and it is ensured that the centre of gravity is within the predetermined limits set by the CAMO 2.3. Maintenance records are updated with new figures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures
- configuring aircraft for weighing
- weighing aircraft
- using weighing results to calculate centre of gravity

Required knowledge

Look for evidence that confirms knowledge of:

- types of weighing equipment used to weigh aircraft and associated safety precautions:
  - mechanical platform scales
  - electronic platform scales

  - electronic load pots
- methods used to level aircraft for weighing
- the importance of correctly configuring aircraft for weighing
- mathematical formulae used to calculate centre of gravity

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to determine the requirement to weigh an aircraft, weigh it using a specified method and use the results to calculate centre of gravity. Safety precautions applicable to the weighing method involved are to be fully observed.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of aircraft types. Ability to interpret the instructions for configuring and weighing aircraft is critical. Evidence of transferability of skills and knowledge related to weighing of aircraft and calculation of centre of gravity is essential. The aircraft weighing work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards, especially in relation to aircraft jacking and levelling. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under supervision without intervention. This shall be established via simulated activities at the CASR Part 147 MTO and performance during observed workplace activities.
Context of and specific resources for assessment	Competency may be assessed in the workplace or in the training environment.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Centre of gravity calculation	Centre of gravity of the aircraft is calculated: • using the results obtained by weighing an aircraft • using the weight and moment arm data for a modification
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual activities or supervision of other personnel
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA327B Fabricate and/or repair aircraft mechanical components or parts

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated. Additional assessment advice provided in the Evidence Guide. Missing knowledge requirements reinstated.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) and Structures Certificate IV training pathways. It covers the competencies required to fabricate and repair a range of aircraft mechanical components and parts. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen B1 Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of relevant maintenance manuals, drawings and specifications to fabricate and repair a range of aircraft mechanical components.

Applications include fixed and rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity

MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Fabricate mechanical components or parts	1.1. Specifications are interpreted to determine the dimensions and procedure for fabrication 1.2. Appropriate materials, tools, equipment and assembly or fabrication jigs are selected and prepared for the particular specification requirements 1.3. ***Components*** or parts are fabricated in accordance with required specifications 1.4. Test equipment and rigs are used, where applicable, to confirm serviceability of finished components 1.5. Fabricated components are tagged, sealed and packaged within specified procedures 1.6. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
2. Repair mechanical	2.1. Repair or replacement requirements are determined, following disassembly and assessment of component parts for

components or parts	serviceability, in accordance with the relevant maintenance documentation 2.2. Tagging and repair instructions are accurately specified for parts requiring specialist repair 2.3. Components are modified, as approved, by relevant manufacturers' bulletins or procedures 2.4. Mechanical component parts are assembled within specified tolerances and in accordance with the appropriate maintenance documents 2.5. Mechanical components are adjusted, as required, to operate within prescribed specifications 2.6. Repaired components are tagged, sealed and packaged in accordance with specified procedures 2.7. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures
- using relevant maintenance documentation, specifications and aircraft/component manuals to:
  - recognise state of serviceability and repair requirements for the range of mechanical components listed in the Range Statement
  - fabricate components
  - identify requirements and complete repairs
  - test and/or adjust components as required
  - correctly tag, seal and package completed components

Required knowledge

Look for evidence that confirms knowledge of:

- component operation
- fabrication and repair procedures and processes
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures
- relevant OHS practices
- how to obtain MSDS
- use of PPE

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and use relevant maintenance manuals, drawings and specifications to fabricate and repair mechanical components while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of fabrication and repair applications associated with aircraft components. It is essential that the relevant procedures are interpreted and applied to ensure quality and safety standards are achieved. Evidence of knowledge about the general aspects of material specification and selection, measurement and fabrication should be related to specific aircraft component fabrication applications. Evidence of transferability of skills and knowledge related to repair is essential. This may be demonstrated through application across a number of different aircraft components. Ability to assess component serviceability and interpret parts requirements will be necessary before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one item from each of Groups 1 to 4, as listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general and special purpose tools and test equipment found in most routine situations would be

	used where appropriate.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained MEA328C Maintain and/or repair aircraft mechanical components or parts, will have fully met the criteria for Element 2. Log of Industrial Experience and Achievement records relating to MEA328C Maintain and/or repair aircraft mechanical components or parts, may be accepted as also meeting the evidence requirements for the Performance Criteria for this Element.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Applicable components	Components to be fabricate and/or repaired may include: 1. Hose assemblies 2. Pipes 3. Cables, pulleys, chains, sprockets and gear drives 4. Control rods, bellcranks and links
Repair	Repair comprises standard techniques for pipes and replacement of eye-ends, tubes or bearings for control rods/pulleys/sprockets and bushes or bearings for bellcranks and links
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA328C Maintain and/or repair aircraft mechanical components or parts

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated. Additional assessment advice provided in the Evidence Guide.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to maintain and repair a range of aircraft mechanical components and parts. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of relevant maintenance publications to maintain and repair a range of aircraft mechanical components.

Applications include fixed and rotary wing aircraft, and components in workshops.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA302C	Remove and install aircraft hydro-mechanical and landing gear system components
MEA303D	Remove and install aircraft pneumatic system components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Maintain and/or repair mechanical components or parts
   - 1.1. Maintenance and/or repair requirements are determined, following disassembly and assessment of component parts for serviceability, in accordance with the relevant maintenance documentation
   - 1.2. Tagging and repair instructions are accurately specified for parts requiring specialist repair
   - 1.3. Appropriate materials, tools, equipment and assembly or fabrication jigs are selected and prepared for the particular specification requirements
   - 1.4. ***Components or parts*** are maintained, repaired or modified, as approved by relevant manufacturers' bulletins or procedures, in accordance with required specifications
   - 1.5. Mechanical component parts are assembled within specified tolerances and in accordance with the appropriate maintenance documents
   - 1.6. Mechanical components are adjusted, as required, to operate within prescribed specifications
   - 1.7. Test equipment and rigs are used, where applicable, to confirm serviceability
   - 1.8. Maintained/repaired or modified components are tagged, sealed and packaged within specified procedures
   - 1.9. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices, including the use of MSDS and PPE
- using relevant maintenance documentation, specifications and aircraft/component manuals to:
  - recognise state of serviceability and repair requirements for the range of mechanical components listed in the Range Statement
  - identify requirements and complete repairs and/or modifications
  - test and/or adjust components as required
  - correctly tag, seal and package completed components

Required knowledge

Look for evidence that confirms knowledge of:

- construction, repair procedures and processes for:
  - cables
  - pulleys
  - chains,=
  - sprockets
  - gear drives
  - control rods
  - bellcranks
  - linkages
  - non-structural removable components of fuselages, fairings, nacelles, empennage and wings
  - engine thrust reversers
  - from unpressurised aircraft:
    - entry, cargo and access doors
    - windows
    - transparent panels
- construction and serviceability criteria for hoses and pipes, including pressure test requirements
- construction, materials, cleaning and repair requirements for:
  - trim panels
  - cabin linings
  - seats
  - cabin equipment and consoles
  - floor panels
  - coverings

  - emergency equipment and stowages
  - cargo, crew and/or passenger seat restraints
- relevant OHS practices
- how to obtain MSDS
- use of PPE
- relevant maintenance manuals, standards and specifications
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and use relevant maintenance publications to maintain and repair mechanical components while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of maintenance and repair applications associated with aircraft components. It is essential that the relevant procedures are interpreted and applied to ensure quality and safety standards are achieved. Evidence of transferability of skills and knowledge related to maintenance/repair is essential. This may be demonstrated through application across a number of different aircraft components. Ability to assess component serviceability and interpret parts requirements will be necessary before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a representative range of components or parts from each of Groups 1 to 6, as listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where

	appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general and special purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained MEA327B Fabricate and/or repair aircraft mechanical components or parts, will have partially met the Performance Criteria for Element 1 for some of the listed variables. Log of Industrial Experience and Achievement records relating to MEA327B Fabricate and/or repair aircraft mechanical components or parts, may be accepted as also meeting the evidence requirements for the Performance Criteria for this Element in respect to common variables.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Components or parts to be maintained and/or repaired	Components or parts to be maintained and/or repaired may include: 1. Hoses 2. Pipes 3. Cables, pulleys, chains, sprockets and gear drives 4. Control rods, bellcranks and links 5. Non-structural removable components of fuselages, fairings, nacelles, empennage, wings, thrust reversers. For non-pressurised aircraft - entry, cargo, access doors and

	associated seals, windows and transparent panels 6. Trim panels, linings, seats, cabin equipment and consoles, floor panels, coverings, emergency equipment (including passenger escape systems, inflatable slides, life jackets, rafts, location transmitters, beacons, cargo, crew and/or passenger seat restraints)
Repair	Repair comprises standard techniques for pipes and replacement of eye-ends, tubes or bearings for control rods/pulleys/sprockets and bushes or bearings for bellcranks and links
Maintain	Maintain involves cleaning, inspection for wear or damage and adjustment and lubrication, where applicable
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA329B Dismantle, inspect, maintain and assemble aircraft basic hydraulic and pneumatic components or parts

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated. Missing knowledge requirements reinstated.

Unit Descriptor

This unit of competency is part of a Mechanical Certificate II training pathway. It covers the competencies required to maintain and/or repair aircraft basic hydraulic and pneumatic components under the guidance of a qualified person. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills and maintenance documentation to maintain, repair and modify aircraft basic hydraulic and pneumatic components under the guidance of a qualified person.

Applications include fixed and rotary wing aircraft components either attached to the aircraft or in a workshop.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications

MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Prepare to dismantle, inspect, maintain and assemble basic hydraulic and pneumatic components or parts	1.1. Components are removed and/or disassembled in accordance with enterprise procedures, relevant maintenance documentation and qualified person guidance 1.2. Maintenance and/or repair requirements, as defined by the qualified person, enterprise procedures and the relevant maintenance documentation, are understood 1.3. Tagging and repair instructions are accurately specified in accordance with enterprise procedures and qualified person directions for parts requiring specialist repair 1.4. Appropriate materials, tools, equipment and assembly or fabrication jigs, where applicable, are selected and prepared for the particular maintenance and repair requirements in accordance with enterprise procedures and relevant maintenance documentation
2. Dismantle, inspect, maintain and assemble basic hydraulic and pneumatic components or parts	2.1. Routine maintenance, repair or modification procedures are carried out, as approved by relevant manufacturers' bulletins or procedures, in accordance with required enterprise procedures and specifications 2.2. Component parts are assembled within specified

	tolerances and in accordance with enterprise procedures and the appropriate maintenance documents
	2.3. Where applicable and as required by the qualified person, assistance is provided in the final adjustment and testing of components to confirm serviceability
3. Complete maintenance and repair activities	3.1. Required documentation is completed and processed in accordance with standard enterprise procedures
	3.2. Maintained/repaired or modified components are tagged, sealed and packaged within specified procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures
- using relevant maintenance documentation, specifications and aircraft/component manuals to:
  - recognise state of serviceability and standard/routine repair requirements for the range of hydraulic and pneumatic components listed in the Range Statement
  - identify requirements under the guidance of a qualified person and complete routine repairs and/or modifications
  - adjust components under expert guidance, as required
  - where post-assembly testing is applicable, set up components for testing and have a basic understanding of the test procedures
  - correctly tag, seal and package completed components

Required knowledge

Look for evidence that confirms knowledge of:

- component operation at a basic level
- standard/routine repair procedures and processes
- relevant OHS practices
- how to obtain MSDS
- use of PPE

For the purpose of this unit of competency, basic knowledge is defined as the level of knowledge required to:

- understand the instructions provided by qualified persons and relevant documentation for the disassembly, routine replacement of component parts and seals and reassembly of components
- under guidance and in the training environment make post-assembly adjustments such as length of stroke or operating pressure

- under guidance and in the training environment perform simple tests involving pressure and function

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to maintain, repair and modify aircraft basic hydraulic and pneumatic components under qualified person guidance while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of maintenance and repair applications associated with aircraft components. It is essential that the relevant enterprise procedures are interpreted and applied to ensure quality and safety standards are achieved. Evidence of transferability of skills and knowledge related to maintenance/repair standard operating procedures is essential. This may be demonstrated through application across a number of different aircraft components. Ability to assess component serviceability under qualified person guidance and interpret parts requirements will be necessary before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under qualified person guidance on a representative range of components or parts from each of Groups 1 to 4, as listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general and special purpose tools

	found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	The Range Statements below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Components to be maintained and/or repaired/modified	Components to be maintained and/or repaired/modified may include: 1. Hoses 2. Pipes 3. Simple check or shutoff valves 4. Basic hydraulic and pneumatic actuators and valves
Routine work	Routine work is carried out using basic operational knowledge and a defined range of skills ('routine' work is that which follows a customary or regular course of procedure)
Work outcomes	All work outcomes are achieved by applying known solutions chosen from a limited range of pre-determined options consistent with enterprise procedures. This includes accepting responsibility for own work in terms of quality of outcomes using pre-determined specifications of quality
Scope of work	Note that the scope of any repair or modification and the procedure to be followed will be provided by the qualified person, and be within the scope of the skills and knowledge included in the unit of competency MEA109B Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Maintain	Maintain involves cleaning, inspection for wear or damage and consequent replacement of parts, and routine adjustment and lubrication where applicable in accordance with enterprise procedures
Application	Work can relate to: • routine scheduled or unscheduled maintenance activities performed under qualified person guidance in accordance with enterprise procedures • tasks performed either autonomously or as part of a team and under the guidance of a qualified person
Procedures and requirements	Refer to procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA330B Dismantle, inspect, maintain and assemble aircraft non-primary structural removable components or parts and internal fittings

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated. Missing knowledge requirements reinstated.

Unit Descriptor

This unit of competency is part of a Mechanical Certificate II training pathway. It covers the competencies required to maintain and perform routine basic repairs, under qualified person guidance, on a range of aircraft non-primary structural removable components or parts. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills and maintenance documentation to dismantle, inspect, maintain, and assemble aircraft non-primary structural removable components and interior fittings/emergency equipment under the guidance of a qualified person.

Applications include fixed and rotary wing aircraft components either attached to the aircraft or in a workshop.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes

MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Prepare to dismantle, inspect, maintain and assemble non-primary structural removable components or parts and internal fittings	1.1. Components are removed and/or disassembled in accordance with enterprise procedures, relevant maintenance documentation and qualified person guidance 1.2. Maintenance and/or repair requirements as defined by the qualified person, enterprise procedures and the relevant maintenance documentation, are understood 1.3. Tagging and repair instructions are accurately specified in accordance with enterprise procedures and qualified person directions for parts requiring specialist repair 1.4. Appropriate materials, tools, equipment and assembly or fabrication jigs, where applicable, are selected and prepared for the particular maintenance and repair requirements in accordance with enterprise procedures and relevant maintenance documentation
2. Dismantle, inspect,	2.1. ***Routine maintenance***, ***repair or modification***

maintain and assemble non-primary structural removable components or parts and internal fittings	***processes*** are carried out as approved by relevant manufacturers' bulletins or procedures in accordance with required enterprise procedures and specifications 2.2. Component parts are assembled within specified tolerances in accordance with enterprise procedures and the appropriate maintenance documents 2.3. Where applicable and as required by the qualified person, assistance is provided in the conduct of final load or functional tests
3. Complete maintenance/ modification activities	3.1. Required documentation is completed and processed in accordance with standard enterprise procedures 3.2. Where applicable, maintained/repaired or modified components are tagged, sealed and packaged within specified procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures
- using relevant maintenance documentation, specifications and aircraft/component manuals to:
  - for on-aircraft work, correctly remove and install components covered by the Range Statement, including emergency equipment
  - recognise state of serviceability and standard/routine repair requirements for the range of components listed in the Range Statement
  - identify requirements under the guidance of a supervisor and complete repairs and/or modifications
  - adjust components under expert guidance as required
  - where load or functional testing is applicable in the training environment, set up components for testing and perform tests
  - correctly tag, seal and package completed components

Required knowledge

Look for evidence that confirms knowledge of:

- component construction and/or operation at a basic level
- standard/routine repair procedures and processes
- relevant OHS practices
- how to obtain MSDS
- use of PPE

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to dismantle, maintain and assemble aircraft non-primary structural removable components or parts under qualified person guidance while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of maintenance and repair applications associated with the aircraft components listed in the Range Statement. It is essential that the relevant enterprise procedures are interpreted and applied to ensure quality and safety standards are achieved. Evidence of transferability of skills and knowledge related to maintenance/repair enterprise procedures is essential. This may be demonstrated through application across a number of different aircraft components. Ability to assess component serviceability and interpret parts requirements will be necessary before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under qualified person guidance on a representative range of components or parts from each of Groups 1 to 3, as listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general and special purpose tools found in most routine situations would be used where appropriate, and that competency would be demonstrated in setting up components for functional or load testing

	where such routine tests are specified.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	The Range Statements below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Routine maintenance, **repair or modification processes**	Routine maintenance, repair or modification processes may be performed on: 1. Non-structural removable components of fuselages, fairings, nacelles, empennage, wings and thrust reversers. For non-pressurised aircraft - entry, cargo, access doors and associated seals, windows and transparent panels 2. Trim panels, linings, seats, cabin equipment and consoles, floor panels, coverings, emergency equipment (including passenger escape systems and inflatable slides, where appropriate, i.e. excluding removal and installation of slides fitted to wide-bodied aircraft), and cargo, crew and/or passenger seat restraints 3. Stowages for life jackets, rafts, location transmitters and beacons (including the removal and installation of the equipment, where applicable)
Routine work	Routine work is carried out using basic operational knowledge and a defined range of skills ('routine' work is that which follows a customary or regular course of procedure.
Work outcomes	Work outcomes are achieved by applying known solutions chosen from a limited range of pre-determined options consistent with enterprise procedures. This includes accepting responsibility for own work in terms of quality

	of outcomes using pre-determined specifications of quality
Primary structure	Note that 'primary structure/structural' refers to all components of an aircraft, the failure of which would seriously endanger safety, e.g. wing or tailplane spars, main fuselage frames, engine bearers, portions of skin that are highly stressed. 'Non-primary' refers to any other items
The scope of any modification and the procedure to be followed	The scope of any modification and the procedure to be followed will be provided by the qualified person, and be within the scope of the skills and knowledge included in the unit of competency MEA109B Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
Repair	Repair comprises standard techniques as defined by the qualified person and/or the relevant maintenance manual
Maintain	Maintain involves removal and installation, cleaning, inspection for wear or damage and consequent replacement of parts, and routine adjustment and lubrication, where applicable, in accordance with enterprise procedures
Application	Work can relate to: • routine scheduled or unscheduled maintenance activities performed under qualified person guidance in accordance with enterprise procedures • tasks performed either autonomously or as part of a team and under the guidance of a qualified person
Procedures and requirements	Refer to procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA331B Dismantle, inspect, maintain and assemble aircraft gas turbine engine components or parts

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated. Missing knowledge requirements reinstated.

Unit Descriptor

This unit of competency is part of a Mechanical Certificate II training pathway. It covers the competencies required to undertake routine maintenance and/or repair/modify aircraft gas turbine engine components or parts under the guidance of a qualified person. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills and maintenance documentation to dismantle, inspect, maintain and assemble aircraft gas turbine engine components or parts under the guidance of a qualified person.

Applications include gas turbine engine components or parts in a workshop.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications

MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Prepare to dismantle, inspect, maintain and assemble aircraft gas turbine engine components or parts	1.1. Components are removed and/or disassembled in accordance with enterprise procedures, relevant maintenance documentation and qualified person guidance 1.2. Maintenance and/or repair requirements as defined by the qualified person, enterprise procedures and the relevant maintenance documentation, are understood 1.3. Tagging and repair instructions are accurately specified in accordance with enterprise procedures and qualified person directions for parts requiring specialist repair 1.4. Appropriate materials, tools, equipment and assembly or fabrication jigs, where applicable, are selected and prepared for the particular maintenance and repair requirements in accordance with enterprise procedures and relevant maintenance documentation
2. Dismantle, inspect, maintain and assemble aircraft gas turbine engine components or parts	2.1. Routine maintenance, repair or modification procedures are carried out, as approved by relevant manufacturers' bulletins or procedures, in accordance with required enterprise procedures and specifications 2.2. Component parts are assembled within specified

	tolerances and in accordance with enterprise procedures and the appropriate maintenance documents
	2.3. Where applicable and as required by the qualified person, assistance is provided in the final adjustment and testing of components to confirm serviceability
3. Complete maintenance repair or modification activities	3.1. Required documentation is completed and processed in accordance with standard enterprise procedures
	3.2. Maintained/repaired or modified components are tagged, sealed and packaged within specified procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures
- using relevant maintenance documentation, specifications and aircraft/component manuals to:
  - recognise state of serviceability and standard/routine maintenance and repair requirements for the range of engine components listed in the Range Statement
  - identify requirements under the guidance of a qualified person and complete repairs and/or modifications
  - correctly tag, seal and package completed components

Required knowledge

Look for evidence that confirms knowledge of:

- component operation at a basic level
- standard/routine repair procedures and processes
- relevant OHS practices
- how to obtain MSDS
- use of PPE

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to dismantle, inspect, maintain and assemble

	aircraft gas turbine engine components or parts under qualified person guidance while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of maintenance and repair applications associated with engine components. It is essential that the relevant enterprise procedures are interpreted and applied to ensure quality and safety standards are achieved. Evidence of transferability of skills and knowledge related to enterprise procedures for maintenance and repair is essential. This may be demonstrated through application across a number of different engine components. Ability to assess component serviceability under qualified person guidance and interpret parts requirements will be necessary before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under qualified person guidance on a representative range of components or parts listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general and special purpose tools found in most routine situations would be used where appropriate
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work

environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Routine work	Routine work is carried out using basic operational knowledge and a defined range of skills ('routine' work is that which follows a customary or regular course of procedure)
Work outcomes	Work outcomes are achieved by applying known solutions chosen from a limited range of pre-determined options consistent with enterprise procedures. This includes accepting responsibility for own work in terms of quality of outcomes using pre-determined specifications of quality
Components	Maintain basic components, such as: • oil coolers, fuel nozzles, flex drive shafts, fuel manifolds and engine bearings • engine change unit hoses, pipes and ducts, and like components fitted to modular assemblies and sub-assemblies
Repair or modify	Repair or modify compressor and turbine blades
Scope of work	Note that the scope of any repair or modification and the procedure to be followed will be provided by the qualified person, and be within the scope of the skills and knowledge included in the unit of competency MEA109B Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
Maintain	Maintain involves removal and installation, cleaning, inspection for wear or damage and consequent replacement of parts, and routine adjustment and lubrication, where applicable, in accordance with enterprise procedures
Application	Work can relate to: • routine scheduled or unscheduled maintenance activities performed under qualified person guidance in accordance with enterprise procedures • tasks performed either autonomously or as part of a team and under the guidance of a qualified person
Procedures and requirements	Refer to procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA332B Dismantle, inspect, maintain and assemble aircraft mechanical components or parts

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated. Missing knowledge requirements reinstated.

Unit Descriptor

This unit of competency is part of a Mechanical Certificate II training pathway. It covers the competencies required to maintain and/or perform basic routine repairs on a range of aircraft mechanical components or parts under the guidance of a qualified person. This unit does not cover work on hydraulic and pneumatic components or parts. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills and maintenance documentation to dismantle, inspect, maintain and assemble aircraft mechanical components or parts under the guidance of a qualified person.

Applications include components or parts either attached to the aircraft or in a workshop.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications

MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Prepare to dismantle, inspect, maintain and assemble basic mechanical components or parts	1.1. Components are removed and/or disassembled in accordance with enterprise procedures, relevant maintenance documentation and qualified person guidance 1.2. Maintenance and/or repair requirements as defined by the qualified person, enterprise procedures and the relevant maintenance documentation, are understood 1.3. Tagging and repair instructions are accurately specified in accordance with enterprise procedures and qualified person directions for parts requiring specialist repair 1.4. Appropriate materials, tools, equipment and assembly or fabrication jigs, where applicable, are selected and prepared for the particular maintenance and repair requirements in accordance with enterprise procedures and relevant maintenance documentation
2. Maintain and/or repair mechanical components or parts	2.1. Routine maintenance, repair or modification procedures are carried out, as approved by relevant manufacturers' bulletins or procedures, in accordance with required enterprise procedures and specifications

	2.2. Mechanical component parts are assembled within specified tolerances in accordance with enterprise procedures and the appropriate maintenance documents
	2.3. Where applicable and as required by the qualified person, assistance is provided in the final adjustment of components to confirm serviceability
3. Complete maintenance/repair activities	3.1. Required documentation is completed and processed in accordance with standard enterprise procedures
	3.2. Maintained/repaired or modified components are tagged, sealed and packaged within specified procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures
- using relevant maintenance documentation, specifications and aircraft/component manuals to:
  - recognise state of serviceability and standard/routine repair requirements for the range of mechanical components listed in the Range Statement
  - identify requirements under the guidance of a qualified person and complete routine repairs and/or modifications
  - adjust components under qualified person guidance as required
  - where post-assembly testing is applicable, under guidance and in the training environment, set up components for testing and perform tests
  - correctly tag, seal and package completed components

Required knowledge

Look for evidence that confirms knowledge of:

- component operation at a basic level
- standard/routine repair procedures and processes
- relevant OHS practices
- how to obtain MSDS
- use of PPE

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to dismantle, inspect, maintain and assemble aircraft mechanical components or parts under qualified person guidance while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of maintenance and repair applications associated with aircraft components. It is essential that the relevant enterprise procedures are interpreted and applied to ensure quality and safety standards are achieved. Evidence of transferability of skills and knowledge related to enterprise procedures for maintenance and repair is essential. This may be demonstrated through application across a number of different aircraft components. Ability to assess component serviceability under qualified person guidance and interpret parts requirements will be necessary before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under qualified person guidance on a representative range of components or parts listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general and special purpose tools found in most routine situations would be used where appropriate.
Method of assessment	

Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Routine work	Routine work is carried out using basic operational knowledge and a defined range of skills ('routine' work is that which follows a customary or regular course of procedure)
Outcomes	Outcomes are achieved by applying known solutions chosen from a limited range of pre-determined options consistent with enterprise procedures. This includes accepting responsibility for own work in terms of quality of outcomes using pre-determined specifications of quality
Maintain and/or repair/modify basic components	Maintain and/or repair/modify basic components, such as: • cables, pulleys, chains, sprockets, gear drives, control rods, bellcranks and links
Scope of work	Note that the scope of any repair or modification and the procedure to be followed will be provided by the qualified person, and be within the scope of the skills and knowledge included in the unit of competency MEA109B Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
Repair	Repair comprises replacement of parts, such as: • eye-ends, tubes, bearings and bushes
Maintain	Maintain involves cleaning, inspection for wear or damage and routine adjustment and lubrication where applicable in accordance with enterprise procedures
Application	Work can relate to: • routine scheduled or unscheduled maintenance activities performed under qualified person guidance in accordance with enterprise procedures and applicable

	maintenance documentation • tasks performed either autonomously or as part of a team and under the guidance of a qualified person
Procedures and requirements	Refer to procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA333B Dismantle, inspect, maintain and assemble aircraft piston engine components or parts

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated. Missing knowledge requirements reinstated.

Unit Descriptor

This unit of competency is part of a Mechanical Certificate II training pathway. It covers the competencies required to undertake routine maintenance and/or repair/modification of aircraft piston engine components or parts under the guidance of a qualified person. Achievement of this unit will contribute towards the attainment of MEA388A Repair and/or overhaul piston engines. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills and maintenance documentation to dismantle, inspect, maintain and assemble aircraft piston engine components or parts under the guidance of a qualified person.

Applications include piston engine components or parts in a workshop.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications

MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Prepare to dismantle inspect, maintain and assemble piston engine components or parts	1.1. Maintenance and/or repair requirements as defined by the qualified person, standard enterprise procedures and the relevant maintenance documentation, are understood 1.2. Tagging and repair instructions are accurately specified in accordance with standard enterprise procedures and as directed by a qualified person for parts requiring specialist repair 1.3. Appropriate materials, tools, equipment and assembly or fabrication jigs, where applicable, are selected and prepared for the particular maintenance and repair requirements in accordance with standard enterprise procedures and relevant maintenance documentation
2. Dismantle, inspect, maintain and assemble aircraft piston engine components or parts	2.1. ***Components*** are removed and/or disassembled in accordance with standard enterprise procedures, relevant maintenance documentation and qualified person guidance 2.2. Routine maintenance, repair or modification procedures are carried out, as approved by relevant manufacturers' bulletins or procedures in accordance with required standard enterprise procedures and specifications 2.3. Component parts are assembled within specified tolerances

	and in accordance with standard enterprise procedures and the appropriate maintenance documents
	2.4. Where applicable, and as required by the qualified person, assistance is provided in the final adjustment and testing of components to confirm serviceability
3. Complete maintenance, repair or modification activities	3.1. Required documentation is completed and processed in accordance with standard enterprise procedures
	3.2. Maintained/repaired or modified components are tagged, sealed and packaged within specified procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures
- using relevant maintenance documentation, specifications and aircraft/component manuals to:
  - recognise state of serviceability and standard/routine maintenance and repair requirements for the range of engine components listed in the Range Statement
  - identify requirements under the guidance of a qualified person and complete repairs and/or modifications
  - correctly tag, seal and package completed components

Required knowledge

Look for evidence that confirms knowledge of:

- component operation at a basic level
- standard/routine repair procedures and processes

For the purpose of this unit, basic knowledge is defined as the level of knowledge required to:

- remove, install and maintain components, such as hoses, pipes and ducts, and so on
- dismantle and maintain engine assemblies and sub-assemblies
- apply relevant hand skills to repair or modify components of sub-assemblies and systems listed in the Range Statement
- relevant OHS practices
- how to obtain MSDS
- use of PPE

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to dismantle, inspect, maintain and assemble aircraft piston engine components or parts under qualified person guidance while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of maintenance and repair applications associated with engine components. It is essential that the relevant standard enterprise procedures are interpreted and applied to ensure quality and safety standards are achieved. Evidence of transferability of skills and knowledge related to maintenance/repair standard enterprise procedures is essential. This may be demonstrated through application across a number of different engine components. Ability to assess component serviceability under qualified person guidance and interpret parts requirements will be necessary before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under qualified person guidance on a representative range of components or parts listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general and special purpose tools found in most routine situations would be used where appropriate.
Method of assessment	

Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Routine work	Routine work is carried out using basic operational knowledge and a defined range of skills ('routine' work is that which follows a customary or regular course or procedure)
Outcomes are achieved by:	Outcomes are achieved by applying known solutions chosen from a limited range of pre-determined options consistent with standard enterprise procedures. This includes accepting responsibility for own work in terms of quality of outcomes using pre-determined specifications of quality
Scope of work	Note that the scope of any repair or modification and the procedure to be followed will be provided by the qualified person, and will be within the scope of the unit of competency MEA109B Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
Maintain	Maintain involves removal and installation, cleaning, inspection for wear or damage and consequent replacement of parts, and routine adjustment and lubrication, where applicable, in accordance with standard enterprise procedures
Components to be maintained	Components to be maintained include hoses, pipes, ducts and components of: • cooling systems • engine head assemblies • engine block assemblies • accessory drives • lubrication systems
Application	Work can relate to:

	• routine scheduled or unscheduled maintenance activities performed under qualified person guidance in accordance with standard enterprise procedures • tasks performed either autonomously or as part of a team and under the guidance of a qualified person
Procedures and requirements	Refer to procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA339C Inspect, repair and maintain aircraft structures

Modification History

Release 2 – Bolted composite repairs added to Knowledge, Skills and Range Statement - equivalent.

Release 1 - Knowledge requirements and Range Statement revised to include additional inspection coverage - equivalent to previous version.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to inspect, repair and maintain aircraft structures.

The competency Elements and Performance Criteria also cover a significant portion of those required for unit MEA311D Inspect and repair/modify aircraft structures. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of procedures and techniques associated with the inspection and maintenance of aircraft structure, and with the performance of a limited range of metal and composite repairs.

Applications include the performance of structural maintenance activities on fixed or rotary wing aircraft on the flight line or in the hangar.

Licensing/Regulatory Information

Refer to unit descriptor

Pre-Requisites

MEA304C Remove and install non-pressurised aircraft structural and non-structural components

OR

MEA317C Remove and install pressurised aircraft structural and non-structural components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Inspect aircraft structure	1.1 ***Relevant maintenance documentation*** is used to identify specific inspection requirements
	1.2 Appropriate preparation and access to the aircraft structure is undertaken to allow for proper inspection in accordance with maintenance documentation
	1.3 ***Aircraft structure*** is visually or physically checked for signs of deformation defects or damage in accordance with maintenance documentation and approved procedures
	1.4 ***Damage or defects*** are assessed against damage or wear limits specified by structural repair manual or other approved data to determine if repair or replacement is required
	1.5 Maintenance documentation is completed and processed in accordance with standard enterprise procedures
2 Prepare to undertake repair	2.1 Extent of damage is correctly assessed to assist in determining repair procedure
	2.2 Appropriate repair scheme is identified in accordance with structural repair manual and/or approved data
	2.3 ***Specialist advice*** is obtained in establishing an approved repair scheme where a standard repair scheme cannot be identified or damage is out of limits
	2.4 All materials and equipment required are organised

3 Repair and maintain aircraft structure	3.1 ***Structural repairs*** are performed, in accordance with approved repair scheme, ensuring that aircraft standard practices are used and process requirements are carried out
	3.2 Preventative maintenance techniques are employed to preserve the integrity of aircraft structure
	3.3 Work area is cleaned of all waste material or contaminants
	3.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- applicable OHS procedures, including the use of MSDS and PPE
- construction methods and materials used in:
  - fuselage sections
  - wing sections
  - engine nacelles and mounts
  - windows and window frames
  - doors, locks and access panels in pressurised and non-pressurised aircraft
- definition of structural terms, i.e. safe life, damage tolerant, failsafe, stress, strain, shear and cycles
- inspection requirements for metal and composite structure, including:
  - ageing aircraft inspection requirements
  - safe life structure
  - damage tolerant structure
  - fail safe structure
- potential causes of structural failure
- NDT methods and application of the various techniques
- construction methods of, and assessing common defects in, aircraft plastic transparencies
- basic constructional features of, and assessing common defects in, glass windscreens
- the various forms of structural corrosion, stating the causes and structural effects of corrosion on aircraft
- the terms associated with composite materials
- requirements for handling and storing aircraft metals and composite materials, including sealing agents, to industry standards
- means of identifying aircraft structural assembly fasteners (metal and composite) by interpretation of markings, numbering systems, size, shape and colour
- assessment of structural damage:

  - types and classes of mechanical damage
  - types of corrosion and determining the extent of damage
  - relevant documentation and manuals
  - damage limits and repair schemes for metallic and non-metallic structure
- procedures for the fabrication and fitment of metal repairs:
  - scab patch
  - flush patch
  - splice
  - lap
  - formed section
- corrosion removal and passivation
- procedures for performing composite repairs:
  - external patch
  - scarf patch
  - stepped repairs
  - bolted repairs
- repair of integral fuel tanks and sealing of faying surfaces, including specific OHS and PPE requirements
- surface finishes and methods of restoration, including specific OHS and PPE requirements
- how to obtain MSDS
- relevant maintenance and structural repair manuals
- relevant regulatory requirements and standard procedures

Look for evidence that confirms skills in:

- applying all relevant OHS procedures, including the use of MSDS and selection and use of applicable items of PPE
- demonstrating appropriate cleaning procedures to enable structure inspection
- demonstrating correct inspection procedures, in particular pressurised aircraft, in accordance with aircraft and procedures manuals
- identifying damage to aircraft metallic (ferrous and non-ferrous) structures and/or components by way of impact, fatigue or the various types of corrosion
- inspecting damage and assessing composite components/structures
- identifying various aircraft metals and their basic properties
- identifying composite materials used in aircraft construction, associated safety precautions and hazards
- correctly interpreting repair scheme drawings, including third angle projection, isometric, sectional formats and hand sketches
- using appropriate hand tools and machines, including riveting equipment, drilling equipment, aligning tools and material fasteners (grip pins)
- applying correct removal, installation and repair techniques for:
  - a range of rivets (blind and solid) using hand, squeeze and pneumatic situations
  - a range of close tolerance fasteners (standard and oversize – hillocks and taper locks),

including hole preparation
    - threaded devices, including internal and external thread cutting, Helicoil inserts and damaged stud replacement
    - hardware assembled by close tolerance fits using heat, cooling and force methods, including bearings, bushes and inserts
- performing a range of metal structure and composite material repair techniques, including:
    - metal scab patch, flush, splice, lap and formed section repair
    - composite external patch, scarf and stepped repairs
    - bolted repairs to composite skin
    - metal to metal and metal to composite bonding
- applying structural corrosion removal/treatment techniques
- restoring aircraft structure sealing and surface finishes

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect and maintain aircraft structure and perform a range of metal and composite structural repair tasks that are representative of the scope of the listed variables in accordance with relevant maintenance documentation while applying all relevant OHS procedures and standard processes.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and repair applications associated with aircraft maintenance. It is essential that the procedures take into account all aircraft and personal safety precautions relating to aircraft structure. Evidence of transferability of skills and knowledge related to inspection, testing and repair of aircraft structure is essential. This may be demonstrated through application across a number of aircraft systems or aircraft types. Ability to interpret inspection and repair procedures and specifications and apply them in practice is critical. The application of the procedures should also clearly indicate knowledge of structural flight loads and aerodynamic requirements. A person cannot be assessed as competent until it can be

	demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision across the variables in the Range Statement as follows: • Inspection and/or testing of at least one item from each of groups 1 to 8 • Recognition of each type of damage in groups 9 to 12 • One repair task from each of groups 13 to 20. This shall be established via the records in the Log of Industrial Experience and Achievement.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained MEA311D Inspect and repair/modify aircraft structures, or MEA363B Inspect, repair and maintain structures and related components of non-pressurised small aircraft, will have met the requirements of the Performance Criteria and Range Statement variables for Elements 1 to 3 for common Range Statement variables. Those who have attained MEA401C Maintain aircraft structure/components, will have met the Performance Criteria and Range Statement variables requirements for Element 1. Log of Industrial Experience and Achievement records relating to MEA311D Inspect and repair/modify aircraft structures, MEA363B Inspect, repair and maintain structures and related components of non-pressurised small aircraft, and MEA401C Maintain aircraft structure/components, may be accepted as also meeting the evidence requirements for this unit in the applicable areas.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with

training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Inspection and repair of aircraft structure	Inspection of aircraft structure includes: 1. Non-ferrous and ferrous alloys and composite (FRP) materials used in aircraft construction 2. Structural fastening and attachment hardware and/or devices 3. Seals and sealants 4. Glass and moulded plastics 5. Application of NDT techniques 6. Doors, hinges and locking mechanisms for damage/misalignment 7. Inspections applicable to each of safe life, damage tolerant and fail safe structure relevant to enterprise 8. Ageing aircraft inspection programs
Damage or defects	Damage or defects may include: 9. Impact damage 10. Fatigue cracking 11. Corrosion 12. Delamination of composites and bonded structures
Structural repairs	Structural repairs may include the following: 13. Remove corrosion by chemical and mechanical methods 14. Restore protective coatings 15. Apply sealants and jointing compounds 16. Freehand precision hole generation 17. Remove and install structural hardware and fastening devices 18. Remove and replace bushes, bearings and bearing surfaces 19. Metal scab patch, flush, splice, lap and formed section repair

	20. Composite external patch, scarf, stepped and bolted repairs
Specialist advice	Specialist advice is obtained from: • supervisors • specialist structures personnel
Relevant maintenance documentation	Relevant maintenance documentation includes: • servicing schedules • maintenance manuals • applicable Defence regulations and instructions
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance, including special inspections required after events, such as heavy landings, overstress or flight through heavy turbulence • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA340A Lay out and set up aircraft systems

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of Diploma and Advanced Diploma training pathways. It covers the basic design and schematic layout of aircraft systems, including mechanical, hydraulic, pneumatic and fuel systems. A basic hydraulic system is set up and operated.

Application of the Unit

Competency in this unit requires application of basic knowledge of aircraft system design and schematic layout, including the relative advantages of the different types of system. The candidate should be able to select appropriate types of systems for given applications and sketch the schematic layout of systems given a list of components.

A simple hydraulic system will also be set up and operated.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Select and lay out schematically aircraft mechanical systems	1.1. ***Mechanical system applications*** in aircraft design and their relative advantages and disadvantages compared to other system types are identified 1.2. Components of mechanical systems are identified 1.3. A mechanical system is selected for an application, the schematic layout is sketched and all components are labelled 1.4. Mechanical system maintenance requirements are identified
2. Select and lay out schematically aircraft hydraulic systems	2.1. ***Hydraulic system applications*** in aircraft design, their operation and their relative advantages and disadvantages compared to other system types are identified 2.2. Aircraft hydraulic fluids, their characteristics and handling precautions are identified 2.3. ***Components of hydraulic systems*** are identified and their operation is described in general terms 2.4. A hydraulic system is selected for an application, the schematic layout is sketched and all components are labelled 2.5. Hydraulic system maintenance requirements are identified
3. Select and lay out schematically aircraft pneumatic systems	3.1. ***Pneumatic system applications*** in aircraft design, their operation and their relative advantages and disadvantages compared to other system types are identified

	3.2. ***Components of pneumatic systems*** are identified and their operation is described in general terms 3.3. A pneumatic system is selected for an application, the schematic layout is sketched and all components are labelled 3.4. Pneumatic system maintenance requirements are identified
4. Select and lay out schematically aircraft fuel storage and distribution systems	4.1. Typical ***fuel storage and distribution systems*** used in aircraft design are identified. 4.2. ***Components of fuel storage and distribution systems*** are identified and their operation is described. 4.3. A fuel storage and distribution system is selected for an application, the schematic layout is sketched and all components are labelled. 4.4. Types of aircraft fuel, their characteristics and handling precautions are identified. 4.5. Fuel storage and distribution system maintenance requirements are identified.
5. Set up and operate a simple hydraulic system	5.1. The hydraulic system is sketched and all components are labelled 5.2. ***Required components*** are obtained 5.3. The system is assembled and operated

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- laying out a typical aircraft mechanical system
- laying out a typical aircraft hydraulic system
- laying out a typical aircraft pneumatic system
- laying out a typical fuel storage and distribution system
- setting up and operating a basic hydraulic system
- applying relevant OHS precautions, including the use of MSDS and PPE

Required knowledge

Look for evidence that confirms knowledge of:

- fluid power principles
- plumbing identification marking
- mechanical, hydraulic and pneumatic aircraft systems, their components and maintenance

requirements
- the relative advantages and disadvantages of mechanical, hydraulic and pneumatic systems
- hydraulic fluid types, characteristics and handling precautions
- aircraft fuel storage and distribution systems and components thereof
- aircraft fuels, their characteristics and handling precautions
- OHS precautions relating to aircraft systems and their operation

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply basic knowledge of aircraft system design and layout for a range of aircraft applications. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, teacher's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency
Context of and specific resources for assessment	This unit may be assessed off the job in a training environment equipped to provide exposure to the range of system types and provide for the layout, set-up and operation of basic hydraulic systems. The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
Method of assessment	

Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Application	Application of this unit may relate to: • individual or team-related activities
Mechanical system applications	Mechanical system applications may include: • flight controls • flap operation • nose wheel steering • landing gear door operation • entrance door mechanisms
Components of mechanical systems	Components of mechanical systems may include: • cables • chains • sprockets • pulleys • fairleads • cable tensioners • gearboxes • screwjacks • rods • universal joints • constant velocity joints • clutches • bearings and bushes
Hydraulic system applications	Hydraulic system applications may include: • flight controls • flap and spoiler operation • landing gear retraction and extension • brakes (including anti-skid)

	• nose wheel steering • shimmy damping • door operation
Components of hydraulic systems	Components of hydraulic systems may include: • pumps • plumbing • valves (manual and electrically operated) • actuators • motors • check valves • pressure gauges (direct reading and electrical) • electrical control circuit micro switches • reservoirs • accumulators • filters • heat exchangers
Pneumatic system applications	Pneumatic system applications may include: • landing gear retraction and extension • pneudraulic emergency systems for landing gear extension and brakes • engine bleed air • engine starting • anti-icing • de-icing • pressurisation • air cycle air conditioning
Components of pneumatic systems	Components of pneumatic systems may include: • pre-coolers • pressure regulator and shutoff valves • temperature modulating valve • check valves • over-pressure valves • temperature regulating valves • underloading valves • shuttle valves • back pressure valves • outflow valves • moisture separators • chemical driers • filters

	• mechanical compressors • compressed air bottles • de-icing boots • ducting
Components of fuel storage and distribution systems	Components of fuel storage and distribution systems may include: • integral fuel cells • rigid and flexible fuel cells • external fuel tanks • rigid and flexible plumbing and couplings • manifolds • selector valves • anti-surge valves • anti-gravity valves • fuel quantity indication • fuel flow indication • boost pumps • transfer pumps • filters • strainers • fuel heaters
Required components	Required components may include: • hydraulic rig • manual selector valve • filter • accumulator • check valve • linear actuators • rigid and flexible plumbing

Unit Sector(s)

Aeronautical engineering

Competency field

Co-requisite units

Not applicable

MEA341A Apply basic aircraft design characteristics

Modification History

Minor formatting and editorial changes made. Prerequisite unit version codes updated.

Unit Descriptor

This unit of competency is part of Diploma and Advanced Diploma training pathways. It covers the aerodynamic shape and structure of aircraft.

Application of the Unit

This unit requires application of basic knowledge of aerodynamic shape and structural methods.

Applications include aeroplanes and rotary wing aircraft

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Research and evaluate aeroplane aerodynamic shape	1.1. ***Common wing plan forms*** are identified and relative advantages and disadvantages are evaluated 1.2. ***Common wing configurations*** are identified and relative advantages and disadvantages are identified 1.3. Aerofoil characteristics are discussed in terms of aircraft performance 1.4. Aeroplane .stability and control is discussed in terms of aerodynamic design 1.5. Types of primary and secondary flight control surfaces are identified and control balancing is discussed 1.6. Types of lift augmentation device are identified and compared 1.7. Factors that affect an aircraft in subsonic and high speed flight are identified
2. Research and evaluate rotary wing aerodynamic design	2.1. ***Common rotor configurations*** are identified and their aerodynamic characteristics discussed 2.2. Rotary wing aircraft control and stability are discussed
3. Research and evaluate basic aircraft structural design	3.1. The loads acting on an aircraft structure are identified 3.2. The methods of construction of airframes and power plant support structures are identified and compared 3.3. The materials of construction commonly used in aircraft structures are identified and their relative advantages and disadvantages are discussed 3.4. Fabrication methods commonly used in aircraft structure are identified and discussed 3.5. Maintenance requirements for aircraft structure are identified

4. Research and evaluate basic landing gear design and construction	4.1. The ***configurations of landing gear*** are identified and discussed in terms of relative advantages and disadvantages 4.2. The relative benefits of fixed and retractable landing gear are identified and discussed 4.3. Construction materials used in landing gear components are identified and discussed
5. Apply basic aircraft design characteristics	5.1. Given required aircraft use and performance characteristics, an appropriate aerodynamic shape is determined 5.2. An appropriate method of construction, materials of construction and fabrication method are proposed 5.3. An appropriate landing gear configuration is proposed

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying basic aircraft design characteristics

Required knowledge

Look for evidence that confirms knowledge of:

- theory of flight, including rotary wing
- loads acting on aircraft structures and structural fatigue, including rotary wing
- aircraft design characteristics, including rotary wing
- types of aircraft structure
- methods of aircraft construction
- materials of construction
- structural maintenance requirements
- use of NDT in structural maintenance
- basic landing gear design characteristics
- use of ultra high strength steels in landing gear design and related maintenance requirements

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment

Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to identify and apply basic aircraft design characteristics. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, teacher's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
Context of and specific resources for assessment	This unit may be assessed off the job in a training environment equipped to provide exposure to the relevant aircraft design characteristics and to theory of flight. The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Application	Application of this unit may relate to:

	• individual or team-related activities
Common wing plan forms	Common wing plan forms may include: • straight • tapered • swept • delta • variable geometry • canard
Common wing configurations	Common wing configurations may include: • mid-wing • low wing • high wing
Common rotor configurations	Common rotor configurations may include: • main rotor and tail rotor • two main rotors • two blade main rotor • multiple blade main rotor • hinged main rotor blades • rigid rotor
Configurations of landing gear	Configurations of landing gear may include: • tricycle • tail wheel • tail skid • floats • skis • helicopter skids • helicopter wheels and brakes

Unit Sector(s)

Aeronautical engineering

Competency field

Co-requisite units

Not applicable

MEA342A Apply basic aircraft power plant design characteristics

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of Diploma and Advanced Diploma training pathways. It covers the basics of aircraft power plant selection and propulsion.

Application of the Unit

This unit requires application of basic knowledge of propulsion and power plant selection.

Applications include aeroplanes and rotary wing aircraft, piston engines and propellers/rotors, turbo prop, gas turbines and gas turbine/rotor.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Research and evaluate the types of aeroplane and rotary wing aircraft power plant and their relative advantages and disadvantages	1.1. The ***types of aeroplane and rotary wing aircraft power plant*** are identified and compared in terms of relative advantages and disadvantages 1.2. ***Types of propeller*** are identified and compared in terms of relative advantages and disadvantages 1.3. Turbojet and turbofan performance is compared in terms of relative advantages and disadvantages 1.4. Maintenance requirements for aircraft power plants are identified
2. Apply basic power plant and propulsion system selection processes	2.1. Given required aeroplane use and performance characteristics, an appropriate type of power plant is determined 2.2. An appropriate type of propulsion system is selected 2.3. Given required rotary wing aircraft use and performance characteristics, an appropriate type of power plant is determined

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying basic power plant and propulsion system design characteristics

Required knowledge

Look for evidence that confirms knowledge of:

- basic power plant characteristics
- basic propeller theory and characteristics
- use of NDT in power plant maintenance
- power plant maintenance requirements, including the use of engine condition monitoring

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to identify and apply basic power plant and propulsion system design characteristics. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, teacher's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
Context of and specific resources for assessment	This unit may be assessed off the job in a training environment equipped to provide exposure to the relevant aircraft design characteristics and to theory of flight. The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The

	assessment environment should not disadvantage the candidate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Application	Application of this unit may relate to: • individual or team-related activities
Types of aeroplane and rotary wing aircraft power plant	Types of aeroplane and rotary wing aircraft power plant may include: • piston engine (petrol or diesel) • rotary • turboprop or gas turbine and rotor • turbofan • turbojet
Types of propeller	Types of propeller may include: • fixed pitch • adjustable pitch • constant speed • contra-rotating • tractor • pusher

Unit Sector(s)

Aeronautical engineering

Competency field

Co-requisite units

Not applicable

MEA343B Remove and install avionic system components

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit of competency is part of the B1 Mechanical Aircraft Maintenance Engineer licensing pathway under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines. It covers the competencies required for the removal and installation of avionic system components and certification of tasks where system serviceability can be verified without the use of specialist off-aircraft test equipment.

Application of the Unit

This unit requires application of hand skills and the use of maintenance documentation/publications in the removal, installation and task certification of avionic systems components where system serviceability can be established by a simple self-test facility, other on-board test systems/equipment or by simple ramp test equipment.

Applications include fixed and rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA211C	Inspect, test and troubleshoot advanced aircraft electrical systems and components
	OR
MEA227D	Test and troubleshoot aircraft electrical systems and components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Remove avionic system components	1.1 System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety
	1.2 ***Avionic component*** removal is carried out in accordance with the applicable maintenance manual
	1.3 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
	1.4 Removed components are tagged and packaged in accordance with specified procedures
2. Install avionic system components and verify system serviceability	2.1 Avionic components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life
	2.2 Installation of avionic components is performed in accordance with the applicable maintenance manual and regulatory requirements
	2.3 System is reinstated to correct operational condition and is ***tested for serviceability***
	2.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures and regulatory requirements

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- locating and identifying avionic components that are part of instrument and radio systems
- determining that component and system serviceability can be confirmed by a simple self-test facility, other on-board test systems/equipment or by simple ramp test equipment requiring a simple go/no go decision
- applying relevant OHS practices
- component attachment methods
- connecting hardware and plugs
- handling precautions for electrostatic sensitive devices
- using approved maintenance documentation and aircraft publications relating to avionic systems
- using built-in test equipment to confirm system serviceability (this may involve the operation of specific built-in test equipment, on-board maintenance systems and Integrated Modular Avionic modules)

Required knowledge

Look for evidence that confirms knowledge of:

- electronic fundamentals
- digital techniques relating to electronic instrument systems
- engine indication systems
- the operation of built-in test equipment
- on-board maintenance systems
- Integrated Modular Avionics and the interface with hydraulic, fuel and pneumatic systems

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to remove and install avionic components and verify system serviceability through the use of built-in test equipment or similar on-board systems and/or off-aircraft test equipment that provides a simple go/no go decision while observing all relevant safety and component handling precautions.
Critical aspects for assessment and	It is essential that cleanliness requirements and safety

evidence required to demonstrate competency in this unit	precautions applicable to the system being maintained are fully observed, understood and complied with, as well as work practices associated with electrostatic sensitive devices. Evidence of transferability of skills and knowledge related to removal and installation is essential. This is to be demonstrated by application across a range of aircraft avionic system components as listed in the Range Statement. An understanding of the attachment methods, connection of hardware, and system test requirements as they relate to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a representative range of avionic components, as listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Note	The scope of this unit is restricted to removing and installing avionic components from systems whose serviceability can be established and certified through the use of built-in test equipment or any other on-board system that can verify correct system operation. The use of off-aircraft test equipment is limited to items that provide a simple go/no go decision
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise
Avionic components	Avionic components include: • components/line replaceable units from electronic instrument systems • components/line replaceable units from engine indication systems • communication system components • navigation system components • software updates to avionic systems where serviceability can be determined by a simple test
Tested for serviceability	Tested for serviceability means: • confirming system serviceability through the operation of built-in test equipment or any other on-board system that can confirm correct operation • using only off-aircraft test equipment that provides a simple go/no go decision regarding system serviceability

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA344A Remove and install aircraft components

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit covers the competencies required to remove and install aircraft components that are within the privileges of the Aircraft Maintenance Engineer A Licence. It is one of the units required for the granting of the chosen Aircraft Maintenance Engineer A Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and standard trade practices in the removal and installation of aircraft components, including hydro-mechanical and mechanical components, and emergency equipment that is within the privileges of the A Licence.

Applications include component removal and installation on both fixed and rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes

MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Remove landing gear components	1.1. The aircraft is jacked as specified in the maintenance manual for ***landing gear component*** removal 1.2. Removal of components is carried out in accordance with the applicable maintenance publications 1.3. Required maintenance documentation is accurately completed and correctly processed 1.4. Removed components are tagged, sealed and packaged in accordance with standard organisational procedures
2. Remove hydro-mechanical components	2.1. Hydro-mechanical system is rendered safe and prepared in accordance with the applicable maintenance publication, including fitment of isolation tags, where necessary, to ensure personal safety 2.2. Removal of ***hydro-mechanical components*** is carried out in accordance with the applicable maintenance publications 2.3. Required maintenance documentation is accurately

	completed and correctly processed
	2.4. Removed components are tagged, sealed and packaged in accordance with standard organisational procedures
3. Remove mechanical components/emergency equipment	3.1. Applicable safety precautions are identified and observed for the removal and handling of components
	3.2. Removal of ***mechanical components***/***emergency equipment*** is carried out in accordance with the applicable maintenance publications
	3.3. Required maintenance documentation is accurately completed and correctly processed
	3.4. Removed components and/or items of emergency equipment are tagged, sealed and packaged in accordance with standard organisational procedures
4. Install landing gear components	4.1. Components to be installed are checked to confirm correct part numbers, serviceability and modification status
	4.2. Component installation is carried out in accordance with applicable maintenance publications
	4.3. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures.
5. Install hydro-mechanical components	5.1. Components to be installed are checked to confirm correct part numbers, serviceability and modification status.
	5.2. Component installation is carried out in accordance with applicable maintenance publications.
	5.3. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
6. Install mechanical components/emergency equipment	6.1. Components to be installed are checked to confirm correct part numbers, serviceability and modification status
	6.2. Component installation is carried out in accordance with applicable maintenance publications
	6.3. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying applicable OHS procedures, including the use of MSDS and PPE
- jacking of aircraft for landing gear component removal
- using hand skills and tools to perform component removal and installation tasks
- correctly installing and securing of aircraft hardware
- inspecting and correctly installing bearings
- safely handling heavy components
- using maintenance publications to prepare the aircraft for component removal and installation and correct interpretation of removal and installation instructions
- applying standard procedures

Required knowledge

Look for evidence that confirms knowledge of:

- standard trade practices relating to tool usage and installation/securing of aircraft hardware
- how to locate and correctly remove and install components
- how to locate and correctly remove and install items of emergency equipment
- OHS procedures relating to component removal and installation and handling of heavy components
- how to obtain PPE
- how to obtain MSDS
- relevant maintenance publications
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to use maintenance publications and applicable tools to remove and install specified landing gear, hydro-mechanical and mechanical components and emergency equipment while applying all relevant OHS procedures and standards processes.
Critical aspects for assessment and evidence required to demonstrate	The underlying skills inherent in this unit should be transferable into other units that require similar techniques. It is essential that system cleanliness

competency in this unit	requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Evidence of transferability of skills and knowledge related to removal and installation is essential. This may be demonstrated through application across a number of aircraft systems or aircraft types, but must cover a sufficient range of tasks to demonstrate familiarity with attachment methods, connection hardware and couplings peculiar to each type of system, and of safe handling of heavy components. An understanding of system operation as it relates to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of this unit of competency are being achieved under supervision without intervention on at least one component from each of Groups 1 to 8 listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment using procedures, tools and equipment specified in maintenance documentation. It is also expected that general purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of

the item, and local industry and regional contexts) may also be included.	
Note	The Range Statements below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Landing gear components	Landing gear components may include: 1. Main and nose wheel assemblies 2. Brake units
Components	Hydro-mechanical components may include: 3. Toilet system components, excluding gate valves 4. Windscreen wiper blades Mechanical components/emergency equipment may include: 5. Passenger and crew seats, seat belts and harnesses 6. Internal doors excluding any doors that form part of the pressure hull 7. Trim panels, linings, cabin equipment and consoles 8. Applicable emergency equipment, such as life jackets, rafts, location transmitters/beacons
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA345A Perform scheduled line maintenance activities on gas turbine engine fixed wing aircraft

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit covers the competencies required to perform line maintenance activities including flight servicings and scheduled aircraft line maintenance checks that are within the privileges of the Aircraft Maintenance Engineer A1 Licence. It is one of the units required for the granting of the chosen Aircraft Maintenance Engineer A1 Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and standard trade practices in the performance of scheduled servicings up to the weekly check or equivalent, pre and post-flight servicing activities and the application of aircraft ground handling procedures.

Applications include the performance of flight servicings and scheduled maintenance checks on gas turbine engine fixed wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and

	specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Prepare for flight	1.1. Aircraft is positioned, as required 1.2. Ground locks, aircraft support and safety devices and covers are removed and stowed in accordance with ***maintenance documentation*** 1.3. Aircraft tie-down devices are removed and stowed/stored
2. Inspect aircraft and systems	2.1. Preparation of the aircraft and systems is appropriate to allow for proper inspection 2.2. Aircraft and systems are visually or physically checked for external signs of defects in accordance with applicable maintenance documentation
3. Replenish aircraft systems	3.1. Fluid level checks and replenishments are carried out in accordance with maintenance documentation requirements 3.2. Maintenance of gaseous levels (oxygen, nitrogen and compressed air) is carried out in accordance with maintenance documentation requirements 3.3. Role equipment/components requiring pre-flight replacement are changed as required by maintenance documentation

	3.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
4. Perform scheduled line maintenance checks	4.1. Inspection requirements are determined from maintenance documentation 4.2. Aircraft structure and systems are visually inspected for external signs of defects in accordance with applicable maintenance documentation 4.3. Defects are recorded and reported in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- ground handling of aircraft
- using hand skills and tools to perform flight servicing activities
- correctly installing and securing of aircraft hardware
- locating, using and correctly stowing aircraft safety and security equipment (including ground locks, covers, support and safety devices and tie-down devices)
- applying ground power (where applicable)
- inspecting structure for damage and deterioration
- recognising external signs of component damage, leakage and security in aircraft systems
- recognising visual signs of damage, leakage and security with regard to engines and propellers (where applicable)
- refuelling the aircraft with the correct type, quantity and distribution of fuel
- checking and replenishing fluid level using the correct fluids
- recharging of gaseous levels using the correct support equipment and procedures
- lubricating components
- checking fire protection systems (where applicable) for correct gas charge levels
- replacing role equipment requiring pre-flight replacement
- the use of maintenance data and manuals to determine flight servicing requirements and procedures
- application of standard procedures
- observance of all relevant OHS procedures, including the use of MSDS and PPE

Required knowledge

Look for evidence that confirms knowledge of:

- standard trade practices relating to tool usage and installation/securing of aircraft hardware
- aircraft structural concepts and structure to the extent required to be able to recognise typical types of structural damage and deterioration during flight servicing activities and scheduled

inspections up to the level of a weekly check or equivalent
- system layout, operation and typical external signs of faults to the extent required to perform flight servicing and scheduled inspections up to the level of a weekly check or equivalent
- types and characteristics of fuels and fuel additives
- types and characteristics of lubricants
- types and characteristics of hydraulic fluids
- OHS procedures relating to flight servicing activities, including how to obtain MSDS and PPE
- basic theory of flight relating to fixed wing aircraft, including stability and control
- the function of on-board maintenance systems
- gas turbine engine and propeller basic theory, installation and operation
- relevant principles of mathematics and physics

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform flight servicing activities on the occasions as listed in the variables and scheduled line maintenance checks (up to a weekly check or equivalent) that are relevant to the organisation in accordance with relevant maintenance documentation, while applying all relevant OHS procedures and standard processes.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that the specific aspects of the aircraft flight servicing or scheduled line maintenance task are checked to ensure quality and safety standards are fully observed, understood and complied with. Safety precautions applicable to the system being maintained are to be fully observed. An understanding of system operation as it relates to the work must be demonstrated before undertaking any action. Evidence of knowledge of system operation, recognition of defects and completion of documentation, the relationship of individual components and the links with other systems will be necessary to the extent required for completion of flight servicing and scheduled line maintenance task before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.

	A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of this unit of competency are being achieved under supervision but without intervention on the flight servicings and scheduled line maintenance tasks listed in Groups 1 to 5 of the Range Statement that are applicable to the enterprise. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment using procedures, tools and equipment specified in maintenance documentation. It is also expected that general purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Note	The Range Statements below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Applicable maintenance activities	Applicable maintenance activities include: 1. Preparation for flight following maintenance 2. Before flight servicing 3. After flight servicing 4. Turn around servicing 5. Scheduled line maintenance activities up to the level of a weekly check or specified equivalent

Maintenance documentation	Maintenance documentation may include: • maintenance manuals • servicing schedules • applicable airworthiness regulations • aircraft maintenance program
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA346A Perform scheduled line maintenance activities on gas turbine engine rotary wing aircraft

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit covers the competencies required to perform line maintenance activities including flight servicings and scheduled aircraft line maintenance checks that are within the privileges of the Aircraft Maintenance Engineer A3 Licence. It is one of the units required for the granting of the chosen Aircraft Maintenance Engineer A3 Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and standard trade practices in the performance of scheduled servicings up to the Weekly Check or equivalent, pre and post-flight servicing activities and the application of aircraft ground handling procedures.

Applications include the performance of flight servicings and scheduled maintenance checks on gas turbine engine rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and

	specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Prepare for flight	1.1. Aircraft is positioned, as required 1.2. Ground locks, aircraft support and safety devices and covers are removed and stowed in accordance with maintenance documentation 1.3. Aircraft tie-down devices are removed and stowed/stored
2. Inspect aircraft and systems	2.1. Preparation of the aircraft and systems is appropriate to allow for proper inspection 2.2. Aircraft and systems are visually or physically checked for external signs of defects in accordance with applicable maintenance documentation
3. Replenish aircraft systems	3.1. Fluid level checks and replenishments are carried out in accordance with maintenance documentation requirements 3.2. Maintenance of gaseous levels (oxygen, nitrogen and compressed air) is carried out in accordance with maintenance documentation requirements 3.3. Role equipment/components requiring pre-flight replacement are changed as required by ***maintenance documentation***

	3.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
4. Perform scheduled line maintenance checks	4.1. Inspection requirements are determined from maintenance documentation 4.2. Aircraft structure and systems are visually inspected for external signs of defects in accordance with applicable maintenance documentation 4.3. Defects are recorded and reported in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- ground handling of aircraft
- using hand skills and tools to perform flight servicing activities
- correctly installing and securing of aircraft hardware
- locating, using and correctly stowing aircraft safety and security equipment (including ground locks, covers, support and safety devices and tie-down devices)
- applying ground power (where applicable)
- inspecting structure for damage and deterioration
- recognising external signs of component damage, leakage and security in aircraft systems
- recognising visual signs of damage, leakage and security with regard to engines, transmissions and rotors
- refuelling the aircraft with the correct type, quantity and distribution of fuel
- checking and replenishing fluid level using the correct fluids
- recharging of gaseous levels using the correct support equipment and procedures
- lubricating components
- checking fire protection systems (where applicable) for correct gas charge levels
- replacing role equipment requiring pre-flight replacement
- the use of maintenance data and manuals to determine flight servicing requirements and procedures
- applying standard procedures
- observing all relevant OHS procedures, including the use of MSDS and PPE

Required knowledge

Look for evidence that confirms knowledge of:

- standard trade practices relating to tool usage and installation/securing of aircraft hardware
- aircraft structural concepts and structure to the extent required to be able to recognise typical types of structural damage and deterioration during flight servicing activities and scheduled

inspections up to the level of a Weekly Check or equivalent
- system layout, operation and typical external signs of faults to the extent required to perform flight servicing and scheduled inspections up to the level of a Weekly Check or equivalent
- types and characteristics of fuels and fuel additives
- types and characteristics of lubricants
- types and characteristics of hydraulic fluids
- OHS procedures relating to flight servicing activities, including how to obtain MSDS and PPE
- basic theory of flight relating to rotary wing aircraft, including stability and control
- the function of on-board maintenance systems
- gas turbine engine basic theory, installation and operation
- engine transmission and rotor basic theory, installation and operation
- relevant principles of mathematics and physics

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform flight servicing activities on the occasions as listed in the variables and scheduled line maintenance checks (up to a Weekly Check or equivalent) that are relevant to the organisation in accordance with relevant maintenance documentation, while applying all relevant OHS procedures and standard processes.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that the specific aspects of the aircraft flight servicing or scheduled line maintenance task are checked to ensure quality and safety standards are fully observed, understood and complied with. Safety precautions applicable to the system being maintained are to be fully observed. An understanding of system operation as it relates to the work must be demonstrated before undertaking any action. Evidence of knowledge of system operation, recognition of defects and completion of documentation, the relationship of individual components and the links with other systems will be necessary to the extent required for completion of flight servicing and scheduled line maintenance task before undertaking any action. The work plan should take account of applicable safety and

	quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of this unit of competency are being achieved under supervision but without intervention on the flight servicings and scheduled line maintenance tasks listed in Groups 1 to 5 of the Range Statement that are applicable to the enterprise. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment using procedures, tools and equipment specified in maintenance documentation. It is also expected that general purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Note	The Range Statements below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Applicable maintenance activities	Applicable maintenance activities include: 1. Preparation for flight following maintenance 2. Before flight servicing 3. After flight servicing 4. Turn around servicing 5. Scheduled line maintenance activities up to the level

	of a Weekly Check or specified equivalent
Maintenance documentation	Maintenance documentation may include: • maintenance manuals • servicing schedules • applicable airworthiness regulations • aircraft maintenance program
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA347A Perform scheduled line maintenance activities on piston engine fixed wing aircraft

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit covers the competencies required to perform line maintenance activities, including flight servicings and scheduled aircraft line maintenance checks, that are within the privileges of the Aircraft Maintenance Engineer A2 Licence. It is one of the units required for the granting of the chosen Aircraft Maintenance Engineer A2 Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and standard trade practices in the performance of scheduled servicings up to the Weekly Check or equivalent, pre and post-flight servicing activities and the application of aircraft ground handling procedures.

Applications include the performance of flight servicings and scheduled maintenance checks on piston engine fixed wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications

MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Prepare for flight	1.1. Aircraft is positioned, as required
	1.2. Ground locks, aircraft support and safety devices and covers are removed and stowed in accordance with ***maintenance documentation***
	1.3. Aircraft tie-down devices are removed and stowed/stored
2. Inspect aircraft and systems	2.1. Preparation of the aircraft and systems is appropriate to allow for proper inspection
	2.2. Aircraft and systems are visually or physically checked for external signs of defects in accordance with applicable maintenance documentation
3. Replenish aircraft systems	3.1. Fluid level checks and replenishments are carried out in accordance with maintenance documentation requirements
	3.2. Maintenance of gaseous levels (oxygen, nitrogen and compressed air) is carried out in accordance with maintenance documentation requirements
	3.3. Role equipment/components requiring pre-flight replacement are changed as required by maintenance documentation
	3.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

4. Perform scheduled line maintenance checks	4.1. Inspection requirements are determined from maintenance documentation 4.2. Aircraft structure and systems are visually inspected for external signs of defects in accordance with applicable maintenance documentation 4.3. Defects are recorded and reported in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- ground handling of aircraft
- using hand skills and tools to perform flight servicing activities
- correctly installing and securing of aircraft hardware
- locating, using and correctly stowing aircraft safety and security equipment (including ground locks, covers, support and safety devices and tie-down devices)
- applying ground power (where applicable)
- inspecting structure for damage and deterioration
- recognising external signs of component damage, leakage and security in aircraft systems
- recognising visual signs of damage, leakage and security with regard to engines and propellers
- refuelling the aircraft with the correct type, quantity and distribution of fuel
- checking and replenishing fluid level using the correct fluids
- recharging of gaseous levels using the correct support equipment and procedures
- lubricating components
- checking fire protection systems (where applicable) for correct gas charge levels
- replacing role equipment requiring pre-flight replacement
- using maintenance data and manuals to determine flight servicing requirements and procedures
- applying standard procedures
- observing all relevant OHS procedures, including the use of MSDS and PPE

Required knowledge

Look for evidence that confirms knowledge of:

- standard trade practices relating to tool usage and installation/securing of aircraft hardware
- aircraft structural concepts and structure to the extent required to be able to recognise typical types of structural damage and deterioration during flight servicing activities and scheduled inspections up to the level of a Weekly Check or equivalent
- system layout, operation and typical external signs of faults to the extent required to

perform flight servicing and scheduled inspections up to the level of a Weekly Check or equivalent
- the function of on-board maintenance systems
- types and characteristics of fuels and fuel additives
- types and characteristics of lubricants
- types and characteristics of hydraulic fluids
- OHS procedures relating to line maintenance activities, including how to obtain MSDS and PPE
- basic theory of flight relating to fixed wing aircraft, including stability and control
- piston engine and propeller basic theory, installation and operation
- factors influencing piston engine performance
- relevant principles of mathematics and physics

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform flight servicing activities on the occasions as listed in the variables and scheduled line maintenance checks (up to a Weekly Check or equivalent) that are relevant to the organisation in accordance with relevant maintenance documentation, while applying all relevant OHS procedures and standard processes.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that the specific aspects of the aircraft flight servicing or scheduled line maintenance task are checked to ensure quality and safety standards are fully observed, understood and complied with. Safety precautions applicable to the system being maintained are to be fully observed. An understanding of system operation as it relates to the work must be demonstrated before undertaking any action. Evidence of knowledge of system operation, recognition of defects and completion of documentation, the relationship of individual components and the links with other systems will be necessary to the extent required for completion of flight servicing and scheduled line maintenance task before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and

	regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of this unit of competency are being achieved under supervision but without intervention on the flight servicings and scheduled line maintenance tasks listed in Groups 1 to 5 of the Range Statement that are applicable to the enterprise. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment using procedures, tools and equipment specified in maintenance documentation. It is also expected that general purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	The Range Statements below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Applicable maintenance activities	Applicable maintenance activities include: 1. Preparation for flight following maintenance 2. Before flight servicing 3. After flight servicing 4. Turn around servicing 5. Scheduled line maintenance activities up to the level of a Weekly Check or specified equivalent

Maintenance documentation	Maintenance documentation may include: • maintenance manuals • servicing schedules • applicable airworthiness regulations • aircraft maintenance program
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA348A Perform scheduled line maintenance activities on piston engine rotary wing aircraft

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit covers the competencies required to perform line maintenance activities including flight servicings and scheduled aircraft line maintenance checks that are within the privileges of the Aircraft Maintenance Engineer A4 Licence. It is one of the units required for the granting of the chosen Aircraft Maintenance Engineer A4 Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and standard trade practices in the performance of scheduled servicings up to the Weekly Check or equivalent, pre and post-flight servicing activities and the application of aircraft ground handling procedures.

Applications include the performance of flight servicings and scheduled maintenance checks on piston engine rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and

	specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Prepare for flight	1.1. Aircraft is positioned, as required 1.2. Ground locks, aircraft support and safety devices and covers are removed and stowed in accordance with ***maintenance documentation*** 1.3. Aircraft tie-down devices are removed and stowed/stored
2. Inspect aircraft and systems	2.1. Preparation of the aircraft and systems is appropriate to allow for proper inspection 2.2. Aircraft and systems are visually or physically checked for external signs of defects in accordance with applicable maintenance documentation
3. Replenish aircraft systems	3.1. Fluid level checks and replenishments are carried out in accordance with maintenance documentation requirements 3.2. Maintenance of gaseous levels (oxygen, nitrogen and compressed air) is carried out in accordance with maintenance documentation requirements 3.3. Role equipment/components requiring pre-flight replacement are changed as required by maintenance documentation

	3.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
4. Perform scheduled line maintenance checks	4.1. Inspection requirements are determined from maintenance documentation 4.2. Aircraft structure and systems are visually inspected for external signs of defects in accordance with applicable maintenance documentation 4.3. Defects are recorded and reported in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- ground handling of aircraft
- using hand skills and tools to perform flight servicing activities
- correctly installing and securing of aircraft hardware
- locating, using and correctly stowing aircraft safety and security equipment (including ground locks, covers, support and safety devices and tie-down devices)
- applying ground power (where applicable)
- inspecting structure for damage and deterioration
- recognising external signs of component damage, leakage and security in aircraft systems
- recognising visual signs of damage, leakage and security with regard to engines, transmissions and rotors
- refuelling the aircraft with the correct type, quantity and distribution of fuel
- checking and replenishing fluid level using the correct fluids
- recharging of gaseous levels using the correct support equipment and procedures
- lubrication of components
- checking fire protection systems (where applicable) for correct gas charge levels
- replacing role equipment requiring pre-flight replacement
- the use of maintenance data and manuals to determine flight servicing requirements and procedures
- applying standard procedures
- observing all relevant OHS procedures, including the use of MSDS and PPE

Required knowledge

Look for evidence that confirms knowledge of:

- standard trade practices relating to tool usage and installation/securing of aircraft hardware
- aircraft structural concepts and structure to the extent required to be able to recognise typical types of structural damage and deterioration during flight servicing activities and scheduled

inspections up to the level of a weekly check or equivalent
- system layout, operation and typical external signs of faults to the extent required to perform flight servicing and scheduled inspections up to the level of a Weekly Check or equivalent
- the function of on-board maintenance systems
- types and characteristics of fuels and fuel additives
- types and characteristics of lubricants
- types and characteristics of hydraulic fluids
- OHS procedures relating to flight servicing activities, including how to obtain MSDS and PPE
- basic theory of flight relating to rotary wing aircraft, including stability and control
- piston engine basic theory, installation and operation
- factors influencing piston engine performance
- engine transmission and rotor basic theory, installation and operation
- relevant principles of mathematics and physics

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform flight servicing activities on the occasions as listed in the variables and scheduled line maintenance checks (up to a Weekly Check or equivalent) that are relevant to the organisation in accordance with relevant maintenance documentation, while applying all relevant OHS procedures and standard processes.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that the specific aspects of the aircraft flight servicing or scheduled line maintenance task are checked to ensure quality and safety standards are fully observed, understood and complied with. Safety precautions applicable to the system being maintained are to be fully observed. An understanding of system operation as it relates to the work must be demonstrated before undertaking any action. Evidence of knowledge of system operation, recognition of defects and completion of documentation, the relationship of individual components and the links with other systems will be necessary to the extent required for completion of flight servicing and scheduled line maintenance task before undertaking any action. The

	work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of this unit of competency are being achieved under supervision but without intervention on the flight servicings and scheduled line maintenance tasks listed in Groups 1 to 5 of the Range Statement that are applicable to the enterprise. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment using procedures, tools and equipment specified in maintenance documentation. It is also expected that general purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	The Range Statements below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Applicable maintenance activities	Applicable maintenance activities include: 1. Preparation for flight following maintenance 2. Before flight servicing 3. After flight servicing 4. Turn around servicing

	5. Scheduled line maintenance activities up to the level of a Weekly Check or specified equivalent
Maintenance documentation	Maintenance documentation may include: • maintenance manuals • servicing schedules • applicable airworthiness regulations • aircraft maintenance program
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA349B Apply basic scientific principles and techniques in aeronautical engineering situations

Modification History

Knowledge requirements expanded - equivalent to previous version.

Unit Descriptor

This unit of competency covers applying basic scientific principles and techniques to appropriate aeronautical engineering situations.

Application of the Unit

This unit requires application of basic aeronautical scientific principles and techniques as a member of a design and development team or similar in support of the design and development of aeronautical applications, or within the engineering department of an aircraft maintenance organisation.

Applications include identifying the range of basic aeronautical scientific principles and techniques relevant to aeronautical engineering, selecting aeronautical principles and techniques for particular applications, applying aeronautical principles and techniques appropriately to engineering tasks, quoting results appropriately.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Research and identify the range of basic scientific principles and techniques relevant to aeronautical engineering	1.1 The basic scientific principles relating to aeronautical engineering are researched and reported on from appropriate ***sources of information*** and examination of applications
	1.2 The basic aeronautical techniques and associated technologies, software and hardware required to implement scientific principles relating to ***aeronautical engineering*** situations are identified
2 Select basic aeronautical scientific principles and techniques relevant to particular aeronautical engineering applications	2.1 For particular **aeronautical engineering** situations, the ***relevant basic aeronautical scientific techniques and principles*** can be selected
	2.2 For particular aeronautical engineering situations, the relevant basic aeronautical techniques and associated technologies, software and hardware can be selected
3 Apply the relevant basic aeronautical scientific principles and techniques appropriately	3.1 The basic aeronautical scientific principles are applied in a consistent and appropriate manner to obtain any required solution
	3.2 Appropriate calculations and coherent units are used in the solution of engineering calculations
	3.3 Significant figures are used in engineering calculations
	3.4 The basic aeronautical techniques and associated technologies, software and hardware are applied in a consistent and appropriate manner to obtain required solutions
4 Quote the results of the application of the basic aeronautical scientific principles and basic techniques correctly	4.1 For applications involving engineering calculations, the solution is quoted in an appropriate style
	4.2 For applications not involving engineering calculations, the solution is quoted in an appropriate style

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- basic aeronautical scientific principles including:
  - statics – complete tasks requiring analysis and application of:
    - forces and moments of forces
    - systems of concurrent and non-concurrent forces
    - dry sliding friction
  - dynamics – complete tasks requiring analysis and application of:
    - Newton's Laws
    - kinematics and kinetics of uniformly accelerated linear motion
    - kinematics and kinetics of uniformly accelerated rotation
    - curvilinear motion and centrifugal force
    - work, energy, power and torque
    - mechanical advantage and efficiency
  - strength of materials:
    - axial tension and compression
    - direct shear
    - bolted, riveted, bonded and welded connections
    - shear in beams
    - bending stresses and bending deflections (by standard formulas only)
    - torsion
  - aerodynamics:
    - Bernoulli's Theorem
    - the atmosphere
    - aerodynamic forces (lift, drag, weight and thrust)
    - stability and control (to a level not requiring the application of calculus)
    - airscrews and propulsion (to a level not requiring the application of calculus)
    - aircraft performance (to a level not requiring the application of calculus)
  - fluid mechanics:
    - properties of fluids including mineral and synthetic hydraulic fluids
    - fluid statics, Archimedes' Principle and Pascal's Principle
    - fluid flow – continuity and energy conservation
    - fluid power – pumps
  - thermodynamics:
    - heat transfer principles (conduction, convection and radiation)
    - perfect gas laws
    - kinetic theory of gases
    - laws of thermodynamics
- control concepts including closed and open loop control

- electricity and electronics:
  - basic electrical concepts
  - Ohm's Law
  - Kirchhoff's Current and Voltage Laws
  - basic DC circuits
  - basic power supply, transformer, rectifier, filter and regulator
  - PLC concepts – I/O, timing, counting, programming
  - electronic devices (discrete) – resistors, diodes, capacitors, inductors, transistors and rectifiers
  - microprocessor concepts
- light, sound and vibration:
  - wave behaviour – standing vs travelling waves, transverse and longitudinal
  - light – reflection, absorption, refraction, diffraction, spectrum, infrared, visible, ultraviolet, transmission medium and engineering applications
  - sound – pitch, frequency, intensity (power), decibel scale, 'noise dose', spectrum, infrasound, audible, ultrasound, speed, natural frequency, resonance, transmission medium and engineering applications
  - vibration – sources, balancing, shaft alignment, measurement, damping and engineering applications
- basic aeronautical techniques and related technologies, software and hardware associated with implementing scientific principles in mechanical engineering solutions
- the applicability and limitations of basic aeronautical scientific principles
- the applicability and limitations of basic aeronautical techniques and associated technologies, software and hardware
- appropriateness of calculations
- fundamental and derived quantities
- common systems of units
- the procedure for converting between systems of units
- common prefixes used with units and their values
- the procedure for carrying out dimensional analysis
- the concept of significant figures
- the uncertainty of computations based on experimental data
- the procedures for determining the significance of figures in calculations
- the procedures for estimating errors in derived quantities

Look for evidence that confirms skills in:

- selecting appropriate basic aeronautical scientific principles to suit specific applications
- selecting appropriate basic aeronautical techniques and associated technologies, software and hardware to suit specific applications
- applying basic aeronautical scientific principles to particular engineering situations
- applying and manipulating appropriate formulas for applications involving engineering calculations
- applying appropriate calculations to engineering situations

- checking the validity of equations is using dimensional analysis
- applying basic aeronautical techniques and associated technologies, software and hardware in a manner appropriate to the application and identified scientific principles
- referring solutions to the original aim of the application
- quoting solutions in appropriate units, using appropriate significant figures
- quoting limitations of solutions, due to assumptions, scientific principles and techniques used
- presenting solutions referring to the original aim of the application

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply basic scientific principles and techniques in aeronautical engineering situations.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is, the candidate is not in productive work, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace

	procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Method of assessment	This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with applying basic scientific principles and techniques in aeronautical engineering situations or other units requiring the exercise of the skills and knowledge covered by this unit.
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Sources of information	Sources of information include: • reference texts • manufacturer catalogues and industrial magazines • international aerospace organisation publications • websites • use of phone, email and fax information gathering
Aeronautical engineering	Aeronautical engineering refers to: • the engineering discipline concerned with the conceptual development, research, design, manufacture, implementation, installation, commissioning and maintenance of aerospace mechanical, hydraulic, pneumatic, fuel and fire products, processes, systems or services for civil and military applications
Relevant basic aeronautical scientific techniques and principles	Candidates should apply appropriate basic techniques supported by their mathematical skills and introductory knowledge of scientific principles to design, manufacturing, commissioning and maintenance related tasks and projects relating to metal and composite structure, aerodynamic loads, stability, control and performance, mechanical systems and related

	components, hydraulic systems and related components, pneumatic systems and related components, air cycle air conditioning and pressurisation systems and related components, power plant systems and components, and the application and interfacing of electrical and electronic system control. The applications may require the use of one or two basic aeronautical scientific principles together with a fundamental mathematical calculation leading to process, resources and system choices from a limited range of options. Basic techniques include: • basic hand and power tool operations • machining • fitting • welding • moulding • fabricating • wiring and programming techniques

Unit Sector(s)

Engineering science

Custom Content Section

Not applicable.

MEA350A Select and test aeronautical engineering materials

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency covers selecting appropriate materials and materials and components tests for aeronautical engineering applications.

Application of the Unit

Applications of this unit include selecting engineering materials and materials tests, sourcing materials data; ensuring appropriate performance and physical standards for aeronautical applications; documenting materials tests, ensured calibration standards; interpreting and documenting materials data sheets as appropriate for mass production, batch production, jobbing shop, and prototyping applications.

Activities may be performed as a member of a design and development or engineering support team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Identify classes of materials, based on properties and materials tests relevant to aeronautical engineering	1.1. ***Classes of materials*** are identified, ***based on properties***, required for particular ***aeronautical engineering*** applications 1.2. Relate material properties are related to common production and construction methods and processes 1.3. Common characteristics, faults or flaws in materials and components or product are identified in particular engineering applications 1.4. Test methods for materials and components or product are identified in particular engineering applications 1.5. Specific industrial test standards/codes, calibration requirements, regulations and authorities related to selection of materials and products are identified for particular engineering applications 1.6. The role of ***Australia's national measurement system*** is investigated
2. Identify and use sources of information on engineering materials, materials tests and test equipment, including manufacturers' catalogues and websites	2.1. Appropriate ***sources of information*** on materials are identified and used 2.2. Appropriate sources of information on methods of testing of properties of materials are identified and used to ensure suitability for a particular application 2.3. Appropriate sources of information on materials, materials tests, test calibration, test certificates, regulations, standards, ***standards councils***/***societies***/***authorities***/***regulatory bodies*** are identified and used 2.4. The use of ***standards and codes*** are investigated and reported on 2.5. Appropriate sources of information on MSDS are identified and used
3. Specify and implement materials for particular aeronautical engineering	3.1. Materials for particular applications are specified and implemented

applications.

4. Specify and implement methods used to test or obtain the properties of engineering materials	4.1. ***Tests of materials*** are specified and implemented to ensure quality, safety or suitability for a range of applications 4.2. ***Traceability*** of measurement standard is ensured 4.3. Test sheets/certificates for appropriate materials are obtained for applications in accordance with organisational procedures and/or codes and regulations 4.4. Appropriate MSDS are obtained for applications in accordance with organisational procedures and/or codes and regulations
5. Report on and record materials design data and methods and results of materials tests	5.1. Materials selections are reported and recorded against design functional requirements in accordance with organisational procedures, codes and regulations, including environmental impact and sustainability assessment. 5.2. Materials tests and test sheets/certificates are reported and recorded in accordance with organisational procedures, codes and regulations 5.3. Appropriate calibration and traceability are ensured 5.4. Appropriate MSDS are reported and recorded for applications in accordance with organisational procedures, codes and regulations

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- selecting class of materials for an application based on comparison of properties for a significant range of materials classes
- selecting class of materials for an application suitable to production and construction methods and processes
- identifying, overcoming or compensating for common characteristics, faults or flaws in materials or product
- identifying test methods for materials and components, specific industrial test standards and regulations for particular engineering applications
- identifying test methods for faults or flaws in materials and components or product
- selecting materials following an extensive search of appropriate sources of information, including manufacturer's catalogues and websites
- selecting appropriate tests from a range of possible tests, following an extensive search of appropriate sources of information, including manufacturer's catalogues and websites

- satisfying applicable standards and regulations for materials and components
- sourcing materials test certificates and using the material properties information from them
- sourcing and implementing MSDS
- implementing tests correctly for materials and component faults and properties of materials
- selecting testing methods appropriate to applications
- obtaining appropriate test sheets/certificates for applications
- obtaining appropriate MSDS for application
- completing reports, records and design documentation
- addressing environmental impact and sustainability issues
- reporting, recording and filing test reports and documentation
- implementing materials tests and test sheets/certificates, test calibration and traceability

Required knowledge

Look for evidence that confirms knowledge of:

- properties of materials classes
- the effect of material properties on production and construction methods and processes
- the effect of characteristics, faults or flaws in materials on product and processes
- test methods for materials and components, specific industrial test standards, regulations and authorities related to particular engineering applications
- test methods for faults or flaws in materials and components or product
- methods of accessing and using alternative information sources
- test procedures and typical applications for tests
- sources and uses of information on materials, materials tests, test certificates, regulations, standards, regulatory bodies and industrial authorities
- methods of accessing MSDS
- identification of materials for an application based on comparison of properties of materials
- identification of test for an application based on an understanding of its ability to measure specific material or product properties
- significance of test sheets/certificates to applications
- the need for obtaining and filing test sheets/certificates
- significance of MSDSs and relevance of procedures
- materials selections in relation to design functional requirements
- environmental impact and sustainability assessment
- significance of test reports and documentation to applications
- significance of reporting and recording procedures
- significance of materials tests and test sheets/certificates, test calibration and traceability
- significance of MSDS to applications
- significance of reporting and recording procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to select and test aeronautical engineering materials.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.
Method of assessment	This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with selecting and testing aeronautical engineering materials or other units requiring the exercise of the skills and knowledge covered by this unit.
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Classes of materials, based on properties	Classes of materials include: • non-ferrous metals and alloys (copper, aluminium, zinc, lead, tin and their alloys), ferrous metals (carbon steels, alloy steels and cast irons), non-metallic composite materials, bearing materials, lubricants, non-metals (timber, ceramics, polymers and fabrics, adhesives and electrical insulation materials), thermal conductors and insulators, electrical conductors, semiconductors and insulators Properties of materials include: • strength, elasticity, plasticity, malleability, toughness, brittleness, fatigue endurance, mouldability, weldability, machinability, formability, resistance to creep and stress relaxation, resistance to degradation (e.g. use of plastic fillers to enhance UV resistance), adhesion, electrical, magnetic, thermal, chemical and optical, material structure and effect on properties, and flammability of fabrics Other factors include: • corrosion and corrosion protection methods. • aging of metals • the effect of manufacturing and construction processes on material properties. • the effect of property enhancement on design (e.g. adhesives plus sintering replacing some forging and machining of gears on shafts) • lay-up methods for composite structures. Cost includes: • manufacture of material and source of material,typical applications and possibilities
Aeronautical engineering	Aeronautical engineering refers to: • the engineering discipline concerned with the conceptual development, research, design,

	manufacture, implementation, installation, commissioning and maintenance of aerospace mechanical, hydraulic, pneumatic, fuel and fire products, processes, systems or services for civil and military applications
Australia's national measurement system	Australia's national measurement systems includes: • National Standards Commission (legal metrology) • Commonwealth Scientific and Research Organisation (physical standards) • National Association of Testing Authorities, Aust. (Laboratory accreditation) • Standards Australia International Ltd (AS standards specifications)
Standards councils/ societies/ authorities/regulatory bodies	Standards councils/societies/authorities/regulatory bodies include: • Australian Standards Council • ASTM • MIL Spec • ASME • ISO Regulatory bodies include: • CASA • ADF • United States Federal Aviation Authority, • European Joint Aviation Authority
Standards and codes	Standards and codes include: • NDT and mechanical test standards • chemical test standards • electrical test standards • compliance test standards for components
Tests of materials	Tests of materials include: • destructive, including tensile, compression, impact, hardness, fatigue, corrosion, stress relaxation and creep, and peel resistance (adhesives) • mon-destructive, including hardness, ultrasonics, X-ray, dye penetrant, eddy current, surface friction, conductivity, heat expansion, photoelastic, heat capacity refractive index, magnetic hysteresis loop
Traceability	Traceability ensures test calibrations can be traced back to the relevant base unit in the relevant measurement system

Unit Sector(s)

Engineering science

Competency field

Co-requisite units

Not applicable

MEA351A Maintain airframe systems of basic light fixed wing aircraft

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to maintain basic light fixed wing aircraft airframe systems and components.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the applicable Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot, and replace components of airframe systems of basic light aircraft.

Applications include fixed wing aircraft that have fixed undercarriage and a normally aspirated engine driving a fixed pitch propeller or a small gas turbine engine.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes

MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect basic light fixed wing airframe systems	1.1. Relevant ***maintenance documentation*** and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements 1.2. Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual 1.3. ***Airframe system*** components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual 1.4. Defects are correctly identified and reported
2. Test/adjust basic light fixed wing airframe systems and components	2.1. Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation 2.2. Airframe system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction 2.3. System adjustment/rigging is performed in accordance

	with maintenance manual
3. Troubleshoot basic light fixed wing airframe systems	3.1. Available information from maintenance documentation, inspection and test results are used, where necessary, to assist in fault determination 3.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate ***troubleshooting*** 3.3. Specialist advice is obtained, where required, to assist with the troubleshooting process 3.4. Airframe system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures 3.5. Rectification requirements are determined
4. Remove and install basic light fixed wing airframe system components	4.1. System is rendered safe in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety 4.2. ***Airframe system component*** removal is carried out in accordance with the applicable maintenance manual 4.3. Required maintenance documentation is accurately completed and correctly processed 4.4. Removed components are tagged, sealed and packaged in accordance with specified procedures 4.5. Components to be installed are checked to confirm correct part numbers, serviceability and modification status 4.6. Mass balance of control surfaces to be installed is checked in accordance with the applicable maintenance manual, if required 4.7. Installation is carried out in accordance with the applicable maintenance manual 4.8. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- using hand skills, tools and test equipment in the testing, adjustment and troubleshooting of airframe systems and components, including airframe system component removal and

installation
- recognising system and component defects/external damage, correct installation and security for the range of airframe systems listed in the Range Statement
- removing, installing and rigging of flight controls
- checking flight control mass balance
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability
- effectively using maintenance documentation and relevant fault diagnosis guides in the troubleshooting process and for component removal and installation
- applying standard procedures
- observing all relevant OHS procedures, including the use of MSDS and PPE

Required knowledge

Look for evidence that confirms knowledge of:

- OHS precautions relevant to airframe system maintenance, including the use of MSDS and PPE
- standard trade practices relating to tool and test/rigging equipment usage and installation/securing of system components
- flight control system layout and operation
- theory of flight:
  - airflow
  - conditions of flight
  - lift and forces
  - drag
  - wings, tailplane and vertical stabiliser
  - lift augmentation (flaps, slats and slots)
  - aircraft control surfaces and their function (elevator, ailerons, rudder, elevons and trim tabs)
  - flight control balancing and flutter
  - stability and control and flight control rigging
- system layout and operation:
  - cockpit controls
  - cables and cable tensioning
  - pulleys and fairleads
  - bellcranks
  - levers
  - control surface horns
  - screwjacks
  - push/pull rods
- mechanical flight control system maintenance procedures and troubleshooting
- fixed undercarriage and shock absorber systems:

  - undercarriage configurations and types (tailwheel, tricycle and bicycle)
  - relative advantages of undercarriage configurations
  - steering systems
  - types of shock absorber (springs, leaf, coil, spring tube, rubber disc, bungee and oleo)
  - wheels and tyres
  - axles and wheel bearings
  - wheel spats
  - fixed undercarriage maintenance procedures and troubleshooting
- small aircraft brake systems:
  - types of brake system (mechanical and hydraulic)
  - master/slave cylinder hydraulic brake system operation
  - hydraulic fluids and seals
  - rigid and flexible plumbing
  - brake pads and shoes
  - brake discs and drums/linings
  - brake system maintenance procedures and troubleshooting
- cabin heater system layout and operation:
  - heat source (muff heaters)
  - ducting for heating and demisting
  - valves and linkages
  - fan
  - cabin heating system maintenance procedures and troubleshooting
- fuel system layout and operation:
  - fuel tank types and location
  - selector valves and linkages
  - drain valves
  - rigid and flexible plumbing
  - fuel filters
  - boost pumps
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must

	be able to inspect, test and troubleshoot airframe systems and remove and install a range of airframe system components that is representative of the scope of the listed variables in accordance with relevant maintenance manual instructions while applying all relevant OHS procedures and standard processes.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with airframe systems and components of basic light fixed wing aircraft. It is essential that relevant procedures, cleanliness requirements and safety precautions are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, testing, troubleshooting and component removal and installation is essential. This may be demonstrated through application across a range of airframe systems and components as listed in the Range Statement. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of this unit of competency are being achieved under routine supervision on groups listed in the Range Statement, as follows: • at least one of each system listed in Groups 1 to 5 • a representative range of components from each of Groups 6 to 12. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is

	also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Maintenance documentation	Relevant maintenance documentation includes: • servicing schedules • maintenance manuals
Airframe systems	Airframe systems may include: 1. Flight control systems 2. Fixed undercarriage shock absorbers 3 Master/slave cylinder brake systems 4. Fuel systems 5. Cabin heating systems
Troubleshooting	Troubleshooting involves the use of test sets, downloaded maintenance data and fault-finding charts or similar, to line replacement level
Airframe system components	Airframe system components may include: 6. Ailerons, elevators, rudders, trim tabs, flaps and slats 7. Flight control wheels or sticks, cables, pulleys, guides, fairleads, bellcranks, rods, torque tubes, chains, sprockets, trim wheels or handles and rudder pedals or bars

	8. Fixed undercarriage hydraulic and rubber shock absorbers 9. Wheels and brake units 10. Brake master cylinders and rigid or flexible plumbing 11. Rigid or flexible fuel tanks, selector/shutoff valves and rigid or flexible plumbing 12. Cabin heater ducting and control valves
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA352A Maintain basic rotary wing aircraft systems

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to maintain basic rotary wing aircraft rotors, rotor control systems, airframe systems and components.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the applicable Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot, and replace components of rotor, rotor control systems and airframe systems of basic rotary wing aircraft.

Applications include rotary wing aircraft that have mechanical control systems, either skids or floats and a normally aspirated engine.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes

MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect rotor and rotor control systems and components	1.1. Isolation and warning signs are fitted/installed to the system or related systems and the aircraft configured for safe system inspection and operation in accordance with relevant aircraft publications/maintenance regulations orders and standards and practices
	1.2. ***Rotor and rotor control system*** is visually or physically checked/inspected for external signs of defects in accordance with relevant aircraft publications maintenance regulations/orders and standards and practices
	1.3. Defects are identified and recorded in accordance with standard enterprise procedures
2. Inspect basic rotary wing airframe systems	2.1. Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements
	2.2. Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual

	2.3. ***Airframe system*** components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual
	2.4. Defects are correctly identified and reported
3. Ground test rotor and rotor control systems	3.1. Aircraft and system prepared in accordance with relevant aircraft publications/maintenance regulations orders and standards and practices, for ***the operation of engine and rotor system***
	3.2. Rotor and rotor control system are functionally tested in accordance with relevant aircraft publications maintenance regulations/orders and standards and practices for evidence of malfunction
	3.3. System calibration or adjustments are performed in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices
4. Test/adjust basic rotary wing airframe systems and components	4.1. Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation
	4.2. Airframe system is functionally tested, in accordance with maintenance manual, for evidence of serviceability or malfunction
	4.3. System adjustment is performed in accordance with maintenance manual
5. Troubleshoot rotor and rotor control systems	5.1. Available information from aircraft maintenance documentation, inspection and test results is used to assist in fault determination
	5.2. Relevant aircraft publication fault diagnosis guide and logical processes are used to ensure efficient and accurate ***troubleshooting***
	5.3. Specialist advice is obtained to assist with the troubleshooting process
	5.4. Rotor and rotor control system faults are located and the causes of the faults are clearly identified and recorded in aircraft maintenance documentation in accordance with standard enterprise procedures
	5.5. Fault rectification requirements are determined
6. Troubleshoot basic rotary wing airframe systems	6.1. Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination
	6.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting
	6.3. Specialist advice is obtained, where required, to assist with the troubleshooting process

	6.4. Airframe system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures
	6.5. Rectification requirements are determined
7. Remove and install rotary wing rotor and rotor system components	7.1. System is rendered safe and prepared in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices, and isolation and warning signs are installed/fitted to ensure personnel safety
	7.2. Rotor and rotor system component removal is carried out in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices
	7.3. Required aircraft maintenance documentation is completed and processed in accordance with standard enterprise procedures
	7.4. Removed components are labelled, sealed and packaged in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices
	7.5. Rotor or rotor system component to be installed is checked to confirm correct part or model numbers, modification status and serviceability
	7.6. Mass balance of rotor blades/head is checked in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices
	7.7. Installation is carried out in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices
	7.8. Support/safety equipment is removed at the appropriate time to ensure personnel safety and freedom from structural damage
8. Remove and install rotor control system components	8.1. System is rendered safe and prepared in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices, and isolation and warning signs are installed/fitted to ensure personnel safety
	8.2. Rotary wing flight control system component removal is carried out in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices
	8.3. Required aircraft maintenance documentation is completed and processed in accordance with standard enterprise procedures
	8.4. Removed components are labelled, sealed and packaged in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices
	8.5. Rotary wing flight control system components to be installed

	are checked to confirm correct part or model numbers, modification status and serviceability
	8.6. Installation is carried out in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices
	8.7. Support/safety equipment is removed at the appropriate time to ensure personnel safety and freedom from structural damage
	8.8. Required aircraft maintenance documentation is completed and processed in accordance with standard enterprise procedures
9. Remove and install basic rotary wing airframe system components	9.1. System is rendered safe in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety
	9.2. ***Airframe system component*** removal is carried out in accordance with the applicable maintenance manual.
	9.3. Required maintenance documentation is accurately completed and correctly processed
	9.4. Removed components are tagged, sealed and packaged in accordance with specified procedures
	9.5. Components to be installed are checked to confirm correct part numbers, serviceability and modification status
	9.6. Mass balance of control surfaces to be installed is checked in accordance with the applicable maintenance manual, if required
	9.7. Installation is carried out in accordance with the applicable maintenance manual
	9.8. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- using hand skills, tools and test equipment in the testing, adjustment and troubleshooting of:
  - rotary wing mechanical control systems
  - helicopter airframe systems and components, including rotors and rotor system
- recognising system and component defects/external damage, correct installation and security for the range of airframe systems listed in the Range Statement
- removing, installing and rigging of rotor systems and rotor/flight controls
- removing and installing the range of airframe components listed in the Range Statement

- checking rotor mass balance
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability
- effectively using maintenance documentation and relevant fault diagnosis guides in the troubleshooting process and for component removal and installation
- applying standard procedures
- observing all relevant OHS procedures, including the use of MSDS and PPE

Required knowledge

Look for evidence that confirms knowledge of:

- OHS precautions relevant to airframe system maintenance, including the lifting and handling of heavy components and how to obtain MSDS and PPE
- standard trade practices relating to tool and test/rigging equipment usage and installation/securing of system components
- theory of flight:
  - airflow
  - conditions of flight
  - lift and forces
  - drag
- rotary flight principles:
  - terminology relating to:
    - aerofoils
    - main rotor blades
    - rotor discs
    - rotors (main and tail)
  - aerodynamic characteristics:
    - aerofoil design
    - forces
    - rotor thrust and power requirements
    - vortex ring
    - autorotation
  - helicopter stability
- helicopter dynamic components:
  - main rotors:
    - blades
    - heads
    - linkages
  - tail rotors
  - swash plates
  - transmissions and drive shafts
- helicopter structure and airframe systems:

  - structure and layout
  - engine and transmission
  - flight control system layout and operation
  - cabin heater system layout and operation
  - fuel system layout and operation
- helicopter maintenance procedures and troubleshooting
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures, including requirements for engine and rotor system operation

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot basic rotary wing aircraft rotor, rotor control and airframe systems and remove and install rotors, and a range of rotor control and airframe system components that is representative of the scope of the listed variables in accordance with relevant maintenance manual instructions while applying all relevant OHS procedures and standard processes.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with the, rotors, rotor control systems, airframe systems and components of basic rotary wing aircraft. It is essential that relevant procedures, cleanliness requirements and safety precautions are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, testing, troubleshooting and component removal and installation is essential. This may be demonstrated through application across a range of rotors, rotor control systems, airframe systems and components as listed in the Range Statement. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of

	individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of this unit of competency are being achieved under routine supervision on groups listed in the Range Statement, as follows: • at least one component from each of Groups 1 to 7 • a representative range of components from Groups 8 and 9. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Rotor and rotor control system	Rotor and rotor control system components may include:

	1. Main rotor blades and tail rotor blades 2. Rotor heads, swash plates and tail rotor pitch control assemblies 3. Mechanical flight control components (collective and cyclic pitch levers, rudder pedals, cables, pulleys, guides, fairleads, bellcranks, rods, torque tubes, chains and sprockets) 4. Main rotor, intermediate or tail rotor gearboxes 5. Drive shafts and couplings
Engine and rotor system operation	The operation of engine and rotor system: • must be performed by a qualified pilot
Airframe systems and components	Airframe systems may include: 6. Fuel systems 7. Cabin heating systems Airframe system components may include: 8. Rigid or flexible fuel tanks, selector/shutoff valves and rigid or flexible plumbing 9. Cabin heater ducting and control valves
Troubleshooting	Troubleshooting involves the use of test sets, downloaded maintenance data and fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA353A Maintain basic light aircraft engines and propellers

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to maintain basic light fixed and rotary wing aircraft piston engines and fixed pitch propellers.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the applicable Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills, the use of maintenance publications and knowledge of piston engine and system theory to inspect, test and troubleshoot, remove and install normally aspirated piston engines and engine system components The unit also covers the inspection, maintenance, removal and installation of fixed pitch propellers.

Applications include normally aspirated piston engines of basic light fixed wing aircraft and basic rotary wing aircraft, and fixed pitch propellers.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes

MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect piston engine system and components/systems	1.1. Isolation tags already attached to the system or related systems are checked and aircraft/engine configured for safe system inspection and operation in accordance with applicable maintenance manual
	1.2. ***Piston engine and components/systems*** are visually or physically checked for external and internal signs of defects in accordance with applicable maintenance manual
2. Test piston engine	2.1. Aircraft and engine are correctly prepared in accordance with applicable maintenance manual
	2.2. Assistance is provided with ***engine and/or system operation*** during prescribed test procedures to establish serviceability and correct function in accordance with applicable maintenance manual
3. Troubleshoot piston engine	3.1. Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination

	3.2. Maintenance manual fault diagnosis guide and logical processes are used to ensure efficient and accurate ***troubleshooting***
	3.3. Specialist advice is obtained, where required, to assist with the troubleshooting process
	3.4. Piston engine faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required
	3.5. Fault rectification requirements are determined to assist in planning the repair
4. Remove piston engine and engine system components	4.1. Aircraft is prepared and supported and rendered safe in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure the safety of personnel and freedom from damage during engine removal
	4.2. Removal is carried out in accordance with the applicable maintenance manual
	4.3. Engine is tagged and prepared for transport or storage in accordance with the specified procedures
	4.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
5. Install piston engine and engine system components	5.1. Engine to be installed is checked to confirm correct part or model numbers, modification status and serviceability
	5.2. Installation is carried out in accordance with the applicable maintenance manual
	5.3. Support/safety equipment is removed at the appropriate time to ensure personnel safety and freedom from structural damage
	5.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
6. Inspect and maintain fixed pitch propeller	6.1. Engine is rendered safe for propeller inspection in accordance with maintenance manual or enterprise procedures
	6.2. ***Fixed pitch propeller*** is inspected for security, damage and deterioration in accordance with the applicable maintenance manual
	6.3. Metal propeller nicks and dents within damage limits are blended out in accordance with maintenance manual procedures
7. Remove fixed pitch propeller	7.1. Engine is rendered safe and the aircraft is prepared for propeller removal in accordance with maintenance manual or enterprise procedures

	7.2. Propeller is removed in accordance with maintenance manual procedures
	7.3. Removed propeller is tagged and prepared for transport or storage in accordance with specified procedures
	7.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
8. Install fixed pitch propeller	8.1. Engine is rendered safe and the aircraft is prepared for propeller installation in accordance with maintenance manual or enterprise procedures
	8.2. Propeller to be installed is checked to confirm correct part or number, modification status and serviceability
	8.3. Installation is carried out in accordance with the applicable maintenance manual
	8.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures, including the use of MSDS and PPE
- using relevant maintenance documentation and aircraft manuals
- recognising external and internal signs of defects in piston engines, components and system components visual/physical inspection
- assisting with testing of piston engine and engine system operation, be able to operate systems, monitor indications, record parameters and recognise correct function
- compiling engine condition monitoring records
- rigging and adjusting engine controls and systems
- using fault diagnosis guides and equivalent data to accurately and efficiently troubleshoot the causes of unserviceabilities in piston engines and engine systems, clearly record details and identify the required rectification actions
- correctly removing and installing piston engine, engine components and fixed pitch propellers, including spinners
- inspecting propellers for security, damage and deterioration
- blending out metal propeller nicks and dents that are within maintenance manual limits

Required knowledge

Look for evidence that confirms knowledge of:

- OHS procedures associated with engine and propeller maintenance, including lifting and

handling of heavy objects
- how to obtain MSDS
- use of PPE
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures
- fault diagnosis techniques
- piston engine and engine system layout and operation:
  - four stroke engine theory of operation and performance
  - cylinder configurations
  - construction (components and materials)
  - carburettors and air induction systems
  - fuel injection systems
  - fuels and their characteristics
  - ignition systems
  - lubricating systems and lubricants
  - cooling systems
  - exhaust systems
  - accessory drives and mounts
  - normally aspirated piston engine maintenance requirements and troubleshooting procedures
- system component operation, including electrical and instrument system interfaces:
  - magnetos and ignition harnesses
  - spark plugs
  - fuel pumps
  - fuel filters
  - oil pumps
  - oil filters
  - oil tanks
  - vacuum pumps
  - generators
  - starter motors
  - oil pressure gauges (direct reading)
  - temperature gauges (direct reading)
  - tachometers
  - manifold pressure gauges
  - maintenance requirements and troubleshooting procedures
- removal and installation procedures for piston engines and engine components:
  - removal procedures and handling
  - control linkages
  - electrical wiring

- engine instrument connections
- installation and rigging
- ground running
- system component removal, installation and system testing

- propellers, materials and damage and deterioration criteria:
  - fixed pitch propeller types, terminology and theory:
    - tractor/pusher
    - matching to engine and aircraft
    - leading edge/trailing edge
    - blade stations
    - forces acting on a propeller
    - propeller balance
  - materials and construction methods:
    - metal propeller metals, construction and surface protection
    - wooden propeller materials, construction and surface protection
    - composite propeller materials, construction and surface protection
    - damage and deterioration
  - methods of blending out of minor damage to metal propellers
- propeller removal and installation procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills, use maintenance publications and engine and system theory knowledge to maintain fixed pitch propellers and to inspect, test, troubleshoot, remove and install piston engines and engine system components on fixed or rotary wing aircraft while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing, troubleshooting and removal and installation tasks (including the timely involvement of supervisor or other trades) associated with engines, engine systems and fixed pitch propellers. It is essential that system testing procedures take into account all safety precautions associated with piston engine system operation, and that

	awareness be demonstrated of dual inspection requirements associated with work on engine controls. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This may be demonstrated through application across a number of engine systems or types and propellers made from different materials. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. The application of testing procedures and functional rigging checks should also indicate knowledge of system operation. Engine system operation knowledge, the relationship of individual components and the links with other systems will be necessary to supplement evidence of ability to carry out rigging checks and troubleshoot the system within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one item from each of Groups 1 to 6 listed in the Range Statement (Group 6 may be omitted where not applicable to the enterprise), and on at least one type of fixed pitch propeller. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Piston engines and components/systems	Piston engines and components/systems may include: 1. Normally aspirated engine (all types), main components and accessories/drives 2. Control system 3. Starter system 4. Fuel, air systems 5. Exhaust system 6. Oil system (if dry sump)
Engine and/or system operation	Engine and/or system operation: • testing of engines fitted to helicopters (where auxiliary drive is not available) may be carried out through the applicant directing a pilot qualified on type
Troubleshooting	Troubleshooting involves the use of test sets, downloaded maintenance data and fault-finding charts or similar, to line replacement level
Fixed pitch propellers	Fixed pitch propeller may include a spinner and the propeller may be made from: • metal • composite • wood
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA354A Maintain light aircraft pneumatic systems

Modification History

Minor formatting and editorial changes made. Prerequisite unit version codes updated. Unit version codes updated in unit application.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It cover

s the competencies required to maintain light aircraft pneumatic systems and system components. Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test, troubleshoot and replace components of light aircraft pneumatic systems.

Applications include light aircraft that have pneumatic systems where the air source is other than gas turbine engine bleed air. Bleed-air supplied pneumatic systems are covered by units MEA303D Remove and install aircraft pneumatic system components and MEA310C Inspect, test and troubleshoot aircraft pneumatic systems and components.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance

MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect light aircraft pneumatic systems	1.1. Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements
	1.2. Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual
	1.3. Components of ***pneumatic systems*** are visually or physically checked for external signs of defects in accordance with applicable maintenance manual
	1.4. Defects are correctly identified and reported
2. Test/adjust light aircraft pneumatic systems and	2.1. Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation

components	2.2. Pneumatic system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction 2.3. System adjustment is performed in accordance with maintenance manual
3. Troubleshoot light aircraft pneumatic systems	3.1. Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination 3.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate ***troubleshooting*** 3.3. Specialist advice is obtained, where required, to assist with the troubleshooting process 3.4. Pneumatic system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures 3.5. Rectification requirements are determined
4. Remove and install light aircraft pneumatic system components	4.1. System is rendered safe in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety 4.2. ***Pneumatic system component*** removal is carried out in accordance with the applicable maintenance manual 4.3. Required maintenance documentation is accurately completed and correctly processed 4.4. Removed components are tagged, sealed and packaged in accordance with specified procedures 4.5. Components to be installed are checked to confirm correct part numbers, serviceability and modification status 4.6. Installation is carried out in accordance with the applicable maintenance manual 4.7. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- using hand skills, tools and test equipment in the testing, adjustment and troubleshooting of light aircraft pneumatic systems and components, including pneumatic system component

removal and installation
- recognising pneumatic system and component defects/external damage, correct installation and security for the types of systems listed in the Range Statement
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability
- effectively using maintenance documentation and relevant fault diagnosis guides in the troubleshooting process and for component removal and installation
- applying standard procedures
- observing of all relevant OHS procedures, including use of MSDS and PPE

Required knowledge

Look for evidence that confirms knowledge of:

- OHS precautions relevant to light aircraft pneumatic system maintenance and how to obtain MSDS and PPE
- standard trade practices relating to tool and test equipment usage and installation/securing of system components
- types of light aircraft pneumatic system and components thereof:
  - vacuum
  - positive pressure
  - high pressure
- pneumatic system layout, operation and characteristics and system component operation and construction (including electrical and instrument system interfaces)
- how to configure the aircraft for inspection, testing and troubleshooting of pneumatic systems and components
- pneumatic system maintenance requirements and troubleshooting
- component attachment methods
- connection hardware and couplings
- electrical circuit isolation and plug removal and installation
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot light aircraft pneumatic systems and remove and install a range of pneumatic system components that is representative of the scope of the listed variables in accordance with

	relevant maintenance manual instructions while applying all relevant OHS procedures and standard processes.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with light aircraft pneumatic systems and components. It is essential that relevant procedures, cleanliness requirements and safety precautions are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, testing, troubleshooting and component removal and installation is essential. This may be demonstrated through application across pneumatic systems and components as listed in the Range Statement. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of this unit of competency are being achieved under routine supervision on a system as listed in Group 1 and on a representative range of components as listed in Groups 2 to 5 in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for	

assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Pneumatic systems	Pneumatic systems may include: 1. De-icing systems including de-icer boots on wings and tailplanes
Troubleshooting	Troubleshooting involves the use of test sets, downloaded maintenance data and fault-finding charts or similar, to line replacement level
Pneumatic system components	Pneumatic system components may include: 2. Filters, valves, pumps, regulators and timers 3. Gauges (direct reading) 4. De-icer boots 5. Rigid and flexible pipelines, hoses and fittings
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA355A Maintain light aircraft air cycle air conditioning systems

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to maintain light aircraft air cycle air conditioning systems and system components.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test, troubleshoot and replace components of light aircraft air cycle air conditioning systems.

Applications include unpressurised gas turbine engine-powered fixed and rotary wing light aircraft that have air cycle air conditioning systems. Where the aircraft has a pressurisation system the air conditioning and pressurisation systems are covered by MEA303D Remove and install aircraft pneumatic system components and MEA310C Inspect, test and troubleshoot aircraft pneumatic systems and components.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA201B	Remove and install miscellaneous aircraft electrical hardware and components

MEA246C Fabricate and/or repair aircraft electrical hardware or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect light aircraft air cycle air conditioning system	1.1. Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements
	1.2. Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual
	1.3. ***Air cycle air conditioning system components*** are visually or physically checked for external signs of defects in accordance with applicable maintenance manual
	1.4. Defects are correctly identified and reported
2. Test/adjust light aircraft air conditioning systems and components	2.1. Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation
	2.2. Air cycle air conditioning system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction
	2.3. System adjustment is performed in accordance with maintenance manual
3. Troubleshoot light aircraft air cycle air conditioning systems	3.1. Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination

	3.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate ***troubleshooting***
	3.3. Specialist advice is obtained, where required, to assist with the troubleshooting process
	3.4. Air cycle air conditioning system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures
	3.5. Rectification requirements are determined
4. Remove and install light aircraft air cycle air conditioning system components	4.1. System is rendered safe in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety
	4.2. Air cycle air conditioning system component removal is carried out in accordance with the applicable maintenance manual
	4.3. Required maintenance documentation is accurately completed and correctly processed
	4.4. Removed components are tagged, sealed and packaged in accordance with specified procedures
	4.5. Components to be installed are checked to confirm correct part numbers, serviceability and modification status
	4.6. Installation is carried out in accordance with the applicable maintenance manual
	4.7. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- using hand skills, tools and test equipment in the testing, adjustment and troubleshooting of light aircraft air cycle air conditioning systems and components, including system component removal and installation
- recognising air cycle air conditioning system and component defects/external damage, correct installation and security for the types of system components listed in the Range Statement
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability

- effectively using maintenance documentation and relevant fault diagnosis guides in the troubleshooting process and for component removal and installation
- applying standard procedures
- observing all relevant OHS procedures, including the use of MSDS and PPE

Required knowledge

Look for evidence that confirms knowledge of:

- OHS precautions relevant to light aircraft air cycle air conditioning system maintenance and how to obtain MSDS and PPE
- standard trade practices relating to tool and test equipment usage and installation/securing of system components
- air cycle air conditioning system:
  - terminology
  - layout
  - operation including component operation and construction
  - electrical temperature control system components
- how to configure the aircraft for inspection, testing and troubleshooting of air cycle air conditioning systems and components
- air cycle air conditioning maintenance requirements and troubleshooting
- component attachment methods
- connection hardware and couplings
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures
- maintenance requirements and troubleshooting procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot light aircraft air cycle air conditioning systems and remove and install a range of pneumatic system components that is representative of the scope of the listed variables in accordance with relevant maintenance manual instructions while applying all relevant OHS procedures and standard processes.
Critical aspects for assessment and evidence required to demonstrate	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and

competency in this unit	troubleshooting applications (including the timely involvement of supervisors or other trades) associated with light aircraft air cycle air conditioning systems and components. It is essential that relevant procedures, cleanliness requirements and safety precautions are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, testing, troubleshooting and component removal and installation is essential. This may be demonstrated through application across air cycle air conditioning systems and components as listed in the Range Statement. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of this unit of competency are being achieved under routine supervision on an air cycle air conditioning system and on a representative range of components as listed in Groups 1 to 6 in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Air cycle air conditioning system components	Air cycle air conditioning system components may include: 1. Valves and regulators 2. Heat exchangers, water separators and humidifiers 3. Expansion turbines 4. Rigid and flexible pipelines, hoses and fittings 5. Ducting 6. Temperature sensors, temperature controllers, and electrical control circuit wiring/components
Troubleshooting	Troubleshooting involves the use of test sets, downloaded maintenance data and fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA356A Maintain light piston engine aircraft pressurisation systems

Modification History

Minor formatting and editorial changes made. Unit version codes updated in unit application.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to maintain light piston engine aircraft pressurisation systems and system components.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test, troubleshoot and replace components of light piston engine aircraft pressurisation systems.

Applications include all types of light fixed wing piston engine aircraft that have cabin pressurisation systems. Where aircraft types have pressurisation and air cycle air conditioning systems the applicable units are MEA208C Remove and install aircraft pressurisation control system components, MEA219C Inspect, test and troubleshoot aircraft pressurisation control systems and components, MEA303D Remove and install aircraft pneumatic system components and MEA310C Inspect, test and troubleshoot aircraft pneumatic systems and components.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA201B	Remove and install miscellaneous aircraft electrical hardware and components
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect light piston engine aircraft pressurisation system	1.1. Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements 1.2. Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual 1.3. ***Pressurisation system components*** are visually or physically checked for external signs of defects in accordance with applicable maintenance manual 1.4. Defects are correctly identified and reported
2. Test/adjust light piston engine aircraft pressurisation systems and components	2.1. Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation 2.2. Pressurisation system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction 2.3. System adjustment is performed in accordance with maintenance manual

3. Troubleshoot light piston engine aircraft pressurisation systems	3.1. Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination 3.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate ***troubleshooting*** 3.3. Specialist advice is obtained, where required, to assist with the troubleshooting process 3.4. Pressurisation system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures 3.5. Rectification requirements are determined
4. Remove and install light piston engine aircraft pressurisation system components	4.1. System is rendered safe in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety 4.2. Pressurisation system component removal is carried out in accordance with the applicable maintenance manual 4.3. Required maintenance documentation is accurately completed and correctly processed 4.4. Removed components are tagged, sealed and packaged in accordance with specified procedures 4.5. Components to be installed are checked to confirm correct part numbers, serviceability and modification status 4.6. Installation is carried out in accordance with the applicable maintenance manual 4.7. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- using hand skills, tools and test equipment in the testing, adjustment and troubleshooting of light piston engine aircraft pressurisation systems and components, including system component removal and installation
- recognising pressurisation system and component defects/external damage, correct installation and security for the types of system components listed in the Range Statement
- performing system functional tests and checks to isolate system faults and assess

post-maintenance serviceability
- effectively using maintenance documentation and relevant fault diagnosis guides in the troubleshooting process and for component removal and installation
- applying standard procedures
- observing all relevant OHS procedures, including use of MSDS and PPE

Required knowledge

Look for evidence that confirms knowledge of:

- OHS precautions relevant to light piston engine aircraft pressurisation system maintenance and how to obtain MSDS and PPE
- physiological aspects relating to high altitude flight:
  - human oxygen requirements and hypoxia
  - human temperature requirements and hypothermia
- standard trade practices relating to tool and test equipment usage and installation/securing of system components
- sources of pressurised air (cabin supercharger, air pump or engine turbocharger)
- the relationship between cabin altitude and pressure differential and related structural limitations
- pressurisation system:
  - layout
  - operation and characteristics
  - system component operation and construction:
    - outflow valves
    - pressure controllers
    - safety valves
    - negative pressure relief valves
    - dump valves
    - ducting and outlets
  - electrical and instrument interfaces, including warning and cabin pressure indication systems
- interface with heating and air conditioning systems
- how to configure the aircraft for inspection, testing and troubleshooting of pressurisation systems and components
- pressurisation system maintenance requirements and troubleshooting
- component attachment methods
- connection hardware and couplings
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures
- maintenance requirements and troubleshooting procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot light piston engine aircraft pressurisation systems and remove and install a range of pressurisation system components that is representative of the scope of the listed variables in accordance with relevant maintenance manual instructions while applying all relevant OHS procedures and standard processes.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with light piston engine aircraft pressurisation systems and components. It is essential that relevant procedures, cleanliness requirements and safety precautions are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, testing, troubleshooting and component removal and installation is essential. This may be demonstrated through application across pressurisation systems and components as listed in the Range Statement. The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of this unit of competency are being achieved under routine supervision on a pressurisation system and on a representative range of components as listed in Groups 1 to 5 in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.

Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Pressurisation system components	Pressurisation system components may include: 1. Pressure controllers 2. Outflow valves 3. Safety valves 4. Negative pressure relief valves 5. Ducting
Troubleshooting	Troubleshooting involves the use of test sets, downloaded maintenance data and fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA357A Inspect, test and repair aircraft fabric surfaces

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to inspect, test and repair aircraft fabric surfaces.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the applicable Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills, knowledge of fabric covering systems and maintenance publications to inspect, test and repair aircraft fabric surfaces.

Applications include aircraft and aircraft components that are covered with fabric.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications

MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect/test aircraft fabric surfaces	1.1. Relevant maintenance documentation and modification status, including defect reports, where relevant, are used to identify specific ***inspection***/***testing*** requirements
	1.2. Appropriate preparation and access to the aircraft structure is undertaken to allow for proper inspection in accordance with maintenance documentation
	1.3. Aircraft fabric-covered surfaces are inspected/tested for signs of damage, deterioration or loss of tensile strength in accordance with maintenance documentation and approved procedures
	1.4. Damage or deterioration is assessed against limits specified by maintenance manual or other approved data to determine if ***repair***, restoration or replacement is required
2. Repair aircraft fabric surfaces	2.1. Extent of damage is correctly assessed to assist in determining repair procedure
	2.2. Structure is supported and prepared in accordance with the applicable maintenance manual to ensure personal safety and freedom from damage
	2.3. Appropriate repair scheme is identified in accordance with maintenance manual and/or approved data

2.4. All materials and equipment required are organised

2.5. Fabric repairs are performed, in accordance with approved repair scheme, ensuring that aircraft standard practices are used and process requirements are carried out

2.6. Work area is cleaned of all waste material or contaminants

2.7. Components are adjusted and/or re-balanced, where necessary, to operate within prescribed specifications

2.8. Required maintenance/repair documentation is completed and processed in accordance with standard enterprise procedures

2.9. Where required, repaired components or assemblies are tagged, sealed and packaged or cradled in accordance with specified procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures, including the selection and use of MSDS and PPE
- using approved maintenance documentation and aircraft publications relating to aircraft fabric surfaces
- testing the soundness of fabric surfaces
- recognising and assessing fabric surface damage and deterioration
- recognising defective doping
- identifying and applying applicable repair and surface rejuvenation schemes

Required knowledge

Look for evidence that confirms knowledge of:

- OHS hazards associated with fabric covering processes and how to obtain relevant MSDS and PPE
- regulatory requirements relating to the repair of fabric surfaces
- industry publications relating to the repair of fabric surfaces
- aircraft fabric surface covering and finishing materials and principles
- fabric-covered component attachment methods
- types of fabric and related characteristics
- types of tape, cord and thread and their relative advantages and disadvantages
- cements and finishing scheme materials, their characteristics, uses, storage requirements and related safety precautions
- inspection and testing requirements for existing fabric coverings and new fabric prior to use
- the criteria for fabric rejuvenation, repairs and repair methods, including the need for re-balancing of flight control surfaces after fabric rejuvenation or repair

- the application of flight loads to fabric-covered surfaces, and related failure mechanisms

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills, knowledge of fabric surfaces and maintenance publications to inspect, test and repair aircraft fabric surfaces.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection and testing applications associated with maintenance of aircraft fabric surfaces. It is essential that the procedures take into account all aircraft and personal safety precautions, especially with regard to the use of finishing scheme materials. Evidence of transferability of skills and knowledge related to inspection, testing and repair of aircraft fabric surfaces is essential. This may be demonstrated through application across a range of aircraft fabric surfaces. Ability to interpret inspection, testing and repair procedures and specifications (allowable limits) and apply them in practice is critical. The application of the procedures should also clearly indicate knowledge of structural flight loads. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on all items in each of Groups 1 to 9, as listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.

Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Inspection and testing	Inspection/testing for: 1. Blockage of drainage and water and dirt collection points 2. Deterioration of finishing scheme 3. Deterioration of fabric tensile strength 4. Damage to inspection panels and zips
Repair	Repair of fabric surface: 5. By surface rejuvenation 6. By stitching 7. By unsewed doped-on repair 8. Correct application of finishing scheme 9. Recognition of requirement to re-balance fabric-covered control surfaces after rejuvenation or repair of fabric covering
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA358A Re-cover aircraft fabric surfaces

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to re-cover aircraft fabric surfaces.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills, knowledge of fabric surfaces and maintenance publications to re-cover aircraft fabric surfaces.

Applications include aircraft and aircraft components that are covered with fabric.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Re-cover aircraft fabric surfaces	1.1. Required covering materials and methods are determined from maintenance manual and/or approved data 1.2. Required finishing scheme is determined from maintenance manual and/or approved data 1.3. Materials and equipment required are organised 1.4. Necessary structure and system inspection and preparation prior to covering is correctly performed 1.5. Fabric covering is correctly fabricated and attached to the structure 1.6. Drainage holes are correctly created 1.7. Applicable finishing scheme is correctly applied 1.8. Components are adjusted and/or re-balanced, where necessary, to operate within prescribed specifications 1.9. Required maintenance/repair documentation is completed and processed in accordance with standard enterprise procedures 1.10. Where required, repaired components or assemblies are tagged, sealed and packaged or cradled in accordance with specified procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures, including the correct selection and use of MSDS and PPE
- using approved maintenance documentation and aircraft publications relating to aircraft fabric surfaces
- inspecting structural members, wiring, grommets and system components and initiation of any necessary repair or rectification action

- fabricating and fitting fabric covering with appropriately placed inspection panels, zips and drainage holes
- applying fabric finishing scheme ready for paint
- recognising defective doping

Required knowledge

Look for evidence that confirms knowledge of:

- OHS hazards and how to obtain and use relevant MSDS and PPE
- regulatory requirements and industry publications relating to fabric covering of aircraft surfaces
- aircraft fabric surface covering and finishing materials and principles
- fabric-covered component attachment methods
- types of fabric and related characteristics
- types of tape, cord and thread and their relative advantages and disadvantages
- cements and finishing scheme materials, their characteristics, uses, storage requirements and related safety precautions
- fabric sewing techniques
- application techniques for cements and finishing schemes
- inspection and testing requirements for new fabric prior to use
- the need for re-balancing of flight control surfaces after re-covering, finishing scheme application and painting
- aircraft structure and system inspection requirements prior to re-covering with fabric
- the application of flight loads to fabric-covered surfaces, and related failure mechanisms
- the methods and procedures used (including doping and finishing) in re-covering components, such as wings, fuselages and control surfaces
- the requirements for the placement of inspection panels and zips, and for the creation of drainage holes

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills, knowledge of fabric surfaces and maintenance publications to re-cover aircraft fabric surfaces.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range re-covering applications associated with aircraft fabric surfaces. It is essential that the procedures take into account all aircraft and personal

	safety precautions, especially with regard to the use of finishing scheme materials. Evidence of transferability of skills and knowledge related to re-covering of aircraft fabric surfaces is essential. This may be demonstrated through application across a range of aircraft fabric surfaces. Ability to interpret re-covering procedures and specifications and apply them in practice is critical. The application of the procedures should also clearly indicate knowledge of structural flight loads. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a representative range of fabric surface re-covering tasks. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Scope	This unit of competency applies to the re-covering of a fabric-covered surfaces and the correct application of the approved finishing scheme
Application	Application of this unit may relate to:

	• scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

MEA357A Inspect, test and repair aircraft fabric surfaces

MEA359A Inspect and repair aircraft wooden structures

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to inspect and repair aircraft wooden structures.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of woodworking hand skills and knowledge and the use of maintenance publications to inspect and repair aircraft wooden structures.

Applications include all aircraft with wooden structures and wooden components.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications

MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect aircraft wooden structure	1.1. Relevant maintenance documentation and modification status, including defect reports, where relevant, are used to identify specific inspection requirements 1.2. Appropriate preparation and access to the aircraft structure is undertaken to allow for proper ***inspection and testing*** in accordance with maintenance documentation 1.3. Aircraft wooden structure is visually or physically checked for signs of deterioration, deformation defects or damage in accordance with maintenance documentation and approved procedures 1.4. Damage or defects are assessed against damage or wear limits specified by structural repair manual or other approved data to determine if repair or replacement is required
2. Repair aircraft wooden structure	2.1. Extent of deterioration or damage is correctly assessed to assist in determining ***repair*** procedure 2.2. Structure is supported and prepared in accordance with the applicable maintenance manual to ensure personal safety and freedom from damage 2.3. Appropriate repair scheme is identified in accordance with structural repair manual and/or approved data

2.4. Specialist advice is obtained in establishing an approved repair scheme where a standard repair scheme cannot be identified or damage is beyond limits

2.5. All materials and equipment required are organised

2.6. Structural repairs are performed, in accordance with approved repair scheme, ensuring that aircraft standard practices are used and process requirements are carried out

2.7. ***Finishing scheme*** is restored

2.8. Work area is cleaned of all waste material or contaminants

2.9. Components are adjusted, where necessary, to operate within prescribed specifications

2.10. Required maintenance/repair documentation is completed and processed in accordance with standard enterprise procedures

2.11. Where required, repaired components or assemblies are tagged, sealed and packaged or cradled in accordance with specified procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures, including the correct selection and use of MSDS and PPE
- using approved maintenance documentation and aircraft publications relating to aircraft wooden structure
- identifying and using woodworking tools
- identifying aircraft structural timbers and their characteristics
- identifying potential causes of deterioration in wooden structural components
- identifying wooden structure defects and damage
- identifying the condition of glue lines
- fabricating and fitting repair members
- gluing of wooden structure
- restoring surface finish after repair

Required knowledge

Look for evidence that confirms knowledge of:

- OHS hazards relating to wooden structure repair materials and how to obtain relevant MSDS and PPE
- aircraft wooden construction principles and inspection techniques
- wooden structural component attachment methods

- the effects of environmental factors on aircraft wooden structures
- wooden structure glues and application methods
- wooden component assembly methods and testing of joints
- wooden structure finishing schemes for exterior and interior surfaces
- the application of flight loads to aircraft wooden structural components and joints, and related failure mechanisms
- wooden component fabrication and repair techniques

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply woodworking hand skills and use applicable tools and maintenance publications to inspect and repair aircraft wooden structures while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and repair applications associated with maintenance of aircraft wooden structures. It is essential that the procedures take into account all aircraft and personal safety precautions relating to aircraft structure. Evidence of transferability of skills and knowledge related to inspection, testing and repair of aircraft wooden structures is essential. This may be demonstrated through application across a range of aircraft wooden structures. Ability to interpret inspection and repair procedures and specifications (allowable limits) and apply them in practice is critical. The application of the procedures should also clearly indicate knowledge of structural flight loads. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on all items in each of Groups 1 to 10 in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.

Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Inspection and testing	Inspection and/or testing of: 1. Drainage and water and dirt collection points 2. Fabric covered plywood surfaces 3. Single and double plywood skin 4. Structural timbers and bolt holes 5. Glued joint strength 6. Glue lines Inspection techniques may include: • visual inspection, physical checks, mensuration and alignment
Repair	Repair of: 7. Load carrying structural timbers 8. Plywood skin 9. Spars and ribs

Finishing scheme	10. Refinishing of structure after repair using approved finishing scheme
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA360A Maintain aircraft diesel engines

Modification History

Minor formatting and editorial changes made. Unit version codes updated in unit application.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to maintain installed aircraft diesel engines.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills, the use of maintenance publications and knowledge of diesel engine and system theory to inspect, test and troubleshoot, remove and install aircraft diesel engines and engine system components.

Applications include diesel engines fitted to light aircraft and driving fixed pitch propellers. Where the engine is driving a constant speed propeller, MEA307C Remove and install propeller systems and components and MEA315C Inspect, test and troubleshoot propeller systems and components, will also be required. FADEC systems are covered by MEA279A Inspect, test and troubleshoot full authority digital engine control systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect diesel engine and components/systems	1.1. Isolation tags already attached to the system or related systems are checked and aircraft/engine configured for safe system inspection and operation in accordance with applicable maintenance manual
	1.2. ***Diesel engine and components*/*systems*** are visually or physically checked for external and internal signs of defects in accordance with applicable maintenance manual
2. Test diesel engine	2.1. Aircraft and engine are correctly prepared in accordance with applicable maintenance manual
	2.2. Built-in system test functions and status displays are activated, where applicable, outputs recorded and interpreted
	2.3. Assistance is provided with engine and/or system operation during prescribed test procedures to establish serviceability and correct function in accordance with applicable maintenance manual
3. Troubleshoot diesel engine	3.1. Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination
	3.2. Maintenance manual fault diagnosis guide and logical processes are used to ensure efficient and accurate ***troubleshooting***
	3.3. Specialist advice is obtained, where required, to assist with the troubleshooting process
	3.4. Diesel engine faults are located and the causes of the faults are clearly identified and correctly recorded in

	maintenance documentation, where required
	3.5. Fault rectification requirements are determined to assist in planning the repair
4. Remove diesel engine and engine system components	4.1. Aircraft is prepared and supported and rendered safe in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure the safety of personnel and freedom from damage during engine removal
	4.2. Removal is carried out in accordance with the applicable maintenance manual
	4.3. Engine is tagged and prepared for transport or storage in accordance with the specified procedures
	4.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
5. Install diesel engine and engine system components	5.1. Engine to be installed is checked to confirm correct part or model numbers, modification status and serviceability
	5.2. Installation is carried out in accordance with the applicable maintenance manual
	5.3. Support/safety equipment is removed at the appropriate time to ensure personnel safety and freedom from structural damage
	5.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures, including the use of MSDS and PPE
- using relevant maintenance documentation and aircraft manuals
- recognising external and internal signs of defects in aircraft diesel engines, components and system components through visual/physical inspection
- assisting with testing of diesel engine and engine system operation, be able to operate systems, monitor indications, record parameters and recognise correct function
- compiling engine condition monitoring records
- rigging and adjusting engine controls and systems other than FADEC systems
- using fault diagnosis guides and equivalent data to accurately and efficiently troubleshoot the causes of unserviceabilities in diesel engines and engine systems, clearly record details and identify the required rectification actions.

- correctly removing and installing diesel engines and engine components

Required knowledge

Look for evidence that confirms knowledge of:

- OHS procedures associated with engine and propeller maintenance, including lifting and handling of heavy objects and how to obtain MSDS and PPE
- fault diagnosis techniques
- two and four stroke diesel aircraft engines and engine system layout and operation:
  - principles of operation of two and four stroke diesel engines
  - component function, construction and materials
  - engine operation
  - engine power, efficiency and performance
- diesel aircraft engine super/turbo charging systems
- diesel aircraft engine fuels and lubricating oils
- diesel fuel injection systems
- interfaces between engine systems and FADEC
- diesel aircraft engine induction systems
- diesel aircraft engine cooling systems (liquid and air)
- diesel aircraft engine exhaust systems
- system component operation, including electrical and instrument system interfaces
- dry sump lubrication systems
- removal and installation procedures for diesel aircraft engines and engine components
- diesel aircraft engine maintenance requirements and troubleshooting
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills, use maintenance publications and engine and system theory knowledge to inspect, test, troubleshoot, remove and install aircraft diesel engines and engine system components on fixed or rotary wing aircraft while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate	The underlying skills inherent in this unit should be transferable across a range of inspection, testing,

competency in this unit	troubleshooting and removal and installation tasks (including the timely involvement of supervisor or other trades) associated with diesel aircraft engines and engine systems. It is essential that system testing procedures take into account all safety precautions associated with diesel engine system operation (including interfaces with FADEC systems) and that awareness be demonstrated of dual inspection requirements associated with work on engine controls. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This may be demonstrated through application across a number of engine systems or types. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. The application of testing procedures and functional checks should also indicate knowledge of system operation. Engine system operation knowledge, the relationship of individual components and the links with other systems will be necessary to supplement evidence of ability to carry out engine control system checks and troubleshoot the system within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one item from each of Groups 1 to 8 listed in the Range Statement (Group 8 may be omitted where not applicable to the enterprise). This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for	

assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Diesel engines and components/systems	Diesel engines and components/systems may include: 1. Two and four stroke diesel aircraft engines, main components and accessories/drives 2. Super/turbo charging systems 3. Control system/FADEC interface 4. Starter system 5. Fuel and air systems 6. Cooling system (liquid or air as applicable to enterprise) 7. Exhaust system 8. Oil system (if dry sump)
Engine testing	Testing of engines fitted to helicopters (where auxiliary drive is not available) may be carried out through the individual directing a pilot qualified on type
Troubleshooting	Troubleshooting involves the use of test sets, downloaded maintenance data and fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

MEA353A Maintain basic light aircraft engines and propellers

MEA361A Maintain aircraft two stroke petrol engines

Modification History

Minor formatting and editorial changes made. Unit version codes updated in unit application.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to maintain installed aircraft two stroke petrol engines.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills, the use of maintenance publications and knowledge of two stroke petrol engine and system theory to inspect, test and troubleshoot, remove and install aircraft two stroke petrol engines and engine system components.

Applications include aircraft two stroke petrol engines driving fixed pitch propellers. Where the engine is driving a constant speed propeller, MEA307C Remove and install propeller systems and components and MEA315C Inspect, test and troubleshoot propeller systems and components, will also be required.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect two stroke petrol engine and components/systems	1.1. Isolation tags already attached to the system or related systems are checked and aircraft/engine configured for safe system inspection and operation in accordance with applicable maintenance manual
	1.2. ***Two stroke petrol engine and components*/*systems*** are visually or physically checked for external and internal signs of defects in accordance with applicable maintenance manual
2. Test two stroke petrol engines	2.1. Aircraft and engine are correctly prepared in accordance with applicable maintenance manual
	2.2. Assistance is provided with engine and/or system operation during prescribed test procedures to establish serviceability and correct function in accordance with applicable maintenance manual
3. Troubleshoot two stroke petrol engines	3.1. Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination
	3.2. Maintenance manual fault diagnosis guide and logical processes are used to ensure efficient and accurate ***troubleshooting***
	3.3. Specialist advice is obtained, where required, to assist with the troubleshooting process
	3.4. Two stroke petrol engine faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required
	3.5. Fault rectification requirements are determined to assist in planning the repair

4. Remove two stroke petrol engine and engine system components	4.1. Aircraft is prepared and supported and rendered safe in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure the safety of personnel and freedom from damage during engine removal 4.2. Removal is carried out in accordance with the applicable maintenance manual 4.3. Engine is tagged and prepared for transport or storage in accordance with the specified procedures 4.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
5. Install two stroke petrol engine and engine system components	5.1. Engine to be installed is checked to confirm correct part or model numbers, modification status and serviceability 5.2. Installation is carried out in accordance with the applicable maintenance manual 5.3. Support/safety equipment is removed at the appropriate time to ensure personnel safety and freedom from structural damage 5.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures, including the use of MSDS and PPE
- using relevant maintenance documentation and aircraft manuals
- recognising external and internal signs of defects in two stroke petrol aircraft engines, components and system components through visual/physical inspection
- assisting with testing of two stroke petrol engine and engine system operation, be able to operate systems, monitor indications, record parameters and recognise correct function
- compiling engine condition monitoring records
- rigging and adjusting engine controls and systems
- using fault diagnosis guides and equivalent data to accurately and efficiently troubleshoot the causes of unserviceabilities in two stroke petrol engines and engine systems, clearly record details and identify the required rectification actions
- correctly removing and installing two stroke petrol engine and engine components

Required knowledge

Look for evidence that confirms knowledge of:

- OHS procedures associated with engine maintenance, including lifting and handling of heavy objects and how to obtain MSDS and PPE
- fault diagnosis techniques
- two stroke petrol aircraft engine layout and operation:
  - principles of operation of two stroke engines
  - component function, construction and materials
  - engine operation
  - engine power, efficiency and performance
- two stroke aircraft engine fuels, oils and fuel/oil mixing
- components, layout and operation of two stroke petrol aircraft engine:
  - fuel systems
  - ignition systems:
    - magneto
    - coil
    - spark plugs
    - ignition harnesses
    - switches
  - starting systems
  - induction systems
  - cooling systems (liquid and air)
  - exhaust systems
  - electrical and instrument system interfaces:
    - battery charging system
    - tachometer
- removal and installation procedures for two stroke petrol aircraft engines and engine components
- petrol two stroke aircraft engine maintenance requirements and troubleshooting
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills, use maintenance publications and engine and system theory knowledge to

	inspect, test, troubleshoot, remove and install aircraft two stroke petrol engines and engine system components while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing, troubleshooting and removal and installation tasks (including the timely involvement of supervisor or other trades) associated with two stroke petrol aircraft engines and engine. It is essential that system testing procedures take into account all safety precautions associated with two stroke petrol engine system operation and that awareness be demonstrated of dual inspection requirements associated with work on engine controls. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This may be demonstrated through application across a number of engine systems or types. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. The application of testing procedures and functional checks should also indicate knowledge of system operation. Engine system operation knowledge, the relationship of individual components and the links with other systems will be necessary to supplement evidence of ability to carry out engine control system checks and troubleshoot the system within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one item from each of Groups 1 to 7 listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.

Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Two stroke engines and components/systems	Two stroke petrol engines and components/systems may include: 1. Two stroke petrol aircraft engines, main components, including reduction gearboxes and accessories/drives 2. Ignition system 3. Control system 4. Starter system 5. Fuel, air systems 6. Cooling system (liquid or air as applicable to enterprise) 7. Exhaust system
Testing of engines	Testing of engines fitted to helicopters (where auxiliary drive is not available) may be carried out through the applicant directing a pilot qualified on type
Troubleshooting	Troubleshooting involves the use of test sets, downloaded maintenance data and fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities

Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

MEA353A Maintain basic light aircraft engines and propellers

MEA362A Maintain aircraft vapour cycle air conditioning systems

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to maintain aircraft vapour cycle air conditioning systems.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills, the use of maintenance publications and knowledge of vapour cycle air conditioning systems to inspect, test and troubleshoot systems, and to remove and install mechanical and electrical system components. Compliance with applicable regulations is required where refrigerant evacuation and recharging is performed.

Applications include all aircraft vapour cycle air conditioning systems and components.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA201B	Remove and install miscellaneous aircraft electrical hardware/components
MEA246C	Fabricate and/or repair aircraft electrical components or parts

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect vapour cycle air conditioning systems	1.1. Isolation tags already attached to the system or related systems are checked and aircraft/engine configured for safe system inspection and operation in accordance with applicable maintenance manual
	1.2. ***Vapour cycle air conditioning systems*** are visually or physically checked for external and internal signs of defects in accordance with applicable maintenance manual
2. Test vapour cycle air conditioning systems	2.1. Aircraft and system are correctly prepared in accordance with applicable maintenance manual
	2.2. Vapour cycle air conditioning system is tested in accordance with prescribed test procedures to establish serviceability and correct function in accordance with applicable maintenance manual
3. Troubleshoot vapour cycle air conditioning systems	3.1. Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination
	3.2. Maintenance manual fault diagnosis guide and logical processes are used to ensure efficient and accurate ***troubleshooting***
	3.3. Specialist advice is obtained, where required, to assist with the troubleshooting process
	3.4. Vapour cycle air conditioning system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required

	3.5. Fault rectification requirements are determined to assist in planning the repair
4. Remove vapour cycle air conditioning system components	4.1. Aircraft and vapour cycle air conditioning system is rendered safe in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure the safety of personnel and freedom from damage during component removal 4.2. Where refrigerant evacuation is necessary, evacuation is performed in accordance with regulatory requirements and maintenance manual procedures 4.3. Component removal is carried out in accordance with the applicable maintenance manual 4.4. Component is tagged and prepared for transport or storage in accordance with the specified procedures 4.5. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
5. Install vapour cycle air conditioning system components	5.1. Component to be installed is checked to confirm correct part or model numbers, modification status and serviceability 5.2. Installation is carried out in accordance with the applicable maintenance manual 5.3. Vapour cycle air conditioning system is recharged with refrigerant, where necessary, in accordance with maintenance manual procedures and regulatory requirements 5.4. Vapour cycle air conditioning system is tested for correct function and freedom from refrigerant leaks if system recharging has been performed 5.5. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures, including the selection and use of applicable MSDS and PPE
- complying with regulatory requirements regarding the de-gassing of vapour cycle air conditioning systems
- using relevant maintenance documentation and aircraft manuals
- recognising external and internal signs of defects in vapour cycle air conditioning systems and system components through visual/physical inspection
- testing of vapour cycle air conditioning system operation, be able to operate systems and

leak testing equipment, monitor indications and recognise correct function
- using specialist equipment to evacuate and recharge refrigerant
- using fault diagnosis guides and equivalent data to accurately and efficiently troubleshoot the causes of unserviceabilities in vapour cycle air conditioning systems, clearly recording details and identifying the required rectification actions
- correctly removing and installing vapour cycle air conditioning system electrical and mechanical components

Required knowledge

Look for evidence that confirms knowledge of:

- OHS procedures associated with vapour cycle air conditioning system maintenance, including the selection and use of PPE
- how to obtain applicable MSDS
- regulations applying to the evacuation and recharging of refrigerant
- fault diagnosis techniques
- vapour cycle air conditioning system layout and operation
- vapour cycle air conditioning system electrical and mechanical component operation:
  - compressor
  - condenser
  - receiver dryer
  - thermal expansion valve
  - evaporator
  - magnetic clutch and drive system:
    - belt
    - power takeoff
    - electric motor
    - hydraulic motor
    - pneumatic
  - condenser extension and retraction system
  - blower
  - throttle system shutoff
  - temperature control system
- refrigerant used in aircraft vapour cycle air conditioning systems
- lubricants used in compressors
- equipment used to test systems and evacuate and recharge refrigerant
- procedures for evacuating and recharging system refrigerant
- refrigerant leak testing techniques and equipment
- removal and installation procedures for vapour cycle air conditioning system components
- vapour cycle air conditioning system maintenance requirements
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills, use maintenance publications and engine and system theory knowledge to inspect, test and troubleshoot vapour cycle air conditioning systems and to remove and install system components while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing, troubleshooting and removal and installation tasks (including the timely involvement of supervisor or other trades) associated with vapour cycle air conditioning systems and components. It is essential that system testing procedures take into account all safety precautions associated with vapour cycle air conditioning system operation and testing, and that regulations relating to the evacuation and recharging of refrigerant be strictly observed. Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This may be demonstrated through application across a number of aircraft vapour cycle air conditioning systems. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. The application of testing procedures and functional checks should also indicate knowledge of system operation and regulations relating to refrigerant. Vapour cycle air conditioning system operation knowledge, the relationship of individual components and the links with other systems will be necessary to supplement evidence of ability to carry out engine control system checks and troubleshoot the system within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be

	demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a system and a representative range of components in Groups 1 to 6 as listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Vapour cycle air conditioning systems	Vapour cycle air conditioning systems may include: 1. Refrigeration system compressor, condenser, receiver dryer, thermal expansion valve and evaporator 2. Magnetic clutch and drive system (belt, power takeoff, electric motor, hydraulic motor or pneumatic as applicable) 3. Condenser extension and retraction system 4. Blower 5. Throttle system shutoff 6. Temperature control system

Troubleshooting	Troubleshooting involves the use of test sets, maintenance data and fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA363B Inspect, repair and maintain structures and related components of non-pressurised small aircraft

Modification History

Release 2 – Bolted composite repairs added to Skills and Knowledge, and Range Statement. Numbering in Range Statement items corrected - equivalent.

Release 1 - Knowledge requirements and Range Statement revised to include additional inspection coverage - equivalent to previous version.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to inspect, repair and maintain small aircraft structure and the removal and installation of related non-structural components such as internal trim, seats and emergency equipment.

The competency Elements and Performance Criteria also cover a significant portion of those required for units MEA304C Remove and install non-pressurised aircraft structural and non-structural components, MEA311D Inspect and repair/modify aircraft structures and MEA339C Inspect, repair and maintain aircraft structures.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of procedures and techniques associated with the inspection and maintenance of aircraft structures, and with the performance of a limited range of metal and composite repairs. Also required is an application of procedures and techniques associated with the removal and installation of related structural and non-structural components.

Applications include the performance of structural maintenance activities and component removal and installation on non-pressurised fixed or rotary wing aircraft on the flight line or in the hangar.

Licensing/Regulatory Information

Refer to unit descriptor

Pre-Requisites

MEA101B Interpret occupational health and safety practices in aviation maintenance

MEA103B Plan and organise aviation maintenance work activity

MEA105C Apply quality standards applicable to aviation maintenance processes

MEA107B Interpret and use aviation maintenance industry manuals and specifications

MEA108B Complete aviation maintenance industry documentation

MEA109B Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Inspect aircraft structure	1.1 Relevant maintenance documentation is used to identify specific inspection requirements
	1.2 Appropriate preparation and access to the aircraft structure is undertaken to allow for proper inspection in accordance with maintenance documentation
	1.3 Aircraft structure is visually or physically checked for signs of deformation defects or damage in accordance with maintenance documentation and approved procedures
	1.4 ***Damage or defects*** are assessed against damage or wear limits specified by structural repair manual or other approved data to determine if repair or replacement is required
	1.5 Maintenance documentation is completed and processed in accordance with standard enterprise procedures

2 Prepare to undertake repair	2.1 Extent of damage is correctly assessed to assist in determining repair procedure
	2.1 Appropriate repair scheme is identified in accordance with structural repair manual and/or approved data
	2.3 ***Specialist advice*** is obtained in establishing an approved repair scheme where a standard repair scheme cannot be identified or damage is out of limits
	2.4 All materials and equipment required are organised
3 Repair and maintain aircraft structure	3.1 ***Structural repairs*** are performed, in accordance with approved repair scheme, ensuring that aircraft standard practices are used and process requirements are carried out
	3.2 Preventative maintenance techniques are employed to preserve the integrity of aircraft structure
	3.3 Work area is cleaned of all waste material or contaminants
	3.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
4 Remove components	4.1 Structure is supported and prepared in accordance with the applicable maintenance manual to ensure personnel safety and freedom from damage to aircraft or component during component removal
	4.2 ***Component*** removal is carried out in accordance with the applicable maintenance manual
	4.3 Required maintenance ***documentation*** is completed and processed in accordance with standard enterprise procedures
	4.4 Where applicable, removed components are tagged and prepared for transport in accordance with specified procedures
5 Install components	5.1 Structural and/or non-structural components to be installed are checked to confirm correct part numbers, serviceability and modification status
	5.2 Component installation is carried out in accordance with the applicable maintenance manual
	5.3 Support/safety equipment is removed at an appropriate time to ensure personnel safety and freedom from structural damage
	5.4 Required maintenance documentation is completed and processed

in accordance with standard enterprise procedures

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- applicable OHS procedures, including the use of PPE and MSDS
- construction methods and materials used in:
  - fuselage sections
  - wing sections
  - engine nacelles and mounts
  - windows and window frames
  - doors, locks and access panels
- definition of structural terms, i.e. safe life, damage tolerant, failsafe, stress, strain, shear and cycles
- inspection requirements for metal and composite structure, including:
  - ageing aircraft inspection requirements
  - safe life structure
  - damage tolerant structure
  - fail safe structure
- potential causes of structural failure
- NDT methods and application of the various techniques
- construction methods of, and assessing common defects in, aircraft plastic transparencies
- basic constructional features of, and assessing common defects in, glass windscreens
- the various forms of structural corrosion, stating the causes and structural effects of corrosion on aircraft
- the terms associated with composite materials and types of composite materials
- requirements for handling and storing aircraft metals and composite materials, including sealing agents, to industry standards
- means of identifying aircraft structural assembly fasteners (metal and composite) by interpretation of markings, numbering systems, size, shape and colour
- structural and non-structural component methods of attachment, faying surface treatment and fuel tank sealing
- non-pressurised fuselage aircraft doors, related seals and window and transparent panel attachment methods and sealing
- aircraft interior fittings (trim, linings, seats and floor panels) construction and attachment methods
- the location and attachment or stowage methods for emergency equipment
- assessment of structural damage:
  - types and classes of mechanical damage
  - types of corrosion and determining the extent of damage

    - relevant documentation and manuals
    - damage limits and repair schemes for metallic and non-metallic structure
- procedures for the fabrication and fitment of metal repairs:
    - scab patch
    - flush patch
    - splice
    - lap
    - formed section
- corrosion removal and passivation
- procedures for performing composite repairs:
    - external patch
    - scarf patch
    - stepped repairs
    - bolted repairs
- repair of integral fuel tanks and sealing of faying surfaces, including specific OHS and PPE requirements
- surface finishes and methods of restoration, including specific OHS and PPE requirements
- how to obtain MSDS
- relevant maintenance and structural repair manuals
- relevant regulatory requirements and standard procedures

Look for evidence that confirms skills in:

- applying all relevant OHS procedures, including the selection and use of MSDS and applicable items of PPE
- demonstrating appropriate cleaning procedures to enable structure inspection
- demonstrating correct inspection procedures in accordance with aircraft and procedures manuals
- identifying damage to aircraft metallic (ferrous and non-ferrous) structures and/or components by way of impact, fatigue or the various types of corrosion
- inspecting damage and assessing composite components/structures
- identifying various aircraft metals and their basic properties
- identifying composite materials used in aircraft construction, associated safety precautions and hazards
- correctly interpreting repair scheme drawings, including third angle projection, isometric, sectional formats and hand sketches
- using appropriate hand tools and machines, including riveting equipment, drilling equipment, aligning tools and material fasteners (grip pins)
- applying correct removal, installation and repair techniques for:
    - a range of rivets (blind and solid) using hand, squeeze and pneumatic situations
    - a range of close tolerance fasteners (standard and oversize – hillocks and taper locks), including hole preparation
    - threaded devices, including internal and external thread cutting, Helicoil inserts and damaged stud replacement

  - hardware assembled by close tolerance fits using heat, cooling and force methods, including bearings, bushes and inserts
- performing a range of metal structure and composite material repair techniques, including:
  - metal scab patch, flush, splice, lap and formed section repair
  - composite external patch, scarf, stepped and bolted repairs
  - metal to metal and metal to composite bonding
- applying structural corrosion removal/treatment techniques
- restoring aircraft structure sealing and surface finishes
- using relevant maintenance documentation and aircraft manuals to:
  - remove and install structural and non-structural components
  - remove and install aircraft interior fittings
  - remove and install doors, door seals, windows and transparent panels
- checking and adjusting all doors and access panels, including locking mechanisms
- removing and installing emergency equipment

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect and maintain aircraft structure, perform a range of metal and composite structural repair tasks and remove and install structural and non-structural components that are representative of the scope of the listed variables in accordance with relevant maintenance documentation while applying all relevant OHS procedures and standard processes.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of inspection, testing and repair applications associated with aircraft maintenance. It is essential that the procedures take into account all aircraft and personal safety precautions relating to aircraft structure. Evidence of transferability of skills and knowledge related to inspection, testing and repair of aircraft structure is essential. This may be demonstrated through application across a number of aircraft systems or aircraft types. Ability to interpret inspection and repair procedures and specifications and apply them in practice is critical. The application of the procedures should also

	clearly indicate knowledge of structural flight loads and aerodynamic requirements. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision across the variables in the Range Statement as follows: • inspection and/or testing of at least one item from each of Groups 1 to 8 • recognition of each type of damage in Groups 9 to 12 • one repair task from each of Groups 13 to 20 • one removal and installation task from each of Groups 21 to 25. This shall be established via the records in the Log of Industrial Experience and Achievement.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Inspection and repair of aircraft structure and removable components of structure	Inspection of aircraft structure includes: 1. Non-ferrous and ferrous alloys and composite (FRP) materials used in aircraft construction

	2. Structural fastening and attachment hardware and/or devices 3. Seals and sealants 4. Glass and moulded plastics 5. Application of NDT techniques 6. Doors, hinges and locking mechanisms for damage/misalignment 7. Inspections applicable to each of safe life, damage tolerant and fail safe structure relevant to enterprise 8. Ageing aircraft inspection programs
Damage or defects	Damage or defects may include: 9. Impact damage 10. Fatigue cracking 11. Corrosion 12. Delamination of composites and bonded structures
Structural repairs	Structural repairs may include the following: 13. Remove corrosion by chemical and mechanical methods 14. Restore protective coatings 15. Apply sealants and jointing compounds 16. Freehand precision hole generation 17. Remove and install structural hardware and fastening devices 18. Remove and replace bushes, bearings and bearing surfaces 19. Metal scab patch, flush, splice, lap and formed section repair 20. Composite external patch, scarf, stepped and bolted repairs
Removable components	Removable components of structure: • are those that are installed using bolts and/or screws. Where component removal and installation requires the removal and installation of rivets the applicable unit is MEA311D Inspect and repair/modify aircraft structures
Components	Components may include:

	21. Removable components of wings, tail booms, pylons, empennage, skids, fairings and nacelles 22. Removable components or sections of non-pressurised fuselages 23. Non-pressurised fuselage entry, cargo, access doors and associated seals (including checking and adjustment of all doors and access panels and associated locking mechanisms) 24. Non-pressurised fuselage windows and transparent panels 25. Floor panels
Specialist advice	Specialist advice is obtained from: • supervisors • specialist structures personnel
Documentation	Relevant maintenance documentation includes: • servicing schedules • maintenance manuals
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance, including special inspections required after events, such as heavy landings, overstress or flight through heavy turbulence • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA364A Maintain and/or repair small aircraft mechanical components or parts

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to maintain and repair a range of small aircraft mechanical components and parts.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of relevant maintenance publications to maintain and repair a range of aircraft mechanical components.

Applications include fixed and rotary wing aircraft classified by CASA as small aircraft, and components in workshops.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications

MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Maintain and/or repair mechanical components or parts	1.1. Maintenance and/or repair requirements are determined following disassembly and assessment of component parts for serviceability in accordance with the relevant maintenance documentation 1.2. Tagging and repair instructions are accurately specified for parts requiring specialist repair 1.3. Appropriate materials, tools, equipment and assembly or fabrication jigs are selected and prepared for the particular specification requirements 1.4. ***Components or parts*** are ***maintained***, ***repaired*** or modified, as approved by relevant manufacturers' bulletins or procedures, in accordance with required specifications 1.5. Mechanical component parts are assembled within specified tolerances and in accordance with the appropriate maintenance documents 1.6. Mechanical components are adjusted, as required, to operate within prescribed specifications 1.7. Test equipment and rigs are used, where applicable, to confirm serviceability

1.8. Maintained/repaired or modified components are tagged, sealed and packaged within specified procedures
1.9. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices, including the selection and use of MSDS and PPE
- using relevant maintenance documentation, specifications and aircraft/component manuals to:
  - recognise state of serviceability and repair requirements for the range of components listed in the Range Statement
  - identify requirements and complete repairs and/or modifications
  - test and/or adjust components as required
  - correctly tag, seal and package completed components that are not being immediately refitted

Required knowledge

Look for evidence that confirms knowledge of:

- mechanical component operation and repair procedures and processes:
  - hoses
  - pipes
  - cables, turnbuckles and tensioning devices
  - pulleys
  - chains and sprockets
  - gear drives
  - screwjacks
  - control rods
  - bellcranks
  - links
- internal fittings and emergency equipment operation, construction, installation and maintenance/repair:
  - trim panels
  - linings and coverings
  - seats and crew/passenger restraints
  - cargo restraints
  - cabin equipment and consoles

- emergency equipment inspection and stowage requirements:
  - passenger escape systems
  - life jackets
  - rafts
  - emergency location transmitters
- applicable OHS procedures, including the selection and use of items of PPE
- how to obtain relevant MSDS
- how to identify suitable adhesives and patching materials for upholstery and trim
- inspection and test requirements for restraint system components
- safe stowage requirements for items of emergency equipment
- how to determine serviceability of items of emergency equipment
- relevant maintenance manuals, standards and specifications
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and use relevant maintenance publications to maintain and repair mechanical components while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of maintenance and repair applications associated with aircraft components. It is essential that the relevant procedures are interpreted and applied to ensure quality and safety standards are achieved. Evidence of transferability of skills and knowledge related to maintenance/repair is essential. This may be demonstrated through application across a number of different aircraft components. Ability to assess component serviceability and interpret parts requirements will be necessary before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace

	assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a representative range of components or parts from each of Groups 1 to 5, as listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general and special purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Components or parts to be maintained and/or repaired	Components or parts to be maintained and/or repaired may include: 1. Hoses 2. Pipes 3. Cables, pulleys, chains, sprockets and gear drives 4. Control rods, bellcranks, links and screwjacks 5. Trim panels, linings, seats, cabin equipment and consoles, coverings, emergency equipment stowage (including passenger escape systems, life jackets, rafts, location transmitters, cargo, crew and/or passenger seat restraints)

Maintain	Maintain involves cleaning, inspection for wear or damage and adjustment and lubrication, where applicable
Repair	Repair comprises: • standard techniques for pipes and replacement of eye-ends, tubes or bearings for control rods/pulleys/sprockets and bushes or bearings for bellcranks and links • the use of adhesives and appropriate patch materials for trim and upholstery repairs (more extensive repairs involving sewing are covered by MEA509A Manufacture, repair and alter aircraft-related fabric components) • replacement of restraint system components where sewing is not required (more extensive repairs are covered by MEA508A Maintain, install and remove restraint systems)
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team- related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA365A Assess structural repair_modification requirements and evaluate structural repairs and modifications

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency covers the competencies required to progress from an Aircraft Maintenance Engineer at Certificate IV to the granting of a chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in the Assessment Guidelines. The unit replaces MEA324B Perform structural repair/modification assessment and evaluation.

The skills and knowledge covered by the units of competency listed in the MEA11 Aeroskills Training Package for Aircraft Maintenance Engineer at Certificate IV are prerequisite to the attainment of the elements of competency specified in this unit. This includes full coverage of the CASR Part 66 Syllabus subjects/topics listed in the Assessment Guidelines.

Application of the Unit

This unit requires interpretation of structural repair and modification data to determine required action and to determine the compliance with airworthiness requirements of completed structural repairs or modifications. In addition, the performance of colour contrast dye penetrant NDT on applicable components is included.

Applications include both fixed and rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Assess structural repair or modification requirements	1.1. Structural repair requirements are determined from maintenance manuals or approved repair schemes 1.2. Damage beyond repair scheme limits is referred to relevant personnel/authorities 1.3. Modification requirements are determined from approved drawings and specifications/instructions or requirements are referred to relevant personnel/authorities 1.4. Completed work is evaluated for compliance with airworthiness requirements
2. Perform colour contrast dye penetrant NDT	2.1. Inspection requirements are identified from relevant maintenance data or to confirm a visually identified defect 2.2. ***Surfaces to be inspected are prepared*** for the dye penetrant process 2.3. ***Dye penetrant materials*** are selected in accordance with standard operating procedures 2.4. Penetrant test is performed in accordance with standard operating procedures and while observing applicable OHS precautions 2.5. Defect indications are checked and identified in accordance with standard operating procedures 2.6. Penetrant testing equipment is correctly maintained and stored while observing applicable OHS precautions 2.7. Results are recorded in accordance with standard enterprise and regulatory requirements

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- interpreting damage limits and identifying applicable repair schemes
- interpreting all requirements of modification drawings and assessing work against them
- evaluating completed repairs and modifications for compliance with the applicable data and with airworthiness requirements
- recognising weld defects
- performing colour contrast dye penetrant NDT to confirm defects in applicable aircraft components
- applying relevant OHS practices, including the use of MSDS and PPE

Required knowledge

Look for evidence that confirms a post trade level of knowledge of:

- application of regulatory requirements and of manufacturer's requirements in the determination of structural maintenance needs
- assessment of the extent of damage and an understanding of the need for a professional engineer to develop or extend a repair scheme where damage is beyond the limits of maintenance manual repair schemes, including the identification of relevant personnel and authorities
- assessment of new equipment or component mounting requirements and an understanding of the need to have drawings and specifications developed by a professional engineer, including the identification of relevant personnel and authorities
- the need for shoring and support to maintain aerodynamic shape and for safe performance of structural maintenance
- the need for mensuration checks and the techniques used to perform them
- how to determine welding requirements and the recognition of sound welds
- the correct application of colour contrast dye penetrant NDT and the limitations of the testing method
- dye penetrant test procedures:
  - relevant OHS precautions and how to obtain MSDS and PPE
  - cleaning and preparation processes and materials
  - consequences of incorrect preparation
  - basic concepts and principles of NDT and appropriate use of the colour contrast dye penetrant technique
  - general properties of penetrants (penetrability, removability and visibility)
  - types of emulsifiers and developers
  - established procedures and techniques
  - defect types and their consequences
  - post-test cleaning methods
- aircraft welding regulations

- aircraft welding processes and relevant parent metal groups
- defects applicable to each welding process and parent metal group

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to determine structural repair and modification requirements using maintenance manuals, modification instructions and applicable drawings, and must be able to assess the soundness of weld repairs while identifying all safety precautions relevant to specified structural repair or modification tasks and must also be able to perform colour contrast dye penetrant NDT on relevant aircraft components.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of repair and modification applications related to the structure of aircraft. It is essential that the repair and modification procedures take into account all applicable safety precautions. The ability to interpret repair scheme and modification requirements, including applicable specifications (allowable limits) and ensure that they are applied in practice is critical. Evidence of transferability of skills and knowledge related to structural maintenance is essential. This must be demonstrated through the correct determination of repair requirements and the determination of compliance with repair schemes and modification drawings. The ability to assess sound weld repairs must also be demonstrated. Applicable work plans should take account of applicable safety (including safe handling of heavy components) and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the elements of the unit of competency are being achieved under supervision without intervention. This shall be established via simulated activities at the CASR Part 147 MTO and performance during observed workplace activities.

Context of and specific resources for assessment	Competency will be assessed in the training environment using a combination of practical exercises and scenarios.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Application	Application of this unit may relate to:
	• standard practices for structural repair and modification, including damage measurement and assessment against approved repair schemes
	• the process for referral of damage details and modification requirements to relevant personnel/authorities
	• supervision of repair scheme and modification incorporation, including evaluation of work against drawings and specifications
	• scheduled or unscheduled maintenance
	• individual activities or supervision of other personnel performing maintenance tasks which may include:
	  • non-destructive inspection
	  • welding
	  • surface plating
	  • surface finishing
	  • preparing structural repair components
	  • machining

Dye penetrant NDT procedures	Surfaces to be inspected are prepared by: • removal of surface finishes where applicable • thorough cleaning of the surface • drying of the surface • processes included in standard procedures

Dye penetrant materials	Dye penetrant materials may include: • appropriate surface cleaning materials • emulsifiers • developers • materials for surface cleaning after testing
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA366A Perform borescope inspections

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit of competency is required for the grant of approval for Aircraft Maintenance Engineers to perform borescope inspections on aircraft system components and engines. It covers the elements of competency required to set up and use borescopes to perform remote visual inspections required by applicable maintenance data. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit is applied, in conjunction with units relating to the inspection, testing and troubleshooting of applicable aircraft engines, to perform and assess the results of remote visual inspections using borescopes.

Applications include piston engines and gas turbine engines either installed in aircraft or in workshops.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA313C	Inspect, test and troubleshoot piston engine systems and components
OR	
MEA314C	Inspect, test and troubleshoot gas turbine engine systems and components

OR

MEA322C Test and troubleshoot gas turbine engine systems and components

OR

MEA387A Test gas turbine engines and engine modules after overhaul or repair

OR

MEA388A Repair and/or overhaul piston engines

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Set up borescope equipment	1.1. Applicable ***borescope equipment*** is obtained and assembled for use
	1.2. Assembled borescope equipment is tested for correct operation
2. Perform borescope inspection	2.1. Component or engine is prepared for safe borescope inspection in accordance with ***applicable maintenance data***
	2.2. Borescope inspections are performed in accordance with applicable maintenance data or standard operating procedures
3. Record and assess borescope inspection results	3.1. Borescope inspection results are recorded and processed in accordance with standard enterprise procedures for the applicable borescope equipment

	3.2. Identified defects are recorded and reported in accordance with standard enterprise procedures
4. Maintain and re-pack borescope equipment for storage	4.1. Borescope equipment is disassembled, maintained and cleaned in accordance with manufacturer's instructions
	4.2. Borescope equipment is replaced in transport or storage containers and stored in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- selecting applicable borescope equipment and assembling it for use
- identifying required borescope inspections and required techniques using applicable maintenance data
- setting up the applicable system component or engine in accordance with applicable maintenance data for safe borescope inspection
- applying borescope inspection techniques to safely perform required inspections without damage to engine components
- identifying and correctly assessing and reporting/recording defect indications
- maintaining and correctly storing borescope equipment after use

Required knowledge

Look for evidence that confirms knowledge of:

- types of borescope and their applications
- how to assemble borescope equipment and prepare it for use
- use of associated imaging and recording equipment, such as video and digital camera
- use of maintenance data to identify borescope inspection requirements
- borescope inspection techniques and safety
- remote engine rotation equipment
- defect assessment techniques
- borescope inspection reporting and recording requirements
- borescope maintenance and storage requirements

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment

Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills, use maintenance publications and apply borescope inspection techniques to inspect piston or gas turbine engine internal components on fixed or rotary wing aircraft or in workshops while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of remote visual inspection applications associated with internal engine components. It is essential that inspection procedures take into account all safety precautions associated with borescope inspection techniques and the applicable engine. Evidence of transferability of skills and knowledge related to borescope inspection and assessment of results is essential. This may be demonstrated through application across a number of engine types. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Demonstrated knowledge of both borescope inspection techniques and of the subject engine will be necessary before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on representative range of borescope inspection tasks. This shall be established via the records in the Log of Industrial Experience and Achievement, or where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Borescope equipment	Borescope equipment may include: • rigid optical borescopes • flexible optical borescopes • video borescopes • camera attachments for optical borescopes • remote engine rotation equipment
Applicable maintenance data	Applicable maintenance data may include: • borescope user manuals • engine maintenance manuals • servicing schedules • regulatory requirements, such as Airworthiness Directives or Special Technical Instructions
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

MEA367A Repair/modify aircraft composite structure using cold bonding

Modification History

New unit.

Unit Descriptor

This unit of competency is part of the Aeroskills Structures Maintenance Certificate IV training pathway, and of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathways. It covers the competencies required for the repair or modification using cold bonding methods of fixed and rotary wing aircraft structural components that are made from composite materials. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills and the use of maintenance publications, applicable materials, tools and methods to repair aircraft composite material structure and components using cold cure repair techniques.

Applications include composite material structure and components from fixed and rotary wing aircraft either on-aircraft or in the workshop.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA401C Inspect aircraft structures

OR

MEA339C Inspect, repair and maintain aircraft structures

OR

MEA363B Inspect, repair and maintain structures and related components of non-pressurised small aircraft

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Plan repair/modification	1.1 Extent of damage is correctly assessed to assist in determining repair procedure
	1.2 Structure is supported and prepared in accordance with the applicable maintenance manual to ensure personnel safety and freedom from damage
	1.3 Appropriate modification or repair scheme is identified in accordance with structural repair manual and/or approved data
	1.4 Specialist advice is obtained in establishing an approved repair scheme where a standard repair scheme cannot be identified or damage criteria are out of limits
	1.5 All materials and equipment required are organised
2 Repair/modify components using cold cure	2.1 Lay-up of materials is checked to confirm that components meet required specifications and bagging equipment is correctly installed and operated
	2.2 Curing cycle is regularly monitored to ensure required specifications are met
	2.3 Components are checked for blemishes or delamination in accordance with quality procedures
	2.4 Component assemblies requiring further or special treatment are made ready for the appropriate processes
	2.5 Required maintenance documentation is completed and processed in accordance with standard enterprise

procedures

2.6 Completed assemblies are tagged, sealed or packaged as required

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- aircraft construction principles and the causes of structural damage, including metal fatigue and corrosion
- structural fatigue preventative measures
- composite terminology and materials used in both hot and cold bonding
- composite component construction and repair methods including structural assembly fastener types, specifications and identification
- procedures for the design and approval of repair schemes and modifications
- composite material storage requirements
- sealants used in aircraft structure and their application and handling
- paints and finishes for composite structure
- OHS precautions associated with repair of aircraft structure
- MSDS
- PPE

Look for evidence that confirms skills in:

- applying relevant OHS procedures, including the use of MSDS and applicable items of PPE
- using approved maintenance documentation and aircraft publications relating to aircraft structure
- identifying composite component applications in aircraft structures
- identifying various aircraft composite materials/resins and their basic properties by interpretation of markings and visual means
- handling and storing of composite materials to industry standards
- assessing composite component damage using visual and tap test methods
- relative advantages and disadvantages of hot and cold cure
- performing composite component repairs using cold cure adhesives:
  - external patch repair
  - scarf repair
  - stepped repair
  - wet lay up repair
  - composite fastener hole repair
  - metal to metal and metal to composite bonding
- correctly interpreting and/or producing repair scheme/modification drawings/sketches

- using appropriate hand tools and machines to disassemble and assemble aircraft composite components, parts, sections and skin, including extraction/installation equipment, drilling/cutting equipment, and material fastener

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and use maintenance publications, applicable materials, tools and methods to repair aircraft composite material structure and components using cold cure adhesives while applying all relevant safety procedures.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across the range of different material applications applicable to cold curing. It is essential that specific aspects of the laying up and curing process for aircraft composite materials are checked to ensure quality and safety standards are achieved in this area. Correct checking and wearing of PPE is critical. Evidence of knowledge about repair techniques and the use of the standard repair manual in a range of different repair situations will be necessary to supplement evidence of ability to plan and undertake component repair. Ability to apply different materials and curing cycles, including composite to composite and composite to metal components, will be necessary to indicate competency in preparing and curing composite materials. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision using materials from each of Groups 1 and 2 in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace. It is also expected that general purpose tools and test equipment found in most routine

	situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Applicable materials and methods	Applicable materials and methods include: 1. Cold cure or wet lay-up (using either fibreglass or carbon graphite) 2. Core materials (using one of aluminium, nomex, or foam)
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA368A Shot peen aircraft components

Modification History

New unit

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV training pathway. It covers the competencies required to perform peening operations on a range of aircraft components. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills and the use of relevant process documentation to shot peen aircraft components, such as structural components and components of engines, propellers and landing gear shock struts.

Applications include fixed and rotary wing aircraft components.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Prepare for shot peening task	1.1 Process documentation is obtained and correctly interpreted
	1.2 Shot peening equipment is prepared in accordance with the applicable process
2 Apply shot peening process to Almen strip	2.1 The correct Almen strip is selected and fitted and equipment set up with the correct stand-off distance and regulated air pressure or spindle speed in accordance with the process documentation
	2.2 The process is correctly applied to the Almen strip
	2.3 The Almen strip distortion is measured to ensure that it is within the specified tolerance
	2.4 Equipment settings are adjusted and the Almen strip test repeated, if required
	2.5 Settings that produce specified Almen strip distortion are recorded and the test strip is presented for inspection
3 Apply shot peening process to component	3.1 The component is cleaned and masked in accordance with process documentation
	3.2 Shot peening is applied in accordance with the process documentation using equipment settings derived from Almen test strip
	3.3 The shot peened surface is checked for required density and coverage and re-peened, if necessary
	3.4 The shot peened component is checked for cleanliness to ensure that all contaminants have been removed in accordance with the process documentation
4 Complete shot peening task	4.1 Task completion is recorded in accordance with standard enterprise procedures

4.2 Shot peened component is presented for inspection, along with Almen test strip and completed documentation

4.3 Where applicable, the component is tagged, sealed or packaged in accordance with specified procedures

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- how to obtain relevant MSDS
- the correct use of PPE
- OHS procedures
- the reasons for shot peening
- the types of aircraft component and the materials that are shot peened
- shot peening equipment and processes applicable to aircraft components
- the uses of different types of shot peening media
- the use of process documentation
- the types of Almen test strips and their uses
- setting up and calibrating equipment for use
- preparation of surfaces for peening and cleaning after peening
- environmental requirements associated with disposal of used media

Look for evidence that confirms skills in:

- applying relevant OHS procedures, including the use of MSDS and applicable items of PPE
- using relevant process documentation relating to shot peening of component surfaces to:
  - select and set up the required shot peening equipment
  - select and set up the Almen test strip
  - adjust equipment settings to obtain the required Almen strip distortion
  - prepare component surfaces for shot peening
  - shot peen surfaces to obtain the specified intensity and coverage
  - remove surface contaminants from shot peened surfaces
- correctly disposing of waste shot peening media

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment

Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to shot peen surfaces of aircraft components to obtain the intensity and coverage specified in process documentation while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of shot peening applications associated with aircraft components. It is essential that the relevant procedures are interpreted and applied to ensure quality and safety standards are achieved. Evidence of transferability of skills and knowledge related to shot peening is essential. This may be demonstrated through application across a number of different aircraft components. Ability to obtain and correctly interpret shot peening process documentation will be necessary before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a representative range of shot peening tasks. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using equipment specified in process documentation. It is also expected that general and special purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Shot peening equipment	Peening operations may be carried out using air pressure or rotor propulsion of shot and either fixed or portable shot peen units
Stand-off distance	Stand-off distance can apply to: • nozzle distance from surface for air pressure shot peening processes, or • spindle distance from job for rotor shot peening
Regulated air pressure or spindle speed	Regulated air pressure or spindle speed refers to the specified air pressure applied to the shot nozzle or the specified revolutions per minute (r.p.m.) of the spindle in the rotor peening process
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA380A Repair and/or overhaul aircraft hydraulic system components

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. It covers the competencies required to overhaul and repair a range of aircraft hydraulic system components. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills, theory knowledge and maintenance publication procedures to repair and overhaul hydraulic system components in workshops.

Applications include components from fixed and rotary wing aircraft hydraulic systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications

MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Determine requirements	1.1. Component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers
	1.2. ***Hydraulic components*** are inspected and/or operated through prescribed test procedures to establish serviceability or confirm defects, as required
	1.3. Modification status is clearly established to assist in determining the overhaul requirements for the components
	1.4. Extent of overhaul or repair is identified and documented in accordance with standard enterprise procedures
2. Troubleshoot hydraulic components	2.1. Available information from maintenance records and test results is used, where necessary, to assist in fault determination
	2.2. Logical processes are used to ensure efficient and accurate troubleshooting
	2.3. Specialist advice is obtained, where required, to assist with, or confirm, the fault and rectification requirement

	2.4. Hydraulic component faults are located and the causes of the faults are clearly identified
	2.5. Fault rectification requirements are determined to assist in planning the repair
3. Dismantle and inspect hydraulic component parts	3.1. Hydraulic component parts are dismantled in accordance with maintenance manuals
	3.2. Component parts are assessed for serviceability in accordance with the relevant maintenance documentation
	3.3. Parts requiring specialist repair are tagged and repair instructions are specified in accordance with standard enterprise procedures
	3.4. Parts requiring non-destructive testing are prepared for testing in accordance with the relevant maintenance documentation
	3.5. Parts lists are compiled and processed in accordance with standard enterprise procedures
4. Repair and/or modify hydraulic components or parts	4.1. Component parts are ***repaired*** or replaced in accordance with the relevant maintenance documentation
	4.2. Modification of components or parts is undertaken, where required, by relevant manufacturer's bulletins or procedures
5. Assemble, test and adjust hydraulic components	5.1. Hydraulic component parts are assembled within specified tolerances and in accordance with the appropriate maintenance documents
	5.2. Components are adjusted, tested or calibrated to operate within prescribed specifications
	5.3. Finished components are tagged, sealed and packaged in accordance with standard enterprise procedures
	5.4. Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures
- using MSDS and applicable items of PPE
- using relevant maintenance documentation and aircraft/component manuals relating to hydraulic system components to:

- recognise state of serviceability and overhaul or repair requirements
- test and accurately and efficiently troubleshoot unserviceabilities and document the causes
- dismantle and inspect component parts for serviceability and identify repair requirements as applicable
- repair/replace/modify component parts
- assemble, test for correct operation and adjust components

Required knowledge

Look for evidence that confirms knowledge of:

- how to obtain relevant MSDS
- the correct use of PPE
- fault diagnosis techniques
- system and component operation
- repair and overhaul procedures and processes
- hydraulic test rigs and their operation
- compressed air and nitrogen charging equipment

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and component theory knowledge and use maintenance publications to repair and overhaul aircraft hydraulic system components while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of repair and/or overhaul applications associated with aircraft components. It is essential that the maintenance procedures are interpreted and applied to ensure quality and safety standards are achieved. Evidence of transferability of skills and knowledge related to repair is essential. This may be demonstrated through application across a number of different aircraft components. Ability to assess component serviceability and interpret parts requirements will be necessary to supplement the required evidence. Capability to interpret inspection procedures and specifications (allowable

	limits) and apply them in practice is critical. The application of testing procedures should also clearly indicate knowledge of system operation. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one component from each of Groups 1 to 3 in the Range Statement including demonstration of the repair processes listed in Groups 4 to 9. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Hydraulic components	Hydraulic components may include:

	1. Valves, pumps, motors, actuators, regulators, struts/oleos and brake units 2. Accumulators, filters and reservoirs 3. Rigid and flexible pipelines, hoses and fittings
Repair of component parts	Repair of component parts may include: 4. Finishing or re-finishing of metal surfaces through processes, such as polishing and lapping 5. Removal of corrosion within maintenance manual limits 6. Replacement of seals and backing rings 7. Replacement of bearings 8. Application of surface treatments, such as alodining 9. Restoration of paint finishes
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities • complex testing and adjusting of components, and where this is undertaken, may be carried out under supervision at the appropriate level
Procedures and requirements	Procedures and requirements refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA381A Repair and/or overhaul aircraft pneumatic system components

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. It covers the competencies required to overhaul and repair a range of aircraft pneumatic system components. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills, theory knowledge and maintenance publication procedures to repair and overhaul pneumatic system components in workshops.

Applications include components from fixed and rotary wing aircraft pneumatic systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation

MEA109B Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Determine requirements	1.1. Component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers
	1.2. ***Pneumatic components*** are inspected and/or operated through prescribed test procedures to establish serviceability or confirm defects, as required
	1.3. Modification status is clearly established to assist in determining the overhaul requirements for the components
	1.4. Extent of overhaul or repair is identified and documented in accordance with standard enterprise procedures
2. Troubleshoot pneumatic components	2.1. Available information from maintenance records and test results is used, where necessary, to assist in fault determination
	2.2. Logical processes are used to ensure efficient and accurate troubleshooting
	2.3. Specialist advice is obtained, where required, to assist with, or confirm, the fault and rectification requirement
	2.4. Pneumatic component faults are located and the causes of the faults are clearly identified

	2.5. Fault rectification requirements are determined to assist in planning the repair
3. Dismantle and inspect pneumatic parts	3.1. Pneumatic component parts are dismantled in accordance with maintenance manuals 3.2. Component parts are assessed for serviceability in accordance with the relevant maintenance documentation 3.3. Parts requiring specialist repair are tagged and repair instructions are specified in accordance with standard enterprise procedures 3.4. Parts requiring non-destructive testing are prepared for testing in accordance with the relevant maintenance documentation 3.5. Parts lists are compiled and processed in accordance with standard enterprise procedures
4. Repair and/or modify pneumatic components or parts	4.1. Component parts are ***repaired*** or replaced in accordance with the relevant maintenance documentation 4.2. Modification of components or parts is undertaken, where required, by relevant manufacturer's bulletins or procedures
5. Assemble, test and adjust pneumatic components	5.1. Pneumatic component parts are assembled within specified tolerances and in accordance with the appropriate maintenance documents 5.2. Components are adjusted, tested or calibrated to operate within prescribed specifications 5.3. Finished components are tagged, sealed and packaged in accordance with standard enterprise procedures 5.4. Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures
- using MSDS and relevant items of PPE
- using relevant maintenance documentation and aircraft/component manuals relating to pneumatic, pressurisation and air cycle air conditioning system components to:
  - recognise state of serviceability and overhaul or repair requirements
  - test and accurately and efficiently troubleshoot unserviceabilities and document the

causes
- dismantle and inspect component parts for serviceability and identify repair requirements as applicable
- repair/replace/modify component parts
- assemble, test for correct operation and adjust components

Required knowledge

Look for evidence that confirms knowledge of:

- how to obtain relevant MSDS
- identification and use of items of PPE
- fault diagnosis techniques
- system and component operation
- repair and overhaul procedures and processes
- the use of pneumatic test rigs

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and component theory knowledge and use maintenance publications to repair and overhaul aircraft pneumatic system components while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of repair and/or overhaul applications associated with aircraft components. It is essential that the maintenance procedures are interpreted and applied to ensure quality and safety standards are achieved. Evidence of transferability of skills and knowledge related to repair is essential. This may be demonstrated through application across a number of different aircraft components. Ability to assess component serviceability and interpret parts requirements will be necessary to supplement the required evidence. Capability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. The application of testing procedures should also clearly indicate knowledge of system operation. Knowledge of

	system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults before under taking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one component from each of Groups 1 to 3 referenced in the Range Statement including demonstration of the repair processes listed in Groups 4 to 9. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Pneumatic components	Pneumatic components may be from systems, such as pressurisation, air cycle air conditioning and pneumatic, and may include: 1. Valves, pumps, motors, expansion turbines,

	actuators, regulators, temperature sensors, mechanical pressurisation controllers, temperature controllers and thrust reversers 2. Heat exchangers and pressure vessels 3. Rigid and flexible pipelines, hoses, fittings and ducting
Repair of component parts	Repair of component parts may include: 4. Finishing or re-finishing of metal surfaces through processes, such as polishing and lapping 5. Removal of corrosion within maintenance manual limits 6. Replacement of seals and backing rings 7. Replacement of bearings 8. Application of surface treatments, such as alodining 9. Restoration of paint finishes
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities • complex testing and adjusting of components, and where this is undertaken, may be carried out under supervision at the appropriate level
Procedures and requirements	Procedures and requirements refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA382A Repair and/or overhaul aircraft fuel system components

Modification History

Release 3 - Unit application clarified in Application of the Unit and in the Range Statement - equivalent.

Release 2 - Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. It covers the competencies required to overhaul and repair a range of aircraft fuel system components. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills, theory knowledge and maintenance publication procedures to repair and overhaul fuel system components in workshops.

Applications include components from fixed and rotary wing aircraft fuel systems both piston and gas turbine.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications

MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Determine requirements	1.1. Component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers 1.2. ***Fuel system components*** are inspected and/or operated through prescribed test procedures to establish serviceability or confirm defects, as required 1.3. Modification status is clearly established to assist in determining the overhaul requirements for the components 1.4. Extent of overhaul or repair is identified and documented in accordance with standard enterprise procedures
2. Troubleshoot fuel system components	2.1. Available information from maintenance records and test results is used, where necessary, to assist in fault determination 2.2. Logical processes are used to ensure efficient and accurate troubleshooting 2.3. Specialist advice is obtained, where required, to assist with, or confirm, the fault and rectification requirement

	2.4. Fuel system component faults are located and the causes of the faults are clearly identified
	2.5. Fault rectification requirements are determined to assist in planning the repair
3. Dismantle and inspect fuel system component parts	3.1. Fuel system component parts are dismantled in accordance with maintenance manuals
	3.2. Component parts are assessed for serviceability in accordance with the relevant maintenance documentation
	3.3. Parts requiring specialist repair are tagged and repair instructions are specified in accordance with standard enterprise procedures
	3.4. Parts requiring non-destructive testing are prepared for testing in accordance with the relevant maintenance documentation
	3.5. Parts lists are compiled and processed in accordance with standard enterprise procedures
4. Repair and/or modify fuel system components or parts	4.1. Component parts are ***repaired*** or replaced in accordance with the relevant maintenance documentation
	4.2. Modification of components or parts is undertaken, where required, by relevant manufacturer's bulletins or procedures
5. Assemble, test and adjust fuel system components	5.1. Fuel system component parts are assembled within specified tolerances and in accordance with the appropriate maintenance documents
	5.2. Components are adjusted, tested or calibrated to operate within prescribed specifications
	5.3. Finished components are tagged, sealed and packaged in accordance with standard enterprise procedures
	5.4. Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures
- using MSDS and applicable items of PPE
- using relevant maintenance documentation and aircraft/component manuals relating to fuel system components to:

- recognise state of serviceability and overhaul or repair requirements
- test and accurately and efficiently troubleshoot unserviceabilities and document the causes
- dismantle and inspect component parts for serviceability and identify repair requirements as applicable
- repair/replace/modify component parts
- assemble, test for correct operation and adjust components

Required knowledge

Look for evidence that confirms knowledge of:

- how to obtain relevant MSDS
- the use of applicable items of PPE
- fault diagnosis techniques
- system and component operation
- repair and overhaul procedures and processes
- the use of fuel system test rigs

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and component theory knowledge and use maintenance publications to repair and overhaul aircraft fuel system components while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of repair and/or overhaul applications associated with aircraft components. It is essential that the maintenance procedures are interpreted and applied to ensure quality and safety standards are achieved. Evidence of transferability of skills and knowledge related to repair is essential. This may be demonstrated through application across a number of different aircraft components. Ability to assess component serviceability and interpret parts requirements will be necessary to supplement the required evidence. Capability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. The

	application of testing procedures should also clearly indicate knowledge of system operation. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one component from each of Groups 1 and 2 in the Range Statement including demonstration of the applicable repair processes listed in Groups 3 to 9. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Fuel system components	Fuel system components may include: 1. Valves, pumps, fuel control units, injection systems

	and carburettors 2. Filters, rigid and flexible pipelines, hoses, fittings and flexible fuel tanks
Repair of component parts	Repair of component parts may include: 3. Finishing or re-finishing of metal surfaces through processes, such as polishing and lapping 4. Removal of corrosion within maintenance manual limits 5. Replacement of seals and backing rings 6. Replacement of bearings 7. Application of surface treatments, such as alodining 8. Restoration of paint finishes 9. Repair of flexible fuel tank leaks
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities • complex testing and adjusting of components, and where this is undertaken, may be carried out under supervision at the appropriate level
Procedures and requirements	Procedures and requirements refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Not applicable.

Co-requisite units

Not applicable

MEA383A Repair and_or overhaul gas turbine engine air inlet and compressor components and_or modules

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. It covers the competencies required to overhaul and repair components of gas turbine engine or engine module air inlet and compressor sections.

Application of the Unit

This unit requires application of hand skills, theory knowledge and maintenance publication procedures to repair and overhaul aircraft gas turbine air inlet and compressor components in workshops.

Applications include air inlet and compressor components from turbo-jet, turbofan, turboshaft, turboprop engines and engine modules, or auxiliary power units.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications

MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Determine requirements	1.1. Component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers 1.2. ***Air inlet and compressor components*** are inspected and/or operated through prescribed test procedures to establish serviceability and confirm defects, if necessary 1.3. Modification status is clearly established to assist in determining the overhaul requirements for the components 1.4. Extent of overhaul or repair is identified and documented in accordance with standard enterprise procedures
2. Troubleshoot air inlet and compressor components	2.1. Available information from maintenance records and test results is used, where necessary, to assist in fault determination 2.2. Logical processes are used to ensure efficient and accurate troubleshooting 2.3. Specialist advice is obtained, where required, to assist

	with, or confirm, the fault and rectification requirement 2.4. Air inlet and compressor component faults are located and the causes of the faults are clearly identified 2.5. Fault rectification requirements are determined to assist in planning the repair
3. Dismantle and inspect air inlet and compressor parts	3.1. Air inlet and compressor component parts are dismantled in accordance with maintenance manual 3.2. Component parts are assessed for serviceability in accordance with the relevant maintenance documentation 3.3. Parts requiring specialist repair are tagged and repair instructions are specified in accordance with standard enterprise procedures 3.4. Parts requiring non-destructive testing are prepared for testing in accordance with the relevant maintenance documentation 3.5. Parts lists are compiled and processed in accordance with standard enterprise procedures
4. Repair and/or modify air inlet and compressor components or parts	4.1. Component parts are ***repaired*** or replaced in accordance with the relevant maintenance documentation 4.2. Modification of components is undertaken, where required, by reference to relevant manufacturers' bulletins or procedures and/or customer requirements
5. Assemble and adjust air inlet and compressor components	5.1. Air inlet and compressor component parts are assembled within specified tolerances and in accordance with the appropriate maintenance documents 5.2. Support/safety equipment, where fitted, is removed at the appropriate time 5.3. Components are adjusted to ensure that fits and clearances are within prescribed specifications 5.4. Finished components are tagged, sealed and packaged in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures, including the use of MSDS and PPE
- using relevant maintenance documentation, specifications and aircraft/component manuals

to:

- recognise state of serviceability and overhaul or repair requirements for air inlet and compressor components
- test and accurately and efficiently troubleshoot unserviceabilities and document the causes in air inlet and compressor components
- dismantle and inspect air inlet and compressor component parts for serviceability and identify repair requirements as applicable
- repair/replace/modify air inlet and compressor component parts
- assemble and adjust air inlet and compressor components

- correctly tagging, sealing and packaging completed components

Required knowledge

Look for evidence that confirms knowledge of:

- how to obtain relevant MSDS
- the use of applicable items of PPE
- fault diagnosis techniques
- system and component operation
- repair and overhaul procedures and processes, including inspection, rework, repair and reclamation, assembly, balancing of rotating assemblies and final adjustment

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and component theory knowledge and use maintenance publications to repair and overhaul air inlet and compressor components from aircraft gas turbine engines and/or modules while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of repair and/or overhaul applications associated with gas turbine engine components and/or modules. It is essential that the maintenance procedures (including the use of correct fuels and lubricants) are interpreted and applied to ensure quality and safety standards are achieved. Evidence of transferability of skills and knowledge related to repair is essential. This may be demonstrated through application across a number of different gas

	turbine engine components and/or modules. Ability to assess component/module serviceability and interpret parts requirements will be necessary to supplement the required evidence. Capability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. The application of testing procedures should also clearly indicate knowledge of system operation. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one item from each of Groups 1 to 5 listed in the Range Statement (Groups 2 and 5 may be omitted if not applicable to the enterprise), including demonstration of the repair processes listed in Groups 6 to 11. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Air inlet and compressor components	Air inlet and compressor components from fixed or rotary wing gas turbine engines (turbo-jet, turbofan, turboshaft, turboprop) or engine modules, or auxiliary power units and may include: 1. Air inlet structure and blow-in doors where these items are part of an engine change unit or engine module 2. Fan, where applicable 3. Inlet guide vanes 4. Centrifugal or axial flow compressor assemblies (low and high pressure) 5. Compressor bleed valves, where applicable
Repair of component parts	Repair of component parts may include: 6. Finishing or re-finishing of metal surfaces through processes, such as polishing, lapping and blending of damage within maintenance manual limits 7. Removal of corrosion within maintenance manual limits 8. Replacement of seals and gaskets 9. Replacement of bearings 10. Application of surface treatments, such as alodining 11. Restoration of paint finishes
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities • complex testing and adjusting of components, and where this is undertaken, may be carried out under supervision at the appropriate level
Procedures and requirements	Procedures and requirements refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

MEA384A Repair and_or overhaul gas turbine engine combustion section components and_or modules

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. It covers the competencies required to overhaul and repair components of gas turbine engine or engine module combustion sections. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills, theory knowledge and maintenance publication procedures to repair and overhaul aircraft gas turbine engine or engine module combustion section components.

Applications include combustion section components and modules from turbo-jet, turbofan, turboshaft, turboprop engines, engine modules or auxiliary power units.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications

MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Determine requirements	1.1. Component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers 1.2. ***Combustion section components*** are inspected and/or operated through prescribed test procedures to establish serviceability and confirm defects, if necessary 1.3. Modification status is clearly established to assist in determining the overhaul requirements for the components 1.4. Extent of overhaul or repair is identified and documented in accordance with standard enterprise procedures
2. Troubleshoot combustion section components	2.1. Available information from maintenance records and test results is used, where necessary, to assist in fault determination 2.2. Logical processes are used to ensure efficient and accurate troubleshooting 2.3. Specialist advice is obtained, where required, to assist with, or confirm, the fault and rectification requirement

	2.4. Combustion section component faults are located and the causes of the faults are clearly identified
	2.5. Fault rectification requirements are determined to assist in planning the repair
3. Dismantle and inspect combustion section component parts	3.1. Combustion section component parts are dismantled in accordance with maintenance manual
	3.2. Component parts are assessed for serviceability in accordance with the relevant maintenance documentation
	3.3. Parts requiring specialist repair are tagged and repair instructions are specified in accordance with standard enterprise procedures
	3.4. Parts requiring non-destructive testing are prepared for testing in accordance with the relevant maintenance documentation
	3.5. Parts lists are compiled and processed in accordance with standard enterprise procedures
4. Repair and/or modify combustion section components or parts	4.1. Component parts are ***repaired*** or replaced in accordance with the relevant maintenance documentation
	4.2. Modification of components is undertaken, where required, by reference to relevant manufacturers' bulletins or procedures and/or customer requirements
5. Assemble and adjust combustion section components	5.1. Combustion section component parts are assembled within specified tolerances and in accordance with the appropriate maintenance documents
	5.2. Support/safety equipment, where fitted, is removed at the appropriate time
	5.3. Components are adjusted to ensure that fits and clearances are within prescribed specifications
	5.4. Finished components are tagged, sealed and packaged in accordance with standard enterprise procedures
	5.5. Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures, including the use of MSDS and PPE

- using relevant maintenance documentation, specifications and aircraft/component manuals to:
  - recognise state of serviceability and overhaul or repair requirements for combustion section components
  - test and accurately and efficiently troubleshoot engine combustion component unserviceabilities and document the causes
  - dismantle and inspect combustion section component parts for serviceability and identify repair requirements as applicable
  - repair/replace/modify combustion section component parts
  - assemble and adjust combustion section components
- correctly tagging, sealing and packaging completed components

Required knowledge

Look for evidence that confirms knowledge of:

- how to obtain relevant MSDS
- the use of applicable items of PPE
- fault diagnosis techniques
- combustion section and component operation
- repair and overhaul procedures and processes, including inspection, rework, repair and reclamation, assembly, testing and final adjustment

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and component theory knowledge and use maintenance publications to repair and overhaul aircraft gas turbine engine or engine module combustion section components while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of repair and/or overhaul applications associated with gas turbine engine components and/or modules. It is essential that the maintenance procedures (including the use of correct fuels and lubricants) are interpreted and applied to ensure quality and safety standards are achieved. Evidence of transferability of skills and knowledge related to repair is essential. This may be demonstrated

	through application across a number of different gas turbine engine components and/or modules. Ability to assess component/module serviceability and interpret parts requirements will be necessary to supplement the required evidence. Capability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. The application of testing procedures should also clearly indicate knowledge of system operation. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults before under taking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one item from each of Groups 1 and 2 listed in the Range Statement, including demonstration of the repair processes listed in Groups 3 to 5. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Combustion section components and/or modules	Combustion section components and/or modules from fixed or rotary wing gas turbine engine (turbo-jet, turbofan, turboshaft, turboprop), engine module or auxiliary power unit and may include: 1. Fuel manifold and nozzles 2. Combustion chamber (multiple can, can-annular or annular)
Repair of component parts	Repair of component parts may include: 3. Finishing or re-finishing of metal surfaces through processes such as polishing and lapping 4. Removal of corrosion within maintenance manual limits 5. Replacement of seals and gaskets
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities • complex testing and adjusting of components, and where this is undertaken, may be carried out under supervision at the appropriate level
Procedures and requirements	Procedures and requirements refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA385A Repair and_or overhaul gas turbine engine turbine and exhaust section components

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. It covers the competencies required to overhaul and repair components of gas turbine engine or engine module turbine and exhaust sections. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA

Application of the Unit

This unit requires application of hand skills, theory knowledge and maintenance publication procedures to repair and overhaul aircraft gas turbine engine turbine and exhaust section components in workshops.

Applications include turbine and exhaust section components from turbo-jet, turbofan, turboshaft, turboprop engines and engine modules, or auxiliary power units.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications

MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Determine requirements	1.1. Component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers 1.2. ***Turbine and exhaust section components*** are inspected and/or operated through prescribed test procedures to establish serviceability and confirm defects, if necessary 1.3. Modification status is clearly established to assist in determining the overhaul requirements for the components 1.4. Extent of overhaul or repair is identified and documented in accordance with standard enterprise procedures
2. Troubleshoot turbine and exhaust section components	2.1. Available information from maintenance records and test results is used, where necessary, to assist in fault determination 2.2. Logical processes are used to ensure efficient and accurate troubleshooting 2.3. Specialist advice is obtained, where required, to assist with, or confirm, the fault and rectification requirement

	2.4. Turbine and exhaust section component faults are located and the causes of the faults are clearly identified
	2.5. Fault rectification requirements are determined to assist in planning the repair
3. Dismantle and inspect turbine and exhaust section component parts	3.1. Turbine and exhaust section component parts are dismantled in accordance with maintenance manual
	3.2. Component parts are assessed for serviceability in accordance with the relevant maintenance documentation
	3.3. Parts requiring specialist repair are tagged and repair instructions are specified in accordance with standard enterprise procedures
	3.4. Parts requiring non-destructive testing are prepared for testing in accordance with the relevant maintenance documentation
	3.5. Parts lists are compiled and processed in accordance with standard enterprise procedures
4. Repair and/or modify turbine and exhaust section components or parts	4.1. Component parts are ***repaired*** or replaced in accordance with the relevant maintenance documentation
	4.2. Modification of components is undertaken, where required, by reference to relevant manufacturers' bulletins or procedures and/or customer requirements
5. Assemble and adjust turbine and exhaust section components	5.1. Turbine and exhaust section component parts are balanced where required and assembled within specified tolerances and in accordance with the appropriate maintenance documents
	5.2. Support/safety equipment, where fitted, is removed at the appropriate time
	5.3. Components are adjusted to ensure that fits and clearances are within prescribed specifications
	5.4. Finished components are tagged, sealed and packaged in accordance with standard enterprise procedures
	5.5. Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures, including the use of MSDS and PPE
- using relevant maintenance documentation, specifications and aircraft/component manuals to:
  - recognise state of serviceability and overhaul or repair requirements for turbine and exhaust section components
  - test and accurately and efficiently troubleshoot turbine and exhaust section component unserviceabilities and document the causes
  - dismantle and inspect turbine and exhaust section component parts for serviceability and identify repair requirements as applicable
  - repair/replace/modify turbine and exhaust section component parts
  - assemble and adjust turbine and exhaust section components
- correctly tagging, sealing and packaging completed components

Required knowledge

Look for evidence that confirms knowledge of:

- how to obtain relevant MSDS
- the use of applicable items of PPE
- fault diagnosis techniques
- turbine and exhaust section and component operation
- repair and overhaul procedures and processes, including inspection, rework, repair and reclamation, assembly, balancing of rotating assemblies and final adjustment

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and component theory knowledge and use maintenance publications to repair and overhaul aircraft gas turbine engine and engine module turbine and exhaust section components while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of repair and/or overhaul applications associated with gas turbine engine components and/or modules. It is essential that the maintenance procedures (including the use of correct fuels and lubricants) are interpreted and applied to ensure quality and safety standards are achieved.

	Evidence of transferability of skills and knowledge related to repair is essential. This may be demonstrated through application across a number of different gas turbine engine components and/or modules. Ability to assess component/module serviceability and interpret parts requirements will be necessary to supplement the required evidence. Capability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. The application of testing procedures should also clearly indicate knowledge of system operation. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one item from each of Groups 1 to 7 listed in the Range Statement (Groups 2, 3, 6 and 7 may be omitted where they are not applicable to the enterprise), including demonstration of the repair processes listed in Groups 8 to 11. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work

environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Turbine and exhaust section components	Turbine and exhaust section components from fixed or rotary wing gas turbine engine (turbo-jet, turbofan, turboshaft, turboprop), engine module or auxiliary power unit and may include: 1. High and low pressure turbine assemblies 2. Free turbine (where applicable) 3. Automatic turbine rotor clearance control system (where applicable) 4. Engine tail cone and exhaust struts 5. Jet pipe that is part of the engine change unit or module 6. Thrust reversers (where applicable) 7. Afterburner system where it is part of the engine change unit or module (where applicable)
Repair of component parts	Repair of component parts may include: 8. Finishing or re-finishing of metal surfaces through processes, such as polishing and lapping 9. Removal of corrosion within maintenance manual limits 10. Replacement of seals and gaskets 11. Replacement of bearings
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities • complex testing and adjusting of components, and where this is undertaken, may be carried out under supervision at the appropriate level
Procedures and requirements	Procedures and requirements refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA386A Repair and/or overhaul gas turbine engine ancillary section components

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. It covers the competencies required to overhaul and repair components of gas turbine engine or engine module ancillary section. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills, theory knowledge and maintenance publication procedures to repair and overhaul aircraft gas turbine engine ancillary section components in workshops.

Applications include ancillary section components from turbo-jet, turbofan, turboshaft, turboprop engines and engine modules, or auxiliary power units.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications

MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Determine requirements	1.1. Component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers
	1.2. ***Ancillary section components*** are inspected and/or operated through prescribed test procedures to establish serviceability and confirm defects, if necessary
	1.3. Modification status is clearly established to assist in determining the overhaul requirements for the components
	1.4. Extent of overhaul or repair is identified and documented in accordance with standard enterprise procedures
2. Troubleshoot ancillary section components	2.1. Available information from maintenance records and test results is used, where necessary, to assist in fault determination
	2.2. Logical processes are used to ensure efficient and accurate troubleshooting
	2.3. Specialist advice is obtained, where required, to assist with, or confirm, the fault and rectification requirement

	2.4. Ancillary section component/module faults are located and the causes of the faults are clearly identified
	2.5. Fault rectification requirements are determined to assist in planning the repair
3. Dismantle and inspect ancillary section component parts	3.1. Ancillary section component parts are dismantled in accordance with maintenance manual
	3.2. Component parts are assessed for serviceability in accordance with the relevant maintenance documentation
	3.3. Parts requiring specialist repair are tagged and repair instructions are specified in accordance with standard enterprise procedures
	3.4. Parts requiring non-destructive testing are prepared for testing in accordance with the relevant maintenance documentation
	3.5. Parts lists are compiled and processed in accordance with standard enterprise procedures
4. Repair and/or modify ancillary section components or parts	4.1. Component parts are ***repaired*** or replaced in accordance with the relevant maintenance documentation
	4.2. Modification of components is undertaken, where required, by reference to relevant manufacturers' bulletins or procedures and/or customer requirements
5. Assemble and adjust ancillary section components	5.1. Ancillary section component parts are assembled within specified tolerances and in accordance with the appropriate maintenance documents
	5.2. Support/safety equipment, where fitted, is removed at the appropriate time
	5.3. Components are adjusted to ensure that fits and clearances are within prescribed specifications
	5.4. Finished components are tagged, sealed and packaged in accordance with standard enterprise procedures
	5.5. Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures
- using relevant MSDS and items of PPE

- using relevant maintenance documentation, specifications and aircraft/component manuals to:
  - recognise state of serviceability and overhaul or repair requirements for ancillary section components
  - test and accurately and efficiently troubleshoot ancillary section component unserviceabilities and document the causes
  - dismantle and inspect ancillary section component parts for serviceability and identify repair requirements as applicable
  - repair/replace/modify ancillary section component parts
  - assemble and adjust ancillary section components
- correctly tagging, sealing and packaging completed components

Required knowledge

Look for evidence that confirms knowledge of:

- how to obtain relevant MSDS
- the use of applicable items of PPE
- fault diagnosis techniques
- ancillary section and component operation
- repair and overhaul procedures and processes, including inspection, rework, repair and reclamation, assembly and final adjustment

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and component theory knowledge and use maintenance publications to repair and overhaul aircraft gas turbine engine and engine module ancillary section components while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of repair and/or overhaul applications associated with gas turbine engine components and/or modules. It is essential that the maintenance procedures (including the use of correct fuels and lubricants) are interpreted and applied to ensure quality and safety standards are achieved. Evidence of transferability of skills and knowledge related to repair is essential. This may be demonstrated

	through application across a number of different gas turbine engine components and/or modules. Ability to assess component/module serviceability and interpret parts requirements will be necessary to supplement the required evidence. Capability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. The application of testing procedures should also clearly indicate knowledge of system operation. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one item from each of Groups 1 to 3 listed in the Range Statement (Groups 2 and 3 are required only where they are applicable to the enterprise), including demonstration of the repair processes listed in Groups 4 to 8. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility

of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Ancillary section components	Ancillary section components from fixed or rotary wing gas turbine engine (turbo-jet, turbofan, turboshaft, turboprop), engine module or auxiliary power unit may include: 1. Accessory (or high-speed) gearbox 2. Turboprop reduction gearbox 3. Turboshaft drive shaft or reduction gearbox
Repair of component parts	Repair of component parts may include: 4. Finishing or re-finishing of metal surfaces through processes, such as polishing and lapping 5. Replacement of seals and gaskets 6. Replacement of bearings 7. Application of surface treatments 8. Restoration of paint finishes
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities • complex testing and adjusting of components, and where this is undertaken, may be carried out under supervision at the appropriate level
Procedures and requirements	Procedures and requirements refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA387A Test gas turbine engines and engine modules after overhaul or repair

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. It covers the competencies required to test run gas turbine engines or engine modules after overhaul or repair. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills, theory knowledge and maintenance publication procedures to test run aircraft gas turbine engines and engine modules in engine test stands following overhaul or repair in workshops.

Applications include turbo-jet, turbofan, turboshaft, turboprop engines and engine modules, or auxiliary power units.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA383A	Repair and/or overhaul gas turbine engine air inlet and compressor components and/or modules
MEA384A	Repair and/or overhaul gas turbine engine combustion section components and/or modules
MEA385A	Repair and/or overhaul gas turbine engine turbine and exhaust section components

MEA386A Repair and/or overhaul gas turbine engine ancillary section components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Prepare engine or module for testing	1.1. Maintenance documentation is checked to confirm that ***engine*** or ***module*** is ready for testing 1.2. Where required, engine modules are assembled into a test engine 1.3. Engine is configured for testing in accordance with maintenance manual requirements and standard enterprise procedures
2. Install engine in test stand	2.1. Engine is installed in test stand in accordance with maintenance manual requirements and standard enterprise procedures 2.2. Fuel, oil and fluid levels are checked 2.3. Engine test stand is prepared for operation
3. Run and test engine or module performance	3.1. Engine is started and operating parameters are checked 3.2. Engine performance is tested and trimmed, where applicable, in accordance with maintenance manual requirements and standard enterprise procedures 3.3. Engine operating parameters and test results are recorded in accordance with standard enterprise procedures
4. Remove engine from test stand	4.1. Engine is removed from test stand in accordance with maintenance manual requirements and standard enterprise

procedures

4.2. Serviceable engines or modules are configured, inhibited and prepared in accordance with maintenance manual requirements and standard enterprise procedures for transport or storage

4.3. Unserviceable engines or modules are returned to workshop in accordance with standard enterprise procedures for rectification or rework

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures
- using relevant MSDS and items of PPE
- using relevant maintenance manuals and standard enterprise procedures to:
  - prepare engines or modules for test running
  - install engines in test stands
  - test run and trim engines where applicable
  - record engine operating parameters
  - remove engines from the test stand
  - complete documentation
- configure and inhibit serviceable engines and modules for transport or storage

Required knowledge

Look for evidence that confirms knowledge of:

- how to obtain relevant MSDS
- the use of applicable items of PPE
- test stand operation
- engine and module test requirements
- engine operating parameters and adjustment methods

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must

	be able to apply hand skills and gas turbine engine theory knowledge and use maintenance publications to test and adjust the operation of overhauled engines or modules while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of repair and/or overhaul applications associated with gas turbine engines and/or modules. It is essential that the maintenance procedures (including the use of correct fuels and lubricants) are interpreted and applied to ensure quality and safety standards are achieved. Evidence of transferability of skills and knowledge related to repair is essential. This may be demonstrated through application across a number of gas turbine engine and/or module test runs. Capability to interpret test procedures and specifications (allowable limits) and apply them in practice is critical. The application of testing procedures should also clearly indicate knowledge of system operation. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot engine or module faults before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a representative range of engine/module test runs. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment in an applicable engine test stand. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Engines	Engines include: • fixed or rotary wing gas turbine engine (turbo-jet, turbofan, turboshaft, turboprop), or auxiliary power unit
Modules	Modules may include: • various combinations of gas turbine engine sections as determined by the manufacturer
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities • complex adjusting and testing of engine performance to be carried out under supervision
Procedures and requirements	Procedures and requirements refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA389A Repair and/or overhaul propellers

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated. Missing knowledge requirements reinstated.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. It covers the competencies required to overhaul and repair aircraft propellers and components. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills, theory knowledge and maintenance publication procedures to repair and overhaul aircraft propellers and components.

Applications include piston and turbine engine propellers and components, excluding propeller blades that are made from materials other than metal.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation

MEA109B Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Determine requirements	1.1. ***Propellers and component*** defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers
	1.2. Components are inspected and/or operated through prescribed test procedures to establish serviceability or confirm defects, as required
	1.3. Modification status is clearly established to assist in determining the overhaul requirements for the components
	1.4. Extent of overhaul or repair is identified and documented in accordance with standard enterprise procedures
2. Troubleshoot propeller components	2.1. Available information from maintenance records and test results is used, where necessary, to assist in fault determination
	2.2. Logical processes are used to ensure efficient and accurate troubleshooting
	2.3. Specialist advice is obtained, where required, to assist with, or confirm, the fault and rectification requirement
	2.4. Propeller component faults are located and the causes of the faults are clearly identified

	2.5. Fault rectification requirements are determined to assist in planning the repair
3. Dismantle and inspect propeller parts	3.1. Propeller component parts are dismantled in accordance with maintenance manuals 3.2. Component parts are assessed for serviceability in accordance with the relevant maintenance documentation 3.3. Parts requiring specialist repair are tagged and repair instructions are specified in accordance with standard enterprise procedures 3.4. Parts requiring non-destructive testing are prepared for testing in accordance with the relevant maintenance documentation 3.5. Parts lists are compiled and processed in accordance with standard enterprise procedures
4. Repair and/or modify propeller components or parts	4.1. Component parts are ***repaired*** or replaced in accordance with the relevant maintenance documentation 4.2. Modification of components or parts is undertaken, where required, by relevant manufacturers' bulletins or procedures
5. Assemble, test and adjust propeller components	5.1. Component parts are assembled within specified tolerances and in accordance with the appropriate maintenance documents 5.2. Propeller components are adjusted, tested or calibrated to operate within prescribed specifications 5.3. Finished components are tagged, sealed and packaged in accordance with standard enterprise procedures 5.4. Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures, including the use of MSDS and PPE
- using relevant maintenance documentation, specifications and aircraft/component manuals to:
  - recognise state of serviceability and overhaul or repair requirements for propellers and propeller components as listed in the Range Statement
  - test and accurately and efficiently troubleshoot unserviceabilities and document the causes with regard to propeller components

  - dismantle and inspect propeller component parts for serviceability and identify repair requirements as applicable
  - repair/replace/modify propeller component parts
  - assemble, balance, test for correct operation and adjust propeller components and propellers
- correctly tagging, sealing and packaging completed components

Required knowledge

Look for evidence that confirms knowledge of:

- how to obtain relevant MSDS
- the use of applicable items of PPE
- OHS procedures
- fault diagnosis techniques
- system and component operation
- repair and overhaul procedures and processes

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and component theory knowledge and use maintenance publications to repair and overhaul aircraft propellers and components while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of repair and/or overhaul applications associated with aircraft components. It is essential that the maintenance procedures are interpreted and applied to ensure quality and safety standards are achieved. Evidence of transferability of skills and knowledge related to repair is essential. This may be demonstrated through application across a number of different aircraft components. Ability to assess component serviceability and interpret parts requirements will be necessary to supplement the required evidence. Capability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. The application of testing procedures should also clearly

	indicate knowledge of system operation. Knowledge of propeller, engine and constant speed unit operation, individually and as a system, will be necessary to supplement evidence of ability to troubleshoot component faults before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one item from each of Groups 1 to 4 in the Range Statement and on a representative range of the repair processes in Groups 5 to 10. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Propellers and components	Propellers and components may include: 1. Fixed pitch, constant speed, feathering and reversing

	propellers and spinners 2. Anti-ice/de-ice equipment 3. Propeller blades - metal 4. Hardware
Repair of component parts	Repair of component parts may include: 5. Finishing or re-finishing of metal surfaces through processes, such as polishing, lapping and blending of damage within maintenance manual limits 6. Removal of corrosion within maintenance manual limits 7. Replacement of seals and gaskets 8. Replacement of bearings 9. Application of surface treatments, such as alodining 10. Restoration of paint finishes
Power plant relationship	Repair and/or overhaul of propeller and components may be related to aircraft power plant systems
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities • complex testing and adjusting of components, and where this is undertaken, may be carried out under supervision at the appropriate level
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA390A Repair and/or overhaul rotary wing dynamic components

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated. Missing knowledge requirements reinstated.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. It covers the competencies required to overhaul and repair rotary wing aircraft rotor assembly components, transmissions and drive shafts. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills, theory knowledge and maintenance publication procedures to repair and overhaul rotary wing dynamic components.

Applications include rotor assemblies and components, transmissions, drive shafts and couplings from piston and turbine engine rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications

MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Determine requirements	1.1. ***Rotary wing component*** defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers 1.2. Components are inspected and/or operated through prescribed test procedures to establish serviceability or confirm defects, as required 1.3. Modification status is clearly established to assist in determining the overhaul requirements for the components 1.4. Extent of overhaul or repair is identified and documented in accordance with standard enterprise procedures
2. Troubleshoot rotary wing components	2.1. Available information from maintenance records and test results is used, where necessary, to assist in fault determination 2.2. Logical processes are used to ensure efficient and accurate troubleshooting 2.3. Specialist advice is obtained, where required, to assist with, or confirm, the fault and rectification requirement

	2.4. Rotary wing component faults are located and the causes of the faults are clearly identified
	2.5. Fault rectification requirements are determined to assist in planning the repair
3. Dismantle and inspect rotary wing component parts	3.1. Rotary wing component parts are dismantled in accordance with maintenance manuals
	3.2. Component parts are assessed for serviceability in accordance with the relevant maintenance documentation
	3.3. Parts requiring specialist repair are tagged and repair instructions are specified in accordance with standard enterprise procedures
	3.4. Parts requiring non-destructive testing are prepared for testing in accordance with the relevant maintenance documentation
	3.5. Parts lists are compiled and processed in accordance with standard enterprise procedures
4. Repair and/or modify rotary wing components or parts	4.1. Rotary wing component parts are ***repaired*** or replaced in accordance with the relevant maintenance documentation
	4.2. Modification of components or parts is undertaken, where required, by relevant manufacturers' bulletins or procedures
5. Assemble, test and adjust rotary wing components	5.1. Component parts are assembled within specified tolerances and in accordance with the appropriate maintenance documents
	5.2. Rotary wing components are adjusted, tested or calibrated to operate within prescribed specifications
	5.3. Finished components are tagged, sealed and packaged in accordance with standard enterprise procedures
	5.4. Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures, including the use of MSDS and PPE
- using relevant maintenance documentation, specifications and aircraft/component manuals to:

- recognise state of serviceability and overhaul or repair requirements for rotary wing components as listed in the Range Statement
- test and accurately and efficiently troubleshoot unserviceabilities and document the causes in rotary wing components
- dismantle and inspect rotary wing component parts for serviceability and identify repair requirements as applicable
- repair/replace/modify rotary wing component parts
- assemble, balance as required, test for correct operation and adjust rotary wing components

- correctly tagging, sealing and packaging completed components

Required knowledge

Look for evidence that confirms knowledge of:

- how to obtain relevant MSDS
- the use of applicable items of PPE
- OHS procedures
- fault diagnosis techniques
- system and component operation
- repair and overhaul procedures and processes

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and component theory knowledge and use maintenance publications to repair and overhaul rotary wing dynamic components while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of repair and/or overhaul applications associated with aircraft components. It is essential that the maintenance procedures are interpreted and applied to ensure quality and safety standards are achieved. This may be demonstrated through application across a number of different aircraft components. Ability to assess component serviceability and interpret parts requirements will be necessary to supplement the required evidence. Capability to interpret inspection

	procedures and specifications (allowable limits) and apply them in practice is critical. The application of testing procedures should also clearly indicate knowledge of system operation. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one item from each of Groups 1 to 3 in the Range Statement and on a representative range of the repair tasks in Groups 4 to 9. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide

Rotary wing components	Rotary wing components may include: 1. Rotor blades 2. Rotor heads, hinge assemblies and swashplates 3. Transmission gear boxes, drive shafts and couplings
Repair of component parts	Repair of component parts may include: 4. Finishing or re-finishing of metal surfaces through processes, such as polishing, lapping and blending of damage within maintenance manual limits 5. Removal of corrosion within maintenance manual limits 6. Replacement of seals and gaskets 7. Replacement of bearings 8. Application of surface treatments, such as alodining 9. Restoration of paint finishes
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities • complex testing and adjusting of components, and where this is undertaken, may be carried out under supervision at the appropriate level
Procedures and requirements	Procedures and requirements refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA391A Repair and/or overhaul aircraft mechanical system components

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated. Unit code in Range corrected.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. It covers the competencies required to overhaul and repair a range of aircraft mechanical system components. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills and the use of relevant maintenance manuals, drawings and specifications to repair and/or overhaul a range of aircraft mechanical components from systems, such as flight controls, landing gear retraction, nose wheel steering and transmissions other than those that are part of power plant assemblies.

Applications include fixed and rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications

MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Determine requirements	1.1. Component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers
	1.2. ***Mechanical components*** are inspected and/or operated through prescribed test procedures to establish serviceability or confirm defects, as required
	1.3. Modification status is clearly established to assist in determining the overhaul requirements for the components
	1.4. Extent of overhaul or repair is identified and documented in accordance with standard enterprise procedures
2. Troubleshoot mechanical components	2.1. Available information from maintenance records and test results is used, where necessary, to assist in fault determination
	2.2. Logical processes are used to ensure efficient and accurate troubleshooting
	2.3. Specialist advice is obtained, where required, to assist with, or confirm, the fault and rectification requirement

	2.4. Mechanical component faults are located and the causes of the faults are clearly identified
	2.5. Fault rectification requirements are determined to assist in planning the repair
3. Dismantle and inspect mechanical component parts	3.1. Hydraulic component parts are dismantled in accordance with maintenance manuals
	3.2. Component parts are assessed for serviceability in accordance with the relevant maintenance documentation
	3.3. Parts requiring specialist repair are tagged and repair instructions are specified in accordance with standard enterprise procedures
	3.4. Parts requiring non-destructive testing are prepared for testing in accordance with the relevant maintenance documentation
	3.5. Parts lists are compiled and processed in accordance with standard enterprise procedures
4. Repair and/or modify mechanical components or parts	4.1. Component parts are ***repaired*** or replaced in accordance with the relevant maintenance documentation
	4.2. Modification of components or parts is undertaken, where required, by relevant manufacturer's bulletins or procedures
5. Assemble, test and adjust mechanical components	5.1. Mechanical component parts are assembled within specified tolerances and in accordance with the appropriate maintenance documents
	5.2. Components are adjusted, tested or calibrated to operate within prescribed specifications
	5.3. Finished components are tagged, sealed and packaged in accordance with standard enterprise procedures
	5.4. Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures
- using MSDS and applicable items of PPE
- using relevant maintenance documentation and aircraft/component manuals relating to mechanical system components to:

- recognise state of serviceability and overhaul or repair requirements
- test and accurately and efficiently troubleshoot unserviceabilities and document the causes
- dismantle and inspect component parts for serviceability and identify repair requirements as applicable
- repair/replace/modify component parts
- assemble, test for correct operation and adjust components

Required knowledge

Look for evidence that confirms knowledge of:

- how to obtain relevant MSDS
- the correct use of PPE
- OHS procedures
- fault diagnosis and component part inspection techniques
- system and component operation
- repair and overhaul procedures and processes

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and use relevant maintenance manuals, drawings and specifications to repair and/or overhaul mechanical components while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of repair and overhaul applications associated with aircraft mechanical components. It is essential that the relevant procedures are interpreted and applied to ensure quality and safety standards are achieved. Evidence of transferability of skills and knowledge related to mechanical component repair and overhaul is essential. This may be demonstrated through application across a number of different aircraft components. Ability to assess component serviceability and interpret parts requirements will be necessary before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the

	industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on sufficient items from Groups 1 to 4 in the Range Statement to demonstrate the range of repair and overhaul activities listed in Groups 5 to 10. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general and special purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Mechanical components:	Mechanical components may include: 1. Gear boxes and transmissions (except for helicopter components which are covered by MEA390A Repair and/or overhaul rotary wing dynamic components) 2. Screwjacks 3. Mechanical actuators 4. Control rods, bellcranks, walking beams and links

Repair of component parts	Repair of component parts may include: 5. Finishing or re-finishing of metal surfaces through processes, such as polishing and lapping 6. Removal of corrosion within maintenance manual limits 7. Replacement of seals and gaskets 8. Replacement of bearings 9. Application of surface treatments, such as alodining 10. Restoration of paint finishes
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA392A Disassemble aircraft piston engines

Modification History

Release 1 - New unit of competency. Covers components of MEA388A - Not equivalent

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. It covers the competencies required to disassemble aircraft piston engines during repair and/or overhaul. The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Application of the Unit

This unit requires application of hand skills, theory knowledge and maintenance publication procedures to disassemble aircraft piston engines during workshop repair and/or overhaul.

Applications include fixed and rotary wing aircraft piston engines and components.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1	Determine requirements	1.1	Engine defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers
		1.2	Piston engine is inspected in accordance with maintenance publications to establish serviceability state and confirm defects, if necessary
		1.3	Piston engine build status is determined and quick engine change (QEC) components are recorded in accordance with standard enterprise procedures
		1.4	Modification status and engine operating hours are clearly established from the engine log book to assist in determining the repair or overhaul requirements for the engine
		1.5	Extent of overhaul or repair is identified and documented in accordance with standard enterprise procedures
2	Disassemble piston engine	2.1	Where applicable, QEC components are removed from the engine, maintenance requirements are determined, and necessary documentation is raised and packaged with the components
		2.2	Any removed QEC components not requiring maintenance are correctly labelled and stored for reinstallation
		2.3	Engine is installed in work stand and engine is cleaned
		2.4	Engine is disassembled in accordance with maintenance publication and/or enterprise procedures
		2.5	Removed components are cleaned, tagged and inspected for seviceability in accordance with

enterprise procedures

2.6 Components that are not to be reinstalled are disposed of in accordance with enterprise procedures and action is initiated to obtain replacement components

2.7 Components to be re-fitted are processed for detailed inspection, repair/overhaul and/or modification, as required

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- applying relevant work health and safety (WHS) procedures, including the use of material safety data sheets (MSDS) and personal protective equipment (PPE)
- using relevant maintenance documentation, enterprise procedures, specifications and aircraft/component manuals to:
  - recognise state of serviceability and overhaul or repair requirements for piston engines
  - accurately and efficiently troubleshoot unserviceabilities and document the causes for piston engines and components
  - dismantle and inspect piston engine component parts for serviceability
  - identify and initiate procurement for piston engine component parts/hardware that are discarded
  - identify and process engine components that require detailed inspection, repair, overhaul or modification

Required knowledge

Required knowledge includes:

- how to obtain relevant MSDS
- the use of applicable items of PPE
- WHS procedures
- fault diagnosis techniques
- system and component operation
- engine cleaning and disassembly procedures and component inspection for serviceability, including identification of life expired components
- enterprise documentation requirements

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and component theory knowledge and use maintenance publications to disassemble piston engines while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of transferability of skills and knowledge related to repair and overhaul is essential. This may be demonstrated through application across a number of different piston engines. Ability to assess component serviceability and interpret parts requirements will be necessary to supplement the required evidence. Capability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a representative range of the engine types maintained by the enterprise. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	

Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Piston engine	Piston engines may include the engine assembly and components that comprise a quick engine change unit. Engine types include all cylinder arrangements and fuel types (aviation gasoline, two stroke or diesel)
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Procedures and requirements refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA393A Repair and/or overhaul aircraft piston engine cylinder assembly components

Modification History

Release 1 - New unit of competency. Covers components of MEA388A - Not equivalent

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. It covers the competencies required to overhaul and repair aircraft piston engine components. The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Application of the Unit

This unit requires application of hand skills, theory knowledge and maintenance publication procedures to repair and overhaul aircraft piston engine cylinder assembly components.

Applications include components from fixed and rotary wing aircraft piston engines.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1	Determine requirements	1.1	Component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers
		1.2	Cylinder assembly components are inspected and/or operated through prescribed test procedures to establish serviceability and confirm defects, if necessary
		1.3	Modification status is clearly established to assist in determining the overhaul requirements for the components
		1.4	Extent of overhaul or repair is identified and documented in accordance with standard enterprise procedures
2	Dismantle and inspect piston engine cylinder assembly components/parts	2.1	Cylinder assembly component parts are dismantled in accordance with maintenance manual and/or enterprise procedures
		2.2	Component parts are assessed for serviceability in accordance with the relevant maintenance documentation
		2.3	Parts requiring specialist repair are tagged and repair instructions are specified in accordance with standard enterprise procedures
		2.4	Parts requiring non-destructive testing are prepared for testing in accordance with the relevant maintenance documentation
		2.5	Parts lists are compiled and processed in accordance

			with standard enterprise procedures
3	Repair and/or modify piston engine cylinder assembly components or parts	3.1	Component parts are repaired or replaced in accordance with the relevant maintenance documentation
		3.2	Modification of components is undertaken where required by reference to relevant manufacturer bulletins or procedures, regulatory requirements and/or customer requirements
4	Assemble, test and adjust piston engine cylinder assembly components	4.1	Cylinder assembly component parts are assembled within specified tolerances and in accordance with the appropriate maintenance documents
		4.2	Components are tested and adjusted to operate within prescribed specifications
		4.3	Cylinder assemblies are prepared for engine reassembly
		4.4	Where components are not to be assembled into an engine the finished components are tagged, sealed and packaged in accordance with standard enterprise procedures
		4.5	Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- applying relevant work health and safety (WHS) procedures, including the use of material safety data sheets (MSDS) and personal protective equipment (PPE)
- using relevant maintenance documentation, specifications and aircraft/component manuals to:
  - recognise state of serviceability and overhaul or repair requirements for piston engine cylinder assembly components as listed in the Range of Variables
  - dismantle and inspect piston engine cylinder assembly component parts for serviceability and identify repair requirements as applicable

  - repair/replace/modify piston engine cylinder assembly component parts
  - assemble, test for correct operation and adjust piston engine cylinder assembly components
- correctly tagging, sealing and packaging completed components

Required knowledge

Required knowledge includes:

- how to obtain relevant MSDS
- the use of applicable items of PPE
- WHS procedures
- component inspection and wear measurement procedures
- non-destructive testing methods and application
- component repair and overhaul procedures and processes

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and component theory knowledge and use maintenance publications to repair and overhaul aircraft piston engine cylinder assembly components while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of transferability of skills and knowledge related to repair is essential. This may be demonstrated through application across a number of different piston engine cylinder assembly components. Ability to assess component serviceability and interpret parts requirements will be necessary to supplement the required evidence. Capability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Knowledge of cylinder assembly operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.

	A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one item from each of Groups 1 to 5 in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Piston engine cylinder assembly components	Piston engine cylinder assembly components may include: 1. Cylinder 2. Piston and piston rings 3. Piston pins 4. Valves, valve rockers, valve guides, tappets, pushrods and guard tubes 5. Manifold studs
Application	Application of this unit may relate to:

	• scheduled or unscheduled maintenance • individual or team-related activities • complex testing and adjusting of components, and where this is undertaken, may be carried out under supervision at the appropriate level
Procedures and requirements	Procedures and requirements refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA394A Repair and/or overhaul aircraft piston engine crankcase assembly components

Modification History

Release 1 - New unit of competency. Covers components of MEA388A - Not equivalent

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. It covers the competencies required to overhaul and repair aircraft piston engine crankcase assembly components. The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Application of the Unit

This unit requires application of hand skills, theory knowledge and maintenance publication procedures to repair and overhaul aircraft piston engine crankcase assembly components.

Applications include components from fixed and rotary wing aircraft piston engines.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1	Determine requirements	1.1	Component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers
		1.2	Crankcase assembly components are inspected and/or operated through prescribed test procedures to establish serviceability and confirm defects, if necessary
		1.3	Modification status is clearly established to assist in determining the overhaul requirements for the components
		1.4	Extent of overhaul or repair is identified and documented in accordance with standard enterprise procedures
2	Dismantle and inspect piston engine crankcase assembly components/parts	2.1	Crankcase assembly component parts are dismantled in accordance with maintenance manual and/or enterprise procedures
		2.2	Component parts are assessed for serviceability in accordance with the relevant maintenance documentation
		2.3	Parts requiring specialist repair are tagged and repair instructions are specified in accordance with standard enterprise procedures
		2.4	Parts requiring non-destructive testing are prepared for testing in accordance with the relevant maintenance documentation

		2.5	Parts lists are compiled and processed in accordance with standard enterprise procedures
3	Repair and/or modify piston engine crankcase assembly components or parts	3.1	Component parts are repaired or replaced in accordance with the relevant maintenance documentation
		3.2	Modification of components is undertaken where required by reference to relevant manufacturer's bulletins or procedures, regulatory requirements and/or customer requirements
4	Assemble, test and adjust piston engine crankcase assembly components	4.1	Crankcase assembly component parts are assembled within specified tolerances and in accordance with the appropriate maintenance documents
		4.2	Components are tested, adjusted or calibrated to operate within prescribed specifications
		4.3	Crankcase assembly is prepared for engine reassembly
		4.4	Where components are not to be assembled into an engine the finished components are tagged, sealed and packaged in accordance with standard enterprise procedures
		4.5	Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- applying relevant work health and safety (WHS) procedures, including the use of material safety data sheets (MSDS) and personal protective equipment (PPE)
- using relevant maintenance documentation, specifications and aircraft/component manuals to:
  - recognise state of serviceability and overhaul or repair requirements for piston engine crankcase assembly components as listed in the Range of Variables
  - dismantle and inspect crankcase assembly component parts for serviceability and

identify repair requirements as applicable
- repair/replace/modify crankcase component parts
- assemble, test for correct operation and adjust crankcase assembly components

- correctly tagging, sealing and packaging completed components

Required knowledge

Required knowledge includes:

- how to obtain relevant MSDS
- the use of applicable items of PPE
- WHS procedures
- component inspection and wear measurement procedures
- non-destructive testing methods and application
- component repair and overhaul procedures and processes

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and component theory knowledge and use maintenance publications to repair and overhaul aircraft piston engine crankcase assembly components while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of transferability of skills and knowledge related to repair is essential. This may be demonstrated through application across a number of different piston engine crankcase assembly components. Ability to assess component serviceability and interpret parts requirements will be necessary to supplement the required evidence. Capability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. The application of testing procedures should also clearly indicate knowledge of system operation. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults before undertaking any action. The work plan should take account of applicable safety

	and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one item from each of Groups 1 to 8 in the Range Statement (Groups 7 and 8 may be omitted where not applicable to the enterprise). This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Piston engine crankcase assembly components	Crankcase assembly components may include: 1. Crankshaft, gears, con rods and counterweights 2. Camshaft, hydraulic tappets/cam followers and gears 3. Propeller shaft, reduction drive gear and quill shaft 4. Component gear drives/trains

	5. Crankcase castings, bearings, component mounting pads and studs 6. Oil system components 7. Supercharger and turbocharger components (where applicable to enterprise) 8. Propeller governor (where applicable to enterprise)
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities • complex testing and adjusting of components, and where this is undertaken, it may be carried out under supervision at the appropriate level
Procedures and requirements	Procedures and requirements refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA395A Reassemble aircraft piston engines

Modification History

Release 1 - New unit of competency. Covers components of MEA388A - Not equivalent

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. It covers the competencies required to reassemble aircraft piston engines during repair and/or overhaul. Note that this relates to the bare engine and does not include the assembly of a quick engine change (QEC) unit. For QEC build-up refer to unit MEA396A Assemble aircraft piston engine quick engine change unit.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Application of the Unit

This unit requires application of hand skills, theory knowledge and maintenance publication procedures to reassemble aircraft piston engines during workshop repair and/or overhaul.

Applications include fixed and rotary wing aircraft piston engines and components.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1	Prepare to assemble piston engine	1.1	Engine build requirements are correctly interpreted and matched by part and serial numbers
		1.2	Correct engine sub-assemblies and components are gathered for engine assembly and their serviceability state and modification status is confirmed in accordance with the relevant maintenance documentation and quality procedures
		1.3	Required hardware and plumbing is obtained and confirmed as approved items
2	Reassemble piston engine	2.1	Piston engine sub-assemblies and components are prepared for reassembly in accordance with maintenance manual and/or enterprise procedures
		2.2	Components are assembled and adjusted in accordance with the maintenance manual and/or enterprise procedures
		2.3	Engine is assembled and components and linkages are adjusted in accordance with maintenance data requirements
		2.4	Reassembled engine is prepared for testing

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- applying relevant work health and safety (WHS) procedures, including the use of material safety data sheets (MSDS) and personal protective equipment (PPE)
- using relevant maintenance documentation, enterprise procedures, specifications and aircraft/component manuals to:
  - identify the required engine build level and configuration
  - recognise state of serviceability of the required sub-assemblies, components, hardware and plumbing
  - reassemble the engine and adjust components and linkages

Required knowledge

Required knowledge includes:

- how to obtain relevant MSDS
- the use of applicable items of PPE
- WHS procedures
- fault diagnosis techniques
- system and component operation
- engine reassembly and component adjustment requirements

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and component theory knowledge and use maintenance publications to reassemble piston engines while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of transferability of skills and knowledge related to repair and overhaul is essential. This may be demonstrated through application across a number of different piston engines. Ability to assess component/sub-assembly serviceability and interpret parts requirements will be necessary to supplement the required evidence. Capability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. The application of adjustment procedures should also clearly indicate

	knowledge of system operation. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a representative range of the engine types maintained by the enterprise. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Piston engine sub-assemblies and components	Sub-assemblies and components may include: • crankcase assembly • cylinder assemblies • external lubrication system components • propeller governor (where applicable) • fuel system components • ignition system components • exhaust system components • turbocharger and waste gate (where applicable)

Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities • complex testing and adjusting of components, and where this is undertaken, may be carried out under supervision at the appropriate level
Procedures and requirements	Procedures and requirements refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA396A Assemble aircraft piston engine quick engine change unit

Modification History

Release 1 - New unit of competency. Covers components of MEA388A - Not equivalent

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. It covers the competencies required to assemble aircraft piston engine quick engine change (QEC) units following engine repair and/or overhaul. The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Application of the Unit

This unit requires application of hand skills, theory knowledge and maintenance publication procedures to assemble aircraft piston engines QEC units.

Applications include fixed and rotary wing aircraft piston engines and components.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1	Prepare to assemble piston engine QEC unit	1.1	QEC build requirements are correctly interpreted and matched by part and serial numbers
		1.2	Correct QEC components are gathered for assembly and their serviceability state and modification status is confirmed in accordance with the relevant maintenance documentation and quality procedures
		1.3	Required hardware and plumbing is obtained and confirmed as approved items
2	Assemble piston engine QEC unit	2.1	Piston engine is prepared for QEC assembly in accordance with maintenance manual and/or enterprise procedures
		2.2	QEC components are assembled to the engine and adjusted in accordance with the maintenance manual and/or enterprise procedures
		2.3	QEC unit is assembled and components and linkages are adjusted in accordance with maintenance data requirements
		2.4	Where required, QEC unit is prepared for testing

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- applying relevant work health and safety (WHS) procedures, including the use of material safety data sheets (MSDS) and personal protective equipment (PPE)
- using relevant maintenance documentation, enterprise procedures, specifications and aircraft/component manuals to:
  - identify the required QEC build level and configuration
  - recognise state of serviceability of the QEC components, hardware and plumbing
  - assemble the QEC and adjust components and linkages

Required knowledge

Required knowledge includes:

- how to obtain relevant MSDS
- the use of applicable items of PPE
- WHS procedures
- fault diagnosis techniques
- system and component operation
- QEC assembly and component adjustment requirements

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and component theory knowledge and use maintenance publications to assemble piston engine QEC units while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of transferability of skills and knowledge related to repair and overhaul is essential. This may be demonstrated through application across a number of different piston engine QECs. Ability to assess component serviceability and interpret parts requirements will be necessary to supplement the required evidence. Capability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. The application of adjustment procedures should also clearly indicate knowledge of system operation. The work plan should take account of applicable safety and quality requirements in accordance with the industry and

	regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a representative range of the engine types maintained by the enterprise. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Piston engine QEC unit components	The build requirements for individual QEC units may include components from the following list: • engine • engine mount frame • external lubrication system components • baffles • heat shields • fuel system plumbing • pneumatic plumbing • control linkages • induction system • exhaust system components

	• turbocharger and waste gate • tachometer generator and wiring • vacuum pump • air pump • hydraulic pump • fire warning system
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities • complex testing and adjusting of components, and where this is undertaken, may be carried out under supervision at the appropriate level
Procedures and requirements	Procedures and requirements refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA397A Test aircraft piston engines after repair or overhaul

Modification History

Release 1 - New unit of competency. Covers components of MEA388A - Not equivalent

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. It covers the competencies required to test aircraft piston engines that are not fitted to an airframe after repair or overhaul. The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Application of the Unit

This unit requires application of hand skills, theory knowledge and maintenance publication procedures and/or standard enterprise procedures to test run aircraft piston engines, adjust operating parameters and troubleshoot/rectify faults.

Applications include all types of aircraft piston engines that are not installed in an airframe.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA392A	Disassemble aircraft piston engines
MEA393A	Repair and/or overhaul aircraft piston engine cylinder assembly components
MEA394A	Repair and/or overhaul aircraft piston engine crankcase assembly components
MEA395A	Reassemble aircraft piston engines
MEA396A	Assemble aircraft piston engine quick engine change unit

Employability Skills Information

This unit contains employability skills

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1	Prepare piston engine for test run	1.1	Documentation is checked to ensure that engine is ready for testing
		1.2	Engine is installed in test rig or test cell, including connection of fuel, oil and electrical supplies and instrumentation
		1.3	Sump or external oil tank is filled with correct grade and type of lubricating oil
		1.4	Test rig/cell fuel tank is filled with correct type and grade of fuel
		1.5	Correct propeller or club is fitted to the engine
		1.6	Test rig/cell is prepared for operation
2	Run and test piston engine performance	2.1	Engine is started and operating parameters are checked in accordance with maintenance manual and standard enterprise procedures
		2.2	Engine performance is tested and adjusted, where applicable, in accordance with maintenance manual requirements and standard enterprise procedures
		2.3	Engine operating parameters and test results are recorded in accordance with standard enterprise procedures
3	Troubleshoot piston engine faults	3.1	Available information from maintenance records and test results is used, where necessary, to assist in fault determination
		3.2	Logical processes are used to ensure efficient and accurate troubleshooting
		3.3	Specialist advice is obtained, where required, to assist with, or confirm, the fault and rectification

			requirement
		3.4	Piston engine component faults are located and the causes of the faults are clearly identified
		3.5	Fault rectification requirements are determined to assist in determining if the engine must be returned to the workshop
4	Remove engine from test rig/cell	4.1	Engine is removed from test rig/stand in accordance with maintenance manual requirements and standard enterprise procedures
		4.2	Serviceable engines are configured, inhibited and prepared, in accordance with maintenance manual requirements and standard enterprise procedures, for transport or storage
		4.3	Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures
		4.4	Unserviceable engines are returned to workshop in accordance with standard enterprise procedures for rectification or re-work

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- applying relevant work health and safety (WHS) procedures, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE)
- using relevant maintenance manuals and standard enterprise procedures to:
  - prepare engines for test running
  - install engines in test rigs or test cells
  - selecting and installing the correct propeller or test club
  - test run and adjust engine parameters, where applicable
  - troubleshoot faults identified during the test run
  - record engine operating parameters
  - remove engines from the test rig or test cell
  - complete documentation

- configuring and inhibiting serviceable engines for transport or storage

Required knowledge

Required knowledge includes:

- how to obtain relevant MSDS
- the use of applicable items of PPE
- WHS procedures
- fault diagnosis techniques
- system and component operation
- repair and overhaul procedures and processes
- test rig or test cell operation
- engine test requirements
- engine operating parameters and adjustment methods

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and piston engine theory knowledge and use maintenance publications to test run, adjust and troubleshoot the operation of repaired or overhauled engines while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of repair and/or overhaul applications associated with piston engines. It is essential that the maintenance procedures (including the use of correct fuels and lubricants) are interpreted and applied to ensure quality and safety standards are achieved. Evidence of transferability of skills and knowledge related to engine test running is essential. This may be demonstrated through application across a number of engine test runs. Capability to interpret test procedures and specifications (allowable limits) and apply them in practice is critical. The application of testing procedures should also clearly indicate knowledge of system operation. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot engine

	faults before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a representative range of engine test runs. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment in an applicable engine test rig or test cell. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities • complex adjusting and testing of engine performance to be carried out under supervision
Procedures and requirements	Procedures and requirements refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA401C Inspect aircraft structures

Modification History

Knowledge requirements and Range Statement revised to include additional inspection coverage - equivalent to previous version.

Unit Descriptor

This unit of competency is part of the Aeroskills Structures Maintenance Certificate IV and of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathways. It covers the competencies required for the inspection of fixed and rotary wing aircraft structures. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen B1 maintenance certification licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and maintenance documentation and manuals to inspect aircraft structure and identify damage and deterioration.

Applications include the structure of fixed and rotary wing aircraft.

Licensing/Regulatory Information

Refer to unit descriptor

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Inspect aircraft structure	1.1 Relevant maintenance documentation and modification status, including defect reports, where relevant, are used to identify specific inspection requirements
	1.2 Appropriate ***preparation and access*** to ***the aircraft structure*** is undertaken to allow for proper inspection in accordance with maintenance documentation
	1.3 Aircraft structure is visually or physically checked for signs of deformation, defects or damage in accordance with maintenance documentation and approved procedures
	1.4 Damage or defects are assessed against damage or wear limits specified by structural repair manual or other approved data to determine if repair or replacement is required
	1.5 Maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- aircraft construction principles
- structural component attachment methods
- describing the construction methods used in:
  - fuselage sections
  - wing sections

  - engine nacelles and mounts
  - windows and window frames
  - doors, locks and access panels in pressurised and unpressurised aircraft
- defining of structural terms, i.e. safe life, damage tolerant, failsafe, stress, strain, shear and cycles
- inspection requirements for metal and composite structure, including:
  - ageing aircraft inspection requirements
  - safe life structure
  - damage tolerant structure
  - fail safe structure
- describing NDT methods and application of the various techniques
- describing construction methods of, and assessing common defects in, aircraft plastic transparencies
- describing basic constructional features of, and assessing common defects in, glass windscreens
- defining the terms associated with composite materials
- OHS procedures
- relevant PPE
- how to obtain MSDS

Look for evidence that confirms skills in:

- applying all relevant OHS procedures, including the use of PPE and MSDS
- using approved maintenance documentation and aircraft publications relating to aircraft structure
- identifying various aircraft metals and their basic properties
- identifying potential causes of structural failure
- demonstrating appropriate cleaning procedures to enable structure inspection
- demonstrating correct inspection procedures, in particular pressurised aircraft, in accordance with aircraft and procedures manuals
- identifying damage to aircraft metallic (ferrous and non-ferrous) structures and/or components by way of:
  - impact
  - fatigue
  - corrosion
- identifying the various forms of structural corrosion, stating the causes and structural effects of corrosion on aircraft
- identifying composite materials used in aircraft construction, associated safety precautions and hazards
- inspecting damage and assessing composite components/structures for:
  - impact damage
  - fatigue

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and use maintenance publications to prepare aircraft structure for inspection and identify structural damage and deterioration while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of structural inspections associated with aircraft maintenance. It is essential that the procedures take into account all aircraft and personal safety precautions relating to aircraft structure. Evidence is required of the ability to interpret and apply aircraft structural inspection requirements. This may be demonstrated through application across a range of structural components and materials. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. The application of the procedures should also clearly indicate knowledge of structural flight loads. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant Elements of the unit of competency are being achieved under routine supervision on at least one task from Group 1 and inspection of at least one item from each of Groups 2 to 9, as listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	The Range Statements below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Preparation and access to structure	Preparation and access may include: 1. Preparation for NDT (access to relevant structural zones and components)
Aircraft structure inspection	Inspection of aircraft structure includes: 2. Non-ferrous and ferrous alloys and composite (FRP) materials used in aircraft construction 3. Structural fastening and attachment hardware and/or devices 4. Seals and sealants 5. Glass and moulded plastics 6. Application of NDT techniques 7. Doors, hinges and locking mechanisms for damage/misalignment 8. Inspections applicable to each of safe life, damage tolerant and fail safe structure relevant to enterprise 9. Ageing aircraft inspection programs
Inspection techniques	Inspection techniques may include: • visual inspection, physical checks, mensuration and alignment
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standards specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA405B Repair/modify aircraft composite material structure/components

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated. Missing knowledge requirements reinstated.

Unit Descriptor

This unit of competency is part of the Aeroskills Structures Maintenance Certificate IV training pathway, and of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathways. It covers the competencies required for the repair or modification of fixed and rotary wing aircraft structural components that are made from composite materials. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills and the use maintenance publications, applicable materials, tools and methods to repair aircraft composite material structure and components.

Applications include composite material structure and components from fixed and rotary wing aircraft either on-aircraft or in the workshop.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA401C	Inspect aircraft structures

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Plan repair/modification	1.1. Extent of damage is correctly assessed to assist in determining repair procedure 1.2. Structure is supported and prepared in accordance with the applicable maintenance manual to ensure personnel safety and freedom from damage 1.3. Appropriate modification or repair scheme is identified in accordance with structural repair manual and/or approved data 1.4. Specialist advice is obtained in establishing an approved repair scheme where a standard repair scheme cannot be identified or damage criteria is out of limits 1.5. All materials and equipment required are organised
2. Prepare components for hot bonding	2.1. Components are prepared in accordance with applicable process specification 2.2. Bagging is checked to ensure vacuum seal is correct 2.3. Temperature probes are placed appropriately to provide accurate measurement 2.4. Equipment is checked for serviceability to ensure safety in application 2.5. Heat blanket is laid on component or repair in a manner that ensures even temperature distribution
3. Repair/modify components using hot bond	3.1. Hot bonding equipment is operated in accordance with equipment manufacturer's procedures 3.2. Vacuum and temperature recordings are monitored, including checking of hot and cold spots on trailing and leading temperature probes, to ensure specifications are met 3.3. Curing cycle and recording of operating cycle data are monitored as required by approved procedures to ensure specifications are met

	3.4. Blemishes are sealed, potted or filled, where necessary, in accordance with applicable process specification 3.5. Component assemblies, including test pieces, requiring further or special treatment are made ready for the appropriate processes 3.6. Required maintenance documentation is accurately completed and correctly processed 3.7. Completed assemblies are tagged, sealed or packaged, as required
4. Repair/modify components using cold cure	4.1. Lay-up of materials is checked to confirm that components meet required specifications 4.2. Curing cycle is regularly monitored to ensure required specifications are met 4.3. Components are checked for blemishes or delamination in accordance with quality procedures 4.4. Component assemblies requiring further or special treatment are made ready for the appropriate processes 4.5. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures 4.6. Completed assemblies are tagged, sealed or packaged, as required

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures, including the use of MSDS and PPE
- using approved maintenance documentation and aircraft publications relating to aircraft structure
- identifying composite component applications in aircraft structures
- identifying various aircraft composite materials/resins and their basic properties by interpretation of markings and visual means
- handling and storing of composite materials to industry standards
- assessing composite component damage using visual and tap test methods
- performing composite component repairs using:
  - external patch repair
  - scarf repair
  - stepped repair
  - wet lay up repair

  - composite fastener hole repair
  - metal to metal and metal to composite bonding
- correctly interpreting and/or producing repair scheme/modification drawings/sketches.
- using appropriate hand tools and machines to disassemble and assemble aircraft composite components, parts, sections and skin, including extraction/installation equipment, drilling/cutting equipment and material fasteners

Required knowledge

Look for evidence that confirms knowledge of:

- how to obtain relevant MSDS
- the use of applicable items of PPE
- OHS procedures
- aircraft construction principles
- defining composite terminology
- describing composite component construction methods including structural assembly fastener identification

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and use maintenance publications, applicable materials, tools and methods to repair aircraft composite material structure and components while applying all relevant safety procedures.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across the range of different material applications and curing requirements. It is essential that specific aspects of the laying up and curing process for aircraft composite materials are checked to ensure quality and safety standards are achieved in this area. Correct checking and wearing of safety protective clothing is critical, particularly in the hot bonding process. Evidence of knowledge about repair techniques and the use of the standard repair manual in a range of different repair situations will be necessary to supplement evidence of ability to plan and undertake component repair. Ability to apply different materials and curing

	cycles, including composite to composite and composite to metal components, will be necessary to indicate competency in preparing and curing composite materials. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the Unit of Competency are being achieved under routine supervision using materials from each of Groups 1 to 3 in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Applicable materials and methods	Applicable materials/methods include: 1. Pre-preg materials hot cure (performed on one of carbon graphite, kevlar, fibreglass or aluminium) 2. Cold cure or wet lay-up (using either fibreglass or carbon graphite) 3. Core materials (using one of aluminium, nomex or foam)
Application	Application of this unit may relate to:

	• scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA406B Repair/modify aircraft non-primary structural sheetmetal components

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated. Missing knowledge requirements updated.

Unit Descriptor

This unit of competency is part of the Aeroskills Structures Maintenance Certificate II training pathway. It covers the competencies required to perform routine basic repairs and modifications, under qualified person guidance, on a range of aircraft non-primary structural sheetmetal components. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills and the use of maintenance publications to repair aircraft non-primary structure sheetmetal components under the guidance of a qualified person.

Applications include fixed and rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications

MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Prepare to perform routine repairs and minor modifications to aircraft non-primary structural sheetmetal components	1.1. Applicable sheetmetal repair scheme is determined in accordance with applicable maintenance documentation, enterprise procedures and qualified person guidance 1.2. All required materials and equipment are selected and organised in accordance with enterprise procedures and maintenance documentation
2. Perform routine repairs and minor modifications to aircraft non-primary structural sheetmetal components	2.1. ***Sheetmetal repairs*** are performed in accordance with approved repair scheme, ensuring that aircraft standard practices are used and standard process requirements are carried out 2.2. Work area is cleaned of all waste material or adjustments 2.3. Under guidance of a qualified person, minor adjustments are made, where necessary, for components to operate within prescribed specifications
3. Complete routine repair and	3.1. Required documentation is accurately

minor modification activities	completed and correctly processed in accordance with enterprise procedures 3.2. Repaired components or assemblies are tagged, sealed and packaged or cradled in accordance with specified procedures, where required

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures, including the use of MSDS and PPE
- using enterprise procedures, approved maintenance documentation and aircraft publications relating to aircraft sheetmetal components
- identifying various aircraft metals used for sheetmetal components and their basic metallurgy properties by interpretation of markings, numbering systems or visual, chemical or mechanical means
- handling and storing aircraft metals used for sheetmetal components, including sealing agents, to industry standards
- identifying aircraft sheetmetal assembly fasteners (metal and non-metallic) by interpretation of markings, numbering systems, size, shape and colour
- correctly interpreting, with expert qualified person guidance and in accordance with enterprise procedures, sheetmetal repair scheme/modification drawings and hand sketches
- using appropriate hand tools and machines under supervision to remove and assemble aircraft sheetmetal components
- performing under guidance and in accordance with enterprise procedures a range of routine sheetmetal repair techniques, including metal scab patch repairs
- applying corrosion removal/treatment techniques
- restoring sealing and surface finishes

Required knowledge

Look for evidence that confirms a basic knowledge of:

- aircraft sheetmetal component construction principles and repair techniques
- how to obtain relevant MSDS
- the use of applicable items of PPE
- OHS procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the

performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and use maintenance publications under qualified person guidance to repair aircraft non-primary structure sheetmetal components while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable into other areas that require similar techniques. It is essential that procedures take into account all safety precautions and quality requirements, standards and practices, and processes associated with assembly. Evidence of knowledge about enterprise procedures relating to basic repair techniques and the use of the standard repair manual/practices in a range of different routine repair situations will be necessary to supplement evidence of ability to plan and undertake component repair. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the Unit of Competency are being achieved under qualified person guidance on at least one item from each of Groups 1 to 5 listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, using tools and equipment specified by aircraft maintenance manuals. It is also expected that general purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note:	The Range Statements below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Sheetmetal repairs	Sheetmetal repairs may include: 1. Removing corrosion by chemical and mechanical methods 2. Restoring protective coatings 3. Freehand precision hole generation 4. Removing and installing fastening devices 5. Routine repairs to non-primary structural sheetmetal components
Work environment	Work is undertaken either autonomously or as part of a team and under the guidance of a qualified person. Routine work is carried out using basic operational knowledge and a defined range of skills ('routine' work is that which follows a customary or regular course of procedure). All work outcomes are achieved by applying known solutions chosen from a limited range of pre-determined options consistent with enterprise procedures. This includes accepting responsibility for own work in terms of quality of outcomes using pre-determined specifications of quality.
Competency application	Competency applies to the routine repair and/or minor modification of aircraft non-primary structural sheetmetal components. Note that 'primary structure/structural' refers to all components of an aircraft, the failure of which would seriously endanger safety, for example, wing or tailplane spars, main fuselage frames, engine bearers, portions of skin that are highly stressed. 'Non-primary' refers to any other items. Note also that the scope of any modification and the procedure to be followed will be provided by the qualified person.
Scope	Repairs/modification undertaken are limited to the scope of skills and knowledge included in the unit of competency

	MEA109B Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
Procedures and requirements	Refer to industry standard specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA407B Repair/modify aircraft non-primary structural non-metallic components

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated. Missing knowledge requirements reinstated.

Unit Descriptor

This unit of competency is part of the Aeroskills Structures Maintenance Certificate II training pathway. It covers the competencies required to perform routine basic repairs and modifications, under qualified person guidance, on a range of aircraft non-primary structural non-metallic components. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills and the use of maintenance publications to repair aircraft non-primary structure non-metallic components under the guidance of a qualified person.

Applications include fixed and rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications

MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Prepare to perform routine repairs and minor modifications to aircraft non-primary structural non-metallic components	1.1. Applicable non-metallic repair scheme is determined in accordance with applicable maintenance documentation, enterprise procedures and qualified person guidance 1.2. All required materials and equipment are selected and organised in accordance with enterprise procedures and maintenance documentation
2. Perform routine repairs and minor modifications to aircraft non-primary structural non-metallic components	2.1. Work is performed in accordance with approved repair scheme, ensuring that aircraft standard practices are used and standard process requirements are carried out 2.2. Work area is cleaned of all waste material or adjustments 2.3. Under guidance of a qualified person, minor adjustments are made, where necessary, for components to operate within prescribed specifications
3. Complete routine repair and minor	3.1. Required documentation is accurately

modification activities	completed and correctly processed in accordance with enterprise procedures 3.2. Repaired components or assemblies are tagged, sealed and packaged or cradled in accordance with specified procedures, where required

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures, including the use of MSDS and PPE
- using enterprise procedures, approved maintenance documentation and aircraft publications relating to aircraft non-primary structural non-metallic components
- identifying various aircraft non-primary structural non-metallic components and their basic properties by interpretation of markings, numbering systems or visual, chemical or mechanical means
- handling and storing aircraft non-metallic components, including sealing agents, to industry standards
- identifying aircraft assembly fasteners by interpretation of markings, numbering systems, size, shape and colour
- correctly interpreting, with expert guidance and in accordance with enterprise procedures, non-primary structural non-metallic repair scheme/modification drawings and hand sketches
- using appropriate hand tools and machines under guidance of a qualified person to remove and assemble aircraft non-metallic components
- performing under guidance and in accordance with enterprise procedures a range of routine non-primary structural non-metallic repair techniques
- restoring sealing and surface finishes

Required knowledge

Look for evidence that confirms knowledge of:

- aircraft non-metallic component construction principles and repair techniques at a basic level
- how to obtain relevant MSDS
- the use of applicable items of PPE
- OHS procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the

performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and use maintenance publications under qualified person guidance to repair aircraft non-primary structure non-metallic components while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable into other areas that require similar techniques. It is essential that procedures take into account all safety precautions and quality requirements, standards and practices, and processes associated with assembly. Evidence of knowledge about enterprise procedures relating to routine basic repair techniques and the use of the standard repair manual/practices in a range of situations will be necessary to supplement evidence of ability to plan and undertake component repair under qualified person guidance. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under qualified person guidance on a representative range of components in Group 2 using applicable materials from Group 1, as listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, using tools and equipment specified by aircraft maintenance manuals. It is also expected that general purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	The Range Statements below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Competency application	Competency applies to the use of applicable non-metallic materials for the routine repair and/or minor modification under guidance of a qualified person to non-primary structural non-metallic components, as follows: 1. Non-metallic materials can include fibreglass, sandwich honeycomb, nylon, perspex, nomex core materials and matrix resins 2. Components include interior trim panels (sidewalls, galleys, toilets, roof panels and floor panels), cargo lining, fairings and windows **Note** that 'primary structure/structural' refers to all components of an aircraft, the failure of which would seriously endanger safety, for example, wing or tailplane spars, main fuselage frames, engine bearers, portions of skin that are highly stressed. 'Non-primary' refers to any other items. **Note** that the scope of any modification and the procedure to be followed will be provided by the qualified person.
Work environment	Work is undertaken either autonomously or as part of a team and under the guidance of a qualified person. Routine work is carried out using basic operational knowledge and a defined range of skills ('routine' work is that which follows a customary or regular course of procedure). Work outcomes are achieved by applying known solutions chosen from a limited range of pre-determined options consistent with enterprise procedures. This includes accepting responsibility for own work in terms of quality of outcomes using pre-determined specifications of quality.
Scope	Skills and knowledge applied to repairs are limited to those specified in the unit of competency MEA109B Perform basic hand skills, standard trade practices and fundamentals

	in aviation maintenance
Procedures and requirements refer to:	Refer to industry standard specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA410C Maintain aircraft structure/components

Modification History

Knowledge requirements expanded - equivalent to previous version.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathways. It covers the competencies required to remove corrosion damage from the structure and structural components of fixed or rotary wing aircraft. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen B1 maintenance certification licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of maintenance publications to remove corrosion from aircraft structural materials.

Applications include the metallic structure of fixed and rotary wing aircraft and structural components.

Licensing/Regulatory Information

Refer to unit descriptor

Pre-Requisites

MEA401C Inspect aircraft structures

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and

	knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Prepare to remove corrosion damage	1.1 Extent of damage is correctly assessed to assist in determining removal procedure
	1.2 Structure is supported and prepared, in accordance with the applicable maintenance manual, to ensure personnel safety and freedom from damage
	1.3 Appropriate ***corrosion removal procedure*** is identified in accordance with structural repair manual and/or approved data
	1.4 Specialist advice is obtained in establishing an approved repair scheme where a standard corrosion removal procedure cannot be identified or damage criteria is out of limits
	1.5 All materials and equipment required are organised
2 Remove corrosion damage	2.1 Corrosion removal is performed and protective coatings, sealants and jointing compounds applied, in accordance with approved repair scheme, ensuring that aircraft standard practices are used and process requirements are carried out
	2.2 Structure/component is cleaned of all waste material or contaminants
	2.3 Components are adjusted, where necessary, to operate within prescribed specifications
	2.4 Required maintenance/repair documentation is completed and processed in accordance with standard enterprise procedures
	2.5 Repaired components or assemblies are tagged, sealed and packaged or cradled in accordance with specified procedures, where required

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- methods of corrosion removal in aircraft structural metals
- types of corrosion typically found in various areas of aircraft structure
- removal of corrosion damage in integral fuel tanks and sealing of faying surfaces,

including specific OHS and PPE requirements, including confined space entry requirements
- surface finishes and methods of restoration, including specific OHS and PPE requirements
- how to obtain MSDS
- relevant maintenance and structural repair manuals specifying corrosion removal limits and methods
- relevant regulatory requirements and standard procedures

Look for evidence that confirms skills in:

- applying all relevant OHS procedures, including the use of MSDS and selection and use of applicable items of PPE
- using approved maintenance documentation and aircraft publications relating to aircraft structure
- identifying various aircraft metals and their basic metallurgy properties by interpretation of markings, numbering systems or visual, chemical or mechanical means
- applying structural corrosion removal/treatment techniques
- restoring aircraft structure sealing and surface finishes

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and use maintenance publications to remove corrosion damage from aircraft structural materials while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable into other areas that require similar techniques. It is essential that procedures take into account all safety precautions and quality requirements, standards and practices and processes associated with corrosion removal. Evidence of knowledge about corrosion removal techniques and limits and the use of the standard repair manual in a range of different repair situations will be necessary to supplement evidence of ability to plan and undertake structure and component repair by removal of corrosion within applicable limits. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace

	assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one task from each of Groups 1 to 3 in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, using tools and equipment specified by aircraft maintenance manuals. It is also expected that general purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Note	The Range Statements below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Corrosion removal procedure	Corrosion removal procedure may include: 1. Removing corrosion by chemical and mechanical methods 2. Restoring protective coatings 3. Applying sealants and jointing compounds
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA411A Remove surface coatings from aircraft or aircraft components

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit covers the competencies required to prepare aircraft and aircraft components for coating removal and remove the coatings. No licensing requirements apply to this unit at the time of publication, but compliance with legislation and regulations governing handling and disposal of hazardous materials is included in the unit. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of skills and knowledge relating to preparation and masking of aircraft and aircraft components for coating removal and the removal of coatings using chemical and mechanical methods.

Applications include fixed and rotary wing aircraft and aircraft components.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and

	specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Identify the appropriate coating removal method	1.1. The coating removal task is identified from maintenance documentation and enterprise procedures 1.2. Enterprise procedures and maintenance publications are used to identify materials and tools to be used for coating removal 1.3. Aircraft or component identification is matched with relevant maintenance documentation
2. Prepare for coating removal	2.1. ***OHS requirements*** are identified and complied with and PPE is checked for correct fit and function 2.2. ***Materials and tools*** required for coating removal are assembled 2.3. Appropriate preparation for access to the aircraft is undertaken 2.4. Masking requirements are determined using enterprise procedures and maintenance publications 2.5. Masking is applied to relevant areas and sensitive components 2.6. ***Environmental requirements*** are observed during the

	coating removal process
3. Remove coating	3.1. Chemical strippers are applied in accordance with relevant procedures 3.2. Mechanical coating removal is performed in accordance with enterprise procedures and maintenance manuals 3.3. Surfaces are cleaned of all chemical residue and mechanical media in accordance with enterprise procedures and maintenance manuals 3.4. Masking materials are removed and final cleaning of surfaces is performed
4. Clean up work area and maintain equipment	4.1. Material that can be reused is collected and correctly stored 4.2. Waste material is removed and disposed of or stored in accordance with ***legislative***, ***regulatory and enterprise procedures*** 4.3. Equipment is cleaned in accordance with enterprise procedures or manufacturer's instructions 4.4. Equipment is checked for serviceability and unserviceable items are dealt with in accordance with enterprise procedures 4.5. Tools are cleaned and maintained in accordance with enterprise procedures 4.6. Work area is cleaned and inspected for serviceable condition

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying OHS procedures relating to coating removal, including the selection and correct use of PPE
- selecting and applying masking and barrier materials
- selecting and using chemical strippers
- using MSDS
- selecting and using applicable mechanical coating removal methods
- cleaning of surfaces following coating removal
- correctly disposing of waste materials
- cleaning and maintaining equipment and tools

Required knowledge

Look for evidence that confirms knowledge of:

- relevant enterprise procedures and maintenance publications
- OHS procedures relating to the removal of aerospace coatings, including PPE and fume extraction
- how to obtain MSDS
- types of chemicals used for coating removal and methods of application
- mechanical methods that can be used for coating removal
- types of masking and barrier materials
- cleaning methods following coating removal
- environmental legislation and regulations relating to the storage, use and disposal of hazardous materials

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to remove surface coatings from aircraft and aircraft components in accordance with specified procedures while using the correct PPE and observing all relevant safety precautions and environmental protection processes.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of coating removal tasks associated with aircraft and aircraft components. It is essential that system testing procedures, cleanliness requirements and safety precautions, including the correct use of PPE, and application of environmental protection procedures are fully observed, understood and complied with. Ability to interpret coating removal procedures and apply them in practice is critical. Evidence of transferability of skills and knowledge related to coating removal is essential. This is to be demonstrated through application of chemical and mechanical coating removal processes across a range of aircraft and component tasks. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision

	on a representative range of coating removal tasks. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special purpose tools and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise
OHS requirements	OHS requirements are identified from relevant: • state/territory/Commonwealth OHS legislation, regulations and codes • procedures manual • safety manual • work instructions • maintenance organisation manual • MSDS • Defence regulations and instructions • standing instructions
Materials and tools	Materials and tools may include:

	• masking tapes and barrier materials • chemicals • abrasives • grinders • scrapers • paint stripper application pumps • blasting equipment • cleaning material
Environmental requirements	Environmental requirements may relate to: • noise • dust • fume extraction • clean-up management
Legislative, **regulatory and enterprise procedures**	Legislative, regulatory and enterprise procedures may include: • state/territory/Commonwealth environmental legislation, regulations and codes for the storage and disposal of hazardous and toxic materials • MSDS • maintenance organisation manual • procedures manual • work instructions • relevant Defence regulations and instructions • standing instructions

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA412A Pre-treat aluminium alloy surfaces

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit covers the competencies required to pre-treat aircraft and aircraft component aluminium alloy surfaces prior to application of surface coatings. No licensing requirements apply to this unit at the time of publication, but compliance with legislation and regulations governing handling and disposal of hazardous materials is included in the unit. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of skills and knowledge relating to the application of chemical conversion coatings to aluminium alloy surfaces of aircraft and aircraft components.

Applications include fixed and rotary wing aircraft and aircraft components with aluminium alloy surfaces.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and

	specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Prepare surfaces for application of chemical conversion coating	1.1. The required pre-treatment task is identified from maintenance documentation and enterprise procedures 1.2. Enterprise procedures and/or process specifications are used to identify required materials and tools 1.3. Aircraft or component identification is matched with relevant maintenance documentation 1.4. ***OHS requirements*** are identified and complied with and PPE is checked for correct fit and function 1.5. ***Common surface soils*** are removed in accordance with enterprise procedures and/or process specifications 1.6. Masking is completed on areas where pre-treatment is not required 1.7. Aluminium alloy substrate is prepared for application of conversion coating in accordance with enterprise procedures and/or process specifications
2. Apply chemical conversion coating	2.1. The correct environment for conversion coating application is established and maintained

	2.2. The applicable chemical conversion coating is applied 2.3. Masking is removed and the aircraft or component is left in a suitable condition for the next task 2.4. Completion of the pre-treatment process is documented in accordance with enterprise procedures
3. Clean up work area and maintain equipment	3.1. Material that can be reused is collected and correctly stored 3.2. Waste material is removed and disposed of or stored in accordance with ***legislative***, ***regulatory and enterprise procedures*** 3.3. Equipment is cleaned in accordance with enterprise procedures or manufacturer's instructions 3.4. Equipment is checked for serviceability and unserviceable items are dealt with in accordance with enterprise procedures 3.5. Tools are cleaned and maintained in accordance with enterprise procedures 3.6. Work area is cleaned and inspected for serviceable condition

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying OHS procedures relating to pre-treatment of aluminium alloy substrates, including the selection and correct use of PPE
- applying masking
- preparing for chemical conversion coating
- water break testing
- application of specified pre-treatment process
- water break re-testing
- using MSDS
- selecting and using applicable chemical conversion coating
- correctly disposing of waste materials
- cleaning and maintaining equipment and tools

Required knowledge

Look for evidence that confirms knowledge of:

- relevant enterprise procedures and/or process specifications
- OHS procedures relating to aluminium alloy pre-treatment processes, including PPE

- how to obtain MSDS
- types of masking and barrier materials
- types of pre-treatment processes
- environmental legislation and regulations relating to the storage, use and disposal of hazardous materials

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to pre-treat aluminium alloy surfaces in accordance with specified procedures while using the correct PPE and observing all relevant safety precautions and environmental protection processes.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of pre-treatment tasks associated with aircraft and aircraft component aluminium alloy surfaces. It is essential that applicable processes, cleanliness requirements and safety precautions, including the correct use of PPE, and application of environmental protection procedures are fully observed, understood and complied with. Ability to interpret pre-treatment procedures and apply them in practice is critical. Evidence of transferability of skills and knowledge related to pre-treatment is essential. This is to be demonstrated through application of conversion coatings to aluminium alloy surfaces across a range of aircraft and component tasks. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a representative range of pre-treatment tasks. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for	Competency should be assessed in the workplace or

assessment	simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special purpose tools and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Application of this unit may relate to:	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise
OHS requirements	OHS requirements are identified from relevant: • state/territory/Commonwealth OHS legislation, regulations and codes • procedures manual • safety manual • work instructions • maintenance organisation manual • MSDS • Defence regulations and instructions • standing instructions
Common surface soils	Common surface soils may include: • paint • dirt • grease • oils • fuel

	• adhesives
Legislative, **regulatory and enterprise procedures**	Legislative, regulatory and enterprise procedures may include: • state/territory/Commonwealth environmental legislation, regulations and codes for the storage and disposal of hazardous and toxic materials • MSDS • maintenance organisation manual • procedures manual • work instructions • relevant Defence regulations and instructions • standing instructions

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA413A Seal aircraft and aircraft component structural seams

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit covers the competencies required to seal surface seams of aircraft and aircraft components prior to application of surface coatings. No licensing requirements apply to this unit at the time of publication, but compliance with legislation and regulations governing handling and disposal of hazardous materials is included in the unit. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of skills and knowledge relating to the application of sealant to the surface seams of aircraft and aircraft components prior to surface coating application.

Applications include fixed and rotary wing aircraft and aircraft components.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications

MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Prepare to undertake seam sealing	1.1. The seam sealing task is identified from maintenance documentation and enterprise procedures 1.2. Applicable enterprise procedures, process specifications and maintenance publications are used to identify materials and tools to be used for seam sealing 1.3. Aircraft or component identification is matched with relevant maintenance documentation
2. Prepare seams for application of sealant	2.1. ***OHS requirements*** are identified and complied with and PPE is checked for correct fit and function 2.2. Materials and tools required for sealant application are assembled 2.3. Masking is applied in accordance with enterprise procedures and/or process specifications 2.4. Seams are prepared for sealant application in accordance with enterprise procedures and/or process specifications
3. Mix sealant	3.1. Environment is established in accordance with enterprise procedures and/or process specifications 3.2. The applicable sealant is mixed in accordance with manufacturer's specifications

4. Apply sealant to seams	4.1. Sealant is applied in accordance with enterprise procedures and/or process specifications 4.2. The sealed seam is inspected and blemishes, voids or gaps are filled 4.3. Masking materials are removed 4.4. Waste and/or surplus materials are disposed of in accordance with ***legislative***, ***regulatory and enterprise procedures*** 4.5. Documentation is completed in accordance with standard enterprise procedures 4.6. Aircraft or component, equipment and work area is left in a condition enabling the next task to begin

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying OHS procedures relating to seam sealing, including the selection and correct use of PPE
- selecting and applying masking materials
- selecting, mixing and applying applicable sealants
- using MSDS
- selecting and using applicable enterprise procedures and/or process specifications
- correctly disposing of waste materials
- cleaning of work area and maintaining equipment and tools

Required knowledge

Look for evidence that confirms knowledge of:

- relevant enterprise procedures, process specifications and maintenance publications
- OHS procedures relating to seam sealing, including the selection and use of PPE
- how to obtain MSDS
- types of sealants used for seam sealing
- types of masking materials
- environmental legislation and regulations relating to the storage, use and disposal of hazardous materials

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the

performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to seal surface seams of aircraft and aircraft components in accordance with specified procedures while using the correct PPE and observing all relevant safety precautions and environmental protection processes.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of seam sealing tasks associated with surface seams of aircraft and aircraft components. It is essential that applicable processes, cleanliness requirements and safety precautions, including the correct use of PPE, and application of environmental protection procedures are fully observed, understood and complied with. Ability to interpret seam sealing procedures and apply them in practice is critical. Evidence of transferability of skills and knowledge related to seam sealing is essential. This is to be demonstrated through application of sealant to surface seams across a range of aircraft and component tasks. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a representative range of seam sealing tasks. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special purpose tools and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Application of this unit may relate to:	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise
OHS requirements	OHS requirements are identified from relevant: • state/territory/Commonwealth OHS legislation, regulations and codes • procedures manual • safety manual • work instructions • maintenance organisation manual • MSDS • Defence regulations and instructions • standing instructions
Legislative, **regulatory and enterprise procedures**	Legislative, regulatory and enterprise procedures may include: • state/territory/Commonwealth environmental legislation, regulations and codes for the storage and disposal of hazardous and toxic materials • MSDS • maintenance organisation manual • procedures manual • work instructions • relevant Defence regulations and instructions • standing instructions

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA414A Remove light corrosion from aircraft

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit covers the competencies required to remove light corrosion from the surfaces of aircraft structure. No licensing requirements apply to this unit at the time of publication, but compliance with legislation and regulations governing handling and disposal of hazardous materials is included in the unit. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of skills and knowledge relating to the removal of light corrosion from the surfaces of aircraft structure.

Applications include fixed and rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation

MEA109B Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Identify corrosion damage	1.1. ***Signs of corrosion*** are identified through visual inspection 1.2. ***The type of corrosion*** is identified 1.3. The severity of corrosion damage is determined and damage more severe than light surface corrosion is documented and reported in accordance with standard enterprise procedures
2. Remove light corrosion	2.1. The applicable corrosion removal method is selected in accordance with enterprise procedures 2.2. ***OHS requirements*** are identified and complied with and PPE is checked for correct fit and function 2.3. ***Materials and tools*** required for corrosion removal are assembled 2.4. Surface is prepared and corrosion removed using the ***selected removal method***
3. Clean area and equipment	3.1. Surface is cleaned of all chemical residue and mechanical media, in accordance with enterprise procedures, ready for the next process 3.2. Equipment is cleaned in accordance with enterprise procedures or manufacturer's instructions 3.3. Equipment is checked for serviceability and unserviceable items are dealt with in accordance with enterprise procedures 3.4. Waste material is removed and disposed of or stored in accordance with ***legislative***, ***regulatory and enterprise procedures***

3.5. Documentation is completed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying OHS procedures relating to light corrosion removal, including the selection and correct use of PPE
- recognising types of corrosion and damage that exceeds light surface corrosion
- applying enterprise procedures for removal of light corrosion
- selecting and using applicable corrosion removal methods, equipment and tools
- using MSDS
- cleaning surfaces following corrosion removal
- correctly disposing of waste materials
- cleaning and maintaining equipment and tools

Required knowledge

Look for evidence that confirms knowledge of:

- relevant enterprise procedures and maintenance publications
- OHS procedures relating to the removal of aerospace coatings, including PPE
- how to obtain MSDS
- types of chemicals used for corrosion removal and methods of application
- mechanical methods that can be used for corrosion removal
- cleaning methods following corrosion removal
- environmental legislation and regulations relating to the storage, use and disposal of hazardous materials

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to remove light corrosion from the surfaces of aircraft structure in accordance with specified procedures while using the correct PPE and observing all relevant safety precautions and environmental protection

	processes.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of tasks involving the removal of light corrosion damage from the surfaces of aircraft structure. It is essential that applicable processes, cleanliness requirements and safety precautions, including the correct use of PPE, and application of environmental protection procedures are fully observed, understood and complied with. Ability to interpret corrosion removal procedures and apply them in practice is critical. Evidence of transferability of skills and knowledge related to the removal of light corrosion is essential. This is to be demonstrated through corrosion removal using mechanical, manual and chemical means across a range of aircraft tasks. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a representative range of light corrosion removal tasks using applicable mechanical, manual and chemical removal methods as listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special purpose tools and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work

environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise
Signs of corrosion	Signs of corrosion may include: • surface deformed • paint blistered or flaked • powder • discolouration
Types of corrosion	The type of corrosion may be: • uniform etch • pitting • intergranular • exfoliation • filiform • galvanic
OHS requirements	OHS requirements are identified from relevant: • state/territory/Commonwealth OHS legislation, regulations and codes • procedures manual • safety manual • work instructions • maintenance organisation manual • MSDS • Defence regulations and instructions • standing instructions
Materials and tools	Materials and tools may include: • micro grinder • sanders • plastic media blasting equipment • abrasive pads • wet/dry abrasive papers • chemicals

	• PPE applicable to task
Selected removal methods	Selected removal methods may include: • light mechanical using micro grinder, sander or plastic media blasting • manual removal using wet/dry abrasive papers or abrasive pads • chemical
Legislative, regulatory and enterprise procedures	Legislative, regulatory and enterprise procedures may include: • state/territory/Commonwealth environmental legislation, regulations and codes for the storage and disposal of hazardous and toxic materials • MSDS • maintenance organisation manual • procedures manual • work instructions • relevant Defence regulations and instructions • standing instructions

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA415A Paint aircraft surfaces

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit covers the competencies required to apply paint finishes to the surfaces of aircraft and aircraft components. No licensing requirements apply to this unit at the time of publication, but compliance with legislation and regulations governing handling and disposal of hazardous materials is included in the unit. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of skills and knowledge relating to final preparation of surfaces and application of paint finishes to aircraft and aircraft components.

Applications include fixed and rotary wing aircraft and aircraft components.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation

MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
AURV229749A	Prepare spray painting materials and equipment
AURV329603DA	Apply air dry and polyurethane enamel refinishing materials

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Prepare for painting	1.1. The painting task is identified from maintenance documentation and enterprise procedures and ***type of substrate*** is identified
	1.2. Enterprise procedures and maintenance publications are used to identify ***required materials and tools*** and necessary items are assembled
	1.3. Aircraft or component identification is matched with relevant maintenance documentation
	1.4. Surfaces are prepared for application of paint in accordance with enterprise procedures and/or process specification
	1.5. Masking and barrier materials are applied as required by task
2. Apply primer	2.1. ***OHS requirements*** are identified and complied with and PPE is checked for correct fit and function
	2.2. Temperature and humidity requirements are complied with
	2.3. Specified primer is applied in accordance with enterprise procedures and/or process specification
	2.4. Reject paintwork is identified and rectified in accordance

	with enterprise procedures and/or process specification
	2.5. Equipment is cleaned
3. Apply surface top coat	3.1. OHS requirements are identified and complied with and PPE is checked for correct fit and function
	3.2. Temperature and humidity requirements are complied with
	3.3. The specified top coat material is prepared in accordance with manufacturer's instructions
	3.4. Top coat is applied in accordance with enterprise procedures and/or process specifications
	3.5. Reject paintwork is identified and rectified in accordance with enterprise procedures and/or process specifications
	3.6. Masking and barrier materials are removed and final finishing of the surface is completed, as required
	3.7. Documentation is completed in accordance with standard enterprise procedures
4. Clean up work area and maintain equipment	4.1. Waste material is removed and disposed of or stored in accordance with ***legislative***, ***regulatory and enterprise procedures***
	4.2. Equipment is cleaned in accordance with enterprise procedures or manufacturer's instructions
	4.3. Equipment is checked for serviceability and unserviceable items are dealt with in accordance with enterprise procedures
	4.4. Tools are cleaned and maintained in accordance with enterprise procedures
	4.5. Work area is cleaned and inspected for serviceable condition

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying OHS procedures relating to paint application, including the selection and correct use of PPE
- selecting and applying masking and barrier materials
- identifying, preparing and using applicable primers and top coats
- using MSDS
- using manufacturer specifications and directions
- selecting and using applicable paint application equipment
- preparing surfaces for paint application
- correctly disposing of waste materials
- cleaning and maintaining equipment and tools

Required knowledge

Look for evidence that confirms knowledge of:

- relevant enterprise procedures, process specifications and maintenance publications
- OHS procedures relating to the application of aerospace coatings, including PPE and fume extraction
- how to obtain MSDS
- manufacturer specifications and directions
- types of paint finishes and applicability to various substrates
- procedures for preparing surfaces for paint application
- types of masking and barrier materials
- methods used for final finishing of surfaces
- environmental legislation and regulations relating to the storage, use and disposal of hazardous materials

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply paint finishes to the surfaces of aircraft and aircraft components in accordance with specified procedures while using the correct PPE and observing all relevant safety precautions and environmental protection processes.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of paint application tasks associated with aircraft and aircraft components. It is essential that system testing procedures, cleanliness requirements and safety precautions, including the correct use of PPE, and application of environmental protection procedures are fully observed, understood and complied with. Ability to interpret coating removal procedures and apply them in practice is critical. Evidence of transferability of skills and knowledge related to application of paint finishes is essential. This is to be demonstrated through application of paint finishes across a range of aircraft and component substrate types. The work plan should take account of applicable safety and quality requirements in accordance with the industry

	and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a representative range of paint finish application tasks. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special purpose tools and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise
Type of substrate	Type of substrate may be: • high strength steel • aluminium alloys • composite fibre • plastic • transparencies • magnesium alloy

	• fabric • wood
Required materials and tools	Required materials and tools may include: • epoxy primers • lacquer primers • acrylic top coats • polyurethane top coats • chemicals • masking and barrier materials • low pressure gun or touch-up gun • general purpose suction feed spray guns • airless spray units • electrostatic spray equipment • sanding/polishing equipment and materials • PPE
OHS requirements	OHS requirements are identified from relevant: • state/territory/Commonwealth OHS legislation, regulations and codes • procedures manual • safety manual • work instructions • maintenance organisation manual • MSDS • Defence regulations and instructions • standing instructions
Legislative, **regulatory and enterprise procedures**	Legislative, regulatory and enterprise procedures may include: • state/territory/Commonwealth environmental legislation, regulations and codes for the storage and disposal of hazardous and toxic materials • MSDS • maintenance organisation manual • procedures manual • work instructions • relevant Defence regulations and instructions • standing instructions

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA416A Apply aircraft identification markings, graphics and decals

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit covers the competencies required to apply aircraft identification markings, graphics and decals. No licensing requirements apply to this unit at the time of publication, but compliance with legislation and regulations governing handling and disposal of hazardous materials is included in the unit. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of skills and knowledge relating to preparation and application of aircraft markings, graphics and decals.

Applications include fixed and rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications

MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Interpret requirements and prepare materials for aircraft markings, graphics and decals	1.1. Requirements for ***markings***, ***graphics*** and decals are determined from maintenance documentation, enterprise procedures and maintenance publications 1.2. Equipment for task is identified and gathered 1.3. Aircraft or component identification is matched with relevant maintenance documentation 1.4. Decals are prepared and matched with documentation 1.5. Markings or marking stencils are manufactured in accordance with drawings and specifications 1.6. Graphics or graphic stencils are manufactured in accordance with drawings and specifications
2. Prepare for application of aircraft markings and graphics	2.1. ***OHS requirements*** are identified and complied with and PPE is checked for correct fit and function 2.2. ***Materials and equipment*** required for application of markings and graphics are assembled 2.3. Surface on which marking or graphic will be applied is cleaned in accordance with enterprise procedures

	2.4. Marking or graphic position is accurately determined and masking is applied, where necessary
3. Apply aircraft markings, graphics and decals	3.1. Environmental requirements for the ***application*** of markings and graphics are established in accordance with enterprise procedures 3.2. Markings and graphics are applied in accordance with enterprise procedures 3.3. Rework, gloss measuring and thickness measuring are performed, where applicable, in accordance with enterprise procedures 3.4. Masking materials are removed, where applicable, and final clean-up is performed, as required 3.5. Decal positions are accurately determined, surfaces cleaned and decals applied in accordance with enterprise procedures 3.6. Documentation is completed in accordance with standard enterprise procedures
4. Clean up work area and maintain equipment	4.1. Material that can be reused is collected and correctly stored 4.2. Waste material is removed and disposed of or stored in accordance with ***legislative***, ***regulatory and enterprise procedures*** 4.3. Equipment is cleaned in accordance with enterprise procedures or manufacturer's instructions 4.4. Equipment is checked for serviceability and unserviceable items are dealt with in accordance with enterprise procedures 4.5. Tools are cleaned and maintained in accordance with enterprise procedures 4.6. Work area is cleaned and inspected for serviceable condition

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying OHS procedures relating to marking and graphic application, including the selection and correct use of PPE
- using procedures, maintenance manuals and finishing scheme drawings to determine the requirements for markings, graphics and decals
- selecting and applying masking and barrier materials

- manufacturing markings and graphics
- manufacturing stencils for the application of markings and graphics
- using MSDS
- cleaning of surfaces before and following the application of markings and graphics
- correctly disposing of waste materials
- cleaning and maintaining equipment and tools

Required knowledge

Look for evidence that confirms knowledge of:

- relevant enterprise procedures, maintenance publications, drawings and specifications
- manufacturer's specifications and directions
- OHS procedures relating to the application of markings and graphics to aircraft, including PPE and fume extraction
- how to obtain MSDS
- types of chemicals used for cleaning and surface preparation
- manufacturing methods for stencils
- types of masking and barrier materials
- cleaning methods following application of markings and graphics
- environmental legislation and regulations relating to the storage, use and disposal of hazardous materials

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to manufacture and apply markings and graphics and apply decals to aircraft and aircraft in accordance with specified procedures and drawings while using the correct PPE and observing all relevant safety precautions and environmental protection processes.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of marking, graphic and decal application tasks associated with aircraft. It is essential that cleanliness requirements and safety precautions, including the correct use of PPE, and application of environmental protection procedures are fully observed, understood and complied with. Ability to interpret drawing and specification requirements and application procedures and apply them in practice is critical.

	Evidence of transferability of skills and knowledge related to the manufacture and application of markings and graphics is essential. This is to be demonstrated through application of various types of markings and graphics as listed in the Range Statement across a range of aircraft applications. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a representative range of marking and graphic application tasks. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special purpose tools and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Markings	Markings may include: • NATO • national or registration • safety
Graphics	Graphics may include: • organisational logos or emblems • decorative markings required by customer
OHS requirements	OHS requirements are identified from relevant: • procedures manual • safety manual • work instructions • maintenance organisation manual • MSDS • Defence regulations and instructions • standing instructions
Materials and equipment	Materials and equipment may include: • silk screen and/or frame • spray guns • vinyl plotter • screen burner • ink applicators • rollers • brushes • vinyl applicators • hazard tape • masking tape • mediums including paint, ink and vinyl • PPE
Application methods	Application methods may include: • oil board • vinyl (positive and negative) • screen printing • mask • stencil
Legislative, regulatory and enterprise procedures	Legislative, regulatory and enterprise procedures may include: • state/territory/Commonwealth environmental legislation, regulations and codes for the storage and disposal of

	hazardous and toxic materials • MSDS • maintenance organisation manual • procedures manual • work instructions • relevant Defence regulations and instructions • standing instructions

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA417A Apply specialty coatings to aircraft

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit covers the competencies required to apply a range of specialty coatings to aircraft. No licensing requirements apply to this unit at the time of publication, but compliance with legislation and regulations governing handling and disposal of hazardous materials is included in the unit. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of skills and knowledge relating to the preparation and application of a range of specialty coatings to aircraft using application methods applicable to the specific coating material.

Applications include fixed and rotary wing aircraft and aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation

MEA109B Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Determine specialty coating requirements	1.1. ***Specialty coating*** requirements are identified from maintenance documentation and enterprise procedures 1.2. Enterprise procedures and maintenance publications are used to identify materials and tools to be used for specialty coating application 1.3. Aircraft or component identification is matched with relevant maintenance documentation
2. Prepare surface for coating application	2.1. ***OHS requirements*** are identified and complied with and PPE is checked for correct fit and function 2.2. ***Materials and equipment*** required for specialty coating application are assembled 2.3. Surfaces are cleaned and degreased in accordance with enterprise procedures 2.4. Final finishing of surfaces is performed in accordance with enterprise procedures and/or process specifications 2.5. Reject parts and surfaces are identified, recorded and reported in accordance with standard enterprise procedures 2.6. Masking is applied to relevant areas
3. Prepare and apply coating	3.1. The required coating is prepared in accordance with manufacturer's specifications and directions

	3.2. Coating mix is inspected in accordance with enterprise procedures and/or process specifications 3.3. Coating is applied to the required surfaces in accordance with enterprise procedures and/or process specifications 3.4. Coating is inspected for coating thickness and quality compliance with enterprise procedures and/or process specifications 3.5. ***Defects in the coating*** are identified and rectified, as required 3.6. Masking materials are removed and final cleaning of surfaces is performed 3.7. Documentation is completed in accordance with standard enterprise procedures.
4. Clean up work area and maintain equipment	4.1. Waste material is removed and disposed of or stored in accordance with ***legislative, regulatory and enterprise procedures*** 4.2. Equipment is cleaned in accordance with enterprise procedures or manufacturer's instructions 4.3. Equipment is checked for serviceability and unserviceable items are dealt with in accordance with enterprise procedures 4.4. Tools are cleaned and maintained in accordance with enterprise procedures 4.5. Work area is cleaned and inspected for serviceable condition

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying OHS procedures relating to specialty coating application, including the selection and correct use of PPE
- using procedures, process specification and manufacturer's data to identify coating preparation and application requirements
- selecting and applying masking materials
- selecting and using correct specialty coating
- using MSDS
- selecting and using applicable coating application methods
- cleaning and preparing surfaces for coating application
- correctly disposing of waste materials
- cleaning and maintaining equipment and tools

Required knowledge

Look for evidence that confirms knowledge of:

- relevant enterprise procedures and maintenance publications
- OHS procedures relating to the application of specialty aerospace coatings, including PPE
- relevant data from manufacturers of specialty coatings
- how to obtain MSDS
- criticality of areas of aircraft structure with regard to coating application
- cleaning processes and chemicals used to prepare surfaces for coating application
- coating application methods
- masking materials
- environmental legislation and regulations relating to the storage, use and disposal of hazardous materials

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to correctly apply a range of aerospace specialty coatings to aircraft surfaces in accordance with specified procedures and drawings while using the correct PPE and observing all relevant safety precautions and environmental protection processes.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of specialty coating application tasks associated with aircraft. It is essential that cleanliness requirements and safety precautions, including the correct use of PPE, and application of environmental protection procedures are fully observed, understood and complied with. Ability to interpret drawing and specification requirements and application procedures and apply them in practice is critical. Evidence of transferability of skills and knowledge related to the application of a range of specialty coatings is essential. This is to be demonstrated through application of various types of specialty coatings as listed in the Range Statement across a range of aircraft applications. The work plan should take account of applicable safety and quality requirements in accordance

	with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a minimum of two (2) types of specialty coating on at least three (3) application tasks. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special purpose tools and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise
Specialty coatings	Specialty coatings may include: • specialised inner layer coatings • engine coatings • leading edge coatings • radome coatings • waterborne heatproof paints

	• walkway compounds • fuel tank coatings • heatproof coatings • electrical conductive coatings
OHS requirements	OHS requirements are identified from relevant: • state/territory/Commonwealth OHS legislation, regulations and codes • procedures manual • safety manual • work instructions • maintenance organisation manual • MSDS • Defence regulations and instructions • standing instructions
Materials and equipment	Materials and equipment may include: • chemicals • cleaning materials • specialty coating material • various spray guns • brush • roller • trowel • PPE • baking oven • heat lamps • electrical test equipment • wet film thickness gauges
Defects in the coating	Defects in the coating may include: • sags • runs • delamination • imperfections • dry spray • contamination • over-spray • egress
Legislative, **regulatory and enterprise procedures**	Legislative, regulatory and enterprise procedures may include: • state/territory/Commonwealth environmental legislation, regulations and codes for the storage and disposal of

	hazardous and toxic materials • MSDS • maintenance organisation manual • procedures manual • work instructions • relevant Defence regulations and instructions • standing instructions

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA418A Perform basic repair of aircraft internal fittings during line maintenance

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated. Missing knowledge requirements reinstated.

Unit Descriptor

This unit covers the competencies required to repair aircraft internal fittings that are within the privileges of the Aircraft Maintenance Engineer A Licence. It is one of the units required for the granting of the chosen Aircraft Maintenance Engineer A Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of maintenance publications to repair aircraft internal fittings, such as internal doors, that are not part of the pressure hull, overhead storage compartments, and doors and cabin furnishing items that are manufactured from either sheet metal or non-metallic materials.

Applications include fixed and rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications

MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Prepare to perform routine repairs and minor modifications to aircraft internal fittings	1.1. Applicable repair scheme is determined in accordance with applicable maintenance publications and enterprise procedures 1.2. All required materials and equipment are selected and organised in accordance with enterprise procedures and maintenance publications
2. Perform routine repairs to aircraft internal fittings	2.1. ***Sheetmetal repairs*** and ***non-metallic material repairs*** are performed in accordance with approved repair scheme, ensuring that aircraft standard practices are used and standard process requirements are carried out 2.2. Work area is cleaned of all waste material 2.3. Adjustments are made, where necessary, for components to operate within prescribed specifications
3. Complete routine repair activities	3.1. Required documentation is accurately completed and correctly processed in accordance with enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures, including the use of MSDS and PPE
- using enterprise procedures, approved maintenance documentation and aircraft publications relating to aircraft sheetmetal and non-metallic internal fittings
- identifying various materials used for internal fittings and their basic properties by interpretation of markings, numbering systems or visual, chemical or mechanical means
- handling and storing aircraft metals used for sheetmetal internal fittings, including sealing agents, to industry standards
- identifying aircraft sheet metal assembly fasteners (metal and non-metallic) by interpretation of markings, numbering systems, size, shape and colour
- correctly interpreting applicable repair schemes and hand sketches
- using appropriate hand tools and power tools under supervision to remove and assemble aircraft sheet metal internal fittings
- performing under guidance and in accordance with enterprise procedures a range of routine metal and non-metal repair techniques
- applying corrosion removal/treatment techniques
- restoring sealing and surface finishes to repaired areas

Required knowledge

Look for evidence that confirms knowledge of:

- relevant OHS procedures
- how to obtain relevant MSDS
- the use of applicable items of PPE
- aircraft sheet metal component construction principles and repair techniques
- aircraft non-metallic component construction principles and repair techniques

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and use maintenance publications to repair aircraft internal fittings made from sheet metal and non-metallic materials while applying all relevant safety precautions.
Critical aspects for assessment and	The underlying skills inherent in this unit should be

evidence required to demonstrate competency in this unit	transferable into other areas that require similar techniques. It is essential that procedures take into account all safety precautions and quality requirements, standards and practices, and processes associated with repair and assembly. Evidence of knowledge about enterprise procedures relating to basic repair techniques and the use of the standard repair manual/practices in a range of different routine repair situations will be necessary to supplement evidence of ability to plan and undertake internal fitting repairs. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under supervision but without intervention on a representative range of tasks involving Groups 1 to 9 listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, using tools and equipment specified by aircraft maintenance manuals. It is also expected that general purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	The Range Statements below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide

Repairs	Sheetmetal repairs may include: 1. Removing corrosion by chemical and mechanical methods 2. Restoring protective coatings to repaired areas 3. Freehand precision hole generation 4. Removing and installing fastening devices 5. Routine repairs to sheetmetal internal fittings Non-metallic material repairs may include: 6. Repairs to fibreglass, sandwich honeycomb, nylon, perspex, nomex core materials and matrix resins 7. Restoring protective coatings to repaired areas 8. Freehand precision hole generation 9. Removing and installing fastening devices
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • repair of metallic or non-metallic interior fittings, including interior trim panels (sidewalls, galleys, toilets, roof panels, floor panels), overhead lockers, cargo lining and internal doors that are not part of the aircraft pressure hull
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA419A Inspect and repair_modify aircraft cabin_cockpit non-primary structure components

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit of competency is part of the Aeroskills Life Support and Furnishing Certificate III and IV training pathways. It covers the competencies required to inspect for damage and perform routine basic repairs and modifications on a range of aircraft non-primary structural metallic and non-metallic components located in aircraft cabins and cockpits. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills and the use of maintenance publications to inspect for damage and repair aircraft non-primary structure metallic and non-metallic components of aircraft cabins and cockpits.

Applications include fixed and rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications

MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Inspect for damage to aircraft cabin/cockpit non-primary structure metallic and non-metallic components	1.1. ***Metallic and/or non-metallic components*** are visually inspected for damage 1.2. Extent of damage is determined and confirmed to be within repair limits
2. Prepare to perform routine repairs and minor modifications to aircraft cabin/cockpit non-primary structure metallic and non-metallic components	2.1. Applicable metallic or non-metallic repair scheme is determined in accordance with applicable maintenance documentation and standard enterprise procedures 2.2. Modification instructions are obtained in accordance with standard enterprise procedures 2.3. All required materials and equipment are selected and organised in accordance with enterprise procedures and maintenance documentation
3. Perform routine repairs and minor modifications to aircraft cabin/cockpit non-primary structure metallic components	3.1. ***Metallic component repairs*** and minor modifications are performed in accordance with approved repair scheme or modification instructions, ensuring that aircraft standard practices are used and standard process requirements are carried out

	3.2. Work area is cleaned of all waste material 3.3. Minor adjustments are made, where necessary, for components to operate within prescribed specifications
4. Perform routine repairs and minor modifications to aircraft cabin/cockpit non-primary structure non-metallic components	4.1. ***Non-metallic component repairs*** and minor modifications are performed in accordance with approved repair scheme or modification instructions, ensuring that aircraft standard practices are used and standard process requirements are carried out 4.2. Work area is cleaned of all waste material 4.3. Minor adjustments are made, where necessary, for components to operate within prescribed specifications
5. Complete routine repair and minor modification activities	5.1. Required documentation is accurately completed and correctly processed in accordance with standard enterprise procedures 5.2. Repaired components or assemblies are tagged, sealed and packaged or cradled in accordance with specified procedures, where required

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices, including the use of MSDS and the selection and use of applicable items of PPE
- using enterprise procedures, approved maintenance documentation and aircraft publications relating to cabin/cockpit non-primary structure metallic and non-metallic components
- identifying aircraft cabin/cockpit non-primary structure components and their basic properties by interpretation of markings, numbering systems or visual, chemical or mechanical means
- handling and storing aircraft metallic and non-metallic components, including sealing agents, to industry standards
- identifying aircraft assembly fasteners by interpretation of markings, numbering systems, size, shape and colour
- visually inspecting metallic and non-metallic components for damage
- correctly interpreting, in accordance with enterprise procedures, applicable repair scheme/modification drawings and hand sketches
- using appropriate hand tools and machines to remove and assemble aircraft cabin/cockpit non-primary structure metallic and non-metallic components

- performing, in accordance with enterprise procedures, a range of routine non-primary structure sheetmetal repair techniques, including metal scab patch repairs
- performing, in accordance with enterprise procedures, a range of routine non-primary structure non-metallic repair techniques
- applying corrosion removal/treatment techniques
- restoring sealing and surface finishes

Required knowledge

Look for evidence that confirms knowledge of:

- applicable OHS procedures, including how to obtain MSDS
- selection and use of applicable items of PPE
- construction methods used and assessment of common defects in aircraft crew and passenger seats, and in interior trim panels, including sidewalls, galleys, furnishings and partitions, passenger modules/pods, toilets, roof panels, overhead luggage stowage bins, non-structural floor panels and cargo compartment lining
- types of deterioration and damage
- inspection methods
- identification and interpretation of metallic and non-metallic repair schemes applicable to cabin/cockpit non-primary structural components
- the various forms of corrosion
- The terms associated with composite materials
- requirements for handling and storing aircraft metals and composite materials, including sealing agents, to industry standards
- means of identifying aircraft structural assembly fasteners (metal and composite) by interpretation of markings, numbering systems, size, shape and colour

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and use maintenance publications to inspect and repair aircraft cabin/cockpit non-primary structure metallic and non-metallic components while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable into other areas that require similar techniques. It is essential that procedures take into account all safety precautions and quality requirements,

	standards and practices, and processes associated with assembly. Evidence of knowledge about enterprise procedures relating to routine basic repair techniques and the use of the standard repair manual/practices in a range of situations will be necessary to supplement evidence of ability to plan and undertake component repair. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved on a representative range of components, inspecting for damage and performing repair tasks listed in Groups 1 to 6 in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified by aircraft maintenance manuals. It is also expected that general purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Metallic and/or non-metallic component repair	Metallic and/or non-metallic components may include: • aircraft crew and passenger seats, interior trim panels, including sidewalls, galleys, furnishings and partitions,

	passenger modules/pods, toilets, roof panels, overhead luggage stowage bins, non-structural floor panels and cargo compartment lining Types of damage may include: • corrosion, cracking and impact damage to metallic components • delamination, cracking and impact damage to non-metallic components Metallic component repairs may include: 1. Removing corrosion by chemical and mechanical methods 2. Restoring protective coatings 3. Freehand precision hole generation 4. Removing and installing fastening devices 5. Fitting patches to cabin/cockpit non-primary structure sheetmetal components Non-metallic component repairs may include: 6. Composite patch, scarf and stepped repairs using fibreglass, sandwich honeycomb, nylon, perspex, nomex core materials and matrix resins
Primary structure	All components of an aircraft, the failure of which would seriously endanger safety. In the fuselage this includes frames, longerons and stringers, structural floor panels and all additional parts of the pressure hull, such as skin, windows, doors and bulkheads
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA420A Fabricate basic structural components for aircraft

Modification History

New unit.

Unit Descriptor

This unit of competency is part of the Aeroskills Structures Maintenance Certificate IV training pathway. It covers the competencies required to fabricate by hand and in accordance with specifications and drawings basic structural components for aircraft that are either flat or have only a single curve. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills and the use of drawings, specifications and maintenance publications to fabricate basic structural components requiring hand forming only from aluminium alloys and steel alloys at various states of temper.

Applications include components for fixed and rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Interpret specifications and organise materials	1.1 Specifications and drawings are used to determine material requirements
	1.2 Equipment use is planned by determining the procedure for fabricating component
	1.3 Material is correctly identified in accordance with specifications
	1.4 All materials and equipment are organised
2 Prepare material and tooling	2.1 Dimensions to material are translated in accordance with specifications
	2.2 Cutting and forming equipment are prepared and adjusted to ensure accuracy of fabrication
	2.3 Material is cut according to specifications ensuring minimisation of wastage and maintenance of surplus material identification
	2.4 Material requiring special treatment is prepared for the appropriate processes
	2.5 Solution treatment of materials is carried out in accordance with approved procedures and specifications
3 Hand form material	3.1 Hand forming is accurately carried out ensuring that specifications are met
	3.2 Formed components are checked for irregularities and correction requirements determined

	3.3 Irregularities are removed to meet required dimensions and specifications
4 Inspect components	4.1 Fabricated components are inspected to confirm dimensional accuracy and specifications are met
	4.2 Checking fixtures are used, where appropriate, to ensure requirements are met
	4.3 Components requiring special or further treatment are prepared for the appropriate processes
	4.4 Completed components are tagged or identified, as required

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- aircraft construction principles
- causes of structural fatigue and preventative measures
- structural corrosion and preventative measures
- aircraft structural drawings and repair scheme drawings
- material specifications for aluminium alloys and steel alloys used in aircraft structure
- structural material identification by markings and numbering systems
- material identification by chemical, electrical and mechanical methods
- material storage requirements
- hardware types and specifications
- identification of hardware
- sealants used in aircraft structure
- chemical surface treatments
- electroplating
- paints and finishes
- flat pattern development
- OHS precautions associated with fabrication of aircraft structural components
- MSDS
- PPE

Look for evidence that confirms skills in:

- applying relevant OHS procedures, including the use of MSDS and relevant items of PPE
- the use of approved maintenance documentation and aircraft publications relating to aircraft structure
- identifying various aircraft metals and their basic metallurgy properties by interpretation

of markings, numbering systems or visual, chemical or mechanical means
- handling and storing aircraft metals to industry standards
- identifying aircraft structural assembly fasteners by interpretation of markings, numbering systems, size, shape and colour
- fabrication of aircraft structural components and parts by:
  - correctly interpreting drawings (including third angle projection, isometric, sectional formats and hand sketches)
  - developing component flat pattern using basic drawing tools, geometric drawing processes, parallel, radial and triangulation methods, calculating and applying bend allowance/deduction/setback (an understanding of flat pattern development terminology is required)
  - using appropriate hand tools and machines for cutting and drilling
  - assembling component parts using appropriate hand and machine tools and standard aircraft fasteners to industry standards
- applying appropriate metal heat treatment processes
- applying appropriate metal surface treatments

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and use drawings, specifications and maintenance publications to fabricate basic structural components from a range of aircraft metals while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of aircraft applications. It is essential that procedures take into account all safety precautions and quality requirements. Skill and knowledge application must include set back, bend allowance and other standard practices associated with forming of material. Evidence of knowledge and skills associated with basic structural fabrication techniques and their application to different materials used in aircraft manufacture will be required to supplement evidence of ability to fabricate basic aircraft structural components. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace

	assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a representative range of structural fabrication tasks. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified by aircraft maintenance manuals. It is expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Components	Components are to be fabricated • using materials comprising various types of sheet metal used in aircraft manufacture, including aluminium alloys and structural steel alloys across a range of temper
Machinery processes	Machinery processes are to include: • cutting, bending and drilling
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA421A Fabricate advanced structural components for aircraft

Modification History

New unit.

Unit Descriptor

This unit of competency is part of the Aeroskills Structures Maintenance Certificate IV training pathway. It covers the competencies required to fabricate advanced structural components for aircraft in accordance with specifications and drawings. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills and the use of drawings, specifications and maintenance publications to fabricate advanced structural components involving complex and multiple curves and section shapes from aluminium alloys and steel alloys at various temper.

Applications include components for fixed and rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Interpret specifications and organise materials	1.1 Specifications and drawings are used to determine material requirements
	1.2 Equipment use is planned by determining the procedure for fabricating component
	1.3 Material is correctly identified in accordance with specifications
	1.4 All materials and equipment are organised
2 Prepare material and tooling	2.1 Dimensions to material is translated in accordance with specifications
	2.2 Cutting and forming equipment are prepared and adjusted to ensure accuracy of fabrication
	2.3 Material is cut according to specifications ensuring minimisation of wastage and maintenance of surplus material identification
	2.4 Material requiring special treatment is prepared for the appropriate processes
	2.5 Solution treatment of materials is carried out in accordance with approved procedures and specifications
3 Form material	3.1 Appropriate forming procedure is determined ensuring that specifications are met and the most suitable forming method is selected
	3.2 Templates are manufactured, where required, by forming

	method
	3.3 Press tools are designed and manufactured, where required, by forming method
	3.4 Forming equipment is operated correctly and safely to form material in accordance with drawings and specifications
	3.5 Hand forming is performed accurately, where necessary
4 Hand correct fabricated components	4.1 Components are checked for irregularities and correction requirements determined
	4.2 Irregularities are removed to meet required dimensions and specifications
5 Inspect components	5.1 Fabricated components are inspected to confirm dimensional accuracy and specifications are met
	5.2 Checking fixtures are used, where appropriate, to ensure requirements are met
	5.3 Components requiring special or further treatment are prepared for the appropriate processes
	5.4 Completed components are tagged or identified, as required

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- aircraft construction principles
- causes of structural fatigue and preventative measures
- structural corrosion and preventative measures
- aircraft structural drawings and repair scheme drawings
- material specifications for aluminium alloys and steel alloys used in aircraft structure
- structural material identification by markings and numbering systems
- material identification by chemical, electrical and mechanical methods
- material storage requirements
- hardware types and specifications
- identification of hardware
- sealants used in aircraft structure
- chemical surface treatments
- electroplating
- paints and finishes

- flat pattern development
- design and manufacture of templates
- design and manufacture of press tools
- methods for folding complex and nested sections
- machinery used for stretching, shrinking, bending, cutting, drilling, rolling, wheeling and folding
- use of forming blocks, templates and press tools to form components
- OHS precautions associated with fabrication of aircraft structural components
- MSDS
- PPE

Look for evidence that confirms skills in:

- applying relevant OHS procedures, including the use of MSDS and applicable items of PPE
- the use of approved maintenance documentation and aircraft publications relating to aircraft structure
- identifying various aircraft metals and their basic metallurgy properties by interpretation of markings, numbering systems or visual, chemical or mechanical means
- handling and storing aircraft metals to industry standards
- identifying aircraft structural assembly fasteners by interpretation of markings, numbering systems, size, shape and colour
- fabrication of aircraft structural components and parts by:
  - correctly interpreting drawings (including third angle projection, isometric, sectional formats and hand sketches)
  - developing component flat pattern using basic drawing tools, geometric drawing processes, parallel, radial and triangulation methods, calculating and applying bend allowance/deduction/setback (an understanding of flat pattern development terminology is required)
  - using appropriate hand tools, machines (stretching, shrinking, bending, cutting, drilling, rolling, wheeling and folding), forming blocks, templates and presses to form/produce dished, domed, curved components, bent/angled (L, Z, U, hat) sections and lightening holes, flanges and joggles
  - assembling component parts using appropriate hand and machine tools and standard aircraft fasteners to industry standards
- applying appropriate metal heat treatment processes
- applying appropriate metal surface treatments

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and use drawings, specifications, maintenance publications and applicable machinery to fabricate advanced structural components from a range of aircraft metals while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of aircraft applications. It is essential that procedures take into account all safety precautions and quality requirements. Skill and knowledge application must include flat pattern development and other standard practices associated with forming of material. Evidence of knowledge and skills associated with the broad range of structural fabrication techniques and their application to different materials used in aircraft manufacture will be required to supplement evidence of ability to fabricate components. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a representative range of structural fabrication tasks. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified by aircraft maintenance manuals. It is expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the

performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Components	Components are to be fabricated: • using materials comprising various types of sheet metal used in aircraft manufacture, including aluminium alloys and structural steel alloys across a range of temper
Machinery processes	Machinery processes are to include: • bending, cutting, rolling, shrinking and stretching
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA422A Repair/modify aircraft metal structure

Modification History

New unit.

Unit Descriptor

This unit of competency is part of the Aeroskills Structures Maintenance Certificate IV training pathway. It covers the competencies required for the repair and modification of fixed and rotary wing aircraft metal structure. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and the CASA.

Application of the Unit

This unit requires application of hand skills, the use of special tools and structural repair manuals and approved repair schemes to repair aircraft structure. Where fabrication of replacement components is required the applicable units are MEA420A Fabricate basic structural components for aircraft and MEA421A Fabricate advanced structural components for aircraft. Where major structural disassembly is required the applicable unit is MEA423A Aircraft structure major disassembly and reassembly.

Applications include the metal structure of fixed and rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA401C Inspect aircraft structures

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of

	performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Prepare to undertake repair	1.1 The extent of damage is correctly assessed to assist in determining ***repair procedure***
	1.2 Structure is prepared and supported in accordance with the applicable maintenance manual to ensure personnel safety and freedom from damage
	1.3 The appropriate modification or repair scheme is identified in accordance with structural repair manual and/or approved data
	1.4 Specialist advice in establishing an approved repair scheme is obtained where a standard repair scheme cannot be identified or damage is out of limits
	1.5 All required materials and equipment are organised
2 Repair/modify aircraft structure	2.1 Structural repairs are performed in accordance with approved repair scheme, ensuring that aircraft standard practices are used and process requirements are carried out
	2.2 Work area is cleaned of all waste material or contaminants
	2.3 Components are adjusted, where necessary, to operate within prescribed specifications
	2.4 Repaired components or assemblies are tagged, sealed and packaged, or cradled in accordance with specified procedures, where required
	2.5 Required documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- aircraft construction principles and the causes of structural damage, including metal fatigue and corrosion
- structural fatigue preventative measures
- structural corrosion removal and preventative measures

- aircraft repair schemes and modification data/drawings
- procedures for the design and approval of repair schemes and modifications
- material specifications for aluminium alloys and steel alloys used in aircraft structure
- structural material identification by markings and numbering systems
- material identification by chemical, electrical and mechanical methods
- material storage requirements
- hardware types and specifications
- identification of hardware
- sealants used in aircraft structure and their application and handling
- chemical surface treatments
- electroplating
- paints and finishes
- OHS precautions associated with repair of aircraft structure
- MSDS
- PPE

Look for evidence that confirms skills in:

- applying relevant OHS procedures, including the use of MSDS and applicable items of PPE
- using approved maintenance documentation and aircraft publications relating to aircraft structure
- identifying various aircraft metals and their basic metallurgy properties by interpretation of markings, numbering systems or visual, chemical or mechanical means
- identifying various aircraft composite materials and their basic properties by interpretation of markings and visual means
- handling and storing aircraft metals and composite materials, including sealing agents, to industry standards
- identifying aircraft structural assembly fasteners (metal and composite) by interpretation of markings, numbering systems, size, shape and colour
- correctly assessing and describing the extent of damage
- correctly interpreting and/or producing repair scheme/modification drawings (including third angle projection, isometric, sectional formats and hand sketches)
- using appropriate hand tools and machines to remove and assemble aircraft structural components, parts, sections and skin, including riveting equipment, drilling equipment, aligning tools and material fasteners (grip pins)
- applying correct removal, installation and repair techniques for:
  - a range of rivets (blind and solid) using hand, squeeze and pneumatic situations
  - a range of close tolerance fasteners (standard and oversize – hilocks, taper locks), including hole preparation
  - threaded devices, including internal and external thread cutting, helicoil inserts and damaged stud replacement
  - hardware assembled by close tolerance fits using heat, cooling and force methods, including bearings, bushes and inserts
- correct support of the aircraft structure by jacking, trestling and/or jigging methods

- performing a range of metal structure repair techniques, including:
  - metal scab patch, flush, splice, lap and formed section repair
  - metal to metal and metal to composite bonding
- applying structural corrosion removal/treatment techniques
- restoring aircraft structure sealing and surface finishes

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills, use special tools and structural repair manuals and schemes and modification data to repair/modify aircraft structure while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable into other areas that require similar techniques. It is essential that procedures take into account all safety precautions and quality requirements, standards and practices and processes associated with assembly. Evidence of knowledge about repair techniques and the use of the standard repair manual in a range of different repair situations will be necessary to supplement evidence of ability to plan and undertake structure and component repair. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one item from each of Groups 1 to 6 listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, using tools and equipment specified by aircraft maintenance manuals. It is also expected that general purpose tools, test and ground support equipment found in most routine situations would be used where

	appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	The Range Statements below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Repair procedures	Repair procedures may include: 1. Remove corrosion by chemical and mechanical methods 2. Restore protective coatings 3. Apply sealants and jointing compounds 4. Freehand precision hole generation 5. Remove and install structural hardware, fastening devices, bushes, bearings and bearing surfaces 6. Remove and repair damaged sections and reinstall
Procedures and requirements	Refer to industry standard specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA423A Aircraft structure major disassembly and reassembly

Modification History

New unit.

Unit Descriptor

This unit of competency is part of the Aeroskills Structures Maintenance Certificate IV training pathway. It covers the competencies required for major disassembly and reassembly of aircraft structure for the purposes, such as major repair or modification. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills and use of maintenance publications, drawings, and appropriate jigs, fixtures and tools to disassemble and reassemble aircraft structure. Structural repair/modification is covered by MEA422A Repair/modify aircraft metal structure or MEA405B Repair/modify aircraft composite material structure/components. Where fabrication of replacement components is required the applicable units are MEA420A Fabricate basic structural components for aircraft and MEA421A Fabricate advanced structural components for aircraft.

Applications include fixed and rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA401C Inspect aircraft structure

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and

unit of competency.	knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Interpret specifications and organise materials	1.1 The procedure for assembly/disassembly of structure is determined in order to plan equipment use
	1.2 Appropriate jigs, fixtures or bracing methods are selected to ensure maintenance of contour/structural integrity during disassembly/assembly operations
	1.3 All components and equipment are organised
2 Prepare aircraft or sub-assembly for structural disassembly	2.1 Structure is supported with appropriate jigs, fixtures or bracing, as required
	2.2 Structural components are removed, as required, to provide access
3 Disassemble aircraft structure or sub-assembly	3.1 Aircraft standard practices are applied in the removal of structural hardware and fasteners
	3.2 Disassembled components are tagged, as required, to facilitate correct reassembly
4 Prepare components and tooling for assembly	4.1 Jigs and fixtures are set up to ensure accuracy of component assembly
	4.2 Replacement component alignment is checked for conformance to specifications prior to fastener hole generation
	4.3 Hole location/relocation is carried out in accordance with specification procedures and standard practices
	4.4 Standard practices in hole generation sequencing are followed to ensure that assembly stress defects are not built in
	4.5 Components are disassembled, cleaned, deburred and surface treatments applied prior to final assembly
5 Assemble aircraft structure or sub- assembly	5.1 Sealants and/or adhesives are selected and applied in accordance with assembly specifications or applicable documentation

	5.2 Components are positioned and secured with appropriate temporary fastening devices for accurate assembly
	5.3 Fasteners are selected and installed in accordance with assembly specifications or applicable manuals
6 Inspect completed assemblies	6.1 Assembled components are inspected to confirm dimensional accuracy and specifications are met
	6.2 Checking or testing equipment is used, where appropriate, to ensure requirements are met
	6.3 Aircraft mensuration is checked for compliance with applicable maintenance manuals, where necessary
	6.4 Required documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- aircraft construction principles, including the causes of structural fatigue and corrosion
- describing the basic construction methods used to assemble:
  - fuselage (pressure and non-pressurised)
  - wings, vertical and horizontal stabilisers, rotary wing tail cones and pylons
  - engine nacelles/pylons
  - doors and windows, including seals, sealants and locking mechanisms
- material specifications for aluminium alloys and steel alloys used in aircraft structure
- composite cloths, matrix materials and adhesives
- structural material identification by markings and numbering systems
- material identification by chemical, electrical and mechanical methods
- material storage requirements
- hardware types and specifications
- composite bonding methods
- identification of hardware
- sealants used in aircraft structure and their application and handling
- chemical surface treatments
- electroplating
- paints and finishes
- OHS precautions associated with repair of aircraft structure, including the safe handling of heavy components
- MSDS

- PPE

Look for evidence that confirms skills in:

- applying relevant OHS procedures, including the use of MSDS and applicable items of PPE
- the use of approved maintenance documentation and aircraft publications relating to aircraft structural disassembly and assembly
- correctly supporting the aircraft structure by jacking, trestling, bracing and/or jigging methods
- safely handling heavy components during removal and assembly
- identifying various aircraft metals/composite materials and their basic metallurgy properties by interpretation of markings, numbering systems or visual, chemical or mechanical means
- handling and storing aircraft metal and composite components to industry standards
- identifying aircraft structural assembly fasteners (metal and composite) by interpretation of markings, numbering systems, size, shape and colour
- using appropriate hand tools and machines to remove and assemble aircraft structural components, parts, sections and skin, including riveting equipment, drilling equipment, aligning tools, reamers and material fasteners (grip pins)
- applying correct removal and installation techniques for general and close tolerance fasteners (rivets, standard and oversize – hilocks), including hole preparation and location techniques
- performing aircraft alignment and mensuration checks
- applying sealants and restoring aircraft structure surface finishes

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and use maintenance publications, drawings and specifications and appropriate jigs, fixtures and tools to disassemble and reassemble aircraft structure while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable into other areas that require similar techniques. It is essential that procedures take into account all safety precautions and quality requirements, standards and practices, and processes associated with assembly.

	Evidence of knowledge about repair techniques and the use of the standard repair manual in a range of different repair situations will be necessary to supplement evidence of ability to plan and undertake structure and component repair. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on elements from each of Groups 1 to 3 listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment, using tools and equipment specified by aircraft maintenance manuals. It is also expected that general purpose tools and ground support equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	The Range Statements below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide.
Scope	The competency applies to: 1. Assembly of aircraft sub-assemblies or end items from detailed parts using jigs and fixtures 2. Disassembly and reassembly of aircraft structure, such as wings, tailplanes or fuselage sections, using

	trestling, jigs and fixtures 3. Replacement of major structural load carrying members, for example, skins, longerons, spars, frames and bulkheads
Assembly procedures	Assembly procedures will include: • drilling, reaming and counter-sinking • fitting of fasteners and rivets • application of adhesives and sealants • fitting of hardware • application of corrosion inhibitors and protective coatings Assembly stress defects can refer to: • oil canning, buckling, contour misalignment and stress raisers
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA424A Evaluate aircraft non-destructive tests

Modification History

New unit

Unit Descriptor

This unit of competency is part of the Diploma and Advanced Diplomas of Aeroskills (Non-Destructive Testing). It provides the skills and knowledge required to research, analyse, develop and evaluate non-destructive tests (NDT) in the aviation maintenance environment. The unit is similar to unit MEM24011B Establish non-destructive tests but observes the requirements of AS 3669 and of the Regulators, the ADF and CASA for the approval of procedures and the performance of NDT on aircraft and aircraft components.

Application of the Unit

This unit requires application of competencies relating to NDT techniques and related metallurgical knowledge in the research, analysis, development and evaluation of NDT tests for aircraft structure and components to Level 3 (AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace).

The work can relate to scheduled and unscheduled maintenance activities on the metallic and composite structure of aircraft and aircraft components.

Certification against applicable standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712:2005 Non-destructive testing – Qualification and certification of personnel.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
MEA133B	Communicate aviation technical and maintenance management knowledge
MEM13013B	Work safely with ionising radiation
MEM16010A	Write reports
MEM24002B	Perform penetrant testing

MEM24004B Perform magnetic particle testing

MEM24006B Perform eddy current testing

MEM24008B Perform ultrasonic testing

MEM24010B Perform radiographic testing

MEM24012C Apply metallurgy principles

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Assess requirements for NDT	1.1 The inspection area is assessed for testing and all possible failure sites identified using metallurgical analysis
	1.2 Information relevant to test development is collected from available sources using accepted techniques
	1.3 Information is analysed and interpreted
	Test requirements are determined
2 Evaluate NDT techniques and procedures	2.1 ***Test methods, techniques and procedures*** for specific NDT tasks are specified
	2.2 Applicable ***codes, standards, specifications*** and procedures are interpreted
	2.3 Test procedures are developed in accordance with established techniques and metallurgical principles

3 Validate/confirm NDT tasks	3.1 General and specific test procedures are validated in accordance with established techniques
	3.2 Inspection results are interpreted in accordance with existing codes, standards and specifications
4 Evaluate NDT test procedures	4.1 Procedures are evaluated for effectiveness
	4.2 Evaluation results are documented and reported in accordance with standard enterprise procedures
	4.3 Changes/amendments to NDT procedures are made and distributed in accordance with standard enterprise procedures

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- definition of structural terms, i.e. safe life, damage tolerant, failsafe, stress, strain, shear and cycles
- inspection requirements for metal and composite structure, including:
  - ageing aircraft inspection requirements
  - safe life structure
  - damage tolerant structure
  - fail safe structure
- potential causes of structural failure
- metallurgical analysis to assess inspection areas and potential failure sites and modes
- NDT methods, techniques and procedures
- meaning and validity of relevant codes, standards, specifications and procedures
- regulatory requirements of the ADF and CASA relating to the use of NDT for inspection of aircraft structure and components
- test procedure for testing techniques and specimen
- validation processes
- process for approval of procedures
- process for documentation/distribution of procedures
- evaluation procedures
- process for documentation of evaluation results
- process for amending tests and distributing amendments
- national/Australian standards, NOHSC guides, state/territory regulatory codes of practice/standards
- use and application of personal protective equipment

- safe work practices and procedures
- relevant hazards and control measures related to the competency

Look for evidence that confirms skills in:

- conducting metallurgical assessment of inspection areas and identifying potential failure sites and modes
- designating most appropriate method, technique or procedure
- referencing aircraft maintenance information and regulatory requirements for inspection
- developing and validating test procedures
- applying safety procedures, standard operating procedures and legislative requirements to all work
- reading/interpreting/applying relative testing standards
- reading/interpreting/applying relative conformance standards
- documenting procedure and results
- submission of reports in accordance with standard enterprise procedures

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to establish and evaluate non-destructive tests for aircraft structure and components.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.

Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.
Method of assessment	This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the research, analysis, development, approval and evaluation of non-destructive tests, or other units requiring the exercise of the skills and knowledge covered by this unit.
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Test methods, techniques and procedures	Test methods, techniques and procedures refer to standard techniques and procedures associated with: • penetrant testing • magnetic particle testing • eddy current testing • ultrasonic testing • radiographic testing
Codes, standards and specifications	Codes, standards and specifications include: • AAP7002.053 Technical airworthiness Maintenance Manual • CASR • overseas airworthiness regulators, such as FAA, EASA and Transport Canada • AS 3669-2006 Non-destructive testing –

	Qualification and approval of personnel – Aerospace • NAS410 Revision 2 Certification and qualification of non-destructive testing personnel (February 2003) • BS EN 4179:2009 Aerospace series. Qualification and approval of personnel for non-destructive testing • BS EN 473:2008 Non-destructive testing. Qualification and certification of NDT personnel. General principles • ISO 9712:2005 Non-destructive testing – Qualification and certification of personnel • Applicable materials and equipment specifications
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA425A Perform bolted composite skin repairs

Modification History

Release 1 - New unit of competency

Unit Descriptor

This unit of competency is part of the Aeroskills Structures Maintenance Certificate IV training pathway, and of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathways. It covers the competencies required for performing bolted repairs to aircraft composite skin. The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Application of the Unit

This unit requires application of hand skills and the use of maintenance publications, applicable materials, tools and methods to repair aircraft composite skin surfaces using bolted repair techniques.

Applications include composite skin surfaces from fixed and rotary wing aircraft and aircraft components either on-aircraft or in the workshop.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA401C	Inspect aircraft structures

OR

MEA339C	Inspect, repair and maintain aircraft structures

OR

MEA363B	Inspect, repair and maintain structures and related components of non-pressurised small aircraft

Employability Skills Information

This unit contains employability skills

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1	Plan repair	1.1	Extent of damage is correctly assessed to assist in determining repair procedure
		1.2	Structure is supported and prepared in accordance with the applicable maintenance manual to ensure personnel safety and freedom from damage
		1.3	Appropriate bolted repair scheme is identified in accordance with structural repair manual and/or approved data
		1.4	Specialist advice is obtained in establishing an approved repair scheme where a standard repair scheme cannot be identified or damage criteria are out of limits
		1.5	All materials and equipment required are organised
2	Repair components using bolted patches	2.1	Damage is cleaned up ready for repair while observing work health and safety (WHS) requirements
		2.2	Patch material is obtained and patches are fabricated in accordance with the applicable repair scheme
		2.3	Repair plug material is obtained and cut to size
		2.4	Patches are fitted and secured with fasteners in accordance with the repair scheme
		2.5	Applicable sealant is applied in accordance with the repair scheme
		2.6	Surface finish is restored as required

2.7 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

2.8 Completed assemblies are tagged, sealed or packaged as required

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- applying relevant WHS procedures, including the use of material safety data sheets (MSDS) and applicable items of personal protective equipment (PPE)
- using approved maintenance documentation and aircraft publications relating to bolted repairs to composite aircraft skin
- identifying composite component applications in aircraft structures
- identifying various aircraft composite materials and their basic properties by interpretation of markings and visual means
- identifying the range of bolted repair patch and repair plug materials
- identifying applicable fasteners
- identifying applicable sealants
- assessing composite component damage using visual and tap test methods
- performing composite skin bolted repairs:
  - external patch repair
  - internal patch repair
  - external/internal patch repair
- correctly interpreting and/or producing repair scheme/modification drawings/sketches
- using appropriate hand tools and machines to perform bolted repairs, including drilling/cutting equipment and material fasteners

Required knowledge

Required knowledge includes:

- aircraft construction principles and the causes of structural damage, including metal fatigue and corrosion
- structural fatigue preventative measures
- composite terminology and materials used
- bolted repair methods
- types of patch material

- fastener types, specifications and identification
- plug materials
- use of scrim to prevent galvanic corrosion
- sealants used in bolted patch repairs and their application and handling
- paints and finishes for composite structure
- WHS precautions associated with repair of aircraft structure
- MSDS
- relevant PPE

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills and use maintenance publications, applicable materials, tools and methods to repair aircraft composite skin using bolted repairs while applying all relevant safety procedures.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across the range of composite skin materials and patch materials and fasteners. Correct checking and wearing of PPE is critical. Evidence of knowledge about bolted repair techniques and the use of the standard repair manual in a range of different repair situations will be necessary to supplement evidence of ability to plan and undertake repair. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on the application of repair patches from each of Groups 1 to 3 in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.

Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide.
Applicable materials and methods	Types of bolted repair include: 1. External 2. Internal 3. External/internal
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA430A Gas weld aircraft components

Modification History

New unit.

Unit Descriptor

This unit of competency covers the development of competency elements required to gain approval within the CASA or ADF regulatory systems to gas weld aircraft components. Individuals will be authorised to weld specific parent metal groups, as specified in CAAP 33-1(1) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.

Application of the Unit

The unit requires application of the skills and knowledge of MEM05022C Perform advanced welding using oxy acetylene welding process, to the welding of applicable aircraft parent metal groups as specified by the Regulators.

Individuals who have attained this unit and the applicable approval from the relevant Regulator for the relevant parent metal groups will be able to perform weld repairs on aircraft components or fabricate components where the applicable welding process is specified as gas welding.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEM05022C	Perform advanced welding using oxy acetylene welding process
MEM05026C	Apply welding principles

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Prepare to perform repair or fabricate component using gas welding process	1.1 ***Materials*** or ***components*** to be welded and the applicable ***parent metal group are identified in accordance with applicable data***
	1.2 Correct ***welding equipment*** and ***consumables*** are selected and safely set up in accordance with standard operating procedures
	1.3 Component (or materials) for welding are prepared
	1.4 Equipment is adjusted ready for the welding process
2 Gas weld component	2.1 Welds are performed to the ***required standard*** in accordance with the applicable repair scheme or drawing
	2.2 Completed welds are inspected for defects and any defects rectified
3 Complete documentation	2.3 Required documentation is completed in accordance with standard enterprise procedures

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- regulatory requirements applicable to aircraft welding

- standards applicable to aircraft welding
- the procedure for assessment of weld test pieces
- the use of gas welding in relation to specified aircraft parent metal groups

Look for evidence that confirms skills in:

- safely applying advanced gas welding skills defined in unit MEM05022C Perform advanced welding using oxy acetylene welding process, to weld specified aircraft parent metal group materials or components to the standards specified by the relevant Regulator (CASA or the ADF)
- applying welding principles (unit MEM05026C Apply welding principles) in the context of gas welding of aircraft components or materials
- identifying weld requirements from applicable documentation
- selecting and correctly using items of PPE applicable to gas welding of aircraft components

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	Test pieces must be completed and assessed in accordance with the regulatory requirements for the granting of aircraft welding approvals. Competency must be separately assessed for each parent metal group for which a gas welding authority is sought.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence is required of the ability to produce gas welds to required specifications consistently across the range of components that are being fabricated or repaired, while applying all relevant safety precautions. The ability to do this must be demonstrated through the production of the test pieces specified for the welding process and parent metal group in the CAAP 33-1(0) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.
Context of and specific resources for assessment	Test pieces specified for each parent metal group for which approval is sought may be completed in the workplace or a simulated workplace. The individual must be provided with all required equipment, consumables, PPE, materials and data/drawings relating to the test pieces that are required for the approvals being sought.

	Assessment of test pieces must be carried out in a testing facility that meets the requirements specified by the applicable Regulator.
Method of assessment	Assessment methods are specified in the CAAP 33-1(0) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Materials	Materials may be any metal used in the construction of aircraft components that is suitable for gas welding
Component	Component may be any aircraft component where gas welding is specified as either a fabrication or repair technique
Parent metal group	Parent metal groups against which welding authorities are individually granted are: • aluminium alloys • magnesium alloys • carbon steels and low alloy steels • corrosion and heat resisting steels • nickel alloys • copper-based alloys • titanium alloys
Welding equipment	Welding equipment may include: • fuel gases, cylinders, regulators, hoses, torches and tips
Consumables	Consumables may include: • filler rods and fluxes as specified for the task

Required standard	Standards may be specified in: • regulations relating to required test pieces • process specifications • repair manuals • overhaul manuals • Australian and New Zealand Standards

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA431A Braze weld aircraft components

Modification History

New unit.

Unit Descriptor

This unit of competency covers the development of competency elements required to gain approval within the CASA or ADF regulatory systems to braze weld aircraft components. Individuals will be authorised to weld specific parent metal groups, as specified in CAAP 33-1(1) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.

Application of the Unit

The unit requires application of the skills and knowledge of MEM05006C Perform brazing and/or silver soldering, to the brazing of applicable aircraft parent metal groups as specified by the Regulators.

Individuals who have attained this unit and the applicable approval from the relevant Regulator for the relevant parent metal groups will be able to perform braze repairs on aircraft components or fabricate components where the applicable welding process is specified as brazing.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEM05006C	Perform brazing and/or silver soldering
MEM05026C	Apply welding principles

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Prepare to perform repair or fabricate component using braze welding process	1.1 ***Materials*** or ***components*** to be brazed and the applicable ***parent metal group*** are identified in accordance with applicable data
	1.2 Correct ***braze welding equipment*** and ***consumables*** are selected and safely set up in accordance with standard operating procedures
	1.3 Component (or materials) is prepared for braze welding
	1.4 Equipment is adjusted ready for the brazing process
2 Braze weld components	2.1 Braze welds are performed to the ***required standard*** in accordance with the applicable repair scheme or drawing
	2.2 Completed welds are inspected for defects and any defects rectified
3 Complete documentation	3.1 Required documentation is completed in accordance with standard enterprise procedures

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- regulatory requirements applicable to aircraft welding
- standards applicable to aircraft welding
- the procedure for assessment of weld test pieces
- the use of braze welding in relation to specified aircraft parent metal groups

Look for evidence that confirms skills in:

- safely applying braze welding skills defined in unit MEM05006C Perform brazing and/or silver soldering, to weld specified aircraft parent metal group materials or components to the standards specified by the relevant Regulator (CASA or the ADF)
- applying welding principles (unit MEM05026C Apply welding principles) in the context of braze welding of aircraft components or materials
- identifying braze weld requirements from applicable documentation
- selecting and correctly using items of PPE applicable to braze welding of aircraft components

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	Test pieces must be completed and assessed in accordance with the regulatory requirements for the granting of aircraft braze welding approvals. Competency must be separately assessed for each parent metal group for which a braze welding authority is sought.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence is required of the ability to produce braze welds to required specifications consistently across the range of components that are being fabricated or repaired, while applying all relevant safety precautions. The ability to do this must be demonstrated through the production of the test pieces specified for the welding process and parent metal group in the CAAP 33-1(0) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.
Context of and specific resources	Test pieces specified for each parent metal group for which approval is sought may be completed in the

for assessment	workplace or a simulated workplace. The individual must be provided with all required equipment, consumables, PPE, materials and data/drawings relating to the test pieces that are required for the approvals being sought. Assessment of test pieces must be carried out in a testing facility that meets the requirements specified by the applicable Regulator.
Method of assessment	Assessment methods are specified in the CAAP 33-1(0) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Materials	Materials may be any metal used in the construction of aircraft components that is suitable for braze welding
Component	Component may be any aircraft component where braze welding is specified as either a fabrication or repair technique
Parent metal group	Parent metal groups against which welding authorities are individually granted are: • aluminium alloys • magnesium alloys • carbon steels and low alloy steels • corrosion and heat resisting steels • nickel alloys • copper-based alloys • titanium alloys
Welding equipment	Welding equipment may include: • fuel gases, cylinders, regulators, hoses, torches, tips

	and nozzles
Consumables	Consumables may include: • brazing rods and fluxes as specified for the task
Required standard	Standards may be specified in: • regulations relating to required test pieces • process specifications • repair manuals • overhaul manuals • Australian and New Zealand Standards

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA432A Weld aircraft components using the gas tungsten arc welding process

Modification History

New unit.

Unit Descriptor

This unit of competency covers the development of competency elements required to gain approval within the CASA or ADF regulatory systems to weld aircraft components using the gas tungsten arc welding (GTAW) process. Individuals will be authorised to weld specific parent metal groups, as specified in CAAP 33-1(1) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.

Application of the Unit

The unit requires application of the skills and knowledge of MEM05044B Perform welds to code standards using gas tungsten arc welding process, to the welding of applicable aircraft parent metal groups as specified by the Regulators.

Individuals who have attained this unit and the applicable approval from the relevant Regulator for the relevant parent metal groups will be able to perform weld repairs on aircraft components or fabricate components where the applicable welding process is specified as GTAW.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEM05044B	Perform welds to code standards using gas tungsten arc welding process
MEM05026C	Apply welding principles

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Prepare to perform repair or fabricate test pieces using GTAW process	1.1 ***Materials*** or ***components*** to be welded and the applicable ***parent metal group*** are identified in accordance with applicable data
	1.2 **Welding equipment** is inspected for serviceability and correctly set up in accordance with standard operating procedures
	1.3 Component (or materials) is prepared for welding
2 Gas tungsten arc weld component	2.1 Welds are performed to the ***required standard*** in accordance with the applicable repair scheme or drawing
	2.2 Completed welds are inspected for defects and any defects rectified
3 Complete documentation	3.1 Required documentation is completed in accordance with standard enterprise procedures

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- regulatory requirements applicable to aircraft welding
- standards applicable to aircraft welding

- the procedure for assessment of weld test pieces
- the use of GTAW in relation to specified aircraft parent metal groups

Look for evidence that confirms skills in:

- safely applying advanced GTAW skills defined in unit MEM05044B Perform welds to code standards using gas tungsten arc welding process, to weld specified aircraft parent metal group materials or components to the standards specified by the relevant Regulator (CASA or the ADF)
- applying welding principles (unit MEM05026C Apply welding principles) in the context of welding of aircraft components or materials using the GTAW process
- identifying weld requirements from applicable documentation
- selecting and correctly using items of PPE applicable to GTAW of aircraft components

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	Test pieces must be completed and assessed in accordance with the regulatory requirements for the granting of aircraft welding approvals. Competency must be separately assessed for each parent metal group for which a GTAW authority is sought.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence is required of the ability to produce gas tungsten arc welds to required specifications consistently across the range of components that are being fabricated or repaired, while applying all relevant safety precautions. The ability to do this must be demonstrated through the production of the test pieces specified for the welding process and parent metal group in the CAAP 33-1(0) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.
Context of and specific resources for assessment	Test pieces specified for each parent metal group for which approval is sought may be completed in the workplace or a simulated workplace. The individual must be provided with all required equipment, consumables, PPE, materials and data/drawings relating to the test pieces that are required for the approvals being sought. Assessment of test pieces must be carried out in a testing facility that meets the requirements specified by the

	applicable Regulator.
Method of assessment	Assessment methods are specified in the CAAP 33-1(0) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Materials	Materials may be any metal used in the construction of aircraft components that is suitable for GTAW
Component	Components may be any aircraft component where GTAW is specified as either a fabrication or repair technique
Parent metal group	Parent metal groups against which welding authorities are individually granted are: • aluminium alloys • magnesium alloys • carbon steels and low alloy steels • corrosion and heat resisting steels • nickel alloys • copper-based alloys • titanium alloys
Required standard	Standards may be specified in: • regulations relating to required test pieces • process specifications • repair manuals • overhaul manuals • Australian and New Zealand Standards

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA433A Weld aircraft components using the gas metal arc welding process

Modification History

New unit.

Unit Descriptor

This unit of competency covers the development of competency elements required to gain approval within the CASA or ADF regulatory systems to weld aircraft components using the gas metal arc welding (GMAW) process. Individuals will be authorised to weld specific parent metal groups, as specified in CAAP 33-1(1) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.

Application of the Unit

The unit requires application of the skills and knowledge of MEM05043B Perform welds to code standards using gas metal arc welding process, to the welding of applicable aircraft parent metal groups as specified by the Regulators.

Individuals who have attained this Unit and the applicable approval from the relevant Regulator for the relevant parent metal groups will be able to perform weld repairs on aircraft components or fabricate components where the applicable welding process is specified as GMAW.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEM05043B	Perform welds to code standards using gas metal arc welding process
MEM05026C	Apply welding principles

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Prepare to perform repair or fabricate component using GMAW process	1.1 ***Materials*** or ***components*** to be welded and the applicable ***parent metal group*** are identified in accordance with applicable data
	1.2 **Welding equipment** is inspected for serviceability and set up correctly in accordance with standard operating procedures
	1.3 Component (or materials) is prepared for welding
2 Gas metal arc weld component	2.1 Welds are performed to the ***required standard*** in accordance with the applicable repair scheme or drawing
	2.2 Completed welds are inspected for defects and any defects rectified
3 Complete documentation	3.1 Required documentation is completed in accordance with standard enterprise procedures

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- regulatory requirements applicable to aircraft welding
- standards applicable to aircraft welding

- the procedure for assessment of weld test pieces
- the use of GMAW in relation to specified aircraft parent metal groups

Look for evidence that confirms skills in:

- safely applying advanced GMAW skills defined in unit MEM05043B Perform welds to code standards using gas metal arc welding process, to weld specified aircraft parent metal group materials or components to the standards specified by the relevant Regulator (CASA or the ADF)
- applying welding principles (unit MEM05026C Apply welding principles) in the context of welding of aircraft components or materials using the GMAW process
- identifying weld requirements from applicable documentation
- selecting and correctly using items of PPE applicable to GMAW of aircraft components

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	Test pieces must be completed and assessed in accordance with the regulatory requirements for the granting of aircraft welding approvals. Competency must be separately assessed for each parent metal group for which a GMAW authority is sought.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence is required of the ability to produce gas metal arc welds to required specifications consistently across the range of components that are being fabricated or repaired, while applying all relevant safety precautions. The ability to do this must be demonstrated through the production of the test pieces specified for the welding process and parent metal group in the CAAP 33-1(0) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.
Context of and specific resources for assessment	Test pieces specified for each parent metal group for which approval is sought may be completed in the workplace or a simulated workplace. The individual must be provided with all required equipment, consumables, PPE, materials and data/drawings relating to the test pieces that are required for the approvals being sought. Assessment of test pieces must be carried out in a testing facility that meets the requirements specified by the

	applicable Regulator.
Method of assessment	Assessment methods are specified in the CAAP 33-1(0) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Materials	Materials may be any metal used in the construction of aircraft components that is suitable for GMAW
Component	Component may be any aircraft component where GMAW is specified as either a fabrication or repair technique
Parent metal group	Parent metal groups against which welding authorities are individually granted are: • aluminium alloys • magnesium alloys • carbon steels and low alloy steels • corrosion and heat resisting steels • nickel alloys • copper-based alloys • titanium alloys
Required standard	Standards may be specified in: • regulations relating to required test pieces • process specifications • repair manuals • overhaul manuals • Australian and New Zealand Standards

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA434A Weld aircraft components using the plasma arc welding process

Modification History

New unit.

Unit Descriptor

This unit of competency covers the development of competency elements required to gain approval within the CASA or ADF regulatory systems to weld aircraft components using the plasma arc welding (PAW) process. Individuals will be authorised to weld specific parent metal groups, as specified in CAAP 33-1(1) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.

Application of the Unit

The unit requires application and adaptation of the skills and knowledge of MEM05044B Perform welds to code standards using gas tungsten arc welding process, to the PAW of applicable aircraft parent metal groups as specified by the Regulators.

Individuals who have attained this unit and the applicable approval from the relevant Regulator for the relevant parent metal groups will be able to perform weld repairs on aircraft components or fabricate components where the applicable welding process is specified as PAW.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEM05044B	Perform welds to code standards using gas tungsten arc welding process
MEM05026C	Apply welding principles

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Prepare to perform repair or fabricate component using PAW process	1.1 ***Materials*** or ***component*** to be welded and the applicable ***parent metal group*** are identified in accordance with applicable data
	1.2 **Welding equipment** is inspected for serviceability and correctly set up in accordance with standard operating procedures
	1.3 Component (or materials) are prepared for welding
2 Plasma arc weld component	2.1 Welds are performed to the ***required standard*** in accordance with the applicable repair scheme or drawing
	2.2 Completed welds are inspected for defects and any defects rectified
3 Complete documentation	3.1 Required documentation is completed in accordance with standard enterprise procedures

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- regulatory requirements applicable to aircraft welding
- standards applicable to aircraft welding

- the procedure for assessment of weld test pieces
- equipment required for PAW and its operation and maintenance requirements
- the relative advantages of the plasma process for welding and cutting
- the composition of gases used in the PAW process
- safety precautions applicable to PAW and applicable PPE

Look for evidence that confirms skills in:

- safely applying advanced gas tungsten arc welding skills defined in unit MEM05044B Perform welds to code standards using gas tungsten arc welding process, and adapting them to perform PAW of specified aircraft parent metal group materials or components to the standards specified by the relevant Regulator (CASA or the ADF)
- applying welding principles (unit MEM05026C Apply welding principles) in the context of PAW of aircraft components or materials
- inspecting PAW process equipment for serviceability with particular emphasis on the orifice
- identifying weld requirements from applicable documentation
- selecting and correctly using items of PPE applicable to PAW of aircraft components

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	Test pieces must be completed and assessed in accordance with the Regulatory requirements for the granting of aircraft welding approvals. Competency must be separately assessed for each parent metal group for which a PAW authority is sought.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence is required of the ability to produce plasma arc welds to required specifications consistently across the range of components that are being fabricated or repaired, while applying all relevant safety precautions. The ability to do this must be demonstrated through the production of the test pieces specified for the welding process and parent metal group in the CAAP 33-1(0) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.
Context of and specific resources for assessment	Test pieces specified for each parent metal group for which approval is sought may be completed in the workplace or a simulated workplace. The individual must

	be provided with all required equipment, consumables, PPE, materials and data/drawings relating to the test pieces that are required for the approvals being sought. Assessment of test pieces must be carried out in a testing facility that meets the requirements specified by the applicable Regulator.
Method of assessment	Assessment methods are specified in the CAAP 33-1(0) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Materials	Materials may be any metal used in the construction of aircraft components that is suitable for PAW
Component	Components may be any aircraft component where PAW is specified as either a fabrication or repair technique
Parent metal group	Parent metal groups against which welding authorities are individually granted are: • aluminium alloys • magnesium alloys • carbon steels and low alloy steels • corrosion and heat resisting steels • nickel alloys • copper-based alloys • titanium alloys
Required standard	Standards may be specified in: • regulations relating to required test pieces • process specifications • repair manuals

	• overhaul manuals • Australian and New Zealand Standards

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA435A Weld aircraft components using the manual metal arc welding process

Modification History

New unit.

Unit Descriptor

This unit of competency covers the development of competency elements required to gain approval within the CASA or ADF regulatory systems to weld aircraft components using the manual metal arc welding (MMAW) process. Individuals will be authorised to weld specific parent metal groups, as specified in CAAP 33-1(1) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.

Application of the Unit

The unit requires application of the skills and knowledge of MEM05045B Perform welds to code standards using manual metal arc welding process, to the welding of applicable parent metal groups as specified by the Regulators.

Individuals who have attained this unit and the applicable approval from the relevant Regulator for the relevant parent metal groups will be able to perform weld repairs on aircraft components or fabricate components where the applicable welding process is specified as MMAW.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEM05045B	Perform welds to code standards using manual metal arc welding process
MEM05026C	Apply welding principles

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Prepare to perform repair or fabricate component using MMAW process	1.1 The ***materials*** or ***component*** to be welded and the applicable ***parent metal group*** are identified in accordance with applicable data
	1.2 **Welding equipment** is inspected for serviceability and correctly set up in accordance with standard operating procedures
	1.3 Component (or materials) is prepared for welding
2 Manual metal arc weld component	2.1 Welds are performed to the ***required standard*** in accordance with the applicable repair scheme or drawing
	2.2 Completed welds are inspected for defects and any defects are rectified
3 Complete documentation	3.1 Required documentation is completed in accordance with standard enterprise procedures

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- regulatory requirements applicable to aircraft welding
- standards applicable to aircraft welding

- the procedure for assessment of weld test pieces

Look for evidence that confirms skills in:

- safely applying advanced MMAW skills defined in unit MEM05045B Perform welds to code standards using manual metal arc welding process, to weld specified aircraft parent metal group materials or components to the standards specified by the relevant Regulator (CASA or the ADF)
- applying welding principles (unit MEM05026C Apply welding principles) in the context of MMAW of aircraft components or materials
- identifying weld requirements from applicable documentation
- selecting and correctly using items of PPE applicable to MMAW of aircraft components

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	Test pieces must be completed and assessed in accordance with the Regulatory requirements for the granting of aircraft welding approvals. Competency must be separately assessed for each parent metal group for which a MMAW authority is sought.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence is required of the ability to produce manual metal arc welds to required specifications consistently across the range of components that are being fabricated or repaired, while applying all relevant safety precautions. The ability to do this must be demonstrated through the production of the test pieces specified for the welding process and parent metal group in the CAAP 33-1(0) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.
Context of and specific resources for assessment	Test pieces specified for each parent metal group for which approval is sought may be completed in the workplace or a simulated workplace. The individual must be provided with all required equipment, consumables, PPE, materials and data/drawings relating to the test pieces that are required for the approvals being sought. Assessment of test pieces must be carried out in a testing facility that meets the requirements specified by the applicable Regulator.

Method of assessment	Assessment methods are specified in the CAAP 33-1(0) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Materials	Materials may be any metal used in the construction of aircraft components that is suitable for MMAW
Component	Components may be any aircraft component where MMAW is specified as either a fabrication or repair technique
Parent metal group	Parent metal groups against which welding authorities are individually granted are: • aluminium alloys • magnesium alloys • carbon steels and low alloy steels • corrosion and heat resisting steels • nickel alloys • copper-based alloys • titanium alloys
Required standard	Standards may be specified in: • regulations relating to required test pieces • process specifications • repair manuals • overhaul manuals • Australian and New Zealand Standards

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.

MEA501A Maintain and fit anti-G suits

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated. Unit version code updated in unit descriptor.

Unit Descriptor

This unit of competency is part of the Aeroskills Life Support and Furnishing Certificate III and IV training pathways. It covers the competencies required to maintain and fit an anti-G suit. Maintenance involves inspecting, testing, isolating faults, replacing parts, repairing and cleaning, while fitting involves adjusting the anti-G suit to fit an individual. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

This unit is equivalent to PUADEFLS001B Maintain and fit anti-G suits.

Application of the Unit

This unit requires application of skills and knowledge relating to the maintenance and fitment of anti-G suits worn by aircrew and passengers in high performance aircraft. Maintenance involves inspection, testing, fault diagnosis, replacement of parts, repairs to fabric and cleaning. Fitment involves adjusting the anti-G suit to correctly fit an individual.

The scope of repairs excludes inflatable components of the anti-G suit.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity

MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
MEA511A	Operate and maintain sewing machines and overlockers
LMFSF2002B	Machine sew materials

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Maintain anti-G suit	1.1. Anti-G suit is inspected for serviceability in accordance with ***standard procedures***
	1.2. Anti-G suit is tested for serviceability in accordance with standard procedures and manufacturer's specifications
	1.3. Identified ***faults*** beyond own authority to rectify are reported to supervisor and faulty anti-G suit is quarantined
	1.4. Unserviceable ***parts*** of the anti-G suit are replaced and fabric repairs are completed in accordance with standards procedures
	1.5. Anti-G suit is cleaned in accordance with standard procedures
	1.6. Anti-G suit is presented for inspection by supervisor in accordance

	with standard procedures
	1.7. Maintenance documentation is completed and processed in accordance with standard enterprise procedures
2. Fit anti-G suit	2.1. Fitting process is explained to the participant so that optimal fit can be achieved
	2.2. Participant is measured and appropriate size anti-G suit is selected
	2.3. ***Anti-G suit is adjusted*** to optimise fit in conjunction with participant feedback
	2.4. Anti-G suit fit is verified by the supervisor
	2.5. Relevant documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying OHS practices relating to anti-G suit maintenance processes, including the selection and correct use of PPE, where applicable
- using MSDS
- using applicable tools and maintenance documentation to:
  - test/inspect anti-G suits for serviceability
  - replace unserviceable components and repair fabric in accordance with approved procedures, including sewing
  - select and use appropriate anti-G suit cleaning materials
  - correctly fit anti-G suits to users
- tying of knots, including:
  - reef knot
  - bowline
  - thumb knot
  - daisy chain
  - half hitch
- cleaning and maintaining equipment and tools

Required knowledge

Look for evidence that confirms knowledge of:

- relevant enterprise procedures and maintenance publications
- OHS procedures relating to anti-G suit maintenance, including the selection and use of PPE
- how to obtain MSDS
- G forces and anti-G suit operation during flight

- physiological effects of flight
- critical nature of maintaining and fitting anti-G suits
- forces of ejection
- operation of testing and measuring equipment and tools used to maintain anti-G suits
- inflation methods used in the maintenance of anti-G suits
- types of corrosion and contamination that may affect anti-G suits
- modification requirements for anti-G suits
- anti-G suit repair procedures and limitations
- lacing techniques used in the fitting of anti-G suits
- anti-G suit cleaning methods and materials
- handling, storage and transit procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to maintain and fit anti-G suits while using the correct PPE and observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of aircraft life support equipment maintenance activities. It is essential that anti-G suit testing and inspection procedures, cleanliness requirements and safety precautions, including the correct use of PPE, are fully observed, understood and complied with. Ability to interpret maintenance and fitting procedures and apply them in practice is critical. Evidence of transferability of skills and knowledge related to Anti-G suit maintenance and fitting is essential. This is to be demonstrated through demonstration of the ability to recognise faults and damage and perform appropriate repairs that are within the bounds of the individual's authority, and through the demonstration of correct fitting procedures on different sized individuals. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace

	assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a representative range of maintenance tasks and on the correct fitting of anti-G suits to at least three (3) different sized individuals. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special purpose tools and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Standard procedures	Standard procedures may be found in any or all of: • state/territory/Commonwealth OHS legislation, regulations and codes • Australian Standards • equipment manufacturers' specifications, and procedures • industry practices • safety manual • maintenance schedules • work instructions • maintenance organisation manual • MSDS • Defence regulations and instructions • standing instructions
Typical faults	Faults may include:

	• broken zips and stitching • contamination • corrosion of metal parts, such as zippers • damaged hardware • excessive wear • incorrect manufacture • leaks • tears
Anti-G suit replaceable parts	Parts of the anti-G suit may include: • eyelets • press studs • zips
Adjustment of fit	Adjustment of the anti-G suit may be effected by: • lacing of torso and legs • waist extension/reduction
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities

Unit Sector(s)

Aircraft life support

Competency field

Co-requisite units

MEA118A Conduct self in the aviation maintenance environment

MEA502A Maintain and fit helmets

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated. Unit version code updated in unit descriptor.

Unit Descriptor

This unit is part of the Aeroskills Life Support and Furnishing Certificate III and IV training pathways. It covers the competencies required to maintain and fit helmets that are capable of housing communications equipment. Maintenance involves inspecting, testing, isolating faults, replacing parts and sending away for repair, cleaning and testing prior to placing the item back in service. Fitting a helmet includes adjusting the helmet to fit the individual (helmets are not an off-the-shelf issue). This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

This unit is equivalent to PUADEFLS002B Maintain and fit helmets.

Application of the Unit

This unit requires application of skills and knowledge relating to the maintenance and fitment of helmets worn by aircrew and passengers. Maintenance involves inspection, testing, fault diagnosis, replacement of parts, cleaning and functional testing. Fitment involves adjusting the helmet to correctly fit an individual.

Maintaining and fitting ancillary helmet equipment, such as illumination systems, night vision equipment and oxygen masks, is not part of this unit.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity

MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Maintain helmet
   - 1.1. Helmet is inspected for serviceability in accordance with ***standard procedures***
   - 1.2. Helmet is tested for serviceability in accordance with standard procedures and manufacturer's specifications
   - 1.3. Identified ***faults*** beyond own authority to rectify are reported to supervisor and faulty helmet is quarantined
   - 1.4. Unserviceable ***parts*** of the helmet are replaced in accordance with standards procedures
   - 1.5. ***Communication system components*** are tested in accordance with standard procedures
   - 1.6. Helmet is cleaned in accordance with standard procedures
   - 1.7. Helmet is presented for inspection by supervisor in accordance with standard procedures
   - 1.8. Maintenance documentation is completed and processed in

	accordance with standard enterprise procedures
2. Fit helmet	2.1. Fitting process is explained to the participant so that optimal fit can be achieved through relevant feedback
	2.2. Participant is measured to select an appropriate size helmet
	2.3. ***Components*** of helmet are adjusted to optimise fit
	2.4. Helmet fit is verified through participant feedback and by the supervisor
	2.5. Relevant documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying OHS practices relating to helmet maintenance processes, including the selection and correct use of PPE, where applicable
- using MSDS
- using applicable tools and maintenance documentation to:
  - solder helmet electronic/electrical components
  - test the operation of helmet electronic/electrical components
  - replace unserviceable components in accordance with approved procedures, including hand sewing, the use of hazardous chemicals and adhesives, and thermal oven operation
  - select and use appropriate helmet cleaning materials
  - correctly fit helmets to users
- tying of knots, including:
  - reef knot
  - bowline
  - thumb knot
  - half hitch
- cleaning and maintaining equipment and tools
- correctly disposing of hazardous waste

Required knowledge

Look for evidence that confirms knowledge of:

- relevant enterprise procedures and maintenance publications
- OHS procedures relating to helmet maintenance, including the selection and use of PPE
- how to obtain MSDS
- components of a helmet and their function
- helmet operation in relation to flight

- physiological effects of flight
- aircraft crash dynamics
- critical nature of maintaining and fitting helmets
- need to regularly assess correct fitment of helmets
- helmet fitting procedures
- G forces
- Forces of ejection
- Basic electrical principles
- environmental conditions that may affect helmets
- approved cleaning methods for aviation life support equipment
- handling, storage and transit procedures relating to life support equipment
- types of corrosion and contamination that may affect helmets
- modification requirements for helmets
- helmet repair procedures and limitations
- soldering techniques
- operation of testing and measuring equipment and relevant specialist tools, including thermal oven operation
- use and storage of adhesives

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to maintain and fit helmets while using the correct PPE and observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of aircraft life support equipment maintenance activities. It is essential that helmet testing and inspection procedures, cleanliness requirements and safety precautions, including the correct use of PPE, are fully observed, understood and complied with. Ability to interpret maintenance and fitting procedures and apply them in practice is critical. Evidence of transferability of skills and knowledge related to helmet maintenance and fitting is essential. This is to be demonstrated through demonstration of the ability to recognise faults and damage and perform appropriate repairs that are within the bounds of the

	individual's authority, and through the demonstration of correct fitting procedures. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least three (3) unserviceable helmets providing a representative range of maintenance tasks and on the correct fitting of helmets to at least three individuals. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special purpose tools and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Standard procedures	Standard procedures may be found in any or all of: • state/territory/Commonwealth OHS legislation, regulations and codes • Australian Standards • equipment manufacturers' specifications and procedures • industry practices • safety manual • maintenance schedules • work instructions

	• maintenance organisation manual • MSDS • Defence regulations and instructions • standing instructions
Faults	Faults may include: • contamination • corrosion • cracks • delamination • fraying • incorrect manufacture • intermittent communication • scores/scratches
Replaceable parts	Parts of the helmet may include: • comfort pads • ear cup • ear cup pads • liner • retention straps • visor
Communication system components	Communication system components may include: • earphones • microphone • electric cables • switches
Components adjusted for fitment	Components may include: • communications system (e.g. ear cup and microphone, where fitted) • comfort system (e.g. pads) • retention system (e.g. strap) • sizing system (e.g. liner) • visor system
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities

Unit Sector(s)

Aircraft life support

Competency field

Co-requisite units

MEA118A	Conduct self in the aviation maintenance environment
MEA240B	Use electrical test equipment to perform basic electrical tests

MEA503A Maintain and fit immersion suits

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated. Unit version code updated in unit descriptor.

Unit Descriptor

This unit of competency is part of the Aeroskills Life Support and Furnishing Certificate III and IV training pathways. It covers the competencies required to maintain and fit immersion suits. Maintenance involves inspecting, testing, isolating faults, replacing or sending away for repair, cleaning and packing prior to placing the item back into service. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

This unit is equivalent to PUADEFLS003B Maintain and fit immersion suits.

Application of the Unit

This unit requires application of skills and knowledge relating to the maintenance and fitment of immersion suits. Maintenance involves inspection, testing, fault diagnosis, replacement of parts and cleaning. Fitment involves adjusting the immersion suit to correctly fit an individual.

There are two types of immersion suits: quick don and constant wear. Quick don usually does not require fitting while constant wear is custom fitted to the individual.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity

MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
LMTTF2008A	Use adhesives

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Maintain immersion suit
   - 1.1. Immersion suit is inspected for serviceability in accordance with ***standard procedures***
   - 1.2. Immersion suit is tested for serviceability in accordance with standard procedures and manufacturer's specifications
   - 1.3. Identified ***faults*** beyond own authority to rectify are reported to supervisor and faulty immersion suit is quarantined
   - 1.4. Unserviceable ***parts*** of the immersion suit are replaced
   - 1.5. Immersion suit is cleaned in accordance with standard procedures
   - 1.6. Immersion suit is re-packed in accordance with standard procedures
   - 1.7. Immersion suit is presented for inspection by supervisor in accordance with standard procedures

	1.8. Maintenance documentation is completed and processed in accordance with standard enterprise procedures
2. Fit immersion suit	2.1. Fitting process is explained to the participant so that optimal fit can be achieved 2.2. Participant is measured and appropriate size immersion suit is selected 2.3. ***Immersion suit is adjusted*** to optimise fit in conjunction with participant feedback 2.4. Immersion suit fit is verified by the supervisor 2.5. Relevant documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying OHS practices relating to immersion suit maintenance processes, including the selection and correct use of PPE, where applicable
- using MSDS
- using applicable tools and maintenance documentation to:
  - test/inspect immersion suits for serviceability
  - replace unserviceable components in accordance with approved procedures, including the use of hazardous materials and adhesives
  - select and use appropriate immersion suit cleaning materials
  - correctly fit immersion suits to users
- operating specialist equipment, including:
  - heat press
  - vacuum heat sealer
  - 3 stage in-line breathing apparatus
  - filter extraction systems
  - spill kits
- cleaning and maintenaining equipment and tools

Required knowledge

Look for evidence that confirms knowledge of:

- relevant regulations, standards, enterprise procedures and maintenance publications
- OHS procedures relating to immersion suit maintenance, including the selection and use of PPE
- how to obtain MSDS

- emergency procedures in relation to chemical spills and emergency evacuation of personnel in distress
- chemical disposal procedures
- requirements for storage of adhesives
- cold shock and hypothermia in relation to survival
- priorities of survival and how they relate to immersion suits and associated ancillary equipment
- physiological effects of flight
- critical nature of maintaining and fitting immersion suits
- materials used to manufacture immersion suits (i.e. neoprene and gortex)
- operation of testing and measuring equipment and tools used to maintain immersion suits
- components of an immersion suit and their function
- types of corrosion and contamination that may affect immersion suits
- modification requirements for immersion suits
- immersion suit repair procedures and limitations
- immersion suit cleaning methods and materials
- handling, storage and transit procedures relating to life support equipment
- handling and storage procedures relating to immersion suits (i.e. MACPAC highly susceptible to damage)
- specialist equipment operation, including:
  - heat press
  - vacuum heat sealer
  - 3 stage in-line breathing apparatus
  - filter extraction systems
  - spill kits

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to maintain and fit immersion suits while using the correct PPE and observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of aircraft life support equipment maintenance activities. It is essential that immersion suit testing and inspection procedures, cleanliness requirements and safety precautions,

	including the correct use of PPE, are fully observed, understood and complied with. Ability to interpret maintenance and fitting procedures and apply them in practice is critical. Evidence of transferability of skills and knowledge related to immersion suit maintenance and fitting is essential. This is to be demonstrated through demonstration of the ability to recognise faults and damage and perform appropriate repairs that are within the bounds of the individual's authority, and through the demonstration of correct fitting procedures. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a representative range of maintenance tasks and on the correct fitting of immersion suits. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special purpose tools and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Standard procedures	Standard procedures may be found in any or all of: • state/territory/Commonwealth OHS legislation, regulations and codes • Australian Standards • equipment manufacturers' specifications and procedures • industry practices • safety manual • maintenance schedules • work instructions • maintenance organisation manual • MSDS • Defence regulations and instructions • standing instructions
Faults	Faults may include: • contamination • corrosion of metal parts, such as zippers • delamination • incorrect manufacture • leaks • lifting of tapes • scuffing (e.g. boot) • tears in suit and/or seals
Parts of the immersion suit	Parts of the immersion suit may include: • boots • gloves • life line • light • seals (e.g. wrist and neck) • whistle
Adjustment of the immersion suit	*A*djustment of the immersion suit may include: • leg length • sleeve length • trimming seals
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities

Unit Sector(s)

Aircraft life support

Competency field

Co-requisite units

MEA118A Conduct self in the aviation maintenance environment

MEA504A Maintain and fit oxygen masks

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated. Unit version code updated in unit descriptor.

Unit Descriptor

This unit of competency is part of the Aeroskills Life Support and Furnishing Certificate III and IV training pathways. It covers the competencies required to maintain and fit oxygen masks worn by aviation aircrew. Maintenance involves inspecting, testing, isolating faults, replacing parts, cleaning and testing prior to placing the item back in service. Fitting an oxygen mask includes adjusting the mask to fit the individual (oxygen masks are not an off-the-shelf issue). This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

This unit is equivalent to PUADEFLS004B Maintain and fit oxygen masks.

Application of the Unit

This unit requires application of skills and knowledge relating to the maintenance and fitment of oxygen masks worn by aircrew. Maintenance involves inspection, testing, fault diagnosis, replacement of parts, cleaning and functional testing. Fitment involves adjusting the oxygen mask to correctly fit an individual.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance

	processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Maintain oxygen mask	1.1. Oxygen mask is inspected for serviceability in accordance with ***standard procedures***
	1.2. Oxygen mask is tested for serviceability in accordance with standard procedures and manufacturer's specifications
	1.3. Identified ***faults*** beyond own authority to rectify are reported to supervisor and faulty oxygen mask is quarantined
	1.4. Unserviceable ***parts*** of the oxygen mask are replaced in accordance with standards procedures
	1.5. ***Communication system components*** are tested in accordance with standard procedures
	1.6. Oxygen mask is cleaned in accordance with standard procedures
	1.7. Oxygen mask is presented for inspection by supervisor in accordance with standard procedures
	1.8. Maintenance documentation is completed and processed in accordance with standard enterprise procedures

2. Fit oxygen mask	2.1. Fitting process is explained to the participant so that optimal fit can be achieved through relevant feedback 2.2. Participant is measured to select an appropriate size oxygen mask 2.3. ***Components*** of oxygen mask are adjusted to optimise fit 2.4. Integration of the oxygen mask and helmet is confirmed for correct function during operations 2.5. Oxygen mask fit is verified through participant feedback and by the supervisor 2.6. Relevant documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying OHS practices relating to oxygen mask maintenance processes
- using MSDS
- using applicable tools, testing/measuring equipment and maintenance documentation to:
  - solder oxygen mask electronic/electrical components
  - test the operation of helmet electronic/electrical components
  - replace unserviceable components in accordance with approved procedures
  - select and use appropriate oxygen mask cleaning materials
  - correctly fit oxygen masks to users
- safely using the oxygen test rig
- cleaning and maintaining equipment and tools
- correctly disposing of hazardous waste

Required knowledge

Look for evidence that confirms knowledge of:

- relevant enterprise procedures and maintenance publications
- OHS procedures relating to oxygen mask maintenance
- how to obtain MSDS
- safety precautions relating to oxygen and the operation of the oxygen test rig
- requirements for an oxygen mask servicing facility
- oxygen in flight
- components of an oxygen mask and their function
- oxygen mask operation in relation to flight
- oxygen regulator operation
- physiological effects of flight

- hypoxia
- critical nature of maintaining and fitting oxygen masks
- need to regularly assess correct fitment of oxygen masks
- oxygen mask fitting procedures
- fitting procedures relating to the fitment of oxygen masks to helmets
- G forces
- forces of ejection
- basic electrical principles
- environmental conditions that may affect oxygen equipment
- approved cleaning methods for aviation life support equipment
- handling, storage and transit procedures relating to life support equipment
- handling and storage procedures for oxygen masks
- types of corrosion and contamination that may affect oxygen masks
- modification requirements for oxygen masks
- oxygen mask repair procedures and limitations
- soldering techniques
- operation of testing and measuring equipment and tools used to maintain oxygen masks
- use and storage of adhesives

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to maintain and fit oxygen masks while observing all relevant safety precautions, especially those relating to oxygen.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of aircraft life support equipment maintenance activities. It is essential that oxygen mask testing and inspection procedures, cleanliness requirements and safety precautions are fully observed, understood and complied with. Ability to interpret maintenance and fitting procedures and apply them in practice is critical. Evidence of transferability of skills and knowledge related to oxygen mask maintenance and fitting is essential. This is to be demonstrated through demonstration of the ability to recognise faults and damage and perform appropriate repairs that are within

	the bounds of the individual's authority, and through the demonstration of correct fitting procedures. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least three (3) unserviceable oxygen masks providing a representative range of maintenance tasks and on the correct fitting of oxygen masks to at least three individuals. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special purpose tools and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Standard procedures	Standard procedures may be found in any or all of: • state/territory/Commonwealth OHS legislation, regulations and codes • Australian Standards • equipment manufacturers' specifications and procedures • industry practices • safety manual

	• maintenance schedules • work instructions • maintenance organisation manual • MSDS • Defence regulations and instructions • standing instructions
Faults	Faults may include: • contamination • corrosion • cracks • excessive wearing • fraying • incorrect manufacture • intermittent communication • leaks • perishing
Parts of the oxygen mask	Parts of the oxygen mask may include: • communication system (e.g. microphone) • delivery tube • exo-skeleton (e.g. outer shell) • face piece (e.g. may include trimming) • retention system (e.g. strap) • valves
Communication system components	Communication system components may include: • microphone • electric cables • switches
Adjustable components	Components may include: • retention system (e.g. strap) • seals
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities

Unit Sector(s)

Aircraft life support

Competency field

Co-requisite units

MEA118A	Conduct self in the aviation maintenance environment
MEA240B	Use electrical test equipment to perform basic electrical tests

MEA505A Maintain and pack parachutes

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated. Unit version code updated in unit descriptor.

Unit Descriptor

This unit of competency is part of the Aeroskills Life Support and Furnishing Certificate III and IV training pathways. It covers the competencies required to maintain and pack parachutes. Maintenance includes inspecting, testing, isolating faults, replacing components, repairing and cleaning prior to packing. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

This unit is equivalent to PUADEFLS005B Maintain and pack parachutes.

Application of the Unit

This unit requires application of skills and knowledge relating to the maintenance and packing of parachutes. Maintenance involves inspection, testing, fault diagnosis, replacement of parts, completion of repairs and cleaning.

The unit applies to person carrying parachutes including emergency and ejection parachutes. It also applies to ballistic parachutes used for the recovery of light aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes

MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
MEA511A	Operate and maintain sewing machines and overlockers
LMFSF2002B	Machine sew materials

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Maintain parachute
   1.1. Parachute is inspected for serviceability in accordance with ***standard procedures***
   1.2. Parachute is tested for serviceability in accordance with standard procedures and manufacturer's specifications
   1.3. Identified ***faults*** beyond own authority to rectify are reported to supervisor and faulty parachute is quarantined
   1.4. Unserviceable ***parts*** of the parachute are replaced to render parachute serviceable in accordance with standard procedures
   1.5. ***Basic parachute repairs*** are completed in accordance with standard procedures
   1.6. Parachute is cleaned in accordance with standard procedures
   1.7. Parachute is presented for inspection by supervisor in accordance with standard procedures

	1.8. Maintenance documentation is completed and processed in accordance with standard enterprise procedures
2. Pack parachute	2.1. Parachute is packed for use in accordance with standard procedures
	2.2. Parachute is presented for inspection by supervisor in accordance with standard enterprise procedures
	2.3. Relevant documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying OHS practices relating to parachute maintenance processes, including the selection and correct use of PPE, where applicable
- handling, storing and organising transport of equipment
- delivering briefings to personnel in relation to operating parachutes
- using MSDS
- using maintenance publications, drawings and documentation relating to parachute maintenance
- using applicable testing and measuring equipment, tools and maintenance documentation to:
  - test parachutes for serviceability
  - replace unserviceable components in accordance with approved procedures
  - select and use appropriate parachute cleaning materials
  - repair parachutes (both hand and machine sewing)
- cleaning and maintaining equipment and tools

Required knowledge

Look for evidence that confirms knowledge of:

- relevant regulations, standards, enterprise procedures and maintenance publications
- OHS procedures relating to parachute maintenance, including the selection and use of PPE
- how to obtain MSDS
- critical nature of maintaining and packing parachutes, i.e. risk of death
- approved cleaning methods for aviation life support equipment
- components of a parachute and their function
- parachute assembly materials of construction
- environmental conditions that may affect parachutes and parachute assemblies, including UV degradation
- types of corrosion and contamination that may affect parachute assemblies
- handling, storage and transit procedures relating to parachutes

- physiological effects of flight
- sequence of ejection
- operation of person carrying parachutes
- operation of ballistic parachutes in aircraft recovery
- purpose of different types of canopies
- modification requirements for parachutes
- requirements for a parachute servicing facility
- operation of testing and measuring equipment and tools used to maintain parachutes
- repair limitations for parachutes
- packing tools and measuring equipment required to pack parachutes

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to maintain and pack parachutes while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of aircraft life support equipment maintenance activities. It is essential that parachute testing and inspection procedures, cleanliness requirements and safety precautions are fully observed, understood and complied with. Ability to interpret maintenance and packing procedures and apply them in practice is critical. Evidence of transferability of skills and knowledge related to parachute maintenance and packing is essential. This is to be demonstrated through demonstration of the ability to recognise faults, replace components and perform appropriate repairs that are within the bounds of the individual's authority, and through the demonstration of correct packing procedures. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision

	on the following range of tasks: • correctly packing a minimum of three (3) parachutes consecutively and without the need for corrective action by the supervisor • recognising the limits of own authority • replacing canopy/harness, including line sequence tests • correctly repairing a tear in parachute canopy material through patching • inspecting, testing and replacing unserviceable parts of a quick release fitting • recognising a range of faults and their serviceability limits and repairing within limitations/tolerances. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special purpose tools and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Standard procedures	Standard procedures may be found in any or all of: • state/territory/Commonwealth OHS legislation, regulations and codes • Australian Standards • equipment manufacturers' specifications and procedures • industry practices

	• safety manual • maintenance schedules • work instructions • maintenance organisation manual • MSDS • Defence regulations and instructions • CASR and advisory material • standing instructions
Faults	Faults may include: • broken stitching • broken quick release fitting springs • contamination • corrosion of metal parts • damaged hardware • damaged quick release fitting screws • excessive wear • expired parachute components • frayed lines • incorrect manufacture • pulled threads • incorrect rigging line sequence • seized quick release fitting lugs • stretched lines • tears in parachute • UV degradation
Parts of the parachute	Parts of the parachute may include: • canopy • hardware (e.g. buckles, eyelets and connector links) • harness • parachute housing (e.g. pack) • quick release fitting • rigging lines
Basic parachute repairs	Basic parachute repairs may include: • broken stitching • corrosion (e.g. fittings) • damaged hardware • frayed lines • pulled threads • tears in parachute

Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities

Unit Sector(s)

Aircraft life support

Competency field

Co-requisite units

MEA118A Conduct self in the aviation maintenance environment

MEA506A Maintain and pack survival inflatable life rafts and escape slides

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated. Unit version code update din unit descriptor.

Unit Descriptor

This unit of competency is part of the Aeroskills Life Support and Furnishing Certificate III and IV training pathways. It covers the competencies required to maintain and pack survival inflatable life rafts and escape slides. Maintenance includes inspecting, testing, isolating faults, replacing components and cleaning prior to packing. The unit does not include repairing life rafts and escape slides. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

This Unit is equivalent to PUADEFLS006B Maintain and pack survival inflatable life rafts or escape slides.

Application of the Unit

This unit requires application of skills and knowledge relating to the maintenance and packing of survival inflatable life rafts and escape slides. Maintenance involves inspection, testing, fault diagnosis, replacement of parts and cleaning.

The unit applies to a range of types of survival inflatable life raft and to a number of types of inflatable aircraft escape slide.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance

MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Maintain survival inflatable life raft or escape slide
   1.1. ***Survival inflatable life raft*** and ***associated ancillary equipment*** or ***escape slide*** is inspected for serviceability in accordance with ***standard procedures***
   1.2. Identified ***faults*** beyond own authority to rectify are reported to supervisor and faulty survival inflatable life raft, ancillary equipment or escape slide is quarantined
   1.3. Unserviceable ***parts*** of the survival inflatable life raft, ancillary equipment or escape slide are replaced in accordance with standard procedures
   1.4. Survival inflatable life raft or escape slide is ***tested*** for serviceability in accordance with standard procedures and manufacturer's specifications
   1.5. Survival inflatable life raft or escape slide is cleaned in

	accordance with standard procedures 1.6. Survival inflatable life raft or escape slide is presented for inspection by supervisor in accordance with standard procedures 1.7. Maintenance documentation is completed and processed in accordance with standard enterprise procedures
2. Pack survival inflatable life raft or escape slide	2.1. Survival inflatable life raft or escape slide is packed for use in accordance with standard procedures 2.2. Ancillary equipment is packed for use in accordance with standard procedures 2.3. Survival inflatable life raft or escape slide is presented for inspection by supervisor in accordance with standard enterprise procedures 2.4. Relevant documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying OHS practices relating to survival inflatable life raft, ancillary equipment and escape slide maintenance processes, including the selection and correct use of PPE, where applicable
- using MSDS
- using maintenance publications, drawings and documentation relating to survival inflatable life raft, ancillary equipment and escape slide maintenance
- handling, storing and organising transport of equipment
- delivering briefings to personnel in relation to operating survival inflatable life rafts and escape slides
- inflating/deflating survival inflatable devices for maintenance
- using applicable testing and measuring equipment, tools and maintenance documentation to:
  - test survival inflatable devices for serviceability
  - replace unserviceable components or items of ancillary equipment in accordance with approved procedures
  - select and use appropriate survival inflatable device cleaning materials
- solder battery terminals on emergency locator transmitters
- tying various types of knots, including:
  - reef knot
  - bowline
  - thumb knot

  - half hitch
- hand sewing
- cleaning and maintaining equipment and tools

Required knowledge

Look for evidence that confirms knowledge of:

- relevant regulations, standards, enterprise procedures and maintenance publications
- OHS procedures relating to survival inflatable life raft and escape slide maintenance,including the selection and use of PPE
- how to obtain MSDS
- relevant safety precautions including storage and handling of compressed gas cylinders and survival and distress pyrotechnics
- critical nature of maintaining and packing survival inflation devices, i.e. risk of death
- search and rescue procedures
- priorities of survival and how they relate to survival inflatable life rafts and associated ancillary equipment
- electrical principles
- approved cleaning methods for aviation life support equipment
- environmental conditions that may affect survival inflation devices including ultraviolet degradation
- types of corrosion and contamination that may affect survival inflation devices
- handling, storage and transit procedures relating to survival inflation devices
- survival inflation devices and methods of operation
- operation of emergency locator beacons and emergency locator transmitters
- principles of operation of inflation mechanisms
- components of a survival inflation device and their function
- repair limitations for survival inflatable life rafts and escape slides
- modification requirements for survival inflatable life rafts and escape slides
- requirements for a survival inflation device servicing facility
- packing tools and measuring equipment required to pack survival inflatable devices
- use of survival inflatable life rafts, including associated ancillary equipment and escape slides

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to maintain and pack survival inflatable life rafts and escape slides while observing all relevant safety

	precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of aircraft life support equipment maintenance activities. It is essential that survival inflatable device testing and inspection procedures, cleanliness requirements and safety precautions are fully observed, understood and complied with. Ability to interpret maintenance and packing procedures and apply them in practice is critical. Evidence of transferability of skills and knowledge related to survival inflatable life raft and escape slide maintenance and packing is essential. This is to be demonstrated through demonstration of the ability to recognise faults and replace components that are within the bounds of the individual's authority, and through the demonstration of correct packing procedures. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the Unit of Competency are being achieved under routine supervision on the following range of tasks: • completing a minimum of three (3) inflation tests without the need for corrective action by the supervisor • recognising the limits of own authority • testing cylinder weight and determining if it is within tolerance • correctly packing a minimum of three (3) survival inflatable life rafts or escape slides without the need for corrective action by the supervisor • recognising a range of faults and their serviceability limits (faults must include incorrect manufacture and verifying expiry date of inflatable life raft and ancillary equipment or escape slide. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and

	special purpose tools and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Applicable types of survival inflatable life rafts	Survival inflatable life rafts may include: • 10U Mk8 • F2B • LRU 16
Ancillary equipment	Ancillary equipment may include: • electronic locating devices • lighting devices • pyrotechnics • rations • survival/location aids • water
Applicable types of escape slide	Escape slides may include: • 19D22454-2 • 19D22387-2 • 19D22454-5 • 19D22454-6
Standard procedures	Standard procedures may be found in any or all of: • state/territory/Commonwealth OHS legislation, regulations and codes • Australian Standards • equipment manufacturers' specifications and procedures • industry practices • safety manual • maintenance schedules

	• work instructions • maintenance organisation manual • MSDS • Defence regulations and instructions • CASR and advisory material • standing instructions
Faults	Faults may include: • abrasion • broken stitching • contamination • corrosion of metal parts • damaged hardware • delamination/porosity • expired components or equipment • faulty valves • frayed lines • holes • incorrect manufacture • lifting tapes • UV degradation
Parts	Parts may include: • cylinders • operating head • valves • valise
Testing	Testing may include: • checking ancillary equipment (e.g. electronic locating devices and survival/location aids) • cylinder weight tolerance • inflation tests • light and battery test
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities

Unit Sector(s)

Aircraft life support

Competency field

Co-requisite units

MEA118A Conduct self in the aviation maintenance environment

MEA507A Maintain, pack and fit survival inflatable buoyancy vests

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated. Unit version code updated in unit descriptor.

Unit Descriptor

This unit of competency is part of the Aeroskills Life Support and Furnishing Certificate III and IV training pathways. It covers the competencies required to maintain, pack and fit survival inflatable buoyancy vests. Maintenance includes inspecting, testing, isolating faults, replacing components and cleaning prior to packing. The unit does not include repairing buoyancy vests. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

This unit is equivalent to PUADEFLS007B Maintain, pack and fit survival inflatable buoyancy vests.

Application of the Unit

This unit requires application of skills and knowledge relating to the maintenance and packing of survival inflatable buoyancy vests. Maintenance involves inspection, testing, fault diagnosis, replacement of parts and cleaning.

The unit applies to a range of types of survival inflatable buoyancy vests.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity

MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Maintain survival inflatable buoyancy vests	1.1. ***Survival inflatable buoyancy vests*** and ***associated ancillary equipment*** are inspected for serviceability in accordance with ***standard procedures***
	1.2. Identified ***faults*** beyond own authority to rectify are reported to supervisor and faulty survival inflatable buoyancy vest and/or ancillary equipment is quarantined
	1.3. Unserviceable ***parts*** of the survival inflatable buoyancy vest and/or ancillary equipment are replaced in accordance with standard procedures
	1.4. Survival inflatable buoyancy vest is ***tested*** for serviceability in accordance with standard procedures and manufacturer's specifications
	1.5. Survival inflatable buoyancy vest is cleaned in accordance with standard procedures
	1.6. Survival inflatable buoyancy vest is presented for inspection

	by supervisor in accordance with standard procedures 1.7. Maintenance documentation is completed and processed in accordance with standard enterprise procedures
2. Pack survival inflatable buoyancy vests	2.1. Survival inflatable buoyancy vest is packed for use in accordance with standard procedures 2.2. Ancillary equipment is packed for use in accordance with standard procedures 2.3. Survival inflatable buoyancy vest is presented for inspection by supervisor in accordance with standard enterprise procedures 2.4. Relevant documentation is completed and processed in accordance with standard enterprise procedures
3. Fit survival inflatable buoyancy vests	3.1. Fitting process is explained to the participant so that optimal fit can be achieved through relevant feedback 3.2. Participant is measured to select appropriate size survival inflatable buoyancy vest 3.3. Survival inflatable buoyancy vest is ***adjusted*** to optimise fit 3.4. Survival inflatable buoyancy vest fit is verified through participant feedback and supervisor approval 3.5. Relevant documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying OHS practices relating to survival inflatable life raft, ancillary equipment and escape slide maintenance processes, including the selection and correct use of PPE, where applicable
- using MSDS
- using maintenance publications, drawings and documentation relating to survival inflatable buoyancy vests and ancillary equipment maintenance
- handling, storing and organising transport of equipment
- delivering briefings to personnel in relation to operating, donning/doffing and fitting of survival inflatable buoyancy vests
- inflating/deflating survival inflatable devices for maintenance
- using applicable testing and measuring equipment, tools and maintenance documentation to:
  - test survival inflatable devices for serviceability
  - replace unserviceable components or items of ancillary equipment in accordance with approved procedures

    - select and use appropriate survival inflatable device cleaning materials
- solder battery terminals on emergency locator transmitters
- tying various types of knots, including:
    - reef knot
    - bowline
    - thumb knot
    - half hitch
- hand sewing
- cleaning and maintaining equipment and tools

Required knowledge

Look for evidence that confirms knowledge of:

- relevant regulations, standards, enterprise procedures and maintenance publications
- OHS procedures relating to survival inflatable buoyancy vest maintenance, including the selection and use of PPE
- how to obtain MSDS
- relevant safety precautions including storage and handling of compressed gas cylinders and survival and distress pyrotechnics
- critical nature of maintaining and packing survival inflation devices, i.e. risk of death
- search and rescue procedures
- priorities of survival and how they relate to survival inflatable buoyancy vests and associated ancillary equipment
- electrical principles
- approved cleaning methods for aviation life support equipment
- environmental conditions that may affect survival inflation devices including ultraviolet degradation
- types of corrosion and contamination that may affect survival inflation devices
- handling, storage and transit procedures relating to survival inflation devices
- survival inflation devices and methods of operation
- operation of emergency locator beacons and emergency locator transmitters
- principles of operation of inflation mechanisms
- components of a survival inflation device and their function
- repair limitations for survival inflatable buoyancy vests
- modification requirements for survival inflatable buoyancy vests
- requirements for a survival inflation device servicing facility
- packing tools and measuring equipment required to pack survival inflatable devices
- use of survival inflatable buoyancy vests, including associated ancillary equipment

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to maintain, pack and fit survival inflatable buoyancy vests while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of aircraft life support equipment maintenance activities. It is essential that survival inflatable device testing and inspection procedures, cleanliness requirements and safety precautions are fully observed, understood and complied with. Ability to interpret maintenance, packing and fitting procedures and apply them in practice is critical. Evidence of transferability of skills and knowledge related to survival inflatable buoyancy vest maintenance and packing is essential. This is to be demonstrated through demonstration of the ability to recognise faults and replace components that are within the bounds of the individual's authority, and through the demonstration of correct packing and fitting procedures. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on the following range of tasks: • completing a minimum of three (3) inflation tests without the need for corrective action by the supervisor • recognising the limits of own authority • testing cylinder weight and determining if it is within tolerance • correctly packing a minimum of three (3) survival inflatable buoyancy vests without the need for corrective action by the supervisor • correctly fitting survival inflatable buoyancy vests to a minimum of three different people without supervisor intervention

	• recognising a range of faults and their serviceability limits (faults must include incorrect manufacture and verifying expiry date of inflatable buoyancy vest and ancillary equipment. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special purpose tools and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Applicable survival inflatable buoyancy vests	Survival inflatable buoyancy vests may include: • Secumar AUS2
Ancillary equipment	Ancillary equipment may include: • electronic locating devices • lighting devices • pyrotechnics • rations • survival/location aids • water
Standard procedures	Standard procedures may be found in any or all of: • state/territory/Commonwealth OHS legislation, regulations and codes • Australian Standards

	• equipment manufacturers' specifications and procedures • industry practices • safety manual • maintenance schedules • work instructions • maintenance organisation manual • MSDS • Defence regulations and instructions • CASR and advisory material • standing instructions
Faults	Faults may include: • abrasion • broken stitching • contamination • corrosion of metal parts • damaged hardware • delamination/porosity • expired components or equipment • faulty valves • frayed lines • holes • incorrect manufacture • lifting tapes • ultraviolet degradation
Parts	Parts may include: • buoyancy chambers • cylinders • hardware • operating head • valves • valise • zippers
Testing	Testing may include: • checking ancillary equipment (e.g. electronic locating devices and survival/location aids) • cylinder weight tolerance • inflation tests • light and battery test
Adjustment	Adjustment to vest may include:

	• breast height • chest • waist
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities

Unit Sector(s)

Aircraft life support

Competency field

Co-requisite units

MEA118A Conduct self in the aviation maintenance environment

MEA508A Maintain, install and remove restraint systems

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated. Unit version code updated in unit descriptor.

Unit Descriptor

This unit of competency is part of the Aeroskills Life Support and Furnishing Certificate III and IV training pathways. It covers the competencies required to maintain, install and remove personal restraint systems. Maintenance includes inspecting, isolating faults, replacing components, repairing and cleaning prior to returning the item to service. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

This unit is equivalent to PUADEFLS008B Maintain, install and remove restraint systems.

Application of the Unit

This unit requires application of skills and knowledge relating to the maintenance, installation and removal of personal restraint systems. Maintenance may be performed in-situ or in a maintenance workshop and involves inspection, fault diagnosis, replacement of parts, completion of repairs and cleaning.

The unit applies to a range of personal restraint systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity

MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
MEA511A	Operate and maintain sewing and overlocking machines
LMFSF2002B	Machine sew materials

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Maintain restraint belts/harnesses	1.1. ***Restraint belts*/*harnesses*** are inspected for serviceability in accordance with ***standard procedures***
	1.2. Identified ***faults*** beyond own authority to rectify are reported to supervisor and faulty restraint system is quarantined
	1.3. Unserviceable parts of a quick release fitting are inspected, tested and replaced
	1.4. Unserviceable ***parts of the restraint belts*/*harnesses*** are replaced to render restraint system serviceable in accordance with standard procedures
	1.5. Basic restraint belt/harness stitching repairs are completed in

	accordance with standard procedures
	1.6. Restraint belts/harnesses are cleaned in accordance with standard procedures
	1.7. Restraint belts/harnesses are presented for inspection by supervisor in accordance with standard procedures
	1.8. Maintenance documentation is completed and processed in accordance with standard enterprise procedures
2. Remove restraint systems	2.1. Approval to remove restraint system is obtained in accordance with standard enterprise procedures
	2.2. Restraint system is removed from the aircraft in accordance with applicable maintenance publication
	2.3. Maintenance documentation is completed and processed in accordance with standard enterprise procedures
3. Install restraint systems	3.1. Approval to fit restraint system is obtained in accordance with standard enterprise procedures
	3.2. Restraint system is fitted to the aircraft in accordance with applicable maintenance publication
	3.3. Maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying OHS practices relating to restraint system maintenance processes, including the selection and correct use of PPE, where applicable
- handling, storing and organising transport of equipment
- using MSDS
- using maintenance publications, drawings and documentation relating to restraint system maintenance
- using applicable testing and measuring equipment, tools and maintenance documentation to:
  - replace unserviceable components in accordance with approved procedures
  - select and use appropriate restraint system cleaning materials
  - repair restraint systems (both hand and machine sewing)
- cleaning and maintaining equipment and tools

Required knowledge

Look for evidence that confirms knowledge of:

- relevant regulations, standards, enterprise procedures and maintenance publications
- OHS procedures relating to restraint system maintenance, including the selection and use of

PPE

- how to obtain MSDS
- critical nature of maintaining and fitting restraint systems
- approved cleaning methods for aviation life support equipment
- components of a restraint system and their function
- flight line procedures
- UV degradation
- types of corrosion and contamination that may affect restraint systems
- handling, storage and transit procedures relating to life support equipment
- modification requirements for restraint systems
- operation of testing and measuring equipment and tools used to maintain restraint systems
- repair limitations for restraint systems

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to maintain, install and remove restraint systems while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of aircraft life support equipment maintenance activities. It is essential that restraint system inspection procedures, cleanliness requirements, repair procedures and safety precautions are fully observed, understood and complied with. Ability to interpret maintenance, installation and removal procedures and apply them in practice is critical. Evidence of transferability of skills and knowledge related to restraint system maintenance, installation and removal is essential. This is to be demonstrated through demonstration of the ability to recognise faults, replace components and perform appropriate repairs that are within the bounds of the individual's authority, and through the demonstration of correct installation and removal procedures. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace

	assessor that the relevant elements of the unit of competency are being achieved under routine supervision on the inspection, repair, installation and removal of restraint systems, including the demonstration of the ability to recognise a range of faults and their serviceability and repair limitations/tolerances (must include verification of expiry dates of restraint system component parts and recognition of incorrect manufacture). This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special purpose tools and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Restraint belts/harnesses	Restraint belts/harnesses may include: • fixed point attached harness • passenger restraint belts • retractable restraint harnesses (will be attached to inertia reel but the inertia reel does not form part of the restraint system)
Standard procedures	Standard procedures may be found in any or all of: • state/territory/Commonwealth OHS legislation, regulations and codes • Australian Standards

	• equipment manufacturers' specifications and procedures • industry practices • safety manual • maintenance schedules • work instructions • maintenance organisation manual • MSDS • Defence regulations and instructions • CASR and advisory material • standing instructions
Faults	Faults may include: • broken quick release fitting springs • broken stitching • contamination • corrosion of metal parts • damaged hardware • damaged quick release fitting screws • excessive wear • expired date of restraint components • incorrect manufacture • pulled threads • seized quick release fitting lugs • UV degradation
Parts	Parts of the restraint belts/harnesses may include: • belt • fixed point attachment line • hardware (e.g. buckles) • harness • parachute housing (e.g. pack) • quick release fittings, including lugs, springs and screws
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities

Unit Sector(s)

Aircraft life support

Competency field

Co-requisite units

MEA118A Conduct self in the aviation maintenance environment

MEA509A Manufacture, repair and alter aircraft related fabric components

Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated. Unit version code updated in unit descriptor.

Unit Descriptor

This unit of competency is part of the Aeroskills Life Support and Furnishing Certificate III and IV training pathways. It covers the competencies required to manufacture, repair and alter aircraft and support equipment fabric components. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

This unit is equivalent to PUADEFLS009B Manufacture, repair and alter aircraft-related fabric components.

Application of the Unit

This unit requires application of skills and knowledge relating to the manufacture, repair and alteration of aircraft and support equipment fabric components. Manufacture and alteration may be to existing designs or may also involve design. Repair may involve sewing and/or the use of adhesives.

The unit applies to a range of aircraft environmental protection sets, aircraft life support equipment components, aircraft soft furnishings and associated trimming, aircrew personal fit and associated life support equipment, and to ground support equipment covers.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation

	maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
MEA511A	Operate and maintain sewing and overlocking machines
LMFSF2002B	Machine sew materials

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Manufacture a fabric component
   - 1.1. ***Technical instructions*** are identified and interpreted to ensure compliance in accordance with ***standard procedures***
   - 1.2. ***Detailed working plan*** is produced in accordance with standard procedures
   - 1.3. Fabric component is ***assembled*** and fittings are ***attached*** in accordance with standard procedures

	1.4. Aircraft related fabric components are presented for inspection by supervisor in accordance with standard enterprise procedures
	1.5. Relevant documentation is completed and processed in accordance with standard enterprise procedures
2. Repair a fabric component	2.1. Technical instructions are identified and interpreted to ensure ***faults*** are corrected in accordance with standard procedures
	2.2. Fabric component is repaired in accordance with standard procedures
	2.3. Repaired components are presented for inspection by supervisor in accordance with standard enterprise procedures
	2.4. Relevant documentation is completed in accordance with standard enterprise procedures
3. Alter a fabric component to meet customer requirements	3.1. ***Customer*** is consulted to establish the requirements to alter the fabric component and to ensure ***defined outcomes*** are met
	3.2. Identified alterations beyond own authority to alter are reported to supervisor
	3.3. A detailed working plan is produced, where necessary, in accordance with standard procedures
	3.4. Altered fabric components are presented for inspection by supervisor in accordance with standard enterprise procedures
	3.5. Relevant documentation is completed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying OHS practices relating to fabric component manufacture, repair and alteration, including the selection and correct use of PPE, where applicable
- handling, storing and organising transport of equipment
- using MSDS
- using maintenance publications, drawings and documentation relating to fabric component manufacture, repair and alterations
- applying basic sewing techniques associated with the manufacture, repair and alteration of aircraft fabric components
- using hand sewing techniques

- using basic drawing tools
- calculating dimensions and allowable dimension variations
- completing measurements and estimating fabric requirements and other material requirements
- using pre-checking and inspection techniques to anticipate cutting problems and avoid reworking and wastage
- using relevant hand and power tools
- using the limited workplace technology related to cutting, including tools, equipment, calculators and measuring devices
- cleaning and maintaining equipment and tools

Required knowledge

Look for evidence that confirms knowledge of:

- relevant regulations, standards, enterprise procedures and maintenance publications
- OHS procedures relating to fabric component manufacture, repair and alteration, including the selection and use of PPE
- how to obtain MSDS
- basic sewing techniques using *AS 2860-1986 Textiles – stitch types – classification and terminology*
- construction principles of fabric components
- cutting equipment and techniques
- design features of finished items
- fabric types, common faults and inspection procedures
- textiles - stitch types - classification and terminology
- impact of cutting on fabrics
- geometric drawing processes and techniques
- reading and interpreting specifications
- types of corrosion and contamination that may affect aircraft fabric components

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to manufacture, repair and alter aircraft-related fabric components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate	The underlying skills inherent in this unit should be transferable across a range of aircraft life support

competency in this unit	equipment maintenance activities. It is essential that fabric component manufacture, repair and alteration procedures and safety precautions are fully observed, understood and complied with. Ability to interpret fabric component requirements and apply them in practice is critical. Evidence of transferability of skills and knowledge related to fabric component manufacture, repair and alteration is essential. This is to be demonstrated through demonstration of the ability to perform appropriate manufacturing, repair and alteration tasks that are within the bounds of the individual's authority. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on the following tasks: • recognising the limits of own authority • correctly manufacture three (3) fabric components from technical instructions using machine sewing and at least one (1) other assembly method (hand sew, press fit, adhere or staple) • recognising at least three (3) faults and identifying limits of repair for the fabric components • altering a fabric component to meet customer requirements. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special purpose tools and ground support equipment would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise
Fabric components	Fabric components may include: • aircraft environmental protection sets and warning devices • aircraft life support equipment components • aircraft soft furnishings and associated trimming • aircrew personal fit and associated life support equipment • ground support equipment covers
Technical instructions	Technical instructions may include: • aircraft operational requirements • job orders • manufacturers' specifications • maintenance manuals • modification instructions • technical drawings
Standard procedures	Standard procedures may be found in any or all of: • state/territory/Commonwealth OHS legislation, regulations and codes • Australian Standards • equipment manufacturers' specifications and procedures • industry practices • safety manual • maintenance schedules • work instructions • maintenance organisation manual • MSDS • Defence regulations and instructions • CASR and advisory material

	• standing instructions
Detailed working plan	Detailed working plan may include: • cutting plan • expected time of completion • manpower requirements • method and sequence of assembly • resource requirements (material, fittings, tools and ground support equipment) • technical sketch (working drawing)
Assembly of fabric components and attachment of fittings	Assembly of fabric components and attachment of fittings may include: • adhering • hand sewing • machine sewing • press fitting • stapling
Faults	Faults may include: • broken stitching • broken zippers • contamination • corrosion of metal parts • damaged fittings • excessive wear • incorrect manufacture • tears in fabric • ultraviolet degradation
Customers	Customers may include: • aircraft configuration authorities • aircrew • engineering maintenance managers • supervisors
Defined outcomes	Defined outcomes may include: • affect on fit of fabric components • affect on performance of altered fabric components • availability of resources • expected time of completion

Unit Sector(s)

Aircraft life support

Competency field

Co-requisite units

MEA118A Conduct self in the aviation maintenance environment

MEA510A Maintain seat and pod electrical and electronic systems

Modification History

Minor formatting and editorial changes made. Missing knowledge requirements reinstated.

Unit Descriptor

This unit of competency is part of the Aircraft Life Support and Furnishing Certificate III and IV training pathways. It covers the competencies required for the removal, installation and limited maintenance of seat and pod electrical and electronic systems during the overhaul of seats and pods. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit requires application of hand skills in the removal and installation of electrical and electronic system components during the overhaul of aircraft seats and pods, and the use of basic electrical test equipment and in-flight entertainment system test sets to confirm system serviceability.

Applications include electrical and electronic system components fitted to seats and pods undergoing overhaul in workshops

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Remove and inspect seat and pod electrical system components	1.1. System is rendered safe and prepared in accordance with the applicable maintenance manual to ensure personnel safety 1.2. ***Removal*** of ***electrical system components*** is carried out in accordance with the applicable maintenance manual 1.3. Removed components are inspected for ***visible signs of damage or deterioration*** in accordance with maintenance manuals and standard enterprise procedures 1.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures 1.5. Removed components are tagged, packaged or discarded in accordance with specified procedures
2. Remove and inspect seat and pod electronic system components	2.1. System is rendered safe and prepared in accordance with the applicable maintenance manual to ensure personnel safety 2.2. Removal of ***electronic system components*** is carried out in accordance with the applicable maintenance manual 2.3. Removed components are inspected for ***visible signs of damage or deterioration*** in accordance with maintenance manuals and standard enterprise procedures 2.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures 2.5. Removed components are tagged, packaged or discarded in accordance with specified procedures
3. Install seat and pod electrical system components	3.1. Electrical system components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life

	3.2. Physical installation of electrical components is carried out in accordance with the applicable maintenance manual 3.3. System is reinstated to correct physical condition in preparation for testing 3.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
4. Install seat and pod electronic system components	4.1. Electronic system components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life 4.2. Physical installation of electronic components is carried out in accordance with the applicable maintenance manual 4.3. System is reinstated to correct physical condition in preparation for testing 4.4. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
5. Functionally test seat and pod electrical and electronic systems	5.1. Applicable system test set is connected to seat or pod in accordance with the applicable maintenance manual or approved vendor procedures 5.2. Power is applied to the seat or pod in accordance with applicable maintenance manual 5.3. Seat or pod electrical system is functionally tested for correct operation in accordance with the applicable maintenance manual 5.4. Seat or pod electronic system is functionally tested using the applicable test set in accordance with the applicable maintenance manual 5.5. Test equipment is removed and required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices, including the use of MSDS and PPE
- using approved maintenance documentation and aircraft publications relating to aircraft seat and pod electrical and electronic systems and components

- recognising defects in and deterioration of electrical cables to aircraft industry standards, including crimped and soldered joints
- correctly interpreting aircraft wire markings, terminal block identification and plug/socket pin numbering systems
- inspecting electrical looms and harness pre- and post-removal and installation to ensure minimum bends are maintained, cable is not in tension, plugs are correctly aligned, security of route ensures no chaffing of insulation, adequate clipping and cable ties have been utilised and construction complies with aircraft industry standards
- positively identifying seat and pod electrical and electronic system components
- plug connector pin removal and insertion, where soldering is not required
- recognising damage and visual defects in electrical components, such as actuators, motors and switches
- recognising damage and visual defects in electronic system components, such as display screens, tuners, volume controls, audio headset receptacles and data cables

Required knowledge

Look for evidence that confirms knowledge of:

- relevant OHS procedures
- how to obtain relevant MSDS
- the use of applicable items of PPE
- component attachment methods
- connection of hardware and plugs
- electrical wiring used in aircraft and wire marking
- plug/socket pin numbering and terminal block identification
- cable and loom installation requirements, including bonding and screening
- crimping tools and crimp terminals
- procedures for removal and insertion of plug connector pins, where soldering is not required
- handling and maintenance precautions relating to electronic displays and electrostatic sensitive devices
- electromagnetic environment
- data cable installation requirements

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills, use specialist tools and use maintenance publications to remove and install seat and pod electrical and electronic system components, and to

	functionally test the systems while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that applicable cleanliness requirements and OHS safety precautions are fully observed, including awareness of electrostatic discharge procedures. Evidence of transferability of skills and knowledge related to removal and installation is essential. An understanding of the attachment methods, connection of hardware and system operation as they relate to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved on the range of components and tasks listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Removal and installation of	Removal and installation of electrical components involves

electrical components	one or more of the following connection methods: • bolted • plug connectors
Electrical system components	Electrical system components may include: • electrical cables and looms • selectors and switches • motors and actuators • relays, control units and modules
Electronic system components	Electronic system components may include: • display units • tuners/selectors • volume controls • audio headset receptacles • data cables
Visible signs of damage or deterioration	Visible signs of damage or deterioration may include: • broken or chafed wires • corrosion of plugs and connectors • physical damage to components • wear • evidence of electrical or electronic component overheating
Application	Application of this unit may relate to: • scheduled or unscheduled removal and installation of seat and pod electrical and electronic systems and components, and to system functional testing during seat and pod overhaul in workshops

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

MEA240B Use electrical test equipment to perform basic electrical tests

MEA511A Operate and maintain sewing machines and overlockers

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Aeroskills Life Support and Furnishing Certificate III and IV training pathways. It covers the competencies required to maintain sewing machines and overlockers. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

This unit is equivalent to unit LMTPRTF05A Operate and maintain sewing machines - 3 which was deleted from a revised version of its parent Training Package, but the content remains valid for Aeroskills Life Support and Furnishing.

Application of the Unit

This unit requires application of skills and knowledge relating to the operation and maintenance of sewing machines and overlockers in the maintenance of items of aircraft life support equipment and in the fabrication and maintenance of items of aircraft soft furnishings.

The unit applies to sewing machines and overlockers used in the range of tasks mentioned above.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Plan work and prepare work area	1.1. Work is planned to maximise safety and productivity 1.2. Work area is cleared and cleaned to provide work table free of obstructions and clear access to sewing/overlocking machine 1.3. Safe ***working environment*** is established 1.4. Suitable electrical power outlets, if required, are identified 1.5. Assistance to move and position workpiece is obtained, if necessary
2. Select thread and needle	2.1. Type of material to be sewn, type of stitch to be used and nature of duty to which finished product is to be subjected is determined to assist in selection of thread and needle 2.2. Suitable thread is selected with regard to thread material, diameter of thread, tensile strength and colour 2.3. Appropriate needle is chosen to suit type of thread, type of stitch and material to be sewn
3. Set up machine	3.1. Machine is examined for damage, missing components or other defects 3.2. Power cords are examined for knots, unsafe routing and insulation damage 3.3. Machine is safely connected to power and correct 'power-on' procedure is followed 3.4. Condition of needle is checked to ensure it is sharp, clean and free from rust and dirt 3.5. Needle is fitted to machine 3.6. Machine is threaded and thread is checked for free travel

	from spool
	3.7. Thread tension and other machine settings are checked and adjusted using test pieces, if necessary
4. Operate machine	4.1. Work piece is correctly aligned to machine
	4.2. Machine is operated in accordance with ***standard procedures*** and OHS requirements
	4.3. Work piece is appropriately fed into machine
	4.4. Performance of machine is monitored through regular checking of thread tension and other settings and inspection of stitching in finished product
5. Undertake inspection, quality, labelling and documentation	5.1. Work piece is removed from machine using assistance, if necessary
	5.2. Completed work is inspected to verify that it meets applicable ***technical instructions***
	5.3. Any areas in need of rework or rectification are identified and marked
	5.4. Rework is performed or other appropriate action arranged
	5.5. Completed product is labelled or tagged and any necessary documentation completed in accordance with standard enterprise procedures
6. Clean up and maintain equipment	6.1. Machine is switched off using correct 'power off' procedures
	6.2. Machine is cleaned, and programmed maintenance, which is within the province of the operator, is performed in accordance with enterprise requirements and manufacturer's specifications
	6.3. Worn or damaged needles are disposed of in accordance with safe working practice
	6.4. Supervisor is notified of any abnormal conditions requiring maintenance or repair

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills to:

- interpreting and applying work instructions and established procedures
- planning and coordinating work activities
- locating and interpreting technical information about machines and materials used in aircraft life support and furnishing
- selecting appropriate needle and thread

- identifying unsatisfactory machine performance
- using relevant hand and power tools
- using relevant chemicals and cleaning agents and dispose of waste products
- maintaining machines and work area
- applying all relevant safety practices
- communicating effectively within the workplace
- documenting and transferring information

Required knowledge

Look for evidence that confirms knowledge of:

- precautions and safe working practices based on relevant OHS legislation, codes of practice, policies and procedures
- advanced work piece construction principles and methods
- characteristics of a wide range of materials used in aircraft life support and furnishing
- operating principles of a wide range of sewing/overlocking machines
- types of needles and threads and their applications
- types of stitching and their applications
- standard industry practice for needle storage and safe disposal
- the range of sewing/overlocking machines, hand tools and power tools used in sewing/overlocking processes and their appropriateness for particular applications
- relevant quality standards for sewn/overlocked products
- power sources, such as single phase, three phase and weather protected outlets
- electrical isolation procedures for sewing/overlocking machines
- safety and environmental requirements of relevant industry and enterprise procedures
- general housekeeping policies and procedures
- recording and reporting procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to operate and maintain sewing and overlocking machines used in aircraft life support and furnishing while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of aircraft life support equipment maintenance activities involving the use of sewing machines/overlockers. It is essential that fabric

	component manufacture, repair and alteration procedures and safety precautions are fully observed, understood and complied with. Ability to interpret fabric component requirements and apply them in practice is critical. Evidence of transferability of skills and knowledge related to the use and maintenance of sewing machines and overlockers is essential. This is to be demonstrated through demonstration of the ability to perform appropriate manufacturing, repair and alteration tasks that are within the bounds of the individual's authority. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a sufficient number of occasions or over sufficient period of time to ensure consistent performance across a typical range of sewing and overlocking requirements This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Access is required to: • real or appropriately simulated situations involving the sewing or overlocking of materials used in aircraft life support equipment and in aircraft soft furnishings • information on specifications of materials used in sewing and overlocking, settings for machines, relevant safety procedures and regulations, quality standards and enterprise procedures • all necessary facilities, sewing/overlocking machines and associated hand and power tools. Assessment may occur on the job or in an industry approved simulated environment.
Method of assessment	
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise
Working environment	Working environment may include: • work organisation procedures and practices relating to the sewing/overlocking of materials • safe use of sewing/overlocking machines and relevant hand and power tools • storage, safe handling and disposal of needles, threads and materials associated with sewing/overlocking • reporting actions which include verbal and written communication in accordance with enterprise policies and procedures • oral, written or visual communication, including completion of standard forms, interpretation of information and instructions associated with workplace activities, and recording and reporting of work outcomes • procedures for safety, environmental protection, housekeeping and quality as specified by equipment and materials manufacturers, regulatory authorities and the enterprise
Standard procedures	Standard procedures may be found in any or all of: • state/territory/Commonwealth OHS legislation, regulations and codes • Australian Standards • equipment manufacturers' specifications and procedures • industry practices • safety manual • maintenance schedules • work instructions • maintenance organisation manual

RANGE STATEMENT	
	• MSDS • Defence regulations and instructions • CASR and advisory material • standing instructions
Technical instructions	Technical instructions may include: • aircraft operational requirements • job orders • manufacturers' specifications • maintenance manuals • modification instructions • technical drawings

Unit Sector(s)

Aircraft life support

Competency field

Co-requisite units

Not applicable

MEA601A Maintain aircraft egress systems

Modification History

Release 3 - Imported unit code in prerequisites updated to current version - no change in outcomes.

Release 2 - Minor formatting and editorial changes made. Prerequisite unit version codes updated. Unit version code updated in unit descriptor.

Unit Descriptor

This unit of competency is part of the Aeroskills Aircraft Armament Certificate IV training pathway. It covers the competencies required to maintain aircraft egress systems that contain explosive ordnance.

This unit was developed from PUADEFEO717C Maintain aircraft egress systems and is equivalent to that unit. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Application of the Unit

This unit covers the maintenance of aircraft egress systems that contain explosive ordnance.

Maintenance covers the entire egress system, including the explosive ordnance. It involves the installation and removal of safety devices, disarming and rearming, inspecting, testing, replacing parts, cleaning and painting.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activity
MEA105C	Apply quality standards applicable to aviation maintenance processes

MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
DEFEO101D	Work safely with explosive ordnance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Fit and remove safety devices	1.1. Safety devices are fitted to ***aircraft egress systems*** in accordance with standard operating and maintenance procedures
	1.2. Safety devices are removed from aircraft egress systems and are correctly stowed in accordance with standard operating and maintenance procedures
2. Prepare for aircraft egress system maintenance	2.1. ***Applicable maintenance documentation*** is identified and obtained
	2.2. Aircraft egress system maintenance requirements are identified from applicable documentation
	2.3. Special tools and equipment required for the maintenance tasks are obtained and positioned
3. Inspect, test and maintain aircraft	3.1. Aircraft egress systems are inspected in accordance with applicable maintenance documentation

egress systems	3.2. Relevant tests are safely conducted and results are recorded in accordance with standard enterprise procedures 3.3. ***Required maintenance tasks*** are performed in accordance with applicable maintenance documentation and standard enterprise procedures 3.4. Emergency and contingency procedures are performed, as required
4. Remove and install aircraft egress system components	4.1. ***Non-explosive egress system components*** are removed and installed in accordance with applicable maintenance documentation and standard enterprise procedures 4.2. ***Explosive egress system components*** are removed and installed in accordance with applicable maintenance documentation and standard enterprise procedures
5. Complete aircraft egress system maintenance operation	5.1. Removed non-explosive components are tagged and packaged for transportation in accordance with standard enterprise procedures 5.2. Removed explosive components are tagged and packaged in accordance with procedures for packaging and transportation of explosive ordnance/dangerous goods 5.3. Special tools and equipment are maintained in accordance with standard enterprise procedures 5.4. Documentation and records are completed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures, including selection and use of MSDS and PPE
- fitment of applicable safety devices
- egress system disarming and rearming
- safely handling explosive components
- conducting tests involving continuity, gauging and measuring
- identifying and selecting applicable items of specialist equipment and tools
- using maintenance documentation, hand tools, specialist tools and equipment to perform egress system maintenance tasks
- preparing removed explosive components for safe storage or transportation

Required knowledge

Look for evidence that confirms knowledge of:

- egress system construction, layout and operation
- operation, characteristics and limitations of aircraft egress systems
- effect of environmental conditions
- colour coding, marking and labels associated with egress systems
- operation, characteristics and limitations of specialist tools and equipment
- egress system test procedures
- safety precautions associated with explosive components
- requirements for handling and disposal of explosive components
- general OHS procedures applicable to egress system maintenance, including applicable PPE
- how to obtain and use MSDS

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to maintain aircraft egress systems and system components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of aircraft egress system maintenance activities. It is essential that assessment confirms the ability to comply with organisational safety requirements and appropriate legislative and regulatory requirements while maintaining aircraft egress systems. The ability to work safely within an explosive ordnance environment, conduct applicable tests and maintain relevant documentation is critical. Evidence of transferability of skills and knowledge related to egress system maintenance is essential. This is to be established through demonstration of the ability to: • render the system safe • perform relevant inspections and tests, replace components (including disarming and re-arming the system) • perform appropriate maintenance tasks. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.

	A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a range of tasks that is representative of the maintenance tasks, tests and the range of non-explosive and explosive components listed in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special purpose tools and ground support equipment would be used where appropriate. Access will also be required to facilities and resources used in the storage, distribution or maintenance of explosive ordnance, including a licensed explosive site.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Applicable maintenance documentation	Applicable maintenance documentation may include: • defect reports • maintenance releases containing details of unserviceabilities • modification orders or leaflets • service bulletins • instructions issued by airworthiness authorities • work instructions • servicing schedules • maintenance manuals

	• standards and drawings • applicable airworthiness and explosive ordnance regulations • standing instructions • quality manuals • safety manuals • maintenance and explosives records
Required maintenance tasks	Required maintenance tasks may include: • arming and de-arming • cleaning • component changes • painting
Egress system components	Non-explosive components may include: • barometric and gravitational sensing components • canopy jettison components • catapults • ejection seat railings and guns • inertia reels • parachute assemblies • pressure source bottles • survival equipment Explosive components may include: • ejection handles • ejection seat cartridges and initiators • explosive connectors • explosive delay elements • flexible linear shaped charges • rocket motors • shielded mild detonating cord • special function cartridges
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Not applicable.

Co-requisite units

Not applicable

MEA602A Remove and install aircraft stores management system components

Modification History

Release 3 - Imported unit code in prerequisites updated to current version - no change in outcomes.

Release 2 - Minor formatting and editorial changes made. Prerequisite unit version codes updated.

Unit Descriptor

This unit of competency is part of the Armament Certificate IV training pathway. It covers the competencies required to reconfigure aircraft stores management system (SMS) components.

The unit was developed from the ADF Enterprise unit DDDRARM301A Remove and install aircraft stores management systems and components and is equivalent to that unit.

Application of the Unit

This unit applies to members of the ADF who are required to apply explosive ordnance safety and handling procedures, hand skills and use maintenance documentation/publications in the removal and installation of SMS components to meet system reconfiguration requirements.

The unit applies to all aircraft with SMS.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities

MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
DEFEO101D	Work safely with explosive ordnance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Prepare aircraft for SMS reconfiguration	1.1. SMS ***reconfiguration*** task is ***verified*** from applicable ***documentation***
	1.2. Aircraft ***safety devices*** are checked in accordance with relevant ***technical publications and manuals***
	1.3. Correct ***SMS component*** is visually identified for reconfiguration
	1.4. Appropriate tools and ground support equipment are selected in accordance with the task
2. Remove SMS component	2.1. ***Firing devices*** are ***checked*** and removed, if fitted
	2.2. SMS component is removed from aircraft in accordance with technical publications and manuals
	2.3. Protective covers and panels are fitted to aircraft and SMS

	component in accordance with technical publications and manuals
3. Install SMS component	3.1. Applicable protective covers and panels are removed from aircraft and SMS component in accordance with technical publications and manuals
	3.2. SMS component is fitted to aircraft in accordance with technical publications and manuals
4. Complete and process documentation	4.1. ***Applicable*** documentation is completed for reconfigured SMS
	4.2. Documentation is forwarded to MCS

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying all safety procedures relating to aircraft SMS
- applying hand skills and applicable maintenance documentation in the removal and installation of SMS components
- testing the operation of systems and components
- using ground support equipment and test equipment
- determining SMS reconfiguration requirements
- explosive ordnance safety and handling
- manual handling of SMS components

Required knowledge

Look for evidence that confirms knowledge of:

- the aircraft operating and maintenance environment
- aircraft SMS and interfaces with other aircraft systems
- OHS procedures and policies
- explosive ordnance safety and handling procedures
- technical publications and manuals
- hardware and component attachment methods
- system and component testing requirements
- technical documentation procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the

performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to reconfigure SMS by removing and installing system components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of aircraft SMS reconfiguration activities. It is essential that assessment confirms the ability to comply with organisational safety requirements and appropriate legislative and regulatory requirements while maintaining SMS. The ability to work safely within an explosive ordnance environment, conduct applicable tests and maintain relevant documentation is critical, including checking specifically for: • failure to check aircraft safety devices are installed • failure to ensure firing devices checked and removed if fitted • commencing task prior to initiating documentation • failure to comply with relevant OHS procedures and policies. Evidence of transferability of skills and knowledge related to SMS component removal and installation is essential. This is to be established through demonstration of the ability to: • render the system safe • perform relevant inspections and tests • replace components • perform appropriate maintenance tasks. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a range of system reconfiguration tasks involving the SMS components listed in Groups 1 to 4 in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where

	appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed on aircraft and/or simulator using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special purpose tools and ground support equipment would be used where appropriate.
Method of assessment	In addition to evidence provided in the Log of Industrial Experience assessment methods may include questioning and observation in operational or simulated environments. The unit may be assessed independently or in conjunction with unit MEA603A Remove and install aircraft stores suspension system and components.
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Reconfiguration and verification activities	Reconfiguration may include: • removal of currently fitted SMS components • installation of specified SMS components Verified may include: • maintenance restrictions • aircraft tail number • aircraft entered as unserviceable • nil stores fitted
Documentation	Documentation may include: • EE500 • CAMM2 documents • SMS documentation
Safety devices	Safety devices may include:

	• earth lead • aircraft safety pins • aircraft switches
Technical publications and manuals	Technical publications and manuals may include: • aircraft publications • maintenance instruction manuals and process specifications • servicing or service bulletins or structural repair manuals • illustrated parts catalogues, aircraft wiring manuals or drawings • tooling, equipment or manufacturer's manuals • standard practices • enterprise aviation regulations and publications
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
SMS components	SMS components may include: 1. Mission computer 2. Armament computer 3. Encoder/decoder 4. Control unit
Firing devices and checking	Firing devices may include: • stores release cartridges • chaff and flares • gun system • missiles • loaded stores Checked may include: • visually • physically
Applicable	Applicable may include: • aircraft documentation • SMS component documentation
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities

Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Not applicable.

Co-requisite units

Not applicable

MEA603A Remove and install aircraft stores suspension systems and components

Modification History

Release 3 - Imported unit code in prerequisites updated to current version - no change in outcomes.

Release 2 - Minor formatting and editorial changes made. Prerequisite unit version codes updated.

Unit Descriptor

This unit of competency is part of the Armament Certificate IV training pathway. It covers the competencies required to reconfigure aircraft stores suspension system (SSS) components

The unit was developed from the ADF Enterprise unit DDDRARM302A Remove and install aircraft stores suspension systems and components and is equivalent to that unit.

Application of the Unit

This unit applies to members of the ADF who are required to apply explosive ordnance safety and handling procedures, hand skills and use maintenance documentation/publications in the removal and installation of SSS components to meet system reconfiguration requirements.

The unit applies to all aircraft fitted with SSS.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance

	processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
DEFEO101D	Work safely with explosive ordnance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Prepare aircraft for SSS reconfiguration	1.1. SSS ***reconfiguration*** task is ***verified*** from applicable ***documentation***
	1.2. Aircraft ***safety devices*** are checked in accordance with relevant ***technical publications and manuals***
	1.3. Correct ***SSS component*** is visually identified for reconfiguration
	1.4. Appropriate tools and ground support equipment are selected in accordance with the task
2. Remove SSS component	2.1. ***Firing devices*** are ***checked*** and removed if fitted
	2.2. SSS component is removed from aircraft in accordance with technical publications and manuals
	2.3. Protective covers and panels are fitted to aircraft and SSS component in accordance with technical publications and

	manuals
3. Install SSS component	3.1. Applicable protective covers and panels are removed from aircraft and SSS component in accordance with technical publications and manuals 3.2. SSS component is fitted to aircraft in accordance with technical publications and manuals
4. Complete and process documentation	4.1. ***Applicable*** documentation is completed for reconfigured SSS 4.2. Documentation is forwarded to MCS

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying safety procedures relating to aircraft SSS
- applying hand skills and applicable maintenance manuals in the removal and installation of SSS components
- using ground support equipment and test equipment
- determining SSS reconfiguration requirements
- explosive ordnance handling and safety
- manual handling of SSS components

Required knowledge

Look for evidence that confirms knowledge of:

- the aircraft operating and maintenance environment
- aircraft SSS and interfaces with the stores management system and other aircraft systems
- OHS procedures and policies
- explosive ordnance safety and handling procedures
- technical publications and manuals
- hardware and component attachment methods
- system and component test procedures
- technical documentation procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	A person who demonstrates competency in this unit must be able to reconfigure SSS by removing and installing system components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of aircraft SSS reconfiguration activities. It is essential that assessment confirms the ability to comply with organisational safety requirements and appropriate legislative and regulatory requirements while maintaining SSS systems. The ability to work safely within an explosive ordnance environment, conduct applicable tests and maintain relevant documentation is critical, including checking specifically for: • failure to check aircraft safety devices are installed • failure to ensure firing devices checked and removed, if fitted • commencing task prior to initiating documentation • failure to comply with relevant OHS procedures and policies. Evidence of transferability of skills and knowledge related to SSS system component removal and installation is essential. This is to be established through demonstration of the ability to: • render the system safe • perform relevant inspections and tests • replace components • perform appropriate maintenance tasks. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a range of system reconfiguration tasks involving the SSS components listed in Groups 1 to 3 in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed on aircraft and/or simulator using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It

	is also expected that general and special purpose tools and ground support equipment would be used where appropriate.
Method of assessment	In addition to evidence provided in the Log of Industrial Experience assessment methods may include questioning and observation in operational or simulated environments. The unit may be assessed independently or in conjunction with unit MEA602A Remove and install aircraft stores management system components.
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Reconfiguration and verification activities	Reconfiguration may include: • removal of currently fitted SSS components • installation of specified SSS components Verified may include: • maintenance restrictions • aircraft tail number • aircraft entered as unserviceable • nil stores fitted
Documentation	Documentation may include: • EE500 • CAMM2 documents • SSS documentation
Safety devices	Safety devices may include: • earth lead • aircraft safety pins • aircraft switches

Technical publications and manuals	Technical publications and manuals may include: • aircraft publications • maintenance instruction manuals and process specifications • servicing or service bulletins or structural repair manuals • illustrated parts catalogues, aircraft wiring manuals or drawings • tooling, equipment or manufacturer's manuals • standard practices • enterprise aviation regulations and publications
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
SSS component	SSS components may include: 1. Bomb release unit 2. Pylon 3. Missile launcher
Firing devices and checking	Firing devices may include: • stores release cartridges • chaff and flares • gun system • missiles • loaded stores Checked may include: • visually • physically
Applicable	Applicable may include: • aircraft documentation • SSS component documentation
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Not applicable.

Co-requisite units

Not applicable

MEA604A Inspect, test and troubleshoot aircraft stores management systems and components

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Armament Certificate IV training pathway. It covers the competencies required to inspect, test and troubleshoot aircraft stores management systems (SMS) and components

The unit was developed from the ADF Enterprise unit DDDRARM401A Inspect, test and troubleshoot aircraft stores management systems and components and is equivalent to that unit.

Application of the Unit

This unit applies to members of the ADF who are required to apply explosive ordnance safety and handling procedures, hand skills and the use of maintenance documentation/publications in the inspection, testing and troubleshooting of SMS and components.

The unit applies to all aircraft with SMS.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA602A	Remove and install aircraft stores management system components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Prepare to inspect, test and troubleshoot aircraft SMS and components	1.1. The task is ***verified*** from applicable ***documentation***
	1.2. Aircraft ***safety devices*** are checked in accordance with relevant ***technical publications and manuals***
	1.3. Correct ***SMS component*** is visually identified for inspection, testing and troubleshooting
	1.4. Appropriate tools and ground support equipment are selected in accordance with the task
2. Inspect SMS component	2.1. ***Firing devices*** are ***checked*** and removed, if fitted
	2.2. SMS component is inspected in accordance with technical publications and manuals
	2.3. Aircraft is ***prepared*** for testing and troubleshooting of SMS component in accordance with technical publications and manuals
3. Test and troubleshoot SMS component	3.1. SMS component is functionally tested in accordance with applicable technical publications and manuals for evidence of serviceability or malfunction
	3.2. SMS component faults are identified in accordance with technical publications and manuals
	3.3. ***Specialist advice*** is obtained, when required, to assist with the troubleshooting process
	3.4. ***Corrective action*** is taken in accordance with technical publications and manuals
4. Complete and process documentation	4.1. ***Applicable*** documentation is completed for SMS component inspection, testing and troubleshooting
	4.2. Completed documentation is forwarded to MCS

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying all safety procedures relating to aircraft SMS
- applying hand skills and use of applicable maintenance manuals in removal and installation of SMS components
- using ground support equipment and test equipment
- applying logic processes, taking and interpreting measurements, using test equipment and appropriate documentation and manuals to isolate SMS malfunctions
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability
- explosive ordnance handling
- manual handling of SMS components

Required knowledge

Look for evidence that confirms knowledge of:

- the aircraft operating and maintenance environment
- aircraft SMS and interfaces with other aircraft systems
- OHS procedures and policies
- SMS and component test procedures
- explosive ordnance safety and handling procedures
- technical publications and manuals
- hardware and component attachment methods
- technical documentation procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot SMS and system components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of aircraft SMS and system component inspection, testing and troubleshooting activities. It is essential that assessment confirms the ability to comply with organisational safety requirements

	and appropriate legislative and regulatory requirements while maintaining SMS systems. The ability to work safely within an explosive ordnance environment, conduct applicable tests and maintain relevant documentation is critical, including checking specifically for: • failure to check aircraft safety devices are installed • failure to ensure firing devices checked and removed, if fitted • commencing task prior to initiating documentation • failure to comply with relevant OHS procedures and policies. Evidence of transferability of skills and knowledge related to SMS and system component inspection, testing and troubleshooting is essential. This is to be established through demonstration of the ability to: • render the system safe • perform relevant inspections and tests • troubleshoot faults and perform appropriate rectification action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a range of inspection, testing and troubleshooting tasks involving the SMS components listed in Groups 1 to 4 in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed on aircraft and/or simulator using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special purpose tools and ground support equipment would be used where appropriate.
Method of assessment	In addition to evidence provided in the Log of Industrial Experience assessment methods may include questioning and observation in operational or simulated environments.

	The unit may be assessed independently or in conjunction with unit MEA605A Inspect, test and troubleshoot aircraft stores suspension system and components.
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Task verification	Verified may include: • maintenance restrictions • aircraft tail number • aircraft entered as unserviceable • nil stores fitted
Documentation	Documentation may include: • EE500 • CAMM2 documents • SMS documentation
Safety devices	Safety devices may include: • earth lead • aircraft safety pins • aircraft switches
Technical publications and manuals	Technical publications and manuals may include: • aircraft publications • maintenance instruction manuals and process specifications • servicing or service bulletins or structural repair manuals • illustrated parts catalogues, aircraft wiring manuals or drawings • tooling, equipment or manufacturer's manuals • standard practices • enterprise aviation regulations and publications

Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
SMS component	SMS components may include: 1. Mission computer 2. Armament computer 3. Encoder/decoder 4. Control unit
Firing devices and checking	Firing devices may include: • stores release cartridges • chaff and flares • gun system • missiles • loaded stores Checked may include: • visually • physically
Aircraft preparation	Prepared may include: • panels opened • ground support equipment and test equipment connected
Specialist advice	Specialist advice may be obtained from: • subject matter experts • manufacturer • systems program office
Corrective action	Corrective action may include: • repair • component replacement
Applicable	Applicable may include: • aircraft documentation • SMS component documentation
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

MEA605A Inspect, test and troubleshoot aircraft stores suspension systems and components

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Armament Certificate IV training pathway. It covers the competencies required to inspect, test and troubleshoot aircraft stores suspension systems (SSS) and components.

The unit was developed from the ADF Enterprise unit DDDRARM402A Inspect, test and troubleshoot aircraft stores suspension systems and components and is equivalent to that unit.

Application of the Unit

This unit applies to members of the ADF who are required to apply explosive ordnance safety and handling procedures, hand skills and the use of maintenance documentation/publications in the inspection, testing and troubleshooting of SSS and components.

The unit applies to all aircraft fitted with SSS.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA603A	Remove and install aircraft stores suspension systems and components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Prepare to inspect, test and troubleshoot aircraft SSS and components	1.1. The task is ***verified*** from applicable ***documentation***
	1.2. Aircraft ***safety devices*** are checked in accordance with relevant ***technical publications and manuals***
	1.3. Correct ***SSS component*** is visually identified for inspection, testing and troubleshooting
	1.4. Appropriate tools and ground support equipment are selected in accordance with the task
2. Inspect SSS component	2.1. ***Firing devices*** are ***checked*** and removed if fitted
	2.2. SSS component is inspected in accordance with technical publications and manuals
	2.3. Aircraft is ***prepared*** for testing and troubleshooting of SSS component in accordance with technical publications and manuals
3. Test and troubleshoot SSS component	3.1. SSS component is functionally tested in accordance with applicable technical publications and manuals for evidence of serviceability or malfunction
	3.2. SSS component faults are identified in accordance with technical publications and manuals
	3.3. ***Specialist advice*** is obtained when required to assist with the troubleshooting process
	3.4. ***Corrective action*** is taken in accordance with technical publications and manuals
4. Complete and process documentation	4.1. ***Applicable*** documentation is completed for SSS component inspection, testing and troubleshooting
	4.2. Completed documentation is forwarded to MCS

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying all safety procedures relating to aircraft SSS
- applying hand skills in removal and installation of SSS components
- using ground support equipment and test equipment
- applying system and component knowledge and logical fault-finding procedures and applicable maintenance data in the troubleshooting of SSS and component faults
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability
- explosive ordnance safety and handling procedures
- manual handling of SMS components

Required knowledge

Look for evidence that confirms knowledge of:

- the aircraft operating and maintenance environment
- aircraft SSS and component operation and interfaces with other aircraft systems
- hardware and component attachment methods
- OHS procedures and policies
- explosive ordnance safety and handling procedures
- technical publications and manuals
- technical documentation procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot SSS and components while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of aircraft SSS and system component inspection, testing and troubleshooting activities. It is essential that assessment confirms the ability to comply with organisational safety requirements and appropriate legislative and regulatory requirements while maintaining SSS. The ability to work safely within

	an explosive ordnance environment, conduct applicable tests and maintain relevant documentation is critical, including checking specifically for: • failure to check aircraft safety devices are installed • failure to ensure firing devices checked and removed if fitted • commencing task prior to initiating documentation • failure to comply with relevant OHS procedures and policies. Evidence of transferability of skills and knowledge related to SSS and component inspection, testing and troubleshooting is essential. This is to be established through demonstration of the ability to: • render the system safe • perform relevant inspections and tests • troubleshoot faults and perform appropriate rectification action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on a range of inspection, testing and troubleshooting tasks involving the SSS components listed in Groups 1 to 3 in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed on aircraft and/or simulator using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special purpose tools and ground support equipment would be used where appropriate.
Method of assessment	In addition to evidence provided in the Log of Industrial Experience assessment methods may include questioning and observation in operational or simulated environments. The unit may be assessed independently or in conjunction with unit MEA604A Inspect, test and troubleshoot aircraft stores management system and

	components.
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Task verification	Task verification may include: • maintenance restrictions • aircraft tail number • aircraft entered as unserviceable • nil stores fitted
Documentation	Documentation may include: • EE500 • CAMM2 documents • SMS documentation
Safety devices	Safety devices may include: • earth lead • aircraft safety pins • aircraft switches
Technical publications and manuals	Technical publications and manuals may include: • aircraft publications • maintenance instruction manuals and process specifications • servicing or service bulletins or structural repair manuals • illustrated parts catalogues, aircraft wiring manuals or drawings • tooling, equipment or manufacturer's manuals • standard practices • enterprise aviation regulations and publications
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the

	Evidence Guide
SSS component	SSS components may include: 1. Bomb release unit 2. Pylon 3. Missile launcher
Firing devices and checking	Firing devices may include: • stores release cartridges • chaff and flares • gun system • missiles • loaded stores Checked may include: • visually • physically
Aircraft preparation	Prepared may include: • panels opened • GSE and test equipment connected
Specialist advice	Specialist advice may be obtained from: • subject matter experts • manufacturer • systems program office
Corrective action	Corrective action may include: • repair • component replacement
Applicable	Applicable may include: • aircraft documentation • stores suspension system component documentation
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance activities • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable

AURVTP2003 Prepare spray painting materials and equipment

Modification History

Release	Comment
Release 1	Replaces AURV229749A Prepare spray painting materials and equipment Unit code updated to meet policy requirements Reference to OHS legislation replaced with new WHS legislation Licensing statement added to unit descriptor

Unit Descriptor

Unit descriptor	This unit of competency covers the skills and knowledge required to prepare spray painting materials and equipment for use. Licensing, legislative, regulatory or certification requirements may apply to this unit in some jurisdictions. Users are advised to check with the relevant regulatory authority.

Application of the Unit

Application of the unit	The unit includes identification and confirmation of work requirements, preparation for work, preparation of paint for spray guns, preparation of guns and associated equipment, and completion of work finalisation processes, including clean-up and documentation. Work requires individuals to demonstrate judgement and problem-solving skills in managing own work activities and contributing to a productive team environment.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work	1.1. Work instructions are used to determine job requirements, including method and material type. 1.2. Job specifications are read and interpreted. 1.3. Workplace health and safety (WHS) requirements, including personal protection needs, are observed throughout the work. 1.4. Materials are selected and inspected for quality. 1.5. Hand, power tooling and safety equipment are identified and checked for operation. 1.6. Procedures are determined to minimise waste material. 1.7. Procedures are identified for maximising energy efficiency while completing the job.
2. Prepare paint for spray gun(s)	2.1. Information is accessed and interpreted from manufacturer/ component supplier specifications. 2.2. Paints are mixed to conform to specification for type and colour, viscosity and temperature. 2.3. A test card is used for comparison of colour and

ELEMENT	PERFORMANCE CRITERIA
	texture. 2.4. Preparation activities are carried out according to industry regulations/guidelines, WHS requirements, legislation and enterprise procedures/policies. 2.5. Paint is prepared without causing damage to component or system. 2.6. Waste materials are stored and/or disposed of in accordance with statutory and enterprise requirements.
3. Prepare spray gun(s) for spraying	3.1. Information is accessed and interpreted from manufacturer/ component supplier specifications. 3.2. Preparation, maintenance and adjustment of spray painting equipment conforms to requirements of manufacturer/component supplier specifications. 3.3. Preparation activities are carried out according to industry regulations/guidelines, WHS requirements, legislation and enterprise procedures/policies. 3.4. Spray guns are prepared without causing damage to component or system.
4. Clean up work area and maintain equipment	4.1. Material that can be reused is collected and stored. 4.2. Waste and scrap is removed following workplace procedures. 4.3. Equipment and work area are cleaned and inspected for serviceable condition in accordance with workplace procedures. 4.4. Unserviceable equipment is tagged and faults identified in accordance with workplace procedures. 4.5. Operator maintenance is completed in accordance with manufacturer/component supplier specifications and worksite procedures. 4.6. Tooling is maintained in accordance with workplace procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills

REQUIRED SKILLS AND KNOWLEDGE

Required skills include:

- collect, organise and understand information related to work orders, plans and safety procedures for preparing spray painting material and equipment
- communicate ideas and information to enable confirmation of work requirements and specifications, coordination of work with worksite supervisor, other workers and customers, and the reporting of work outcomes and problems
- plan and organise activities, including preparation and layout of worksite and obtaining of equipment and material to avoid backtracking, workflow interruptions or wastage
- work with others and in a team by recognising dependencies and using cooperative approaches to optimise workflow and productivity
- use mathematical ideas and techniques to calculate time, apply accurate measurements, calculate material requirements and establish quality checks
- establish safe and effective work processes which anticipate and/or resolve problems and downtime, to systematically develop solutions to avoid or minimise reworking and wastage
- use workplace technology related to the preparation of spray painting material and equipment, including the use of specialist tooling, measuring equipment and communication devices and the reporting/documenting of results

Required knowledge

Required knowledge includes:

- WHS cleaning materials, equipment, material and personal safety requirements
- environmental protection requirements
- material storage, handling and disposal/material safety data sheets
- types of paints, including acrylic lacquers, solids, clear over base, air dry and polyurethane, and two component systems
- paint application methods
- spray guns and their application
- manufacturer/component supplier specifications for spray gun set-up and maintenance
- equipment preparation procedures
- paint mixing techniques
- paint drying methods
- work organisation and planning processes
- enterprise quality processes

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that competence is fully observed and there is ability to transfer competence to changing circumstances and to respond to unusual situations in the critical aspects of: • observing safety procedures and requirements • communicating effectively with others involved in or affected by the work • selecting methods and techniques appropriate to the circumstances • completing preparatory activity in a systematic manner • applying environmental procedures • preparing automotive paint to specifications • preparing spray guns and associated equipment to manufacturer/component supplier requirements.

Context of, and specific resources for assessment	• Application of competence is to be assessed in the workplace or simulated worksite.
	• Assessment is to occur using standard and authorised work practices, safety requirements and environmental constraints.
	• Assessment is to comply with regulatory requirements, including Australian Standards.
	• The following resources should be made available:
	  • workplace location or simulated workplace
	  • material relevant to the preparation of spray painting material and equipment
	  • equipment, hand and power tooling appropriate to the preparation of spray painting material and equipment
	  • activities covering mandatory task requirements
	  • specifications and work instructions.

Method of assessment	• Assessment must satisfy the endorsed Assessment Guidelines of the Automotive Industry Retail, Service and Repair Training Package. • Assessment methods must confirm consistency and accuracy of performance together with application of underpinning knowledge.

EVIDENCE GUIDE	
	• Assessment must be by direct observation of tasks, with questioning on underpinning knowledge and it must also reinforce the integration of key competencies. • Assessment may be applied under project-related conditions and require evidence of process. • Assessment must confirm a reasonable inference that competence is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances. • It is preferable that assessment reflects a process rather than an event and occurs over a period of time to cover varying quality circumstances. Evidence of performance may be provided by customers, team leaders/members or other persons subject to agreed authentication arrangements. • Competence in this unit may be assessed in conjunction with other functional units which together form part of the holistic work role.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Methods	Methods are to include: • spray gun techniques • various spraying techniques • drying procedures • paint mixing methods • paint straining methods • paint thinning methods
WHS	WHS requirements are to be in accordance with legislation/regulations/codes of practice and enterprise safety policies and procedures. This may include:

RANGE STATEMENT	
	• protective clothing and equipment • use of tooling and equipment • workplace environment and safety • handling of material • use of firefighting equipment • enterprise first aid • hazard control and hazardous material and substances
Personal protective equipment	Personal protective equipment is to include that prescribed under legislation/regulation/codes of practice and workplace policies and practices
Safe operating procedures	Safe operating procedures are to include, but are not limited to: • operational risk assessment and treatments associated with vehicular movement, toxic substances, electrical safety, machinery movement and operation, manual and mechanical lifting and shifting, working in proximity to others and worksite visitors
Emergency procedures	Emergency procedures related to this unit are to include, but are not limited to: • emergency shutdown and stopping of equipment • extinguishing fires • enterprise first aid requirements • worksite evacuation
Environmental requirements	Environmental requirements are to include, but are not limited to: • waste management, noise, dust and clean-up management
Quality requirements	Quality requirements are to include, but are not limited to: • regulations, including Australian standards • internal company quality policies and standards • enterprise operations and procedures
Statutory/regulatory authorities	Statutory/regulatory authorities may include: • federal, state/territory and local authorities

RANGE STATEMENT	
	administering Acts, regulations and codes of practice
Tooling and equipment	Tooling and equipment may include: • tinting machines • microfiche, scales • air-operated agitators • hand paddles • mixing banks • spray gun stem strainers • funnel strainers • mesh strainers • nylon stocking weave • vacuum paint strainers • viscosity measuring equipment • high-volume low-pressure spray guns • gravity feed spray guns • suction feed spray guns • pressure regulators • air compressors • spray booths • baking ovens • heating and lighting systems
Materials	Materials may include: • acrylic lacquers • air dry synthetic enamels • two-pack urethane acrylic enamels • metallic two-pack enamels • clear acrylic lacquers • metallic acrylic lacquers • pearl finishes • water-based finishes • paint thinners and paint reducers
Communications	Communications are to include, but are not limited to: • verbal and visual instructions and fault reporting and may include worksite specific instructions, written instructions, plans or instructions related to job/task, telephones and pagers

RANGE STATEMENT	
Information/documents	Sources of information/documents may include: • verbal or written and graphical instructions, signage, work schedules/plans/specifications, work bulletins, memos, material safety data sheets (MSDS), diagrams or sketches • safe work procedures related to the preparation of spray painting material and equipment • regulatory/legislative requirements pertaining to automotive painting and finishing • engineer's design specifications and instructions • organisation work specifications and requirements • instructions issued by authorised enterprise or external persons • Australian standards

Unit Sector(s)

Unit sector	Vehicle body

Co-requisite units

Not applicable.

Competency field

Competency field	Technical - Paint

AURVTP3012 Apply air dry and polyurethane enamel refinishing materials

Modification History

Release	Comment
Release 1	Replaces AURV329603DA Apply air dry and polyurethane enamel refinishing materials Unit code updated to meet policy requirements Reference to OHS legislation replaced with new WHS legislation Licensing statement added to unit descriptor

Unit Descriptor

Unit descriptor	This unit covers the competence required to apply air dry and polyurethane enamel refinishing materials to a variety of vehicle substrates by spray gun application and determine causes and rectification procedures for paint finish faults. Licensing, legislative, regulatory or certification requirements may apply to this unit in some jurisdictions. Users are advised to check with the relevant regulatory authority.

Application of the Unit

Application of the unit	The unit includes identification and confirmation of work requirement, preparation for work, application of materials, the rectification of faults and completion of work finalisation processes, including clean-up and documentation. Work requires individuals to demonstrate judgement and problem-solving skills in managing own work activities and contributing to a productive team environment.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work	1.1. Work instructions are used to determine the job requirements, including job sheets, material type, colour, quality and quantity. 1.2. Job specifications are read and interpreted. 1.3. WHS requirements, including personal protection needs, breathing apparatus and full body protection, are observed throughout the work. 1.4. Materials are selected and inspected for quality. 1.5. Hand tooling and safety equipment are identified and checked for operation. 1.6. Procedures are determined to minimise waste material. 1.7. Procedures are identified for maximising energy efficiency while completing the job.

ELEMENT	PERFORMANCE CRITERIA
2. Identify paint faults, causes and rectification procedures	2.1. Paint faults are identified according to industry and workplace procedures. 2.2. Paint fault causes are determined according to industry and workplace procedures. 2.3. Rectification procedures are determined according to fault and type of finish material according to industry standard practices and workplace requirements. 2.4. Identification and determination activities are carried out according to industry regulations/guidelines, WHS legislation, and enterprise procedures/policies.
3. Apply air dry and polyurethane enamel refinishing materials by spray gun	3.1. The environment for application of refinishing materials conforms to requirements for temperature, extraction of fumes and cleanliness. 3.2. Refinishing materials are applied at manufacturer/ component supplier recommended intervals using approved methods. 3.3. Refinishing materials are dried using approved methods and equipment. 3.4. Refinishing materials are applied without causing damage to any component or system. 3.5. The finish produced meets specifications for colour, texture, depth and gloss and is contaminant-free. 3.6. Surface refinishing is completed within approved timeframes. 3.7. Application activities are carried out according to industry regulations/guidelines, WHS legislation, and enterprise procedures/policies.
4. Clean up work area and maintain equipment	4.1. Material that can be reused is collected and stored. 4.2. Waste material is removed and disposed of or stored according to statutory and workplace procedure. 4.3. Spray equipment is cleaned as specified by manufacturer/ component supplier and/or workplace policy and procedures. 4.4. Work area is cleaned and inspected for serviceable condition in accordance with workplace procedures. 4.5. Unserviceable equipment is tagged and faults identified in accordance with workplace procedures. 4.6. Operator maintenance is completed in accordance with manufacturer/component supplier specifications and worksite procedures. 4.7. Tooling is maintained in accordance with workplace

ELEMENT	PERFORMANCE CRITERIA
	procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
• collect, organise and understand information related to work orders, plans and safety procedures for applying air dry and polyurethane enamel refinishing materials • communicate ideas and information to enable confirmation of work requirements and specifications, coordination of work with worksite supervisor, other workers and customers, and the reporting of work outcomes and problems • plan and organise activities, including preparation and layout of worksite and obtaining of equipment and materials to avoid backtracking, workflow interruptions or wastage • work with others and in a team by recognising dependencies and using cooperative approaches to optimise workflow and productivity • establish safe and effective work processes which anticipate and/or resolve problems and downtime, to systematically develop solutions to avoid or minimise reworking and avoid wastage • use mathematical ideas and techniques to calculate time, apply accurate measurements, calculate material requirements and establish quality checks • use workplace technology related to application of air dry and polyurethane enamel refinishing materials, including the use of specialist equipment, measuring equipment and communication devices and the reporting/recording of results
Required knowledge
A working knowledge of: • WHS regulations/requirements, equipment, material and personal safety requirements • environmental protection requirements/substance disposal and storage requirements • material safety data sheets • types of air dry and polyurethane enamel refinishing materials • application methods • paint surface fault identification and rectification procedures • drying methods for air dry and polyurethane enamel refinishing material

REQUIRED SKILLS AND KNOWLEDGE
• types of spray guns • spray gun operation and spraying techniques • spray gun cleaning methods • work organisation and planning processes • enterprise quality processes

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that competence is fully observed and there is ability to transfer competence to changing circumstances and to respond to unusual situations in the critical aspects of: • observing safety procedures and requirements • communicating effectively with others involved in or affected by the work • selecting methods and techniques appropriate to the circumstances • completing preparatory activity in a systematic manner • preparing air dry and polyurethane enamel paint • applying a range of air dry and polyurethane enamel refinishing materials • identifying paint faults and determining rectification faults • rectifying faults • applying environmental procedures.
Context of, and specific resources for assessment	Application of competence is to be assessed in the workplace or simulated worksite. Assessment is to occur using standard and authorised work practices, safety requirements and environmental constraints. Assessment is to comply with regulatory requirements, including Australian Standards. The following resources should be made available: • workplace location or simulated workplace • materials relevant to application of air dry and

EVIDENCE GUIDE	
	polyurethane enamel refinishing materials • equipment, hand and power tooling appropriate to application of air dry and polyurethane enamel refinishing materials • activities covering mandatory task requirements • specifications and work instructions.
Method of assessment	• Assessment must satisfy the endorsed assessment guidelines of the automotive industry's RS&R Training Package. • Assessment methods must confirm consistency and accuracy of performance together with application of underpinning knowledge. • Assessment must be by direct observation of tasks, with questioning on underpinning knowledge and it must also reinforce the integration of key competencies. • Assessment may be applied under project related conditions and require evidence of process. • Assessment must confirm a reasonable inference that competence is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances. • It is preferable that assessment reflects a process rather than an event and occurs over a period of time to cover varying quality circumstances. Evidence of performance may be provided by customers, team leaders/members or other persons subject to agreed authentication arrangements. • Competence in this unit may be assessed in conjunction with other functional units which together form part of the holistic work role.
Guidance information for assessment	

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential

RANGE STATEMENT	
operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Paint types	Paint types are to include air dry synthetic enamels, enamel additives, two-pack polyurethane acrylic enamels, urethane additives and paint reducers.
Methods	Methods are to include: • spray gun selection, various spraying techniques, drying procedures, paint mixing • polishing and detailing of surfaces.
WHS	WHS requirements are to be in accordance with legislation/regulations/codes of practice and enterprise safety policies and procedures. This may include protective clothing and equipment, use of tooling and equipment, workplace environment and safety, handling of materials, use of fire fighting equipment, enterprise first aid, hazard control and hazardous materials and substances.
Personal protective equipment	Personal protective equipment is to include that prescribed under legislation/regulation/codes of practice and workplace policies and practices.
Safe operating procedures	Safe operating procedures are to include, but are not limited to operational risk assessment and treatments associated with vehicular movement, toxic substances, electrical safety, machinery movement and operation, manual and mechanical lifting and shifting, working in proximity to others and worksite visitors.
Emergency procedures	Emergency procedures related to this unit are to include, but are not limited to emergency shutdown and stopping of equipment, extinguishing fires, enterprise first aid requirements and worksite evacuation.
Environmental requirements	Environmental requirements are to include but are not limited to waste management, noise, dust and clean-up management.

RANGE STATEMENT	
Quality requirements	Quality requirements are to include, but are not limited to regulations, including Australian Standards, internal company quality policy and standards and enterprise operations and procedures.
Statutory/regulatory authorities	Statutory/regulatory authorities may include Federal, State/Territory and local authorities administering acts, regulations and codes of practice.
Tooling and equipment	Tooling and equipment may include various spray guns, air pressure regulators, air compressors, spray booths, baking ovens, heating and lighting systems, strainers, masking equipment and safety equipment.
Materials	Materials may include rags, tac rags, cleaning solvents and cleaning materials.
Communications	Communications are to include, but are not limited to verbal and visual instructions and fault reporting and may include worksite specific instructions, written instructions, plans or instructions related to job/task, telephones and pagers.
Information/documents	Sources of information/documents may include: • verbal or written and graphical instructions, signage, work schedules/plans/specifications, work bulletins, memos, material safety data sheets, diagrams or sketches • safe work procedures related to application of air dry and polyurethane enamel refinishing materials • regulatory/legislative requirements pertaining to automotive painting and finishing • engineer's design specifications and instructions • organisation work specifications and requirements • instructions issued by authorised enterprise or external persons • Australian Standards.

Unit Sector(s)

Unit sector	Vehicle body

Co-requisite units

Not applicable.

Competency field

Competency field	Technical - Paint

AURVTT2004 Trim vehicle components

Modification History

Release	Comment
Release 1	Replaces AURV231208A Carry out trimming of vehicle components Unit code updated to meet policy requirements Minor changes to unit title Reference to OHS legislation replaced with new WHS legislation Licensing statement added to unit descriptor

Unit Descriptor

Unit descriptor	This unit of competency covers the skills and knowledge required to measure, cut, fabricate and attach material covers to vehicle components. Licensing, legislative, regulatory or certification requirements may apply to this unit in some jurisdictions. Users are advised to check with the relevant regulatory authority.

Application of the Unit

Application of the unit	The unit includes identification and confirmation of work requirements, preparation for work, matching, measuring, cutting, fabricating and attaching of material covers to vehicle components, and completion of work finalisation processes, including clean-up and documentation. Work requires individuals to demonstrate judgement and problem-solving skills in managing own work activities and contributing to a productive team environment.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work	1.1. Work instructions are used to determine job requirements, including method, process and equipment. 1.2. Job specifications are read and interpreted. 1.3. Workplace health and safety (WHS) requirements, including personal safety needs, are observed throughout the work. 1.4. Equipment and tooling are identified and checked for safe and effective operation. 1.5. Procedures are determined to minimise task time.
2. Match material	2.1. Information is accessed and interpreted from manufacturer/ component supplier specifications. 2.2. Matching procedures are carried out in accordance with manufacturer/component supplier

ELEMENT	PERFORMANCE CRITERIA
	specifications. 2.3. Matching procedures are completed within established industry enterprise guidelines. 2.4. Activities are carried out according to industry regulations/ guidelines, WHS requirements, legislation and enterprise procedures/policies.
3. Measure and cut material	3.1. Information is accessed and interpreted from manufacturer/ component supplier specifications. 3.2. Measuring and cutting procedures are carried out in accordance with manufacturer/component supplier specifications. 3.3. Measuring and cutting procedures are completed within established industry enterprise guidelines. 3.4. Activities are carried out according to industry regulations/ guidelines, WHS requirements, legislation and enterprise procedures/policies.
4. Fabricate trim/covers to suit vehicle/ components	4.1. Information is accessed and interpreted from manufacturer/ component supplier specifications. 4.2. Trim/cover fabrication procedures are carried out in accordance with manufacturer/component supplier specifications. 4.3. Fabrication procedures are completed within established industry enterprise guidelines. 4.4. Activities are carried out according to industry regulations/guidelines, WHS requirements, legislation and enterprise procedures/policies.
5. Attach material cover to vehicle/component	5.1. Information is accessed and interpreted from manufacturer/ component supplier specifications. 5.2. Attaching procedures are carried out in accordance with manufacturer/component supplier specifications. 5.3. Attaching procedures are completed within established industry/enterprise guidelines. 5.4. Activities are carried out according to industry regulations/ guidelines, WHS requirements, legislation and enterprise procedures/policies.
6. Clean up work area and maintain equipment	6.1. Material that can be reused is collected and stored. 6.2. Waste and scrap is removed following workplace procedure. 6.3. Equipment and work area are cleaned and inspected for serviceable condition in accordance with

ELEMENT	PERFORMANCE CRITERIA
	workplace procedures. 6.4. Unserviceable equipment is tagged and faults identified in accordance with workplace requirements. 6.5. Operator maintenance is completed in accordance with manufacturer/component supplier specifications and worksite procedures. 6.6. Tooling and equipment is maintained in accordance with workplace procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Required skills include: • collect, organise and understand information related to work orders, plans and safety procedures for trimming of vehicle components • technical literacy and communication skills sufficient to interpret and apply common industry terminology, and interpret technical information and specifications • research and interpretive skills to locate, interpret and apply operational and safety information • communicate ideas and information to enable confirmation of work requirements and specifications, coordination of work with worksite supervisor, other workers and customers, and the reporting of work outcomes and problems • plain English literacy and communication skills in relation to dealing with others involved in the work • questioning and active listening skills, for example when obtaining information regarding trimming requirements • plan and organise activities, including preparation and layout of worksite and obtaining of equipment and material to avoid backtracking or workflow interruptions • work with others and in a team by recognising dependencies and using cooperative approaches to optimise workflow and productivity • use mathematical ideas and techniques to complete tests and measurements to determine trimming requirements • use pre-checking and inspection techniques to anticipate planning and scheduling

REQUIRED SKILLS AND KNOWLEDGE
problems, avoid wastage of time and material • manipulative and dexterity skills to perform trimming activities • problem-solving skills for a range of differing procedural issues • use workplace technology related to carrying out trimming of vehicle components, including the use of specialist tooling, measuring equipment and communication devices and the reporting/documenting of results
Required knowledge
Required knowledge includes: • WHS cleaning materials, equipment, material and personal safety requirements • removal and replacement methods • measuring/testing and adjustment procedures • technical and legal requirements • manufacturer/component supplier/company policies • types and uses of various materials • trim fabrication, matching, measuring and cutting procedures • use of tooling and equipment • work organisation and planning processes • enterprise quality processes

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that competence is fully observed and there is ability to transfer competence to changing circumstances and to respond to unusual situations in the critical aspects of: • observing safety procedures and requirements • communicating effectively with others involved in or affected by the work • selecting methods and techniques appropriate to the circumstances • completing preparatory activity in a systematic manner

EVIDENCE GUIDE	
	• fabricating covers/trims • repairing material covers/trims • replacing material covers/trims • adjusting material covers/trims • completing workplace records.

Context of, and specific resources for assessment	• Application of competence is to be assessed in the workplace or simulated worksite.
	• Assessment is to occur using standard and authorised work practices, safety requirements and environmental constraints.
	• Assessment is to comply with regulatory requirements, including Australian Standards.
	• The following resources should be made available:
	  • workplace location or simulated workplace
	  • material relevant to carrying out trimming of vehicle components
	  • equipment, hand and power tooling appropriate to carrying out trimming of vehicle components
	  • activities covering mandatory task requirements
	  • specifications and work instructions.

Method of assessment	• Assessment must satisfy the endorsed Assessment Guidelines of the Automotive Industry Retail, Service and Repair Training Package. • Assessment methods must confirm consistency and accuracy of performance together with application of underpinning knowledge. • Assessment must be by direct observation of tasks, with questioning on underpinning knowledge and it must also reinforce the integration of key competencies. • Assessment may be applied under project-related conditions and require evidence of process. • Assessment must confirm a reasonable inference that competence is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances. • It is preferable that assessment reflects a process rather than an event and occurs over a period of time to cover varying quality circumstances. Evidence of performance may be provided by customers, team leaders/members or other persons subject to agreed authentication arrangements. • Competence in this unit may be assessed in conjunction

EVIDENCE GUIDE	
	with other functional units which together form part of the holistic work role.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Trimming methods	Trimming methods are to include: • sewing, gluing, riveting, cutting, forming and stapling
Vehicles	Vehicles may include: • marine craft aircraft • light and heavy vehicles and equipment
WHS	WHS requirements are to be in accordance with legislation/regulations/codes of practice and enterprise safety policies and procedures. This may include: • protective clothing and equipment • use of tooling and equipment • workplace environment and safety • handling of material • use of firefighting equipment • enterprise first aid • hazard control and hazardous material and substances
Personal protective equipment	Personal protective equipment is to include that prescribed under legislation/regulation/codes of practice and workplace policies and practices
Safe operating procedures	Safe operating procedures are to include, but are not limited to: • operational risk assessment and treatments

RANGE STATEMENT	
	associated with vehicular movement, toxic substances, electrical safety, machinery movement and operation, manual and mechanical lifting and shifting, working in proximity to others and worksite visitors.
Emergency procedures	Emergency procedures related to this unit are to include, but are not limited to: • emergency shutdown and stopping of equipment • extinguishing fires • enterprise first aid requirements • worksite evacuation
Environmental requirements	Environmental requirements are to include but are not limited to waste management, noise, dust and clean-up management
Quality requirements	Quality requirements are to include, but are not limited to: • regulations, including Australian standards • internal company quality policies and standards • enterprise operations and procedures
Statutory/regulatory authorities	Statutory/regulatory authorities may include: • federal, state/territory and local authorities administering Acts, regulations and codes of practice
Tooling and equipment	Tooling and equipment may include: • hand tooling • power/air tooling • specialist tooling for dismantling/assembly • staple gun • hammers • wad punches • heat gun • foam cutter • scissors and knives • revolving hole punch • ruler and tape • hand clamps

RANGE STATEMENT	
	• adhesive gun • pop rivet kit • punch and die set • hog ring pliers • door handle remover • hacksaw • sander • staple and tack remover • scrapers and putty knives • stuffing irons • vacuum formers
Materials	Materials may include: • fabrics and cleaning materials
Communications	Communications are to include, but are not limited to: • verbal and visual instructions and fault reporting and may include worksite specific instructions, written instructions, plans or instructions related to job/task, telephones and pagers
Information/documents	Sources of information/documents may include: • verbal or written and graphical instructions, signage, work schedules/plans/specifications, work bulletins, memos, material safety data sheets (MSDS), diagrams or sketches • Safe work procedures related to carrying out trimming of vehicle components • Regulatory/legislative requirements pertaining to automotive industry, including Australian Design Rules • Engineer's design specifications and instructions • Organisation work specifications and requirements • Instructions issued by authorised enterprise or external persons • Australian standards

Unit Sector(s)

Unit sector	Vehicle body

Co-requisite units

Not applicable.

Competency field

Competency field	Technical - Trimming and Upholstery

AURVTT2005 Select and apply trim and fabric materials

Modification History

Release	Comment
Release 1	Replaces AURV231268A Select and apply trim/fabric materials and determine attachment methods Unit code updated to meet policy requirements Minor changes to unit title Reference to OHS legislation replaced with new WHS legislation Licensing statement added to unit descriptor

Unit Descriptor

Unit descriptor	This unit of competency covers the skills and knowledge required to select trim/fabric materials and determine methods of attaching trim/fabric materials. Licensing, legislative, regulatory or certification requirements may apply to this unit in some jurisdictions. Users are advised to check with the relevant regulatory authority.

Application of the Unit

Application of the unit	The unit includes identification and confirmation of work requirements, preparation for work, selection of trim/fabric material for specific applications, selection of the methods of attachment of material to vehicle components, and completion of work finalisation processes, including clean-up and documentation. Work requires individuals to demonstrate judgement and problem-solving skills in managing own work activities and contributing to a productive team environment.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work	1.1. Work instructions are used to determine job requirements, including method, process and equipment. 1.2. Job specifications are read and interpreted. 1.3. Workplace health and safety (WHS) requirements, including personal safety needs, are observed throughout the work. 1.4. Equipment and tooling are identified and checked for safe and effective operation. 1.5. Procedures are determined to minimise task time.
2. Select trim/fabric materials	2.1. Information is accessed and interpreted from manufacturer/ component supplier specifications. 2.2. Material applications and usages are compared with the job requirements.

ELEMENT	PERFORMANCE CRITERIA
	2.3. The material selected is that which best meets the user requirement. 2.4. Activities are carried out according to industry regulations/ guidelines, WHS requirements, legislation and enterprise procedures/policies.
3. Determine attachment methods	3.1. Information is accessed and interpreted from manufacturer/ component supplier specifications. 3.2. Attachment options are identified and analysed. 3.3. Attachment option is selected. 3.4. Selected option is documented.
4. Clean up work area and maintain equipment	4.1. Equipment and work area are cleaned and inspected for serviceable condition in accordance with workplace procedures. 4.2. Operator maintenance is completed in accordance with manufacturer/component supplier specifications and worksite procedures. 4.3. Equipment is maintained in accordance with workplace procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- collect, organise and understand information related to work orders, plans and safety procedures for selection and application of trim/fabric materials
- technical literacy and communication skills sufficient to interpret and apply common industry terminology, and interpret technical information and specifications
- research and interpretive skills to locate, interpret and apply operational and safety information
- communicate ideas and information to enable confirmation of work requirements and specifications, coordination of work with worksite supervisor, other workers and customers, and the reporting of work outcomes and problems
- plain English literacy and communication skills in relation to dealing with others involved in the work

REQUIRED SKILLS AND KNOWLEDGE
• questioning and active listening skills, for example when obtaining information relating to selection and application of trim/fabric materials • plan and organise activities, including preparation and layout of worksite and obtaining of equipment and material to avoid backtracking or workflow interruptions • work with others and in a team by recognising dependencies and using cooperative approaches to optimise workflow and productivity • use mathematical ideas and techniques to complete tests and measurements to determine selection and application of trim/fabric materials • establish safe and effective work processes which anticipate and/or resolve problems and downtime, to systematically develop solutions to avoid or minimise reworking and wastage • use workplace technology related to selection and application of trim/fabric materials, including the use of measuring equipment, computerised technology and communication devices and the reporting/documenting of results
Required knowledge
Required knowledge includes: • WHS cleaning materials, equipment, material and personal safety requirements • manufacturer/component supplier/company specifications • trim/fabric material types and their application • selection procedures to determine trim/fabric material requirements • methods of attachment of trim/fabric materials • work organisation and planning processes • enterprise quality processes

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that competence is fully observed and there is ability to transfer competence to changing circumstances and to respond to unusual situations in the critical aspects of: • observing safety procedures and requirements • communicating effectively with others involved in or

EVIDENCE GUIDE	
	affected by the work • completing preparatory activity in a systematic manner • selecting trim/fabric materials for a range of specified jobs • determine attachment methods to be used for a range of specified jobs.

Context of, and specific resources for assessment	• Application of competence is to be assessed in the workplace or simulated worksite.
	• Assessment is to occur using standard and authorised work practices, safety requirements and environmental constraints.
	• Assessment is to comply with regulatory requirements, including Australian Standards.
	• The following resources should be made available:
	  • workplace location or simulated workplace
	  • materials relevant to selection and determination of attachment methods of trim/fabric materials
	  • equipment, hand and power tooling appropriate to selection and determination of attachment methods of trim/fabric materials
	  • activities covering mandatory task requirements
	  • specifications and work instructions.

Method of assessment	• Assessment must satisfy the endorsed Assessment Guidelines of the Automotive Industry Retail, Service and Repair Training Package. • Assessment methods must confirm consistency and accuracy of performance together with application of underpinning knowledge. • Assessment must be by direct observation of tasks, with questioning on underpinning knowledge and it must also reinforce the integration of key competencies. • Assessment may be applied under project-related conditions and require evidence of process. • Assessment must confirm a reasonable inference that competence is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances. • It is preferable that assessment reflects a process rather than an event and occurs over a period of time to cover varying quality circumstances. Evidence of performance may be provided by customers, team leaders/members or other persons subject to agreed authentication arrangements.

EVIDENCE GUIDE	
	• Competence in this unit may be assessed in conjunction with other functional units which together form part of the holistic work role.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Methods	Methods to be considered are to include: • clamping, crimping, gluing and sewing
Trim/fabric materials	Trim/fabric materials may be attached to: • passenger/commercial vehicles • plant and agricultural equipment • recreational equipment • mining equipment • marine craft and aircraft
WHS	WHS requirements are to be in accordance with legislation/regulations/codes of practice and enterprise safety policies and procedures. This may include: • protective clothing and equipment • use of tooling and equipment • workplace environment and safety • handling of material • use of firefighting equipment • enterprise first aid • hazard control and hazardous material and substances
Personal protective equipment	Personal protective equipment is to include that prescribed under legislation/regulation/codes of practice and workplace policies and practices

RANGE STATEMENT	
Safe operating procedures	Safe operating procedures are to include, but are not limited to: • operational risk assessment and treatments associated with electrical safety, machinery movement and operation, manual and mechanical lifting and shifting, working in proximity to others and worksite visitors
Emergency procedures	Emergency procedures related to this unit are to include, but are not limited to: • extinguishing fires • enterprise first aid requirements • worksite evacuation
Environmental requirements	Environmental requirements are to include but are not limited to: • waste management and clean-up management
Quality requirements	Quality requirements are to include, but are not limited to: • regulations, including Australian standards • internal company quality policies and standards • enterprise operations and procedures
Statutory/regulatory authorities	Statutory/regulatory authorities may include: • federal, state/territory and local authorities administering Acts, regulations and codes of practice
Tooling and equipment	Tooling and equipment may include: • computers
Materials	Materials may include: • fabric and cleaning materials
Communications	Communications are to include, but are not limited to: • verbal and visual instructions and may include worksite specific instructions, written instructions, plans or instructions related to job/task
Information/documents	Sources of information/documents may include:

RANGE STATEMENT	
	• verbal or written and graphical instructions, catalogues, colour charts, vehicle details, material safety data sheets (MSDS), diagrams or sketches • regulatory/legislative requirements pertaining to trim/fabric materials • organisation work specifications and requirements • instructions issued by authorised enterprise or external persons • Australian standards

Unit Sector(s)

Unit sector	Vehicle body

Co-requisite units

Not applicable.

Competency field

Competency field	Technical - Trimming and Upholstery

AURVTT2006 Select and apply trim and fabric adhesives

Modification History

Release	Comment
Release 1	Replaces AURV231368A Select and apply trim/fabric adhesives Unit code updated to meet policy requirements Minor changes to unit title Reference to OHS legislation replaced with new WHS legislation Licensing statement added to unit descriptor

Unit Descriptor

Unit descriptor	This unit of competency covers the skills and knowledge required to select, prepare and apply trim/fabric adhesives. Licensing, legislative, regulatory or certification requirements may apply to this unit in some jurisdictions. Users are advised to check with the relevant regulatory authority.

Application of the Unit

Application of the unit	The unit includes identification and confirmation of work requirements, preparation for work, selection, preparation and application of trim adhesives, and completion of work finalisation processes, including clean-up and documentation. This unit may be applied in relation to heavy vehicles, plant and agricultural equipment, recreational craft, mining equipment, marine craft and aircraft. Work requires individuals to demonstrate judgement and problem-solving skills in managing own work activities and contributing to a productive team environment.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work	1.1. Work instructions are used to determine job requirements, including method, process and equipment. 1.2. Job specifications are read and interpreted. 1.3. Workplace health and safety (WHS) requirements, including personal safety needs, are observed throughout the work. 1.4. Equipment and tooling are identified and checked for safe and effective operation. 1.5. Procedures are determined to minimise task time.
2. Select adhesive	2.1. Information is accessed and interpreted from manufacturer/component supplier specifications. 2.2. Adhesives are selected according to material type and adhesive produce/manufacturer/component supplier

ELEMENT	PERFORMANCE CRITERIA
	recommendations. 2.3. Activities are carried out according to industry regulations/guidelines, WHS requirements, legislation and enterprise procedures/policies.
3. Prepare surfaces and apply adhesive	3.1. Information is accessed and interpreted from manufacturer/ component supplier specifications. 3.2. Adhesive surface preparation and application procedures are carried out in accordance with adhesive product/ manufacturer/component supplier specifications. 3.3. Work is completed without causing damage to component or system. 3.4. Activities are carried out according to industry regulations/ guidelines, WHS requirements, legislation and enterprise procedures/policies.
4. Clean up work area and maintain equipment	4.1. Material that can be reused is collected and stored. 4.2. Waste and scrap is removed following workplace procedure. 4.3. Equipment and work area are cleaned and inspected for serviceable condition in accordance with workplace procedures. 4.4. Unserviceable equipment is tagged and faults identified in accordance with workplace requirements. 4.5. Operator maintenance is completed in accordance with manufacturer/component supplier specifications and worksite procedures. 4.6. Tooling and equipment is maintained in accordance with workplace procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Required skills include: • collect, organise and understand information related to work orders, plans and safety procedures for selection, preparation and application of adhesives

REQUIRED SKILLS AND KNOWLEDGE

- technical literacy and communication skills sufficient to interpret and apply common industry terminology, and interpret technical information and specifications
- research and interpretive skills to locate, interpret and apply operational and safety information
- communicate ideas and information to enable confirmation of work requirements and specifications, coordination of work with worksite supervisor, other workers and customers, and the reporting of work outcomes and problems
- plain English literacy and communication skills in relation to dealing with others involved in the work
- questioning and active listening skills, for example when obtaining information for selection, preparation and application of adhesives
- plan and organise activities, including preparation and layout of worksite and obtaining of equipment and material to avoid backtracking or workflow interruptions
- work with others and in a team by recognising dependencies and using cooperative approaches to optimise workflow and productivity
- use mathematical ideas and techniques to complete tests and measurements to determine selection, preparation and application of adhesives
- use pre-checking and inspection techniques to anticipate planning and scheduling problems, avoid wastage of time and material
- manipulative and dexterity skills to perform the preparation and application of adhesives
- problem-solving skills for a range of differing procedural issues
- use workplace technology related to selection and application of trim/fabric adhesives, including the use of specialist tooling and equipment, measuring equipment and communication devices and the reporting/documenting of results

Required knowledge

Required knowledge includes:

- WHS cleaning materials, equipment, material and personal safety requirements
- technical information
- product safety requirements
- manufacturer/component supplier/company policies
- adhesive types and their application
- adhesive selection, preparation and application procedures
- work organisation and planning processes
- enterprise quality processes

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that competence is fully observed and there is ability to transfer competence to changing circumstances and to respond to unusual situations in the critical aspects of: • observing safety procedures and requirements • communicating effectively with others involved in or affected by the work • selecting methods and techniques appropriate to the circumstances • completing preparatory activity in a systematic manner • selecting and applying a range of trim/fabric adhesives • completing workplace records.

Context of, and specific resources for assessment	• Application of competence is to be assessed in the workplace or simulated worksite.
	• Assessment is to occur using standard and authorised work practices, safety requirements and environmental constraints.
	• Assessment is to comply with regulatory requirements, including Australian Standards.
	• The following resources should be made available:
	  • workplace location or simulated workplace
	  • materials relevant to selection and application of trim/ fabric adhesives
	  • equipment, hand and power tooling appropriate to selection and application of trim/fabric adhesives
	  • activities covering mandatory task requirements
	  • specifications and work instructions.

Method of assessment	• Assessment must satisfy the endorsed Assessment Guidelines of the Automotive Industry Retail, Service and Repair Training Package. • Assessment methods must confirm consistency and accuracy of performance together with application of underpinning knowledge. • Assessment must be by direct observation of tasks, with questioning on underpinning knowledge and it must also

EVIDENCE GUIDE	
	reinforce the integration of key competencies. • Assessment may be applied under project-related conditions and require evidence of process. • Assessment must confirm a reasonable inference that competence is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances. • It is preferable that assessment reflects a process rather than an event and occurs over a period of time to cover varying quality circumstances. Evidence of performance may be provided by customers, team leaders/members or other persons subject to agreed authentication arrangements. • Competence in this unit may be assessed in conjunction with other functional units which together form part of the holistic work role.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Adhesive surface components	Adhesive surface components may include: • glass components • mouldings/trim • mirrors • weather shields • body components and panels • foam, fibreglass and trim fabrics
WHS	WHS requirements are to be in accordance with legislation/regulations/codes of practice and enterprise safety policies and procedures. This may include: • protective clothing and equipment • use of tooling and equipment

RANGE STATEMENT	
	• workplace environment and safety • handling of material • use of firefighting equipment • enterprise first aid • hazard control and hazardous material and substances
Personal protective equipment	Personal protective equipment is to include that prescribed under legislation/regulation/codes of practice and workplace policies and practices
Safe operating procedures	Safe operating procedures are to include, but are not limited to: • operational risk assessment and treatments associated with vehicular movement, toxic substances, electrical safety, machinery movement and operation, manual and mechanical lifting and shifting, working in proximity to others and worksite visitors
Emergency procedures	Emergency procedures related to this unit are to include, but are not limited to: • emergency shutdown and stopping of equipment • extinguishing fires • enterprise first aid requirements • worksite evacuation
Environmental requirements	Environmental requirements are to include, but are not limited to: • waste management, noise, dust and clean-up management
Quality requirements	Quality requirements are to include, but are not limited to: • regulations, including Australian standards • internal company quality policies and standards • enterprise operations and procedures
Statutory/regulatory authorities	Statutory/regulatory authorities may include: • federal, state/territory and local authorities administering Acts, regulations and codes of practice

RANGE STATEMENT	
Tooling and equipment	Tooling and equipment may include: • hand tooling • power/air tooling • cleaning equipment • sealing equipment • cutting equipment
Materials	Materials may include: • adhesives, solvents, resins and cleaning materials
Communications	Communications are to include, but are not limited to: • verbal and visual instructions and fault reporting and may include worksite specific instructions, written instructions, plans or instructions related to job/task, telephones and pagers
Information/documents	Sources of information/documents may include: • verbal or written and graphical instructions, signage, work schedules/plans/specifications, work bulletins, memos, material safety data sheets (MSDS), diagrams or sketches • safe work procedures related to selection and application of trim/fabric adhesives • regulatory/legislative requirements pertaining to automotive industry, including Australian Design Rules • engineer's design specifications and instructions • organisation work specifications and requirements • instructions issued by authorised enterprise or external persons • Australian standards

Unit Sector(s)

Unit sector	Vehicle body

Co-requisite units

Not applicable.

Competency field

Competency field	Technical - Trimming and Upholstery

DEFEO101D Work safely with explosive ordnance

Modification History

Release	TP version	Comments
2	DEF12 V2	Layout adjusted.
1	DEF12 V1	First release.

Unit Descriptor

This unit covers the competency required to achieve a safe work environment when working with explosive ordnance.

Application of the Unit

This competency normally applies in any installation or organisation involved in the storage, distribution, maintenance and use of explosive ordnance; this includes research and development establishments, and proof and experimental establishments.

Explosive ordnance being all munitions containing explosives, nuclear fission or fusion materials, and biological and chemical agents.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a Unit of Competency.	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Where ***bold italicised*** text is used, further information is detailed in the Range Statement. Assessment of

	performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Access and apply safety procedures	1.1 ***Safety procedures and instructions*** are accessed and clarified 1.2 All work is conducted within the requirements of ***organisational*** permit-to-work and/or tag out procedures 1.3 Breaches in site safety are identified and acted on or reported in accordance with organisational reporting procedures 1.4 Load handling and shifting procedures are selected in accordance with identified requirements for particular goods 1.5 Handling equipment is checked for conformity with workplace requirements and manufacturer's guidelines 1.6 Where relevant, suitable signage is checked for compliance with workplace procedures
2. Apply personal safety measures	2.1 ***Personal protective measures*** are followed in accordance with organisational policy and procedures 2.2 Safety of immediate working area and equipment is established and maintained in accordance with organisational policy, procedures and directives 2.3 Relevant authorisation is obtained before specialised and hazardous work is carried out in accordance with organisational procedures and directives
3. Apply dangerous goods and hazardous substances requirements	3.1 Individual responsibilities regarding ***dangerous goods and hazardous substances*** are recognised and applied 3.2 Legislative requirements for hazardous substances and/or dangerous goods are understood and are used to plan work activities 3.3 Dangerous goods and hazardous substances labels and characteristics are identified and recognised, and relevant action/criteria is applied 3.4 Confirmation is sought from relevant personnel where dangerous goods or hazardous materials do

ELEMENT	PERFORMANCE CRITERIA
	not appear to be appropriately marked
	3.5 Dangerous goods and hazardous substances are stored in accordance with the relevant compatibility, separation constraints and security requirements
	3.6 Dangerous goods and hazardous substances are handled and moved in accordance with legislative requirements and organisational procedures
4. Apply net explosive quantity and compatibility	4.1 Documentation and licensing limitations are identified and/or acquired in accordance with organisational policy and procedures
	4.2 ***Net explosive quantity*** is applied in accordance with statutory requirements and organisational policy and procedures
	4.3 ***Compatibility*** is applied in accordance with statutory requirements and organisational policy and procedures
5. Identify and report incidents	5.1 Incidents and injuries are identified, recorded and ***reported*** in accordance with organisational procedures
	5.2 Participation in incident investigations is conducted in accordance with the responsibilities and protection under legislation

Required Skills and Knowledge

This describes the essential skills and knowledge and their level, required for this unit.

Required Skills

- access, read, interpret and apply information on safety
- apply area safety procedures
- apply compatibility
- apply net explosive quantity
- apply safe manual handling procedures
- comply with hazardous materials requirements
- encourage other team members
- follow instructions/directives and report information
- identify and report hazards and incidents
- identify, select and use personal protection measures
- read to a level required to interpret job instructions, workplace forms and reports
- use a variety of verbal and non-verbal communication techniques

- write at the level required to complete workplace documentation and reports

Required Knowledge

- application of compatibility
- application of net explosive quantity
- composition of teams and roles and responsibilities of team members
- hazard and incident identification and reporting techniques
- hazardous materials requirements
- manual handling procedures
- organisational safety policies and structures
- organisational safety information sources
- personal protection measures
- safety and advisory signs
- team work
- techniques for supporting others
- verbal and non-verbal communication techniques
- written communication to a level required to complete workplace documentation and reports

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessment must confirm the ability to comply with organisational safety requirements, and appropriate legislative and regulatory requirements. Assessment must also confirm the ability to work safely within an explosive ordnance environment and to: • identify, select and use personal protective measures • apply safe manual handling practices • apply net explosive quantity • apply compatibility • identify and report hazards and incidents • participate in incident investigations **Consistency in performance** Competency should be demonstrated over time and observed in a range of actual or simulated explosive ordnance contexts.

Context of and specific resources for assessment	**Context of assessment** Competency should be assessed in the workplace or in a simulated work environment and in accordance with all relevant legislation and organisational requirements. Evidence should be gathered through observation of the practical component and targeted questioning to assess required knowledge. **Specific resources for assessment** Access is required to: • facilities and resources used in the storage, distribution or maintenance of explosive ordnance.
Method of assessment	In a public safety environment assessment is usually conducted via direct observation in a training environment or in the workplace via subject matter supervision and/or mentoring, which is typically recorded in a competency workbook. Assessment is completed using appropriately qualified assessors who select the most appropriate method of assessment. Assessment may occur in an operational environment or in an industry-approved simulated work environment. Forms of assessment that are typically used include: • direct observation • interviewing the candidate • journals and workplace documentation • third party reports from supervisors • written or oral questions

Range Statement

The Range Statement relates to the Unit of Competency as a whole. It allows for different work environments and situations that may affect performance. ***Bold italicised*** wording in the Performance Criteria is detailed below.

Explosive ordnance may include:	• All munitions containing explosives, nuclear fission or fusion materials and biological and chemical agents, including: • all mines, torpedoes and depth charges • artillery, mortar, rocket and small arms ammunition • bombs and warheads

	• cartridge and propellant actuated devices • clandestine and other improvised explosive devices • clusters and dispensers • demolition charges • electro explosive devices • guided and ballistic missiles • pyrotechnics • all similar or related items or components explosive in nature
Safety procedures and instructions may include:	• explosive ordnance governance regulations, policy and procedures • organisational instructions
Organisation may include:	• defence organisation • enterprises that work with explosive ordnance • other government departments or instrumentalities that work with explosive ordnance
Personal protective measures may include:	• adherence to all work health and safety (WHS) regulations, policy and procedures • organisational instructions • personal protective equipment
Dangerous goods and hazardous substances may include:	• any item that is identified by the UN Classification System for Dangerous Goods
Net explosive quantity includes:	• explosive capacity calculated in a wide range of activities related to the storage, distribution and maintenance of explosive ordnance
Compatibility is:	• applied in a wide range of activities related to the storage, distribution and maintenance of explosive ordnance and other hazardous materials
Reports may include:	• approved forms • verbal • written

Unit Sector(s)

Not applicable.

DEFEO501D Conduct explosive ordnance inspection

Modification History

Release	TP version	Comments
2	DEF12 V2	Layout adjusted.
1	DEF12 V1	First release.

Unit Descriptor

This unit covers the competency required to conduct an inspection on all types of explosive ordnance in order to assess its condition and to process further action.

Application of the Unit

This competency normally applies to the individual who is required to conduct an inspection on all types of explosive ordnance in order to assess its condition and to process the explosive ordnance for further action.

The inspection of the explosive ordnance is carried out in a logical sequence while adhering to all relevant work health and safety (WHS) requirements. How the explosive ordnance is processed is subject to the outcomes of the inspection. In the case of defective or damaged explosive ordnance it may be retained and returned to the manufacturer, maintained or disposed of, or restrictions may be placed on its use.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a Unit of Competency.

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Where ***bold italicised*** text is used, further information is detailed in the Range Statement. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. **Prepare for inspection**	1.1 Requirement for ***explosive ordnance inspection*** is identified from work requests/instructions and confirmed
	1.2 WHS requirements, including those contained in ***organisational*** procedures, are applied throughout the operation
	1.3 ***Technical references***, tools and equipment required for the inspection are identified, acquired and prepared in accordance with organisation procedures
	1.4 Explosive ordnance is acquired, identified and accounted for, moved or pre-positioned in preparation for inspection
	1.5 ***Net explosive quantities*** and ***compatibility*** are identified, calculated, assessed and applied throughout the operation
2. **Inspect explosive ordnance**	2.1 Explosive ordnance is ***inspected*** in a logical set sequence to ensure that ***defects or damage*** are not overlooked in accordance with organisation policy and procedures and technical specifications
	2.2 Damage or other defects are identified and recorded in accordance with organisation procedures
3. **Carry out post inspection procedures**	3.1 Explosive ordnance is ***processed*** in accordance with organisation procedures
	3.2 ***Documentation and records*** are maintained in accordance with statutory, organisation and workshop requirements

Required Skills and Knowledge

This describes the essential skills and knowledge and their level, required for this unit.

Required Skills

- apply compatibility constraints
- apply safety policies and structures
- apply WHS requirements
- calculate net explosive quantity
- communicate orally and in writing
- maintain documentation
- read, access, interpret and apply technical instructions and drawings related to explosive ordnance inspections
- use relevant tools and equipment

Required Knowledge

- assessment of compatibility
- calculation of net explosive quantity
- characteristics and limitations of explosive ordnance to be inspected
- inspection procedures
- organisational documentation requirements
- organisational WH&S requirements
- organisational safety policies and structures

Evidence Guide

Critical aspects for assessment and evidence required to demonstrate competency in this unit

Assessment must confirm the ability to comply with:

- organisational safety requirements
- appropriate legislative and regulatory requirements.

Assessment must also confirm the ability to work safely within an explosive ordnance environment and to:

- calculate and apply net explosive quantity
- assess and apply compatibility
- process explosive ordnance
- maintain documentation

Consistency in performance

Competency should be demonstrated in a range of actual or simulated explosive ordnance contexts.

Context of and specific resources for assessment	**Context of assessment** Competency should be assessed in the workplace or in a simulated work environment, in accordance with all relevant legislation and organisation requirements. **Specific resources for assessment** Access is required to: • facilities and resources used in the storage, distribution or maintenance of explosive ordnance, including a licensed explosive site
Method of assessment	This unit may be assessed with the following unit: • DEFEO101D Work safely with explosive ordnance. In a public safety environment assessment is usually conducted via direct observation in a training environment or in the workplace via subject matter supervision and/or mentoring, which is typically recorded in a competency workbook. Assessment is completed using appropriately qualified assessors who select the most appropriate method of assessment. Assessment may occur in an operational environment or in an industry-approved simulated work environment. Forms of assessment that are typically used include: • direct observation • interviewing the candidate • journals and workplace documentation • third party reports from supervisors • written or oral questions

Range Statement

The Range Statement relates to the Unit of Competency as a whole. It allows for different work environments and situations that may affect performance. ***Bold italicised*** wording in the Performance Criteria is detailed below.	
Explosive ordnance inspections may be conducted:	• As part of a work program • On direction • On receipt • Prior to maintenance • Prior to or post any activity • And may include inspection to confirm free from

	explosives, the use of special measuring devices, gauges and locally patented tools
Organisation may include:	• Defence organisation • Enterprises that work with explosive ordnance • Other government departments or instrumentalities that work with explosive ordnance
Technical references may include:	• Technical drawings • Technical reference pamphlets • Orders and instructions • Other publications
Net explosive quantities include:	• Explosive capacity calculated in a wide range of activities related to the storage, distribution and maintenance of explosive ordnance
Compatibility is:	• Assessed in a wide range of activities related to the storage, distribution and maintenance of explosive ordnance and other hazardous materials
Inspection may result in explosive ordnance being:	• Passed for use • Recommended for sentencing • Rejected
Explosive ordnance defects or damage may include:	• Non-compliance with technical specifications • Corrosion • Surface damage
Processing may include:	• Disposal, including: • jettisoning • ditching • destruction • restrictions on use • Retention for return or maintenance
Documentation and records may include:	• Receipt and issue records • Timesheets • Work records

Unit Sector(s)

Not applicable.

LMFSF2001B Cut single layer fabrics

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the competency to measure out and cut single layer fabrics.

Application of the Unit

Application of the unit	

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	Nil	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan work operations	1.1. Required fabrics, number of items to be cut and required equipment are identified 1.2. Fabric sizes to be cut are identified from work order plus any required allowances 1.3. OHS requirements, including ergonomic criteria and personal protection needs, are observed throughout the work. 1.4. Suitable work area is selected, tidied and cleaned of any contaminants 1.5. Suitable scissors and or blades are selected and checked prior to use for appropriate sharpness, set, operation and safe condition 1.6. Fabrics are selected in accordance with work order and laid out smooth and square
2. Prepare materials for cutting	2.1. Fabrics are inspected for flaws and appropriate finish 2.2. Naps, direction, pattern matches and face of the materials are identified 2.3. Tools and equipment are checked for operation
3. Complete cutting operations	3.1. Cutting is completed with cut out materials identified/labelled where required 3.2. Any measurements for pleat lines, hems, headings and any special seam allowances are marked out using workplace approved methods 3.3. Where required, fabrics are hung using appropriate protective covers and care label information is attached 3.4. Cut lengths are dispatched to next process following workplace procedures

ELEMENT	PERFORMANCE CRITERIA
	3.5. Unused materials are stored as required 3.6. Workplace required documentation is completed following appropriate procedures 3.7. Work area is cleaned and damaged tools tagged as required 3.8. Waste is collected and bundled for recycling/reuse as required

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
• collect, organise and understand information related to work orders, basic plans and safety procedures • communicate ideas and information to enable confirmation of work requirements and specifications, co-ordination of work with site supervisor, other workers and customers, and the reporting of work outcomes and problems • plan and organise activities, including the preparation and layout of the worksite and the obtaining of equipment and materials to avoid any back tracking, workflow interruptions or wastage • work with others and in a team by recognising dependencies and using co-operative approaches to optimise workflow and productivity • use mathematical ideas and techniques to correctly complete measurements and estimate fabric requirements and other material requirements • use pre-checking and inspection techniques to anticipate cutting problems, avoid re-working and wastage • use the limited workplace technology related to cutting, including tools, equipment, calculators and measuring devices.
Required knowledge
• work requirements, including workplace standards • fabric types, common faults and inspection procedures • design features of the finished items in relation to attractive use of fabric patterns • cutting equipment and techniques • the impact of cutting on fabrics

Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	

Critical aspects of evidence	• Interpret work order and locate and apply relevant information
	• Apply safe handling practices for equipment, products and materials
	• Identify materials used and any special marking out requirements
	• Measure accurately and cut fabric quantities to minimise waste and produce consistent quality items for at least five different types of material or product
	• Follow work instructions, operating procedures and inspection practices to:
	  • minimise the risk of injury to self and others
	  • prevent damage to goods, equipment and products
	  • maintain required production output and product quality
	• Work effectively with others
	• Modify activities to cater for variations in workplace contexts and environment

Resource implications	Work orders, fabrics, including linings and interlinings, calculator and where available other workplace calculating and cutting equipment.
Method of assessment	Assessment methods must confirm consistency of performance over time and in a range of workplace relevant contexts. Assessment should be by direct observation of tasks and questioning on underpinning knowledge. Assessment should be conducted over time and will generally be in conjunction with assessment of other units of competency.
Context of assessment	Assessment may occur on the job or in a workplace simulated facility with relevant equipment, materials, work instructions and deadlines.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Unit scope	This unit applies to soft furnishings and upholstered items cut from measurements and instructions. It does not apply to cutting from patterns.
Unit context	• OHS requirements may include legislation, building codes, material safety management systems, hazardous and dangerous goods codes and local safe operating procedures or equivalent • Work is carried out in accordance with legislative obligations, environmental legislation, relevant health regulations, manual handling procedures and organisation insurance requirements • Work requires individuals to demonstrate some discretion, judgement and problem solving skills in the set up and operation of machines. This may be demonstrated either individually or in a team environment
Workplace environment	Work may be performed in workplaces which are involved in the manufacture of soft furnishings and upholstered furniture and in the repair and restoration of furnishing products
Tools and equipment may include, **but are not limited to**:	• cutting equipment • including scissors and cutting machines; measuring and calculating equipment • including tapes • rulers • calculators and computers
Products to be constructed may include, **but are not limited to**:	• curtains • drapes • swags • cushions and upholstered furniture components

RANGE STATEMENT	
Personal protective equipment	Personal protective equipment is to include that prescribed under legislation, regulations and enterprise policies and practices
Information and procedures	• Machine manufacturer specifications and operational procedures • Workplace procedures relating to the setting and operation of machinery • Work instructions, including job sheets, cutting lists, plans, drawings and designs • Workplace procedures relating to reporting and communication

Unit Sector(s)

Unit sector	Soft Furnishing

Competency field

Competency field	

Co-requisite units

Co-requisite units		

LMFSF2002B Machine sew materials

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the competency to use sewing machines for production of soft furnishings, mattresses and bases, and upholstered furniture.

Application of the Unit

Application of the unit	

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	Nil	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify sewing machine equipment controls and procedures	1.1. Job requirements are identified from work instructions 1.2. OHS requirements, including ergonomic criteria and personal protection needs, are observed throughout the work 1.3. Equipment components, equipment condition and controls are identified 1.4. Operating procedures are checked to identify any approved adjustments 1.5. Equipment operations and production procedures are identified 1.6. The process for obtaining materials and moving products to the next process is identified
2. Prepare for work	2.1. Work order or sample is checked to identify sewing specifications 2.2. Required materials, tools and equipment are assembled 2.3. Materials and equipment are inspected and any faults are identified and reported 2.4. Work sequence is planned to suit job, and materials are laid out 2.5. If required, naps, pattern direction and face side of materials are identified 2.6. Components are matched and secured with tacking, pins or adhesives as required 2.7. Any required supplementary equipment is identified for routine lubrication and adjustments
3. Set up and control sewing machine	3.1. Sewing machine is set up and adjusted 3.2. Sewing operation is according to workplace

ELEMENT	PERFORMANCE CRITERIA
operations	procedures and material characteristics 3.3. Required product quality and outputs are maintained
4. Maintain quality requirements	4.1. Machining process is monitored and conditions which may affect work quality are reported 4.2. Authorised changes in operating procedures are implemented
5. Finish and dispatch work	5.1. Completed work is: 5.1.1. checked for required quality 5.1.2. finished as required 5.1.3. repaired (where applicable) 5.1.4. moved to the next process 5.2. Material which is able to be reused is collected and stored 5.3. Equipment and work area clean up and waste management are completed following workplace procedures 5.4. Workplace records are completed as required

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- collect, organise and understand information related to work orders, basic plans and safety procedures
- communicate ideas and information to enable confirmation of work requirements and specifications, co-ordination of work with site supervisor, other workers and customers, and the reporting of work outcomes and problems
- plan and organise activities, including the preparation and layout of the worksite and the obtaining of equipment and materials to avoid any back tracking, workflow interruptions or wastage
- work with others and in a team by recognising dependencies and using co-operative approaches to optimise workflow and productivity
- use mathematical ideas and techniques to correctly complete measurements and estimate material requirements
- use pre-checking and inspection techniques to anticipate sewing problems, avoid re-working and wastage

REQUIRED SKILLS AND KNOWLEDGE
• use the workplace technology related to the sewing of materials, including tools, equipment and measuring devices
Required knowledge
• the types, characteristics, uses and limitations of sewing machines • characteristics of materials used and finished products • safety and environmental aspects of sewing machine operations • quality systems and standards • workflow requirements for sewing process • operation of work systems and industrial sewing equipment • causes of faults and repair methods • procedure for reporting damaged or imperfect products or interruptions to workflow

Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	

Critical aspects of evidence	• Apply safe handling practices for equipment, products and materials, including personal protective equipment
	• Identify and operate three types of industrial sewing machines as identified in the Range of Variables
	• Set up sewing machine for operations and monitor quality of output
	• Interpret work order and locate and apply relevant information
	• Follow work instructions, operating procedures and inspection practices to:
	  • minimise the risk of injury to self and others
	  • prevent damage to goods, equipment and products
	  • maintain required production output and product quality
	• Work effectively with others
	• Modify activities to cater for variations in workplace contexts and environment
	• Identify safe handling of equipment, products and

EVIDENCE GUIDE	
	materials
Resource implications	Appropriate industrial sewing machines, work orders, operating procedures, materials and threads.
Method of assessment	Assessment methods must confirm consistency of performance over time and in a range of workplace relevant contexts. Assessment should be by direct observation of tasks and questioning on underpinning knowledge. Assessment should be conducted over time and will generally be in conjunction with assessment of other units of competency.
Context of assessment	Assessment may occur on the job or in a workplace simulated facility with relevant process equipment, materials, work instructions and deadlines.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Unit context	• OHS requirements may include legislation, building codes, material safety management systems, hazardous and dangerous goods codes and local safe operating procedures or equivalent • Work is carried out in accordance with legislative obligations, environmental legislation, relevant health regulations, manual handling procedures and organisation insurance requirements • Work requires individuals to demonstrate some discretion, judgement and problem solving skills in the set up and operation of machines. This may be demonstrated either

RANGE STATEMENT	
	individually or in a team environment
Sewing specifications include:	• required materials • threads and additional work features • seam and stitch specifications • any special stitch requirements and allowances • shape characteristics and special requirements • needles • attachments and ancillary equipment and quality requirements
Sewing products include:	• top stitching • gathering • piping • braid • fringe • flange cords • straight fabric lengths • padded material • loose covers
Sewing processes may include:	• hemming • seams • machine tacking • gathering • multiple-layer sewing and straight or zig zag sewing
Machines may include, **but are not limited to**:	• single or multi-needle flat bed • overlocker • blind hemming • gathering • flange • bar tacking • tape edging
Sewing machine set up and adjustment includes:	• thread machine and wind bobbin as required • set required tensions • select required machine settings • and test operations for work order requirements
Materials to be machined may include but are not limited to:	• plain and patterned fabrics

RANGE STATEMENT	
Personal protective equipment	Personal protective equipment is to include that prescribed under legislation, regulations and enterprise policies and practices
Information and procedures	• Machine manufacturer specifications and operational procedures • Workplace procedures relating to the setting and operation of machinery • Work instructions, including job sheets, plans, drawings and designs • Workplace procedures relating to reporting and communication • The employee completes quality inspection of own work

Unit Sector(s)

Unit sector	Soft Furnishing

Competency field

Competency field	

Co-requisite units

Co-requisite units		

LMFUP3012B Apply marine sewing and installation techniques

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the competency to use marine sewing techniques in the completion of upholstery products/items.

Application of the Unit

Application of the unit	

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	Nil	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work	1.1. Job requirements are identified from work instructions 1.2. Workplace health and safety requirements, including personal protection needs, are observed throughout the work 1.3. Machines, attachments, materials, work method and sequence are determined 1.4. Equipment, including any supplementary equipment, is identified and checked for safe operation, components and controls 1.5. Materials are identified and inspected and problems, including any materials or part constructed products which do not meet the job order requirements, are identified and reported in accordance with workplace procedures 1.6. Work pieces are laid out in sequence in accordance with specifications and workplace procedures
2. Conduct sewing operation	2.1. Sewing machine (including attachments as required), set up requirements and adjustments are observed in accordance with workplace procedures 2.2. Appropriate thread type and size is fitted to machine 2.3. Machine is operated to maintain required product quality and outputs 2.4. Reinforcing/protective measures, fittings/attachments and fixing devices are attached in accordance with workplace procedures 2.5. Finished products are inspected for quality with unacceptable items being reprocessed in accordance with workplace instructions

ELEMENT	PERFORMANCE CRITERIA
3. Complete work	3.1. Unused materials are stored as required 3.2. Workplace required documentation, including stock usage, is completed and processed following workplace procedures 3.3. Work area is cleaned and damaged tools and equipment tagged as required 3.4. Waste is collected and bundled for recycling/reuse as required by workplace procedures

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- collect, organise and understand information related to work orders, basic plans, and safety procedures
- communicate ideas and information to enable confirmation of work requirements and specifications, coordination of work with work supervisor, other workers and customers, and the reporting of work outcomes and problems
- plan and organise activities including the preparation and layout of the work area and the obtaining of equipment and materials to avoid any back tracking, workflow interruptions or wastage
- work with others and in a team by recognising dependencies and using cooperative approaches to optimise workflow and productivity
- use mathematical ideas and techniques to correctly complete measurements, calculate work requirements, optimise component and material sizes for economical cutting and assemble required materials
- use pre-checking and inspection techniques to plan work, avoiding re-working and wastage
- use the workplace technology related to the application of marine sewing and application techniques

Required knowledge

- procedure for reporting damaged or imperfect products or interruption to workflow
- workflow requirements for sewing process
- operation of work systems and sewing equipment
- characteristics of materials used and application and requirements of the finished products

REQUIRED SKILLS AND KNOWLEDGE
• causes of faults and repair methods • identification of equipment, processes and procedures • quality systems and standards • workplace procedures

Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	

Critical aspects of evidence	• Interpret work order and locate and apply relevant information
	• Identify and select materials used and any special handling requirements for those materials
	• Follow work instructions, operating procedures and inspection practices to:
	  • minimise the risk of injury to self and others
	  • prevent damage to goods, equipment and products
	  • maintain required production output and product quality
	• As a minimum:
	  • prepare and install a minimum of 3 square metres of cover to at least 3 vertical or horizontal surfaces
	  • sew at least three covers
	  • sew appropriate fasteners and attachments to covers sewn
	• Work effectively with others
	• Modify activities to cater for variations in workplace contexts and environment

Resource implications	Appropriate sewing machine, work orders, operating procedures, materials, fittings and threads.
Method of assessment	Assessment methods must confirm consistency of performance over time and in a range of workplace relevant contexts. Assessment should be by direct observation of tasks and

EVIDENCE GUIDE	
	questioning on underpinning knowledge. Assessment should be conducted over time and may be in conjunction with assessment of other units of competency which form a part of the job role.
Context of assessment	Assessment may occur on the job or in a workplace simulated facility with relevant process equipment, materials, work instructions and deadlines.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Unit scope	• This unit addresses the sewing techniques used to sew materials used in marine application and to fit the required attachments and fixing devices • Fittings/attachments and fixing devices include: clips, press studs, buckles, eyelets, shackles, zips, reinforcing patches, straps • Suitable installation methods are used with consideration to suitability or products used in the process
Unit context	• Workplace health and safety includes OHS legislation, material safety management systems, hazardous substances and dangerous goods codes and safe operating procedures • Work requires individuals to demonstrate discretion, judgement and problem solving skills in the application of marine sewing techniques • Work is carried out in accordance with legislative obligations, environmental legislation, relevant health regulations, manual handling procedures and organisation

RANGE STATEMENT	
	insurance requirements
Job requirements may include:	• required materials • threads • additional work features • shape and special requirements for the item • any required workplace documentation to be competed
Machines may include, **but are not limited to**:	• overlocker • flat bed • twin needle and walking foot
Tools and equipment may include:	• measuring tape • scissors • cutting blades • knives and thread
Materials to be sewn may include but are not limited to:	• canvas • sail materials • leather • foam-backed vinyl and upholstery fabrics
Personal protective equipment	Personal protective equipment is to include that prescribed under legislation, regulations and enterprise practices and procedures. It may include: • safety glasses/goggles • hair nets • ear muffs/plugs • gloves • footwear • protective clothing and breathing apparatus
Information and procedures	• Machine manufacturer specifications and operational procedures • Workplace procedures relating to the setting and operation of machines • Work instructions, including job sheets, plans, drawings and designs • Workplace procedures relating to reporting and communication

Unit Sector(s)

Unit sector	Upholstery

Competency field

Competency field	

Co-requisite units

Co-requisite units		

LMTTF2008A Use adhesives

Modification History

Not applicable.

Unit Descriptor

Unit descriptor This unit covers the skills and knowledge required to select and safely use adhesives on canvas and sail products.

Application of the Unit

Application of the Unit This unit applies to the bonding of materials with adhesives on canvas and sail products. Work may be conducted in a variety of environments, such as:

- operational indoor workplaces
- operational outdoor workplaces
- hazardous or exposed conditions

Work may be conducted in small to large scale enterprises and may involve individual and team activities. Work is performed within defined procedures under direct supervision.

The application of this unit is according to OHS practices of the enterprise and workplace practices, which may include:

- requirements prescribed by legislation, awards, agreements and conditions of employment
- standard operating procedures
- work instructions
- oral, written and visual communication
- quality practices, including responsibility for maintenance of own work quality and contribution to quality improvement of team or section output
- housekeeping
- tasks related to environmental protection, waste disposal, pollution control and recycling

This unit requires the application of skills associated with planning and organising for the safe and effective use of adhesives and textile fabrication technology. This unit also requires communication skills

to read and apply workplace information and complete work records. Self management skills are applied to ensure workplace and quality standards are achieved.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

Employability Skills Information

Employability Skills This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Not applicable.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare work area	1.1 Safe working environment is established
	1.2 Suitable electrical power outlets are identified, if required
	1.3 Work is sequenced to maximise safety and productivity
	1.4 Workplace procedures and instructions are read and interpreted
2 Select, use and store tools	2.1 Appropriate hand tools, ***power tools*** and electrical equipment are obtained for the work to be performed
	2.2 Tools are examined for damage, missing components or other defects (including frayed power cords where applicable)
	2.3 Extension power cables are checked for knots and insulation damage
	2.4 Electrical tools are connected safely to power supply
	2.5 Safety equipment is used during tool operation in accordance with ***OHS practices***

ELEMENT	PERFORMANCE CRITERIA
	2.6 Tasks are performed using tools in accordance with safe working practices
	2.7 Tools are located in a safe position when not in use
	2.8 Tools and extension cords are cleaned and stored in accordance with industry and enterprise safe working practices
3 Select adhesives and prepare for their use	3.1 Nature of materials to be joined is ascertained
	3.2 Specified adhesives are obtained
	3.3 Appropriate tools and materials are selected for preparation of work piece surfaces and application of adhesive
	3.4 Adhesive manufacturer's OHS requirements are checked and prescribed precautions taken before adhesives are used
	3.5 Adhesive is prepared to manufacturer's instructions
4 Apply adhesive and bond materials	4.1 Work piece surfaces are prepared for application of adhesive
	4.2 Work piece surfaces to be bonded are anchored or otherwise stabilised
	4.3 Adhesive is applied in accordance with recommended practice and surfaces are joined
	4.4 Joins are allowed to cure for specified time
	4.5 Where appropriate, heat to assist in curing the joins is applied to the work piece in accordance with OHS practices
	4.6 Knowledge of using adhesives are applied to perform required tasks
5 Inspect and rectify	5.1 Work piece is removed and joins are informally inspected and tested for strength
	5.2 Results of informal inspection are verified by supervisor and appropriate action is taken regarding rework or rectification, if necessary
6 Clean up and documentation	6.1 Product is prepared for inspection
	6.2 Work area is cleaned and tools and equipment are cleaned and stored in accordance with OHS practices
	6.3 Remaining adhesive is safely disposed of or stored in a safe, secure location
	6.4 Work records are completed in accordance with workplace requirements

Required Skills and Knowledge

This describes the essential skills and knowledge and their level required for this unit.

Demonstrates knowledge of:

- health, fire and explosion hazards associated with the use of volatile or toxic adhesives and solvents, and specific OHS requirements regarding their use, safe handling and storage
- the range of canvas products in common use
- bonding principles and techniques
- commonly used glues, adhesives and solvents
- curing characteristics of commonly used adhesives and the effects of atmospheric conditions
- quality standards for bonding processes
- safety and environmental requirements of relevant industry and enterprise procedures
- general housekeeping policies and procedures
- OHS practices, including hazard identification and control measures
- quality practices
- workplace practices
- recording and reporting practices

Demonstrates skills to:

- locate and interpret technical information about canvas products, adhesives and equipment used in bonding processes
- use relevant hand and power tools
- use relevant chemicals and cleaning agents and dispose of waste products
- maintain work area
- read, interpret and follow information on work specifications, standard operating procedures and work instructions and other reference material
- maintain accurate records
- communicate within the workplace
- sequence operations
- meet specifications
- clarify and check task-related information
- carry out work according to OHS practices

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for the Training Package.

Critical aspects of evidence to be considered

Demonstrates skills and knowledge to:

- comply with all relevant safety requirements including safe use of adhesives, solvents, hand tools and electrical equipment
- follow work orders
- understand equipment and materials instructions applicable to the use of adhesives
- prepare product to be bonded and set up adhesive application equipment
- perform bonding process
- perform normal operator maintenance of work area to enable work to be conducted safely and efficiently
- document and communicate work related information including reporting of faults and other problems

Consistently applies skills and knowledge when:

- organising work
- completing tasks
- identifying improvements
- using workplace practices
- using OHS practices
- recording and reporting accidents and incidents
- assessing operational readiness of equipment used and work processes
- recognising and adapting to cultural differences in the workplace, including modes of behaviour and interactions
- completing work systematically with attention to detail without damage to goods and equipment

Context and specific resources for assessment

Assessment may occur on the job or in an appropriately simulated environment and requires access to work areas, materials and equipment, and to information on workplace practices and OHS practices.

Guidance information for assessment

This unit may be assessed independently or in combination with other relevant units.

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the Performance Criteria, is detailed below. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs if the candidate, accessibility of the item, and local industry and regional contexts.

Legislative/regulatory requirements	All work must comply with relevant Federal and State or Territory legislative or regulatory requirements.
Power tools may include	• spray guns • portable ventilation fans • hot air dryers • heat lamps
OHS practices	OHS practices must include hazard identification and control, risk assessment and implementation of risk reduction measures specific to the tasks described by this unit, and may include: • manual handling techniques • standard operating procedures • personal protective equipment • safe materials handling • taking of rest breaks • ergonomic arrangement of workplaces • following marked walkways • safe storage of equipment • housekeeping • reporting accidents and incidents • other OHS practices relevant to the job and enterprise

Unit Sector(s)

Sector	Textile Fabrication

MEM05004C Perform routine oxy acetylene welding

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers preparing materials and performing routine oxy acetylene welding.

Application of the Unit

Application of the unit	This unit applies in a maintenance or manufacturing environment where the welding is not required to meet an Australian standard or equivalent. Fillet and butt welds would typically be performed on low carbon/mild steels. Where welding is required to meet Australian Standard 1554 General Purpose or equivalent codes, OHS regulations and/or licensing requirements, Unit MEM05022C (Perform advanced welding using oxy acetylene process) should be selected. **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Refer to Application of the Unit

Pre-Requisites

Prerequisite units		

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Identify weld requirements	1.1. Weld requirements are identified from job instructions. 1.2. Location of welds is identified in accordance with standard operating procedures and job specifications.
2. Prepare materials for welding	2.1. Materials are cleaned and prepared ready for welding.
3. Prepare equipment for welding	3.1. Welding equipment is set up correctly. 3.2. Settings and consumables are selected.
4. Perform routine welding using *oxy acetylene*	4.1. Safe welding practices are applied. 4.2. Materials are welded to job requirements. 4.3. Welds are cleaned in accordance with standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- preparing materials
- setting up welding equipment
- welding with oxy acetylene fuel gas
- reading and interpreting routine information on written job instructions, specifications and standard operating procedures
- following oral instructions
- using measurement skills for joint preparation and routine oxy acetylene welding

Required knowledge

Look for evidence that confirms knowledge of:

- preparatory requirements
- materials and consumables properties and characteristics
- equipment and equipment settings
- fuel gas properties and applications
- post welding treatments
- weld characteristics
- any applicable industry standards, NOHSC guides, State/Territory regulatory codes of practice/standards
- safe work practices and procedures
- safe welding practices
- use and application of personal protective equipment for routine oxy acetylene welding

Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment

EVIDENCE GUIDE	
Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to prepare materials and carry out routine oxy acetylene welding.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing routine oxy acetylene welding or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Materials	Mild and low carbon steel and cast iron
Prepared	Preheating, setting up jigs, fixtures, clamps, joint preparation
Equipment	Hoses, blowpipes, regulators
Consumables	Filler rods, fluxes
Oxy acetylene	The term 'oxy-acetylene' is used here to describe a range of fuel gases, including acetylene, LPG, hydrogen etc.
Cleaned	Fluxes

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

MEM05006C Perform brazing and or silver soldering

Modification History

Corrections to descriptor and range to clarify inclusion of 'braze welding'.

Unit Descriptor

Unit descriptor	This unit covers performing brazing (including braze welding) and silver soldering. It includes the preparation of materials and equipment and the inspection of the completed work.

Application of the Unit

Application of the unit	This unit applies to silver soldering and brazing using all grades of silver solder and braze. It also includes soldering of copper and refrigeration work. Work includes the preparation of materials and equipment and the inspection of the completed work. Work is undertaken in a production or maintenance environment using predetermined standards of quality, safety and work procedures. **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Prepare materials and equipment	1.1. Job requirements are determined from specifications and/ or instructions. 1.2. Materials are correctly prepared using appropriate tools and techniques. 1.3. Materials are correctly assembled/aligned to meet specifications as required. 1.4. Distortion prevention measures are identified and appropriate action is taken as required. 1.5. Heating equipment is assembled and set up safely and correctly in accordance with standard operating procedures. 1.6. Correct and appropriate consumables are selected and prepared. 1.7. Test run is undertaken and verified as required.
2. Braze and/or silver	2.1. The correct process is selected to meet specifications.

ELEMENT	PERFORMANCE CRITERIA
solder	2.2. Materials are preheated as required. 2.3. Consumables are applied using correct techniques. 2.4. Jointing material is applied correctly and in appropriate quantities to meet job/specifications. 2.5. Material temperature is annealed using correct and appropriate techniques.
3. Inspect joints	3.1. Excess jointing materials are removed using correct and appropriate techniques. 3.2. Inspection of joints is undertaken to standard operating procedures. 3.3. Inspection results are reported/recorded using standard operating procedures as required.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • preparing materials • performing brazing, braze welding, silver soldering • undertaking visual inspection • reading and interpreting routine information on written job instructions, specifications and standard operating procedures • following oral instructions
Required knowledge
Look for evidence that confirms knowledge of: • the reasons for selecting specific methods of assembly/alignment • the procedures for minimising distortion of the materials being brazed/braze welded/silver soldered • the procedures for assembling and setting up the specific heating equipment • the reasons for selecting specific heating equipment • the reasons for selecting specific consumables • conducting test runs

REQUIRED SKILLS AND KNOWLEDGE
• typical applications of brazing/braze welding and silver soldering processes • the procedures and precautions for preheating the materials to be joined • the effects of the use of inappropriate techniques on the performance of the jointed materials • the effect of inappropriate quantities of jointing material on the performance of the jointed materials • the procedures for normalising the temperature of jointed materials • the consequences of using inappropriate techniques to normalise the temperature of the joint • the procedures for removing excess jointing material • the procedures for inspecting brazed/braze welded/silver soldered joints • use and application of personal protective equipment for silver soldering and brazing/braze welding • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform brazing (including braze welding) and silver soldering.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, i.e. the candidate is not in productive work, then appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the

EVIDENCE GUIDE	
	candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with brazing (including braze welding) and/or silver soldering or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Materials	Ferrous and non-ferrous
Heating	Oxy acetylene and fuel gas, cylinders, connections, hoses, tips and nozzles
Consumables	Fluxes (resin or powder), all types of silver solder and brazing grades, etc.

RANGE STATEMENT	
Process	Brazing, braze welding and silver soldering

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

MEM05007C Perform manual heating and thermal cutting

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing manual heating, thermal cutting and gouging including the assembly and disassembly and operation of the equipment on a range of materials (ferrous, non-ferrous and non-metallic) using a variety of methods.

Application of the Unit

Application of the unit	This unit applies to manual, straight line cutting standards. Manual or automatic processes are used to cut and heat to specifications. Cutting may include flame gouging by hand. All work is carried out to legislative and regulatory requirements. Predetermined standards of quality and safety are observed and work is carried out following standard operating procedures. **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Assemble/disassemble plant and equipment	1.1. Accessories and equipment are correctly selected and assembled for manual heating and thermal cutting.
2. Operate heating and thermal cutting equipment	2.1. Cutting process and/or procedure appropriate for material is selected. 2.2. All safety procedures are observed. 2.3. Equipment start-up procedures are followed correctly to standard operating procedures. 2.4. Equipment adjustments are made correctly using standard operating procedures. 2.5. Appropriate cutting allowances are made. 2.6. Material is used in the most economical way. 2.7. Defects are identified and corrective action is taken to standard operating procedures. 2.8. Material is heated and cut to specification.

ELEMENT	PERFORMANCE CRITERIA
	2.9. Shape/size/length is to accepted workplace standards.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • performing pre-start checks • safely starting equipment • following standard operating procedures • adjusting equipment to operating specifications • making cutting allowances • economising material and minimising wastage • identifying cutting defects and taking corrective action • heating and cutting materials to specifications • reading and interpreting routine information on written job instructions, specifications and standard operating procedures. May include drawings • following oral instructions • performing measurements needed to meet the requirements of this unit • entering routine and familiar information onto proformas and standard workplace forms
Required knowledge
Look for evidence that confirms knowledge of: • cutting processes appropriate to various materials • heating and cutting specifications • procedures for heating and cutting • the tools, equipment and techniques for heating and cutting • assembling procedures for equipment and accessories • hazards and control measures associated with manual heating and thermal cutting • use and application of personal protective clothing and equipment • equipment pre-checks and operation • procedures for adjusting heating and cutting equipment

REQUIRED SKILLS AND KNOWLEDGE
• cutting allowances and reasons for applying them • procedures for minimising waste material • reasons for minimising waste material • cutting defects and their causes • procedures for correcting cutting defects • tools, equipment and techniques required to correct cutting defects • use and application of personal protective equipment • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform manual heating and thermal cutting.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with manual heating/thermal cutting or other units requiring the exercise of the skills and knowledge covered by this unit.

EVIDENCE GUIDE	
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questions should not require language, literacy and numeracy skills beyond those required in this unit. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Cutting	Use of hand held and self-propelled straight line cutters
Process	Fuel gas, oxy fuel gas and air fuel gas
Material	Various thicknesses and types including ferrous, non-ferrous and non-metallic materials

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

MEM05012C Perform routine manual metal arc welding

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers preparing the materials and carrying out routine manual metal arc welding (MMAW).

Application of the Unit

Application of the unit	This unit applies in a maintenance or manufacturing environment where the welding is not required to meet an Australian standard or equivalent. Fillet and butt welds would typically be performed on low carbon/mild steels. Where welding is required to AS 1554 General Purpose or equivalent codes, occupational health and safety regulations and/or licensing requirements, Unit MEM05015D (Weld using manual metal arc welding process) should be selected. **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Refer to Application of the Unit

Pre-Requisites

Prerequisite units		

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Identify weld requirements	1.1. Weld requirements are identified from job instructions. 1.2. Location of welds is identified in accordance with standard operating procedures and job specifications.
2. Prepare materials for welding	2.1. Materials are cleaned and prepared ready for welding.
3. Prepare equipment for welding	3.1. Welding equipment is set up correctly. 3.2. Correct electrodes are selected to suit application and settings.
4. Perform routine welding using MMAW	4.1. Safe welding practices are applied. 4.2. Materials are welded to job requirements. 4.3. Welds are cleaned in accordance with standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • preparing materials and electrodes • setting up welding equipment • welding with MMAW • reading and interpreting routine information on written job instructions, specifications and standard operating procedures • performing measurements for joint preparation and routine MMAW
Required knowledge
Look for evidence that confirms knowledge of: • material and equipment preparation • properties and characteristics of materials and consumables • weld characteristics • equipment set-up and settings • MMAW processes and properties • post-welding treatments • safe welding practices • use and application of personal protective equipment

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to prepare materials and carry out routine manual metal arc welding (MMAW).

EVIDENCE GUIDE	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, i.e. the candidate is not in productive work, then appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing routine manual metal arc welding or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning should not require language, literacy and numeracy skills beyond those required in this unit. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Materials	Low and mild carbon steel or similar
Prepared	Cleaning, setting up jigs, fixtures, clamps, joint preparation
Welding equipment	Welding leads, welding machines, electrode holder etc.
Cleaned	Slag and spatter, cleaning, using files and grinders

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

MEM05015D Weld using manual metal arc welding process

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency covers the preparation, positioning, fixing, and manual welding techniques associated with general trade level welding using manual metal arc welding (MMAW) equipment including the selection and set up of the equipment appropriate to both the material and the weld to be performed, carrying out the MMAW to prescribed standards, and examining for and correcting defects, in a range of welded fabrications.

Application of the Unit

Application of the unit	This unit of competency applies to welds associated with heavy or light metal fabrications. Welds are fillet and butt welds in all positions on a range of ferrous and non-ferrous materials that may include carbon steel or stainless steel. Weld quality would conform to Australian Standard 1554 General Purpose, American Bureau of Shipping (ABS) or equivalent. This unit has been primarily developed for Engineering Tradesperson - Fabrication apprenticeship training and the recognition of trade level skills in MMAW. It may also apply to other trade occupations requiring higher level MMAW welding skills. Where manual thermal processes associated with preparation, pre-heat and/or post-heat are required, MEM05007C Perform manual heating and thermal cutting and/or MEM05008C Perform advanced manual thermal cutting, gouging and shaping should be considered for selection. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM05012C	Perform routine manual metal arc welding
	MEM05051A	Select welding processes
	MEM05052A	Apply safe welding practices
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare materials for manual metal arc welding (MMAW)	1.1. Weld requirements are identified from specifications and/or drawings 1.2. Materials are correctly prepared 1.3. Materials are assembled/aligned to specification, where required
2. Select welding equipment and consumables	2.1. Welding equipment and electrodes appropriate to the material and the weld are identified and selected
3. Assemble and set up welding equipment	3.1. Welding equipment is assembled and set up
4. Minimise and rectify distortion	4.1. Appropriate distortion prevention measures are selected and applied 4.2. Distortion is rectified
5. Weld to job specification using MMAW	5.1. Weld deposit is to specification 5.2. Joints are cleaned to specifications
6. Ensure weld conformance	6.1. Defects are rectified with minimum loss of sound metal using correct techniques and tools 6.2. Weld joints are visually inspected for conformance to specifications
7. Where required, maintain weld records	7.1. Where required, weld records are completed correctly

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Required skills include: • identifying and interpreting welding specifications including appropriate standards e.g. Australian Standard 1554 General Purpose, American Bureau of Shipping (ABS) or equivalent • selecting and using appropriate tools and equipment

REQUIRED SKILLS AND KNOWLEDGE
• using a variety of welding machines and electrodes • identifying and rectifying weld defects • applying techniques for distortion prevention and rectification • cleaning welds • reading and interpreting information on sketches, written job instructions, specifications, standard operating procedures and engineering drawings • recording routine information including routine weld records related to MMAW onto proformas and standard workplace forms • following oral instructions • measurement skills relating to joint preparation and MMAW
Required knowledge
Required knowledge includes: • material preparation • joint preparations • electrode classification • causes of distortion for materials within the scope of this unit • causes of defects and methods of rectification • the relationships between amperage, electrode and material • safe welding practices • use and application of personal protective equipment for MMAW

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to prepare materials, select and set up the welding equipment, carry out MMAW and examine for and correct defects, in a range of welding activities associated with MMAW. Competency in this unit cannot be awarded until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate	Assessors must be satisfied that the candidate can competently and consistently apply the skills covered in

EVIDENCE GUIDE	
competency in this unit	this unit of competency in new and different workplace situations and contexts. Critical aspects of assessment and evidence include: • following all safety procedures to protect self, other workers and members of the public • identifying and interpreting specifications for MMA welding including Australian Standard 1554 General Purpose • interpreting welding specifications including standard welding symbols used to show weld procedure • selecting appropriate weld preparation methods for material and position of welds. • preparing materials, setting up of jigs, fixtures, clamps,etc. and joint preparation including bevelling • consistently welding different ferrous and non-ferrous materials to AS 1554 General Purpose or equivalent • identifying defects as described in the range statement across a range of welded materials • rectifying defects.
Context of and specific resources for assessment	Welding to AS 1554 General Purpose or equivalent requires both theoretical knowledge and high level practical skills. The assessment process must be designed to identify consistent performance to the standard and the specifications across a range of materials and positions. The assessment must also identify a level of workplace performance in terms of defect rates and weld failure rates. It is recommended that assessment involve demonstrations of competency under both workshop and site conditions. This means that the ideal assessment environment is either on the job or a combination of both on and off the job. The competencies covered by this unit may be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.
Method of assessment	Typically an Engineering Tradesperson - Fabrication and other tradespersons engaged in welding are required to exercise MMAW skills and techniques across a range of jobs and specifications. A single assessment event is not appropriate. On the job assessment should be included as part of the assessment

EVIDENCE GUIDE	
	process wherever possible. Where assessment occurs off the job, judgement must consider evidence of the candidate's performance in a productive work environment that includes a sufficient range of appropriate tasks and materials to cover the scope of application for this unit. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with welding using MMAW process or other units requiring the exercise of the skills and knowledge covered by this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

RANGE STATEMENT	
Welds	Welds include fillet and butt welds carried out in all positions
Materials	Materials may include ferrous materials including carbon or stainless steel, as well as non-ferrous metals and alloys suitable for MMA welding
Prepared	Preparation of materials may include: • pre-heating • setting up of jigs, fixtures and clamps • joint preparation (e.g. bevelling)
Equipment	Equipment may include AC or DC welding machines
Distortion prevention measures	Distortion prevention measures may include: • pre heating • setting up of jigs, fixtures and clamps
Rectified	Rectified refers to oxy acetylene, air arc equipment and grinding devices
Defects	Defects may include: • porosity • slag inclusions • discontinuities • lack of penetration • undercut

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units	

Co-requisite units		

Competency field

Competency field	Fabrication

MEM05016C Perform advanced welding using manual metal arc welding process

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers preparing materials, selecting and setting up the welding equipment, carrying out advanced manual metal arc welding (MMAW), inspecting for and correcting defects, and maintaining the weld records.

Application of the Unit

Application of the unit	This unit applies to welds associated with a range of structural sections and/or plate and/or pipe for general fabrication. Weld quality would typically conform to Australian Standard 1554 Structural Purpose, Bureau Det Norse Verticas or equivalent. Where advanced manual thermal cutting, gouging and shaping is carried out, Unit MEM05008C (Perform advanced manual thermal cutting, gouging and shaping) should also be selected. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM05007C	Perform manual heating and thermal cutting
	MEM05012C	Perform routine manual metal arc welding
	MEM05015D	Weld using manual metal arc welding process
	MEM05051A	Select welding processes
	MEM05052A	Apply safe welding practices
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare welding materials and equipment	1.1. Welding equipment is prepared. 1.2. Welding equipment appropriate to task requirements is assembled and adjusted correctly and safely. 1.3. Materials are prepared to achieve the required weld specification.
2. Weld joints to code requirements using MMAW	2.1. Weld requirements are interpreted correctly. 2.2. Welds are deposited correctly to specifications. 2.3. Appropriate distortion prevention measures are selected for the weld type and material and distortions are rectified as required.
3. Assess weld quality and rectify faults	3.1. Weld joints are visually inspected against specifications. 3.2. Defects are removed using appropriate methods for the given task. 3.3. Weld records are correctly completed and maintained.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- welding to conform to Australian Standard 1554 Structural Purpose, Bureau Det Norse Verticas or equivalent
- interpreting weld requirements and specifications
- entering information onto proformas and standard workplace forms
- interpreting technical drawings and weld specifications relating to advanced MMAW
- using hand and power tools to prepare and weld material using MMAW
- using measurement and numeracy skills relating to advanced MMAW and preparation
- selecting equipment and consumables appropriate to the task
- using visual identification of faults/defects

REQUIRED SKILLS AND KNOWLEDGE
Required knowledge
Look for evidence that confirms knowledge of: • in-depth knowledge of the properties and characteristics of a wide range of materials • requirements to conform to Australian Standard 1554 Structural Purpose, Bureau Det Norse Verticas or equivalent • weld procedures and requirements • different welder identification systems such as numbering, bar coding, paint coding, letter stamps • safety requirements • safe welding practices • use and application of personal protective equipment for MMAW

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to prepare materials, select and set up the welding equipment, carry out advanced MMAW, inspect for and correct defects, and maintain the weld records. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this

EVIDENCE GUIDE	
	unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing advanced welding using manual metal arc welding process (MMAW), or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Welding equipment	AC or DC welding machines, settings, electrodes and related equipment
Materials	Materials used would include low carbon, cast

RANGE STATEMENT	
	iron, stainless and low alloy steel
Prepared	Preparation of materials may include preheating, setting up of jigs, fixtures, clamps, etc., joint preparation e.g. bevelling
Welds	Welds would be fillet and butt in all positions
Distortion prevention measures	Distortion prevention may include preheating, setting up of jigs, fixtures, clamps, etc.
Defects	Porosity, slag inclusions, discontinuities, lack of penetration, undercut
Appropriate methods	Oxy acetylene and air arc equipment and grinding devices
Weld records	Proformas and other standard workplace forms

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

MEM05017D Weld using gas metal arc welding process

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency covers the preparation, positioning, fixing, and manual welding techniques associated with general trade level welding using gas metal arc welding (GMAW) equipment including the selection and set up of the equipment appropriate to both the material and the weld to be performed, carrying out the GMAW to prescribed standards, and examining for and correcting defects, in a range of welded fabrications.

Application of the Unit

Application of the unit	This unit of competency applies to welds associated with heavy or light metal fabrications. Welds are fillet and butt welds in all positions on a range of ferrous and non-ferrous materials that may include carbon steel or stainless steel. Weld quality would conform to Australian Standard 1554 General Purpose, American Bureau of Shipping (ABS) or equivalent. This unit has been primarily developed for Engineering Tradesperson - Fabrication apprenticeship training and the recognition of trade level skills in GMAW. It may also apply to other trade occupations requiring higher level GMAW welding skills. Where manual thermal processes associated with preparation, pre-heat and/or post-heat are required, MEM05007C Perform manual heating and thermal cutting and/or MEM05008C Perform advanced manual thermal cutting, gouging and shaping should be considered for selection. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM05050B	Perform routine gas metal arc welding
	MEM05051A	Select welding processes
	MEM05052A	Apply safe welding practices
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare materials for gas metal arc welding (GMAW)	1.1. Weld requirements are identified from specifications and/or drawings 1.2. Material is correctly prepared 1.3. Materials are assembled/aligned to specification where required
2. Select welding components and consumables	2.1. Welding machine settings, accessories and consumables are identified and selected
3. Assemble and set up welding equipment	3.1. Welding equipment is assembled and set up
4. Minimise and rectify distortion	4.1. Appropriate distortion prevention measures are selected and applied 4.2. Distortion is rectified
5. Weld to job specification using GMAW	5.1. Weld deposit is to specifications 5.2. Joints are cleaned to specifications
6. Ensure weld conformance	6.1. Weld joints are visually inspected for conformance to specifications 6.2. Defects are removed with minimum loss of sound metal using correct and appropriate techniques and tools
7. Maintain weld records as required	7.1. Weld records are completed correctly

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Required skills include: • identifying and interpreting welding specifications including appropriate standards e.g. Australian Standard 1554 General Purpose, American Bureau of Shipping (ABS) or equivalent • selecting and using appropriate tools and equipment

REQUIRED SKILLS AND KNOWLEDGE
• using a variety of welding machines and electrodes • identifying and rectifying weld defects • applying techniques for distortion prevention and rectification • cleaning welds • reading and interpreting information on sketches, written job instructions, specifications, standard operating procedures and engineering drawings • recording routine information including routine weld records related to GMAW onto proformas and standard workplace forms • following oral instructions • measurement skills relating to joint preparation and GMAW
Required knowledge
Required knowledge includes: • types of gases and their uses • the relationships between amperage/wire feed, voltage, gas flow, electrode and material • the application of weld metal transfer (short arc, spray etc.) • correct welding machine, leads, hand pieces and electrodes • material preparation • joint preparations • electrode classification • causes of distortion for materials within the scope of this unit • safe welding practices • use and application of personal protective equipment for GMAW

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to prepare materials, select and set up the welding equipment, carry out GMAW and examine for and correct defects, in a range of welding activities associated with GMAW. Competency in this unit cannot be awarded until all prerequisites have been satisfied.

EVIDENCE GUIDE	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently apply the skills covered in this unit of competency in new and different workplace situations and contexts. Critical aspects of assessment and evidence include: • following all safety procedures to protect self, other workers and members of the public • identifying and interpreting specifications for GMAW including Australian Standard 1554 General Purpose • interpreting welding specifications including standard welding symbols used to show weld procedure • selecting appropriate weld preparation methods for material and position of welds. • preparing materials, setting up of jigs, fixtures, clamps,etc. and joint preparation including bevelling • consistently welding different ferrous and non-ferrous materials to AS 1554 General Purpose or equivalent • identifying defects as described in the range statement across a range of welded materials • rectifying defects.
Context of and specific resources for assessment	Welding to AS 1554 General Purpose or equivalent requires both theoretical knowledge and high level practical skills. The assessment process must be designed to identify consistent performance to the standard and the specifications across a range of materials and positions. The assessment must also identify a level of workplace performance in terms of defect rates and weld failure rates. It is recommended that assessment involve demonstrations of competency under both workshop and site conditions. This means that the ideal assessment environment is either on the job or a combination of both on and off the job. The competencies covered by this unit may be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.
Method of assessment	Typically an Engineering Tradesperson - Fabrication and other tradespersons engaged in welding are required to exercise GMAW skills and techniques across a range of jobs and specifications.

EVIDENCE GUIDE	
	A single assessment event is not appropriate. On the job assessment should be included as part of the assessment process wherever possible. Where assessment occurs off the job, judgement must consider evidence of the candidate's performance in a productive work environment that includes a sufficient range of appropriate tasks and materials to cover the scope of application for this unit. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with welding using GMAW process or other units requiring the exercise of the skills and knowledge covered by this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work

RANGE STATEMENT	
situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Weld	Welds include fillet and butt welds carried out in all positions
Materials	Materials may include ferrous materials including carbon or stainless steel, as well as non-ferrous metals and alloys suitable for GMAW
Prepared	Preparation of materials may include: • pre-heating • setting up of jigs, fixtures and clamps • joint preparation (e.g. bevelling)
Equipment	Equipment may include AC or DC welding machines
Distortion prevention measures	Distortion prevention measures may include: • pre-heating • setting up of jigs, fixtures and clamps
Rectified	Rectified refers to oxy acetylene, air arc equipment and grinding devices
Defects	Defects may include: • porosity • slag inclusions • discontinuities • lack of penetration • undercut

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

MEM05018C Perform advanced welding using gas metal arc welding process

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers preparing materials, selecting and setting up the welding equipment, carrying out advanced gas metal arc welding (GMAW), inspecting for and correcting defects, and maintaining the weld records.

Application of the Unit

Application of the unit	This unit applies to welds associated with a range of structural sections and/or plate and/or pipe for general fabrication using ferrous and non-ferrous materials. Weld quality would typically conform to Australian Standard 1554 Structural Purpose, Bureau Det Norse Verticas or equivalent. Where advanced manual thermal cutting, gouging and shaping is carried out, Unit MEM05008C (Perform advanced manual thermal cutting, gouging and shaping) should also be selected. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM05007C	Perform manual heating and thermal cutting
	MEM05017D	Weld using gas metal arc welding process
	MEM05050B	Perform routine gas metal arc welding
	MEM05051A	Select welding processes
	MEM05052A	Apply safe welding practices
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare welding materials and equipment	1.1. Welding equipment is prepared. 1.2. Welding equipment is assembled and adjusted correctly and safely. 1.3. Materials are prepared to achieve required weld specification.
2. Weld joints to code requirements using advanced GMAW	2.1. Weld requirements are interpreted correctly. 2.2. Welds are deposited correctly to specifications. 2.3. Appropriate distortion prevention measures are selected and distortions are rectified as required.
3. Assess weld quality and rectify faults	3.1. Weld joints are visually inspected against specifications. 3.2. Defects are removed using appropriate methods for the given task.. 3.3. Weld records are correctly completed and maintained.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- welding to conform to Australian Standard 1554 Structural Purpose, Bureau Det Norse Verticas or equivalent
- performing safe welding practices
- using and applying personal protective equipment for GMAW
- interpreting weld requirements and specifications
- entering information onto proformas and standard workplace forms
- interpreting technical drawings and weld specifications relating to advanced GMAW
- using hand and power tools to prepare and weld material using GMAW
- using measurement and numeracy skills relating to advanced GMAW and preparation
- selecting equipment and consumables appropriate to the task

REQUIRED SKILLS AND KNOWLEDGE
• using visual identification of faults/defects
Required knowledge
Look for evidence that confirms knowledge of: • in-depth knowledge of the properties and characteristics of a wide range of materials • requirements to conform to Australian Standard 1554 Structural Purpose, Bureau Det Norse Verticas or equivalent • weld procedures and requirements • different welder identification systems such as numbering, bar coding, paint coding, letter stamps • safe welding practices • use and application of personal protective equipment for GMAW

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to prepare materials, select and set up the welding equipment, carry out advanced GMAW, inspect for and correct defects, and maintain the weld records. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this

EVIDENCE GUIDE	
	unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing advanced welding using gas metal arc welding process or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Welding equipment	AC or DC welding machines, settings, electrodes and related equipment
Preparing materials	Preheating, setting up of jigs, fixtures, clamps, etc., joint preparation e.g. bevelling

RANGE STATEMENT	
Materials	Low carbon, cast iron, stainless and low alloy steel, aluminium and aluminium alloys
Welds	Fillet and butt in all positions
Distortion prevention measures	Preheating, setting up of jigs, fixtures, clamps, etc.
Defects	Porosity, slag inclusions, discontinuities, lack of penetration, undercut
Appropriate methods	Oxy acetylene arc equipment, grinding devices
Weld records	Proformas and other standard workplace forms

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

MEM05019D Weld using gas tungsten arc welding process

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency covers the preparation, positioning, fixing, and welding techniques associated with general trade level welding using gas tungsten arc welding (GTAW) equipment including the selection and set up of the equipment appropriate to both the material and the weld to be performed, carrying out the GTAW to prescribed standards, and examining for and correcting defects, in a range of welded fabrications.

Application of the Unit

Application of the unit	This unit of competency applies to welds associated with heavy or light metal fabrications. Welds are fillet and butt welds in all positions on a range of ferrous and non-ferrous materials that may include carbon steel or stainless steel and aluminium. Weld quality would conform to Australian Standard 1554 General Purpose, American Bureau of Shipping (ABS), or equivalent. This unit has been primarily developed to support Engineering Tradesperson - Fabrication apprenticeship training and the recognition of trade level skills in GTAW. It may also apply to other trade occupations requiring higher level GTAW welding skills. Where manual thermal processes associated with preparation, pre-heat and/or post-heat are required, MEM05007C Perform manual heating and thermal cutting and/or MEM05008C Perform advanced manual thermal cutting, gouging and shaping should be considered for selection. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM05049B	Perform routine gas tungsten arc welding
	MEM05051A	Select welding processes
	MEM05052A	Apply safe welding practices
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare materials for gas tungsten arc welding (GTAW)	1.1. Weld requirements are identified from specifications and/or drawings 1.2. Material is correctly prepared 1.3. Materials are assembled/aligned to specification, where required
2. Select welding equipment and consumables	2.1. Welding equipment and electrodes, accessories and consumables appropriate to the material are identified and selected
3. Assemble and set up welding equipment	3.1. Welding equipment is assembled and set up
4. Minimise and rectify distortion	4.1. Appropriate distortion prevention measures for weld and material type are selected and applied 4.2. Distortion is rectified
5. Weld to job specification using GTAW	5.1. Weld deposit is to specifications 5.2. Joints are cleaned to specifications
6. Ensure weld conformance	6.1. Defects are removed with minimum loss of sound metal using techniques and tools appropriate to the defect, material and process 6.2. Weld joints are visually inspected for conformance to specifications
7. Maintain weld records as required	7.1. Weld records are completed correctly

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- identifying and interpreting welding specifications including appropriate standards e.g. Australian Standard 1554 General Purpose, American Bureau of Shipping (ABS) or equivalent
- selecting and using appropriate tools and equipment

REQUIRED SKILLS AND KNOWLEDGE
• using a variety of welding machines and electrodes • identifying and rectifying weld defects • applying techniques for distortion prevention and rectification • cleaning welds • reading and interpreting information on sketches, written job instructions, specifications, standard operating procedures and engineering drawings • recording routine information including routine weld records related to GTAW onto proformas and standard workplace forms • following oral instructions • measurement skills relating to joint preparation and GTAW
Required knowledge
Required knowledge includes: • correct welding machine, leads, hand pieces and electrodes • material preparation • joint preparations • electrode classification • causes of distortion for materials within the scope of this unit • causes of defects and methods of rectification • the relationships between amperage, electrode and material • types of gases and their uses • types of electrodes, current settings and high frequency voltage • filler materials and consumables • safe welding practices • use and application of personal protective equipment for GTAW

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to prepare materials, select and set up the welding equipment, carry out the GTAW welding and examine for and correct defects, in a range of welding activities associated with GTAW. Competency in this unit cannot

EVIDENCE GUIDE	
	be awarded until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently apply the skills covered in this unit of competency in new and different workplace situations and contexts. Critical aspects of assessment and evidence include: • following all safety procedures to protect self, other workers and members of the public • identifying and interpreting specifications for GTAW including Australian Standard 1554 General Purpose • interpreting welding specifications including standard welding symbols used to show weld procedure • selecting appropriate weld preparation methods for material and position of welds. • preparing materials, setting up of jigs, fixtures, clamps,etc. and joint preparation including bevelling • consistently welding different ferrous and non-ferrous materials to AS 1554 General Purpose or equivalent • identifying defects as described in the range statement across a range of welded materials • rectifying defects.
Context of and specific resources for assessment	Welding to AS 1554 General Purpose or equivalent requires both theoretical knowledge and high practical skills. The assessment process must be designed to identify consistent performance to standard and specification across a range of materials and positions. The assessment must also identify a level of workplace performance in terms of defect rate and weld failure rates. It is recommended that assessment involve demonstrations of competency under both workshop and site conditions. This means that the ideal assessment environment is either on the job or a combination of both on and off the job. The competencies covered by this unit may be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.
Method of assessment	Typically an Engineering Tradesperson - Fabrication and other tradespersons engaged in welding are required to exercise GTAW skills and techniques across a range of

EVIDENCE GUIDE	
	jobs and specifications. A single assessment event is not appropriate. On the job assessment should be included as part of the assessment process wherever possible. Where assessment occurs off the job, judgement must consider evidence of the candidate's performance in a productive work environment that includes a sufficient range of appropriate tasks and materials to cover the scope of application for this unit. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with welding using GTAW process or other units requiring the exercise of the skills and knowledge covered by this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating

RANGE STATEMENT	
conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Prepared	Prepared may include: • pre-heating • setting up of jigs, fixtures and clamps • joint preparation (e.g. bevelling)
Welds	Welds include fillet and butt welds carried out in all positions
Materials	Materials may include ferrous and non-ferrous materials including carbon steel,stainless steel, aluminium and other materials suitable for GTAW welding
Welding equipment	Welding equipment may include AC or DC welding machines
Distortion prevention measures	Distortion prevention measures may include: • pre-heating • setting up of jigs, fixtures and clamps
Rectified	Rectified may include: • oxy acetylene and air arc equipment • grinding devices
Defects	Defects may include: • porosity • slag inclusions • discontinuities • lack of penetration • undercut

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

MEM05020C Perform advanced welding using gas tungsten arc welding process

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers preparing materials, selecting and setting up the welding equipment, carrying out advanced gas tungsten arc welding (GTAW), inspecting for and correcting defects, and maintaining the weld records.

Application of the Unit

Application of the unit	This unit applies to welds associated with a range of structural sections and/or plate and/or pipe for general fabrication. Weld quality would typically conform to Australian Standard 1554 Structural Purpose, Bureau Det Norse Verticas or equivalent. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM05007C	Perform manual heating and thermal cutting

Prerequisite units		
	MEM05019D	Weld using gas tungsten arc welding process
	MEM05049B	Perform routine gas tungsten arc welding
	MEM05051A	Select welding processes
	MEM05052A	Apply safe welding practices
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**

ELEMENT	PERFORMANCE CRITERIA
1. Prepare welding materials and equipment	1.1. Welding equipment is prepared. 1.2. Welding equipment appropriate to task requirements is assembled and adjusted correctly and safely. 1.3. Materials are prepared to achieve the required weld specification.
2. Weld joints to code requirements using advanced GTAW	2.1. Weld requirements are interpreted correctly, 2.2. Welds are deposited correctly to specifications. 2.3. Appropriate distortion prevention measures are selected for the weld type and material and distortions are rectified as required.
3. Assess weld quality and rectify faults	3.1. Weld joints are visually inspected against specifications. 3.2. Defects are removed using appropriate methods for the given task. 3.3. Weld records are correctly completed and maintained.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- welding to conform to Australian Standard 1554 Structural Purpose, Bureau Det Norse Verticas or equivalent
- interpreting technical drawings and weld specifications relating to advanced GTAW
- using hand and power tools to prepare and weld material using GTAW
- using measurement and numeracy skills relating to advanced GTAW and preparation
- selecting equipment and consumables appropriate to task
- using visual identification of faults/defects

Required knowledge

Look for evidence that confirms knowledge of:

REQUIRED SKILLS AND KNOWLEDGE
• in-depth knowledge of the properties and characteristics of a wide range of materials • requirements to conform to Australian Standard 1554 Structural Purpose, Bureau Det Norse Verticas or equivalent • weld procedures and requirements • different welder identification systems such as numbering, bar coding, paint coding, letter stamps • safe welding practices • use and application of personal protective equipment for GTAW • hazards and control measures related to GTAW

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to prepare materials, select and set up the welding equipment, carry out the GTAW welding and inspect for and correct defects and maintain welding records. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

EVIDENCE GUIDE	
	This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing advanced welding using gas tungsten arc welding process (GTAW) or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Equipment	AC or DC welding machines, gases, settings, electrodes and related equipment
Materials	Low carbon, cast iron, stainless and low alloy steel, aluminium
Prepared	Preheating, setting up of jigs, fixtures, clamps, etc., joint preparation e.g. bevelling

RANGE STATEMENT	
Welds	Fillet and butt in all positions
Distortion prevention measures	Preheating, setting up of jigs, fixtures, clamps, etc.
Defects	Porosity, slag inclusions, discontinuities, lack of penetration, undercut
Appropriate methods	Oxy acetylene, air arc equipment and grinding devices
Weld records	Proformas and other standard workplace forms

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

MEM05022C Perform advanced welding using oxy acetylene welding process

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing advanced oxy acetylene welding, carried out using a range of materials for general fabrication.

Application of the Unit

Application of the unit	This unit applies to comprehensive preparation as required in a range of environments. It also includes maintaining weld records and rectifying defects. The term 'oxy acetylene' is used here to describe a range of fuel gases, including acetylene, LPG, hydrogen etc. This unit covers the competencies required for welding quality that would meet the Australian Standard 1554 Special Purpose, appropriate industrial standards, or equivalent outcomes. Where welds comply with one of the certificates covered by Australian Standard 1796, then Unit MEM05026C (Apply welding principles) should also be selected. Where advanced manual thermal cutting, gouging and shaping is carried out, Unit MEM05008C (Perform advanced manual thermal cutting, gouging and shaping) should also be selected. **Band**: **A** **Unit Weight**: **6**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM05004C	Perform routine oxy acetylene welding
	MEM05007C	Perform manual heating and thermal cutting
	MEM05051A	Select welding processes
	MEM05052A	Apply safe welding practices
	MEM09002B	Interpret technical drawing
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Select welding equipment and consumables	1.1. Correct welding equipment and consumables are selected from weld procedure specifications.
2. Prepare welding materials and equipment	2.1. Welding equipment and consumables are prepared according to job requirements. 2.2. Welding equipment appropriate to the task is assembled and adjusted correctly and safely. 2.3. Materials are prepared to achieve required weld specification.
3. Assemble welding equipment	3.1. Welding equipment, including cylinders, regulators, hoses, torches and tips is assembled and set up safely in accordance with standard operating procedures.
4. Weld joints to Australian Standard 1554 SP or equivalent	4.1. Materials are welded to Australian Standard 1554 SP or equivalent in all positions. 4.2. Instructions, symbols, specifications are interpreted correctly including bead size, bead placement, reinforcement etc. and in accordance with weld procedure sheet, if available, and standard operating procedures.
5. Inspect welds	5.1. Weld joints are visually inspected against specifications. 5.2. Weld defects are identified.
6. Correct faults	6.1. Defects are removed with minimum loss of sound metal using correct and appropriate techniques and tools to Australian Standard 3992 or equivalent.
7. Maintain weld records	7.1. Weld records are maintained in accordance with specifications and standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in:

REQUIRED SKILLS AND KNOWLEDGE
• selecting equipment and consumables • assembling welding equipment • welding to AS1554 SP • inspecting welds to specification • correcting weld faults to AS3992 • entering information on to proformas and standard workplace forms • using hand and power tools to prepare and weld materials • interpreting weld requirements and specifications/procedures • using measurement and numeracy skills for advanced oxy acetylene welding • selecting equipment and consumables appropriate to given task • using visual identification of defects/faults
Required knowledge
Look for evidence that confirms knowledge of: • preparatory requirements • the purpose and examples of pre-welding and post-welding heating of the weld materials • the appropriate settings for the given task and the selected equipment/consumables • the purpose of reinforcing areas to be welded • the methods of weld defect removal and their application • material and consumable properties and characteristics • requirements of AS1554SP and AS3992 or equivalent • fuel gas properties and applications • post treatments • recording procedures • safe welding practices • use and application of personal protective equipment for oxy acetylene welding • relevant hazards and control measures related to the competency

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must

EVIDENCE GUIDE	
	be able to perform advanced oxy acetylene welding carried out using a range of materials for general fabrication. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing advanced welding using oxy acetylene welding process or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Equipment and consumables	Fuel gases, including acetylene, LPG, hydrogen etc., cylinders, regulators, hoses, torches, tips, range of filler rods and fluxes
Weld	Fillet and butt in the horizontal, vertical and overhead positions
Preparing materials	Preheating, setting up of jigs, fixtures, clamps, etc., joint preparation e.g. bevelling
Materials	Low carbon steel, plate, pipe, tube and round bar

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

MEM05026C Apply welding principles

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency covers applying welding principles to meet the statutory and regulatory requirements for welding procedures generally associated with the application of one of the units satisfying Australian Standard 1796 Certificates 1-9.

Application of the Unit

Application of the unit	This unit of competency covers the underpinning knowledge required to satisfy Australian Standard 1796. It includes knowledge of welding terms, codes and symbols, the effects of heat treatment on metal as it relates to welding, and the logical sequence for a welding process required to be conducted to AS 1796. It covers welding, planning and set up principles for a range of materials and processes. This unit must be assessed in combination with one of the units satisfying the Australian Standard 1796 Certificates 1-9 and these units include: • MEM05042B Perform welds to code standards using flux core arc welding process • MEM05043B Perform welds to code standards using gas metal arc welding process • MEM05044B Perform welds to code standards using gas tungsten arc welding process • MEM05045B Perform pipe welds to code standards using manual metal arc welding process • MEM05046B Perform welds to code standards using manual metal arc welding process. This unit has been developed for Engineering Tradespersons - Fabrication in either apprenticeship or post trade training and the recognition of trade level

	knowledge of welding principles. This unit has dual status and is to be regarded as both a Specialisation Band A unit and Specialisation Band B unit for progression to C7 (AQF level IV). **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Apply all statutory and regulatory requirements to welding procedures	1.1. Statutory and safety requirements are applied to welding
2. Interpret all welding terms, codes and symbols	2.1. Welding terms and symbols are correctly interpreted
3. Determine the effects of heat treatment on metal in relation to welding	3.1. Reasons for performing heat treatment are identified 3.2. Processes such as pre-heat/post-heat treatment, stress relieving, normalising and annealing are appropriately applied
4. Plan the logical sequence of welding operations	4.1. Principles of planning and setting up welding are applied 4.2. Where specified, welds are prepared for testing

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- interpreting welding specifications including terms, codes and symbols
- planning the sequence of welding operations

Required knowledge

Required knowledge includes:

- any applicable industry standards, national/Australian standards, NOHSC guidelines, state/territory regulatory codes of practice/standards for the applicable welding processes
- safe work practices and procedures
- hazards related to welding
- safety equipment and procedures related to welding activities
- welding terminology
- welding codes and symbols

REQUIRED SKILLS AND KNOWLEDGE
• heat treatment processes • logical sequence for welding processes • tools, equipment, techniques used in welding • effect of heat treatment on metal

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply welding principles to meet the statutory and regulatory requirements for welding procedures.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently apply the skills and knowledge covered in this unit of competency in new and different workplace situations and contexts. Critical aspects of assessment and evidence include: • applying welding statutory and safety requirements to different welding jobs and environments • interpreting welding codes and symbols including symbols for type of weld, weld size, processing and finishing operations etc • applying appropriate pre and post-heat treatment processes for a range of welded materials • setting up weld sequence and preparing materials in a logical manner for welding job.
Context of and specific resources for assessment	This unit must be assessed in combination with one of the units satisfying the Australian Standard 1796 Certificates 1-9. Welding to AS 1796 requires both theoretical knowledge and high practical skills. The assessment process for the two units must be designed to identify consistent performance to the tandards, the code and specifications across a range of materials and positions. The assessment must also identify a workplace level of performance in terms of defect rates and weld

EVIDENCE GUIDE	
	failure rates. It is recommended that assessment involve demonstrations of competency under both workshop and site conditions. This means that the ideal assessment environment is either on the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.
Method of assessment	Typically an Engineering Tradesperson - Fabrication and other tradespersons engaged in welding are required to apply welding principles and techniques across a range of jobs and specifications. A single assessment event is not appropriate. On the job assessment should be included as part of the assessment process wherever possible. Where assessment occurs off the job, judgement must consider evidence of the candidate's performance in a productive work environment that includes a sufficient range of appropriate tasks and materials to cover the scope of application for this unit. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	This unit must be assessed in combination with one of the units satisfying the Australian Standard 1796 Certificate 1-9 and these units include: • MEM05042B Perform welds to code standards using flux core arc welding process • MEM05043B Perform welds to code standards using gas metal arc welding process • MEM05044B Perform welds to code standards using gas tungsten arc welding process

EVIDENCE GUIDE	
	• MEM05045B Perform pipe welds to code standards using manual metal arc welding process • MEM05046B Perform welds to code standards using manual metal arc welding process. This unit could also be assessed in conjunction with any other units addressing the safety, quality, communication materials handling, recording and reporting associated with applying welding principles to meet the statutory and regulatory requirements for welding procedures or other units requiring the exercise of the skills and knowledge covered by this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Statutory and safety requirements	Statutory and safety requirements as required by AS 1796 welding codes
Welding	Welding to AS 1796 using any of the following processes: • flux core arc welding • gas metal arc welding • gas tungsten arc welding • manual metal arc welding

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

MEM05043B Perform welds to code standards using gas metal arc welding process

Modification History

Unit application corrected to include missing notes relating to dual band status.

Unit Descriptor

Unit descriptor	This unit covers preparing and producing welds to code standards using gas metal arc welding (GMAW).

Application of the Unit

Application of the unit	This unit applies to performing GMAW to code standard carried out using a range of materials. Welds in this unit are associated with high quality fabrications. Butt and fillet welds in the flat, horizontal, vertical and overhead positions would be applied to meet Australian Standards 1210, AS 4140, ASME IX or equivalent. This unit, in conjunction with Unit MEM05026C (Apply welding principles), may satisfy the requirements of AS 1796 Certificate 8G. **Band**: **A** This unit has dual status and is to be regarded as both a Specialisation Band A unit and Specialisation Band B unit for progression to C7 (AQF level IV). **Unit Weight**: **6**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM05007C	Perform manual heating and thermal cutting
	MEM05017D	Weld using gas metal arc welding process
	MEM05018C	Perform advanced welding using gas metal arc welding process
	MEM05026C	Apply welding principles
	MEM05050B	Perform routine gas metal arc welding
	MEM05051A	Select welding processes
	MEM05052A	Apply safe welding practices
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range

	statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Maintain welding equipment	1.1. Routine maintenance is performed on welding equipment.
2. Prepare welding materials and equipment for GMAW welding to code standard	2.1. Weld requirements for GMAW welding to code standards are determined. 2.2. Materials are prepared to produce weld to code standard. 2.3. Welding equipment is set up correctly.
3. Weld joints using GMAW to procedure specifications	3.1. Materials are welded as per weld procedure specification.
4. Ensure weld quality	4.1. Discontinuities are rectified to ensure conformance to code requirements. 4.2. Weld records are maintained in accordance with standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • depositing welds to procedure requirements • determining weld outcomes, consumables and settings from welding procedure specification • interpreting technical drawings and weld specifications for welding to code standards using GMAW • using hand and power tools to prepare and weld materials to code standard • using measurement and numeracy skills for welding to code standards • using language and literacy skills to enable completion of weld records

REQUIRED SKILLS AND KNOWLEDGE
Required knowledge
Look for evidence that confirms knowledge of: • requirements to produce welds to quality of AS 1210, AS 4140, ASME IX or equivalent • safe welding practices • use and application of personal protective equipment for GMAW • relevant standards or codes • methods for preparing plate and pipe for code standard welding • pre-welding and post-welding heating methods and requirements for plate and pipe welding to code standard • requirements for maintaining weld records to code standard • hazard and control measures associated with welding, including housekeeping

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to prepare and produce welds to code standards using GMAW process. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment

EVIDENCE GUIDE	
	should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing welds to code standards using gas metal arc welding process or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Routine maintenance	Ensuring gun, liner, contact tip etc. are in serviceable condition
Prepared	Flame cut and ground or machined; preheating, setting up of jigs, fixtures, clamps, etc.
Materials	Carbon/manganese steel, low alloy steel and

RANGE STATEMENT	
	aluminium materials, etc. on plate, pipe and rolled steel sections

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

MEM05044B Perform welds to code standards using gas tungsten arc welding process

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers preparing and producing welds to code standards using gas tungsten arc welding (GTAW).

Application of the Unit

Application of the unit	This unit applies to welds associated with high quality fabrications, using a range of materials. Butt and fillet welds in the flat, horizontal, vertical and overhead positions would be applied to meet Australian Standards 1210, AS 4140, ASME IX or equivalent. The unit, together with Unit MEM05026C (Apply welding principles), may satisfy the requirements of AS 1796 Certificate 7. Where advanced manual thermal cutting, gouging and shaping is carried out, Unit MEM05008C (Perform advanced manual thermal cutting, gouging and shaping) should also be selected. **Band**: **A** **Unit Weight**: **6**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM05007C	Perform manual heating and thermal cutting
	MEM05019D	Weld using gas tungsten arc welding process
	MEM05020C	Perform advanced welding using gas tungsten arc welding process
	MEM05026C	Apply welding principles
	MEM05049B	Perform routine gas tungsten arc welding
	MEM05051A	Select welding processes
	MEM05052A	Apply safe welding practices
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range

	statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Maintain welding equipment	1.1. Routine maintenance is performed on welding equipment.
2. Prepare welding materials and equipment for GTAW welding to code standard	2.1. Weld requirements for GTAW welding to code standards are determined. 2.2. Materials are prepared to produce weld to code standard. 2.3. Welding equipment is set up correctly.
3. Weld joints using GTAW to procedure specifications	3.1. Materials are welded as per weld procedure specification.
4. Ensure weld quality	4.1. Discontinuities are rectified to ensure conformance to code requirements. 4.2. Weld records are maintained in accordance with standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • depositing welds to procedure requirements • determining weld outcomes, consumables and settings from welding procedure specification • interpreting technical drawings and weld specifications for welding to code standards using GTAW • using hand and power tools to prepare and weld materials to code standard • using measurement and numeracy skills for welding to code standards • reading and interpreting routine information on written job instructions,

REQUIRED SKILLS AND KNOWLEDGE
specifications and standard operating procedures. May include drawings • following oral instructions
Required knowledge
Look for evidence that confirms knowledge of: • requirements to produce welds to quality of AS 1210, AS 4140, ASME IX or equivalent • safe welding practices • use and application of personal protective equipment for GTAW • relevant standards or codes • methods for preparing plate and pipe for code standard welding • pre-welding and post-welding heating methods and requirements for plate and pipe welding to code standard • requirements for maintaining weld records to code standard • hazards and control measures associated with welding, including housekeeping

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to prepare and produce welds to code standards using GTAW process. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic

EVIDENCE GUIDE	
	workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing welds to code standards using gas tungsten arc welding process (GTAW) or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Routine maintenance	Ensuring hand piece, gas shroud, flow meter etc. are in serviceable condition

RANGE STATEMENT	
Prepared	Flame cut and ground or machined, preheating, setting up of jigs, fixtures, clamps, etc.
Materials	Carbon/manganese steel, low alloy steel and aluminium materials, etc. on plate, pipe and rolled steel sections

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	

MEM05046B Perform welds to code standards using manual metal arc welding process

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers preparing and producing welds to code standards using manual metal arc welding (MMAW).

Application of the Unit

Application of the unit	This unit applies to MMAW to code standard carried out using a range of materials. Welds in this unit are associated with high quality fabrications. Butt and fillet welds in the flat, horizontal, vertical and overhead positions would be applied to meet Australian Standards 1210, AS 4140, ASME IX or equivalent. This unit, together with Unit MEM05026C (Apply welding principles), may satisfy the requirements of AS 1796 Certificates 1, 1E, 3 and 3E. Where advanced manual thermal cutting, gouging and shaping is carried out, Unit MEM05008C (Perform advanced manual thermal cutting, gouging and shaping) should also be selected. **Band**: **A** **Unit Weight**: **6**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM05007C	Perform manual heating and thermal cutting
	MEM05012C	Perform routine manual metal arc welding
	MEM05015D	Weld using manual metal arc welding process
	MEM05016C	Perform advanced welding using manual metal arc welding process
	MEM05026C	Apply welding principles
	MEM05051A	Select welding processes
	MEM05052A	Apply safe welding practices
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range

	statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Maintain welding equipment	1.1. Routine maintenance is performed on welding equipment.
2. Prepare welding materials and equipment for MMAW welding to code standard	2.1. Weld requirements for MMAW welding to code standards are determined. 2.2. Materials are prepared to produce weld to code standard. 2.3. Welding equipment is set up correctly.
3. Weld joints using MMAW to procedure specifications	3.1. Materials are welded as per weld procedure specification.
4. Ensure weld quality	4.1. Discontinuities are rectified to ensure conformance to code requirements. 4.2. Weld records are maintained in accordance with standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • depositing welds to procedure requirements • determining weld outcomes, consumables and settings from welding procedure specification • interpreting technical drawings and weld specifications for welding to code standards using MMAW • using hand and power tools to prepare and weld materials to code standard • using measurement and numeracy skills for welding to code standards

REQUIRED SKILLS AND KNOWLEDGE
• using language and literacy skills to enable completion of weld records
Required knowledge
Look for evidence that confirms knowledge of: • requirements to produce welds to quality of AS 1210, AS 4140, ASME IX or equivalent • safe welding practices • use and application of personal protective equipment for MMAW • knowledge of appropriate standards or codes • methods for preparing plate for code standard welding • pre-welding and post-welding heating methods and requirements for plate welding to code standard • requirements for maintaining weld records to code standard • hazards and control measures associated with welding, including housekeeping

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform welds to code standards using MMAW process. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this

EVIDENCE GUIDE	
	unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the preparation and production of welds or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Routine maintenance	Ensuring leads, hand pieces etc. are in serviceable condition, and correct current carrying capacity
Prepare welding materials	Preheating, setting up of jigs, fixtures, clamps, etc.

RANGE STATEMENT	
Prepared	Flame cut and ground or machined
Materials	Carbon/manganese steel, stainless steel and low alloy steel materials, etc.

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

MEM05049B Perform routine gas tungsten arc welding

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers preparing the materials and carrying out routine gas tungsten arc welding (GTAW).

Application of the Unit

Application of the unit	This unit applies in a maintenance or manufacturing environment where the weld quality is not required to meet an Australian Standard. Fillet and butt welds would typically be performed on low carbon/mild steels and aluminium. Where welding is required to meet Australian Standard 1554 General Purpose or equivalent codes, occupational health and safety regulations and/or licensing requirements, Unit MEM05019D (Weld using gas tungsten arc welding process) should be selected. **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Refer to Application of the Unit

Pre-Requisites

Prerequisite units		

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Identify weld requirements	1.1. Weld requirements are identified from job instructions. 1.2. The locations of welds are identified in accordance with standard operating procedures and job specifications.
2. Prepare materials for welding	2.1. Materials are cleaned and prepared ready for welding.
3. Prepare equipment for welding	3.1. Welding equipment is set up correctly. 3.2. Settings and consumables are selected to suit application.
4. Perform routine welding using GTAW	4.1. Safe welding practices are applied. 4.2. Materials are welded to job requirements. 4.3. Welds are cleaned to standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • preparing materials • setting up welding equipment • welding with GTAW • reading and interpreting routine information on written job instructions, specifications and standard operating procedures • using measurement skills for joint preparation and routine GTAW
Required knowledge
Look for evidence that confirms knowledge of: • preparatory requirements • properties and characteristics of materials and consumables • equipment and equipment settings • fuel gas properties and applications • post welding treatments • weld characteristics • safe welding practices • use and application of personal protective equipment for routine GTAW

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform routine gas tungsten arc welding (GTAW).

EVIDENCE GUIDE	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with carrying out routine gas tungsten arc welding or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Materials	Mild and low carbon steel
Prepared	Preheating, setting up jigs, fixtures, clamps, joint preparation
Equipment	Hoses, welding leads and gas shrouds, electrodes, gas regulator, liners, contact tips
Consumables	Tungsten electrodes, filler wire, shielding gas
Cleaned	Slag, spatter

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

MEM05050B Perform routine gas metal arc welding

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers preparing materials and routine gas metal arc welding (GMAW).

Application of the Unit

Application of the unit	This unit applies in a maintenance or manufacturing environment where the weld quality is not required to meet an Australian Standard or equivalent. Fillet and butt welds would typically be performed on low carbon/mild steels. Where welding is required to meet Australian Standard 1554 General Purpose or equivalent codes, occupational health and safety regulations and/or licensing requirements, Unit MEM05017D (Weld using gas metal arc welding process) should be selected. **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Refer to Application of the Unit

Pre-Requisites

Prerequisite units		

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Identify weld requirements	1.1. Weld requirements are identified from job instructions. 1.2. Locations of welds are identified in according to standard operating procedures and job specifications.
2. Prepare materials for welding	2.1. Materials are cleaned and prepared ready for welding.
3. Prepare equipment for welding	3.1. Welding equipment is set up correctly. 3.2. Settings and consumables are selected to suit application.
4. Perform routine welding using GMAW	4.1. Safe welding practices are applied. 4.2. Materials are welded to job requirements. 4.3. Welds are cleaned to standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • preparing materials • setting up welding equipment • welding with GMAW • reading and interpreting routine information on written job instructions, specifications and standard operating procedures • following oral instruction • using measurement skills relating to joint preparation and routine GMAW
Required knowledge
Look for evidence that confirms knowledge of: • different current and voltage settings, gas flow rates wire diameters, wire feed speed and other variables to suit typical situations. • material and equipment preparation • properties and characteristics of materials and consumables • equipment and equipment settings • fuel gas properties and applications • post-welding treatments • weld characteristics • safe welding practices • use and application of personal protective equipment for routine GMAW

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must

EVIDENCE GUIDE	
	be able to perform routine gas metal arc welding (GMAW).
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with preparing the materials and carrying out routine gas metal arc welding or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Materials	Mild and low carbon steel
Prepared	Preheating, setting up jigs, fixtures, clamps, joint preparation
Equipment	Hoses, welding leads, gas shrouds, gas regulators, liners, contact tips
Consumables	Filler wire, shielding gas
Cleaned	Slag and spatter

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

MEM05051A Select welding processes

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers identifying material properties and selecting appropriate welding processes to achieve safe and effective welding outcomes.

Application of the Unit

Application of the unit	This unit applies to all types of welding. It includes the identification of properties and characteristics of all commonly used metals, and selection of appropriate welding techniques to ensure integrity of materials is maintained during welding processes. **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify properties of commonly used metals	1.1. Materials to be welded are identified. 1.2. Characteristics and properties of commonly used materials are identified. 1.3. Uses and purposes of commonly used materials are identified. 1.4. Basic metallurgical characteristics are considered.
2. Identify and provide for welding contingencies	2.1. Information relevant to welding processes is sourced as required. 2.2. Potential contingencies are identified and solutions are considered.
3. Identify appropriate welding processes	3.1. Welding processes are identified and selected to achieve specified outcomes with selected metals. 3.2. Effects of welding processes on materials are identified. 3.3. Distortion prevention measures are identified. 3.4. Alternative joining methods for job are identified and assessed for relevancy.
4. Identify cleaning and preparation requirements	4.1. Processes for cleaning and preparing metals are identified. 4.2. Role of contaminants in welding flaws is explained. 4.3. Safety requirements for chemicals and other

ELEMENT	PERFORMANCE CRITERIA
	materials are identified and utilised in accordance with manufacturers' specifications and legislative requirements.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents • planning and sequencing operations • checking and clarifying task-related information
Required knowledge
Look for evidence that confirms knowledge of: • hazards and control measures associated with welding practices, including housekeeping • safe work practices and procedures • properties and characteristics of commonly used metals and materials • basic metallurgy principles • information resources • chemical content of fumes emitted by welding processes • uses and purposes of various metals • distortion prevention measures for various metals

Evidence Guide

EVIDENCE GUIDE
The evidence guide provides advice on assessment and must be read in conjunction with the

EVIDENCE GUIDE	
performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to select welding processes.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with selecting welding processes or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Characteristics	Tensile strength, grade, heat resistance, density
Properties	Physical properties, flammable limits, melting point
Basic metallurgical characteristics	Alloys and grades of metals and different types of electrodes
Information	Steel suppliers handbooks, welding company materials, standard operating procedures, safety documentation

Welding processes	• Fusion:
	  • electric arc welding
	  • gas (oxy-fuel) welding
	  • thermit welding
	• Pressure welding processes:
	  • resistance welding
	  • fire or forge welding
	  • friction welding
	  • explosive welding
	• Low temperature processes:
	  • soldering
	  • brazing
	• Other:
	  • ultrasonic welding
	  • electron beam welding

Effects	Thermal expansion, heat affected zones, fume emissions, altered density, distortion
Distortion prevention measures	Heat treatments, consolidations
Processes for cleaning and weld preparation	Etching, grinding, arc gouging, thermal cutting, chemical additives, anti-corrosion treatments

RANGE STATEMENT	
Safety requirements	• Dry and ventilated areas • In accordance with workplace procedures • Location away from heat risks • Location away from incompatible substances • Requirements for hazardous substances • Adequate signage and labelling • Appropriate sealing • Routine inspections • Emergency procedures • Regulatory notification requirements

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

MEM05052A Apply safe welding practices

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers identifying risks associated with welding operations and implementing hazard reduction practices.

Application of the Unit

Application of the unit	This unit applies to gas and electric arc welding. It includes the identification of risks associated with welding all commonly used metals and implementation of techniques used to reduce or eliminate welding hazards. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Access and interpret OH&S information	1.1. OH&S information is obtained and interpreted. 1.2. Relevant OH&S legislation is identified. 1.3. Work related safety information is obtained and interpreted.
2. Identify risks associated with welding	2.1. Pollutants formed by welding processes are identified. 2.2. Occupational diseases and injuries which may be associated with welding are identified. 2.3. Factors associated with increased risk are identified. 2.4. Exposure levels for pollutants are identified. 2.5. Risks and potential health effects associated with specific metals are identified. 2.6. Risks and potential health effects associated with gases in welding are identified. 2.7. Other hazards of welding are identified.
3. Reduce risks associated with welding	3.1. Manual handling techniques are used. 3.2. Personal protective equipment is used correctly. 3.3. Procedures to control hazards are implemented. 3.4. Workplace safety procedures are implemented. 3.5. Workplace safety non-compliances are reported in accordance with workplace procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • sourcing and interpreting safety-related information and Material Safety Data Sheets (MSDS) • planning and sequencing operations • identifying workplace risks and nonconformances • reporting workplace risks and nonconformances • checking and clarifying task-related information
Required knowledge
Look for evidence that confirms knowledge of: • characteristics and properties of common metals and welding materials • effect of gas and electrical welding operations on metals • hazards and control measures associated with gas and electrical welding, including housekeeping • welding safety practices and procedures • effect of various treatments on a range of commonly used metals • use and application of personal protective equipment

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply safe welding practices.
Critical aspects for assessment and	Assessors must be satisfied that the candidate can

EVIDENCE GUIDE	
evidence required to demonstrate competency in this unit	competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with applying safe welding practices or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different

RANGE STATEMENT	
work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
OH&S information	• National Occupational Health and Safety Commission guidelines • Organisational OH&S practices and procedures manuals • Australian/New Zealand and ISO standards • Company risk management policy • Codes of practice • Australian dangerous goods legislation • Trade practices • Occupational Health and Safety reporting requirements • Weld procedures
Work related safety information	• Standard operating procedures • Material safety data sheets (MSDSs) • Job sheets • Emergency procedures • Safety standards and procedures
Pollutants	• Nitrogen oxides • Ozone • Metal fumes etc. • Lead oxide • Silicon oxide • Calcium fluoride • Calcium oxide • Magnesium oxide • Sodium oxide • Potassium oxides • Carbon dioxide • Organics • Iron • Manganese • Calcium carbonate • Zirconium oxide • Titanium oxide • Hexavalent chromium

RANGE STATEMENT	
Occupational diseases and injuries	• Eye injuries • Skin damage • Respiratory irritations • Chronic effects • Allergies
Factors	• Gas leakage from cylinders • Type of consumable and metals used • Type of welding processes • Type of electrodes • Welding current • Voltage and amperage • Ventilation • Contamination • Interaction of chemicals • Exposure levels • Flammability
Exposure levels	• Time Weighted Average • Short Term Exposure Limit (STEL) • Maximum Allowable Concentration (MAC) or Threshold Limit Value - Ceiling (TLV-C) • Skin Notation
Specific metals	• Aluminium • Antimony • Arsenic • Beryllium • Boron • Cadmium • Chromium • Copper • Cobalt • Iron • Lead • Lithium • Magnesium • Manganese • Mercury • Molybdenum • Nickel • Platinum • Selenium

RANGE STATEMENT	
	• Silver • Thorium • Tin • Titanium • Tungsten • Vanadium • Zinc • Zirconium
Gases	• Acetylene • Argon • Carbon dioxide • Carbon monoxide • Helium • Nitrogen oxides • Ozone • Phosgene • Phosphine • Stibine
Other hazards	• Fluxes • Electro-magnetic radiation • Electric shock • Sparks • Spatter • Contaminated and coated metals • Gas cylinder and electrical hazards • Confined spaces • Noise • Chemical exposure • Solvents • Musculoskeletal, back and overuse injuries • Vibration • Dusts • Heat stress • Ultraviolet radiation • Airborne pollutants • Flammable gases • Infrared radiation • Thermal damage
Manual handling techniques	• Housekeeping practices • Lifting weight limits

RANGE STATEMENT	
	• Appropriate storage • Use of lifting devices • Appropriate training • Hazardous materials storage standards and procedures
Personal protective equipment	• Respirators • Ear muffs • Protective clothing • Gloves • Boots • Helmets • Eye protection • Face shields
Procedures to control hazards	• Substituting hazardous materials with safer materials • Changing workplace design to eliminate hazards • Modifying work practices to reduce exposure • Using personal protective equipment • Using adequate and appropriate ventilation
Workplace safety measures	• Shielding requirements • Ventilation • General and diluted • Local exhaustion • Use of personal protective equipment • Checking equipment condition • Equipment maintenance • Correct operation of equipment • Correct voltage and electrical connections • Good posture • Fire safety, plant and equipment isolation • Communications with appropriate personnel

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

MEM07001B Perform operational maintenance of machines/equipment

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers carrying out programmed safety and maintenance checks on machines/equipment.

Application of the Unit

Application of the unit	This unit mainly applies in a manufacturing setting, where routine programmed operational maintenance to machines/equipment is required. It is not intended to be used where higher level maintenance activities are performed. Machines/equipment range includes manual, semi-automatic and automatic machines of a stand-alone continuous production or process nature. This unit should not be selected when any of the following are selected: Unit MEM18055B (Dismantle, replace and assemble engineering components), Unit MEM18006C (Repair and fit engineering components), Unit MEM07005C (Perform general machining). **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Undertake programmed safety and maintenance checks	1.1. Checks are undertaken safely and to prescribed procedure. 1.2. Status/report is recorded on proforma or reported orally.
2. Undertake programmed maintenance	2.1. Removal/replacement of consumable components is undertaken to prescribed procedure and instructions are followed. 2.2. Fluids and lubricants are replaced and/or topped up to prescribed schedule.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • undertaking programmed safety and maintenance checks • undertaking programmed operational maintenance • entering routine and familiar information onto proformas and standard workplace forms • following routine information on written procedures • following oral instructions • orally reporting routine information
Required knowledge
Look for evidence that confirms knowledge of: • programmed maintenance and safety check procedures for the specified machine/equipment • recording/reporting requirements • safe work practices and procedures • hazards and control measures associated with operational maintenance of machines/equipment

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform operational maintenance of machines/equipment. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required

EVIDENCE GUIDE	
	knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with operational maintenance of machines/equipment or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating

RANGE STATEMENT	
conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Machines/equipment	Manual, semi-automatic and automatic machines of a stand-alone continuous production or process nature
Checks	Programmed safety and maintenance checks Adjustments of a limited nature including safety guards, stops, wear pads and tool holders, nipping up glands and adjustment of scrapers and aprons
Consumable components	Air filters, oil wipers, grease containers, tool tips, indicator globes, fluids and lubricants, guides and limit switch actuators

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations

MEM07002B Perform precision shaping/planing/slotting operations

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing precision shaping/planing/slotting operations.

Application of the Unit

Application of the unit	This unit applies to a range of one or more of precision shaping, planing or slotting operations where achievement of the specified tolerance and finish is mandatory. Work is performed to drawings or sketches, specifications and instructions as appropriate. Precision measuring instruments, standard engineering materials and cutting tools are used. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07005C	Perform general machining

Prerequisite units		
	MEM09002B	Interpret technical drawing
	MEM12003B	Perform precision mechanical measurement
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Observe safety precautions	1.1. Correct safety procedures are observed and protective clothing and safety glasses worn.
2. Determine job requirements	2.1. Drawings are interpreted, sequence of operations determined and tools selected to produce component to specification. 2.2. Cutting parameters are determined.
3. Perform precision shaping operations	3.1. Precision shaping operations are carried out including precision flat surfaces, shoulders, slots, keyways, angles and dovetails.

ELEMENT	PERFORMANCE CRITERIA
4. Perform precision planing operations	4.1. Precision planing operations are carried out including horizontal and vertical surfaces and angles.
5. Perform precision slotting operations	5.1. Precision slotting operations are carried out including feathered and tapered keyways, slotting internal cavities, dovetails, slotting circular surfaces and internal splines.
6. Check component for conformance to specification	6.1. Component is checked for conformance to specification using appropriate techniques, tools and equipment.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- preparing an operational work plan
- performing precision shaping operations:
  - flat surfaces
  - shoulders
  - slots
  - keyways
  - angles
  - dovetails
- performing precision planing operations on:
  - horizontal and vertical surfaces
- performing precision slotting operations:
  - feathered keyways
  - tapered keyways
  - slotting internal cavities
  - dovetails
  - slotting circular surfaces
  - slotting internal splines
- checking for conformance to specifications

REQUIRED SKILLS AND KNOWLEDGE

- using precision measurement equipment
- planning and sequencing operations
- reading and interpreting information on written job instructions, specifications, charts, lists, drawings and other applicable reference documents
- checking and clarifying task related information
- measuring components to specified tolerances
- performing calculations for determining cutting parameters and checking tolerances
- undertaking numerical operations within the scope of this unit

Required knowledge

Look for evidence that confirms knowledge of:

- reasons for selecting the chosen sequence of operations
- procedures for setting up the work piece
- tool type and geometry to achieve the required specifications on different materials
- techniques and procedures for machining the following:
  - flat surfaces
  - shoulders
  - slots
  - keyways
  - angles
  - dovetails
- planing techniques and procedures for machining:
  - horizontal and vertical surfaces
- slotting techniques and procedures for machining:
  - feathered keyways
  - tapered keyways
  - slotting internal cavities
  - dovetails
  - slotting circular surfaces
  - slotting internal splines
- appropriate techniques, tools and equipment to measure machined components
- hazards, control measures and housekeeping associated with precision shaping/planing/slotting operations
- use and application of personal protective equipment
- safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform precision shaping/planing/slotting operations. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing precision shaping/planing/slotting operations or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning should not require language, literacy and numeracy skills beyond those required in this unit. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

EVIDENCE GUIDE	
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Tools	Cutting tools, tool holders
Cutting parameters	Feeds, speeds, depth of cut, length of cut etc.
Precision operations	The use of dedicated precision measuring instruments

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations

MEM07005C Perform general machining

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency covers determining the job requirements and sequence of operations, selecting and mounting tools, performing the machining, measuring the components, and adjusting and maintaining a range of standard machine tools.

Application of the Unit

Application of the unit	The unit of competency applies to the use of machinery to shape metal including lathes, mills, planers, shapers, radial arm drills, slotters and surface grinders. This unit has been developed to support Engineering Tradesperson - Mechanical apprenticeship training and the recognition of trade level skills in machining operations. Skills covered by this unit are generally applied in occupational and work situations associated with fitting and machining. It may also apply to other trade occupations requiring general machining skills. It may also apply in some circumstances to senior operators who have responsibility for machine set up, selection of materials and lubricants, establishment of datum points and basic marking out, and setting of speeds, feeds and other machining parameters. This unit has application in the MEM30205 Certificate III in Engineering - Mechanical qualification and other qualifications requiring a basic trade level of machining skills. It may also apply to MEM20205 Certificate II in Engineering - Production Technology and MEM30105 Certificate III in Engineering - Production Systems and other qualifications requiring machining skills. Machining is undertaken on one or more of a range of standard machine tools. Machines are not computer numerical controlled (CNC) machines.

	Where machining is undertaken without undertaking any set up including mounting of tools, setting of speeds, feeds and other operational parameters then either MEM07024B Operate and monitor machine/process or MEM07025B Perform advanced machine/process operation should be selected. Drilling operations in this unit exclude those covered by MEM18002B Use power tools/hand held operations. Where substantial marking out is required, MEM12006C Mark off/out (general engineering) should be considered. Where precision measurement is required, MEM12003B Perform precision mechanical measurement should also be considered. For set-up and operation of electro-discharge (EDM) machines, refer to MEM07014B Perform electro-discharge (EDM) machining operations. **Band**: **A** **Unit Weight**: **8**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Determine job requirements	1.1. Drawings, instructions and specifications are interpreted and understood
2. Determine sequence of operations	2.1. Sequence of operations including job set-up is determined for maximum efficiency and to meet job specifications 2.2. Appropriate material is selected and datum established as required
3. Select and mount tools	3.1. Appropriate tools for job are selected, sharpened and shaped as required 3.2. Tools are mounted and positioned correctly
4. Perform machining operations	4.1. Basic marking out techniques are used where required 4.2. Machining parameters are set for job requirements and maximum tool life 4.3. Work is held or correctly clamped without damage to product, and all safety requirements are met 4.4. Machining is performed in a safe manner utilising all guards, safety procedures and personal protective clothing and equipment
5. Measure components	5.1. Components are checked with instruments or gauges appropriate to the measurement requirements to ensure compliance with specifications
6. Adjust and maintain machine	6.1. Routine maintenance and adjustments are carried out as required which may include slide and collar adjustment, cleaning and lubrication

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- reading and interpreting routine information on written job instructions, specifications and standard operating procedures which may include drawings
- following oral instruction
- planning and sequencing operations
- preparing operational work plan
- sharpening and shaping cutting tools
- identifying worn or damaged cutting tools
- correct mounting and positioning of cutting tools
- basic marking out of materials
- setting machining parameters to achieve the job requirements and maximise tool life
- using appropriate and sufficient clamping/mounting of the work piece
- using coolant/lubricant correctly
- checking for conformance to specifications
- measuring to specified tolerances and dimensions

Required knowledge

Required knowledge includes:

- reasons for selecting the chosen sequence of operations
- methods of work holding
- basic marking out techniques including datum points/lines
- geometry of cutting tools for a range of materials and applications
- benefits of using correctly sharpened cutting tools
- machine operation
- selection of feeds and speeds to suit a range of materials and operations within the scope of this unit
- correct methods of mounting a variety of cutting tools
- safety issues with regard to correct clamping, guards and shields
- tolerances and limits of size
- situations indicating the need for machine adjustment, lubrication and cleaning
- techniques, tools and equipment to measure materials and machined components

REQUIRED SKILLS AND KNOWLEDGE
• use and application of personal protective equipment • safe work practices and procedures • hazards and control measures associated with general machining

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform general machining including responsibility for selecting and mounting tooling and setting machining parameters. Competency in this unit cannot be claimed until all prerequisites have been satisfied
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently apply the skills covered in this unit of competency in new and different situations and contexts. Critical aspects of assessment and evidence include: • correct job planning including identifying job requirements from drawings, instructions or specifications and sequence of operations • identifying any required tooling, measuring equipment and accessories • selecting and mounting required tooling • selecting material and marking out if required • setting machining parameters • checking machined components for conformance to specifications.
Context of and specific resources for assessment	This unit has been developed to support training in and recognition of trade level competency in general machining as applied to a trade level fitting and machining, other trade or senior operator work environment. Assessment should emphasise a workplace context and procedures found in the candidate's

EVIDENCE GUIDE	
	workplace. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.
Method of assessment	Typically Engineering Tradespersons - Mechanical and other persons engaged in general machining work are required to apply their machining skills and techniques across a range of jobs and specifications. A single assessment event is not appropriate. On the job assessment should be included as part of the assessment process wherever possible. Where assessment occurs off the job, judgement must consider evidence of the candidate's performance in a productive work environment that includes a sufficient range of appropriate tasks and materials to cover the scope of application for this unit. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing general machining or other units requiring the exercise of the skills and knowledge covered by this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Operations	Operations may include: • parallel cutting • slotting • planing • drilling • knurling • cutting flats • non-precision surface grinding operations
Materials	Materials may include ferrous and non-ferrous
Tools	Tools may include: • cutting tools and accessories • measuring devices
Marking out techniques	Marking out techniques may include basic marking out techniques using calipers, steel rules, dividers and scribers
Machining parameters	Machining parameters may include: • speeds • feeds • stops • coolant and cutting lubricants
Machines	Machines may include: • lathes • mills • planers • shapers • radial arm drills • slotters

RANGE STATEMENT	
	• surface grinder
Maintenance and adjustments	Maintenance and adjustments may include: • slide and collar adjustment • cleaning and lubrication

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations

MEM07006C Perform lathe operations

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency covers performing machining operations on a lathe to produce components to required tolerances and specifications using all types of accessories except for the use of taper turning attachment and copy turning attachments. The unit does not cover turning of multi-start threads.

Application of the Unit

Application of the unit	This unit of competency applies to the production of components using centre lathes and lathe accessories, precision measuring equipment and cutting tools on a range of standard engineering materials. It does not include use of a taper turning attachment, copy turning attachment or multi-start threads. Work is performed to established processes, practices and specifications. Cutting tools are selected using International Standard Organisation (ISO) standards or according to standard operating procedure as appropriate. Work is performed to drawings, sketches, specifications and instructions as appropriate. This unit has been developed for Engineering Tradesperson - Mechanical apprenticeship training and the recognition of trade level skills in lathe operations. Skills covered by this unit are generally applied in occupational and work situations associated with trade level fitting and machining work. This unit has application in the MEM30205 Certificate III in Engineering - Mechanical qualification and other qualifications requiring a trade level of lathe operation skills. Lathe operations may also be known as turning and the processes and associated level of skill covered by this unit are often described in industry by the term '1st Class

	Machining'. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07005C	Perform general machining
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Observe safety precautions	1.1. Correct safety procedures are observed and protective clothing and safety glasses worn
2. Determine job requirements	2.1. Drawings are interpreted, sequence of operation is determined and tooling is selected to produce component to specification
3. Mount job	3.1. Job is set up using instruments such as dial test indicators, and digital read-out equipment
4. Perform turning operations	4.1. Speeds and feeds are calculated using appropriate mathematical techniques and reference material 4.2. The full range of accessories on a centre lathe are used including three and four jaw chucks, centres, face plate, steadies, cross slide and tailstock 4.3. Turning operations are performed to specification
5. Check components for conformance with specifications	5.1. Components are checked for conformance to specification using appropriate techniques, tools and equipment

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- interpreting technical drawings/specifications in relation to turning
- setting up jobs using appropriate equipment
- calculating and setting cutting feeds and speeds appropriate to the job
- checking that job is concentric and running true
- safely operating lathes
- performing turning operations

Required knowledge

Required knowledge includes:

- sequence of operations to achieve the job requirements

REQUIRED SKILLS AND KNOWLEDGE
• tool type and geometry to achieve the required specifications and for work pieces of different materials • numerical operations, geometry and calculations/formulae within the scope of this unit • the consequences of varying speeds and feeds from the optimum rates calculated • characteristics of different materials and their effects on cutting speeds and feeds • application of lathe accessories • techniques, tools and equipment to measure materials and machined components • use and application of personal protective equipment • safe work practices and procedures • hazards and control measures associated with lathe operations

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform a variety of lathe operations to specifications. Competency in this unit cannot be claimed until all prerequisites have been satisfied
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently apply the skills covered in this unit of competency in new and different situations and contexts. Critical aspects of assessment and evidence include: • determining requirements for turning job including quantity, material, measurements and tolerances • correct job planning including identifying required measuring equipment, tooling, accessories and sequence of operations • correct preparation of high speed steel tooling • correct fixing of job and tooling • calculating and setting of required speeds and feeds • correct monitoring of turning operation • turning undertaken to trade standard in terms of time

EVIDENCE GUIDE	
	and responsibility for own work • undertaking correct remedial procedures for out of specification results as per enterprise procedures e.g. procedures for scrapping or reworking of components not turned to specification.
Context of and specific resources for assessment	This unit has been developed to support training in and recognition of trade level competency in lathe operations as applied to a trade level fitting and machining work environment. Assessment should emphasise a workplace context and procedures found in the candidate's workplace. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.
Method of assessment	Typically, persons engaged in Engineering Tradesperson - Mechanical work are required to apply their lathe operations skills and techniques across a range of jobs and specifications. A single assessment event is not appropriate. On the job assessment should be included as part of the assessment process wherever possible. Where assessment occurs off the job, judgement must consider evidence of the candidate's performance in a productive work environment that includes a sufficient range of appropriate tasks and materials to cover the scope of application for this unit. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated

EVIDENCE GUIDE	
	with lathe operations or other units requiring the exercise of the skills and knowledge covered by this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Drawings	Drawings include engineering drawings to AS 1100/1102
Tooling	Tooling includes: • high speed steel, tungsten carbide, ceramic graphite and other standard cutting tools • boring bars • drills • reamers • thread chasers • tapping heads • taps
Instruments	Instruments may include: • manual and digital micrometers • vernier calipers • dial indicators • scribing blocks
Speeds and feeds	Speeds and feeds may include: • setting up machine

RANGE STATEMENT	
	• changing gears and speeds • use of lead screw • calculations
Accessories	Accessories may include: • three and four jaw chucks • centres • face plate • steadies • cross slide • tailstock
Turning operations	Turning operations may include: • manual parallel and taper turning • internal and external turning including boring drilling, reaming, single start thread cutting and parting off

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations

MEM07007C Perform milling operations

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency covers performing machining operations on a range of milling machines to produce components to required tolerances and specifications using all types of accessories.

Application of the Unit

Application of the unit	This unit of competency applies to a range of milling machines including vertical, horizontal and universal types, a range of precision measuring equipment and cutting tools. Work is performed to established processes, practices and to drawings, sketches, specifications and instructions as appropriate. Cutting tools are selected using International Standard Organisation (ISO) standards or according to standard operating procedure as appropriate. This unit has been developed for Engineering Tradesperson - Mechanical apprenticeship training and the recognition of trade level skills in milling operations. Skills covered by this unit are generally applied in occupational and work situations associated with trade level fitting and machining work. This unit has application in the MEM30205 Certificate III in Engineering - Mechanical qualification and other qualifications requiring a trade level of mill machine operation skills. Milling operations and the processes and associated level of skill covered by this unit are often described in industry by the term '1st Class Machining'. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07005C	Perform general machining
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Observe safety	1.1. Correct safety procedures are observed and

ELEMENT	PERFORMANCE CRITERIA
precautions	protective clothing and safety glasses worn
2. Determine job requirements	2.1. Drawings are interpreted, sequence of operation is determined and tooling is selected to produce component to specification 2.2. Cutting parameters are determined
3. Perform milling operations	3.1. Milling operations are carried out to produce components to specification 3.2. Operations are undertaken using conventional and/or climb milling techniques and a variety of cutters including slab, gang, end, shell, slot, form, slitting 3.3. The full range of standard accessories is used including dividing heads and rotary tables as required
4. Check components for conformance with specifications	4.1. Components are checked for conformance to specification using appropriate techniques, tools, instruments and equipment

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Required skills include: • setting up jobs using appropriate equipment • calculating and setting cutting feeds and speeds appropriate to the job • interpreting drawings and job instructions/specifications • milling components to specification • visually and dimensionally checking components for conformance to specification
Required knowledge
Required knowledge includes: • safety hazards associated with milling machines • sequence of operations to achieve the job requirements • cutter types and tooling geometry • consequences of varying speeds and feeds from the optimum rates calculated

REQUIRED SKILLS AND KNOWLEDGE
• effects of different materials on cutting speeds and feeds • conventional and climb milling techniques and their applications • the application of each of the following: slab, gang, shell, slot, form and slitting • applications requiring the use of dividing heads and rotary tables when milling components • the procedures for using dividing heads and rotary tables on milling machines • appropriate techniques, tools and equipment to measure milled components • use and application of personal protective equipment • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform a variety of milling operations to specifications. Competency in this unit cannot be claimed until all prerequisites have been satisfied
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently apply the skills covered in this unit of competency in new and different situations and contexts. Critical aspects of assessment and evidence include: • determining requirements for milling job including quantity, material, measurements and tolerances • correct job planning including identifying required measuring instruments and equipment, tooling, accessories and sequence of operations • correct fixing of job and tooling • calculation and setting of required speed and feed • correct monitoring of milling operation • milling undertaken to trade standard in terms of time and responsibility for own work • undertaking correct remedial procedures for out of specification results as per enterprise procedures e.g.

EVIDENCE GUIDE	
	procedures for scrapping or reworking of components not milled to specification.
Context of and specific resources for assessment	This unit has been developed to support training in and recognition of trade level competency in milling operations as applied to a trade level fitting and machining work environment. Assessment should emphasise a workplace context and procedures found in the candidate's workplace. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.
Method of assessment	Typically, persons engaged in Engineering Tradesperson - Mechanical work are required to apply their milling operations skills and techniques across a range of jobs and specifications. A single assessment event is not appropriate. On the job assessment should be included as part of the assessment process wherever possible. Where assessment occurs off the job, judgement must consider evidence of the candidate's performance in a productive work environment that includes a sufficient range of appropriate tasks and materials to cover the scope of application for this unit. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with milling operations or other units requiring the exercise of the skills and knowledge covered by this unit.

EVIDENCE GUIDE	
	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Drawings	Drawings include engineering drawings to AS 1100/1102
Tooling	Tooling includes: • slab • gang • end • shell • slot • form • slitting cutters
Instruments	Instruments may include: • manual and digital micrometers • vernier calipers • dial indicators • scribing blocks
Cutting parameters	Cutting parameters may include setting up machine, feed and speed calculations
Accessories	Accessories may include dividing heads and rotary tables

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations

MEM07008D Perform grinding operations

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency covers determining the job requirements, observing safety precautions, selecting appropriate wheels and accessories, performing the grinding operations and checking the components for conformance to specifications.

Application of the Unit

Application of the unit	This unit of competency applies to grinding operations performed on surface, cylindrical and centreless grinding machines. It requires use of measuring equipment and standard engineering materials and tooling. Work is performed to established processes, practices and to drawings, sketches, specifications and instructions as appropriate. This unit has been developed for Engineering Tradesperson - Mechanical apprenticeship training and the recognition of trade level skills in grinding operations. Skills covered by this unit are generally applied in occupational and work situations associated with trade level fitting and machining work. This unit has application in the MEM30205 Certificate III in Engineering - Mechanical qualification and other qualifications requiring a trade level of grinding machine operation skills. Grinding operations and the processes and associated level of skill covered by this unit are often described in industry by the term '1st Class Machining'. Where precision mechanical measurement is required, MEM12003B Perform precision mechanical measurement should also be considered.

	Band: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07005C	Perform general machining
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Determine job requirements	1.1. Job requirements are determined from specifications, and sequence of operations is determined 1.2. Correct and appropriate holding devices are selected and applied
2. Observe safety precautions	2.1. Machine guards, coolant and dust extraction devices are checked 2.2. Correct safety procedures are observed and protective clothing and safety glasses are worn
3. Select grinding wheels and accessories	3.1. Wheels are selected, balanced and dressed based on knowledge of grinding wheel structure and application 3.2. Accessories are selected to facilitate production to job specifications
4. Perform grinding operations	4.1. Grinding machine is set up and adjusted in accordance with defined procedures 4.2. Work piece is held or clamped appropriately to avoid damage 4.3. Grinding operations are performed safely, utilising all guards, safety procedures and personal protective clothing and equipment
5. Check components for conformance with specifications	5.1. Components are checked for conformance to specification using appropriate techniques, tools and equipment

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- reading and interpreting information on written job instructions, procedures, specifications, charts, lists, drawings and other applicable reference documents
- checking and clarifying task related information
- preparing an operational work plan

REQUIRED SKILLS AND KNOWLEDGE
• planning and sequencing operations • using precision measurement equipment within the scope of this unit • setting up work using tools, techniques and equipment • using coolant and dust extraction devices • selecting and preparing grinding wheels and accessories appropriate to the grinding task • performing and monitoring internal/external cylindrical grinding process • clamping/mounting work pieces • checking for conformance to specifications • performing numerical operations and calculations within the scope of this unit
Required knowledge
Required knowledge includes: • reasons for selecting the chosen sequence of operations • the application of a range of holding devices/accessories • reasons for selecting specific work holding devices, tools, techniques and equipment • coolant selection/function • standard grinding wheel shapes • the range of abrasive materials used in grinding wheels • factors impacting grinding wheel selection including grain size of abrasive particles, grade or strength of bond and bond material • grinding wheel dressing tools and their application • internal/external cylindrical grinding process • principles of effective clamping • grinding operations/procedures • the function of any grinding accessories • tools, techniques and equipment for checking components for conformance to specifications • hazards and control measures associated with grinding operations, including housekeeping • use and application of personal protective equipment • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform a variety of grinding operations to specifications. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently apply the skills covered in this unit of competency in new and different situations and contexts. Critical aspects of assessment and evidence include: • determining requirements for grinding job including quantity, material, measurements and tolerances • correct job planning including identifying required measuring instruments and equipment, safety equipment, holding devices, grinding wheels, accessories and sequence of operations • identifying guard, coolant and dust extraction requirements and checking equipment and coolant before grinding operation • correct fixing of job • correct monitoring of grinding operation • undertaking grinding to trade standard in terms of time and responsibility for own work • undertaking correct remedial procedures for out of specification results as per enterprise procedures e.g. procedures for scrapping or reworking of components not ground to specification.
Context of and specific resources for assessment	This unit has been developed to support training in and recognition of trade level competency in grinding operations as applied to a trade level fitting and machining work environment. Assessment should emphasise a workplace context and procedures found in the candidate's workplace. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.
Method of assessment	Typically, persons engaged in Engineering Tradesperson - Mechanical work are required to apply their grinding

EVIDENCE GUIDE	
	operations skills and techniques across a range of jobs and specifications. A single assessment event is not appropriate. On the job assessment should be included as part of the assessment process wherever possible. Where assessment occurs off the job, judgement must consider evidence of the candidate's performance in a productive work environment that includes a sufficient range of appropriate tasks and materials to cover the scope of application for this unit. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with grinding operations or other units requiring the exercise of the skills and knowledge covered by this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating

RANGE STATEMENT	
conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Specifications	Specifications may include: • dimensions and tolerances • geometry and tolerances • surface finish
Holding devices	Holding devices may include: • vices • clamps • magnetic chucks • face plates • collets • 3/4 jaw chuck
Wheels	Wheels may include: • shape • grit/bond composition
Balanced	Balanced may include static and dynamic balancing
Grinding machines	Grinding machines may include surface, cylindrical and centreless machines

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Co-requisite units		

Competency field

Competency field	Machine and process operations

MEM07009B Perform precision jig boring operations

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing precision jig boring operations using a range of jig boring and milling machines.

Application of the Unit

Application of the unit	This unit applies to operations where a range of jig boring and milling machines, tools and accessories are used to achieve a high level of precision in finished products. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07005C	Perform general machining
	MEM07007C	Perform milling operations
	MEM09002B	Interpret technical drawing
	MEM12003B	Perform precision mechanical measurement

Prerequisite units		
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Observe safety precautions	1.1. Correct safety procedures are observed and protective clothing and safety glasses are worn.
2. Determine job requirements	2.1. Drawings are interpreted and sequence of operations is determined.
3. Select appropriate tools and accessories	3.1. Tools and accessories are selected in accordance with standard operating procedures to meet job specifications.
4. Mount job	4.1. Job is set up using instruments such as dial test indicators and digital read out equipment.
5. Perform jig boring	5.1. Holes are bored relative to coordinate position and to specification. 5.2. Rotary or tilting rotary table is used as required.

ELEMENT	PERFORMANCE CRITERIA
6. Check components for conformance to specification	6.1. Components are checked for conformance to specification using appropriate techniques, tools and equipment.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • reading, interpreting and following information on written job instructions, specifications, procedures, charts, lists, drawings and other applicable reference documents • preparing operational work plan • planning and sequencing operations • selecting tools and accessories • checking for conformance to specifications • using precision measurement equipment • checking and clarifying task related information • performing numerical operations and calculations within the scope of this unit
Required knowledge
Look for evidence that confirms knowledge of: • reasons for selecting the chosen sequence of operations • the application of rotary and tilting rotary tables to jig boring operations • checks for conformance to specifications • appropriate techniques, tools and equipment to measure machined components • hazards and control measures associated with jig boring operations, including housekeeping • use and application of personal protective equipment • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform precision jig boring operations. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing precision jig boring operations or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

EVIDENCE GUIDE	
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Tools and accessories	Cutting tools, tool attachments, charts and nomograms, rotary or tilting rotary table etc.
Appropriate techniques	Measuring techniques, comparison methods

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations

MEM07010B Perform tool and cutter grinding operations

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing a range of tool and cutter grinding operations.

Application of the Unit

Application of the unit	This unit applies to the use of a range of precision measuring instruments and standard engineering materials in performing tool and cutter grinding operations. Work is performed to drawings or sketches, specifications and instructions as appropriate. Work is carried out autonomously to predetermined standards of quality and safety. General off hand grinding is covered by Unit MEM18002B (Use power tools/hand held operations). **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07005C	Perform general machining

Prerequisite units		
	MEM07008D	Perform grinding operations
	MEM09002B	Interpret technical drawing
	MEM12003B	Perform precision mechanical measurement
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Observe safety precautions	1.1. Machine guards, coolant and dust extraction devices are checked. 1.2. Correct safety procedures are observed, and protective clothing and safety glasses are worn.
2. Determine job requirements	2.1. Drawings are interpreted and sequence of operations is determined.
3. Select appropriate	3.1. Tool and cutter grinding wheels are selected, based

ELEMENT	PERFORMANCE CRITERIA
tool and cutter grinding wheels and accessories	on knowledge of grinding wheel structure, and are balanced and dressed. Accessories are selected to facilitate production to specification.
4. Perform tool and cutter grinding	4.1. Universal tool and cutter grinding machines are operated to sharpen and shape the full range of tools and cutters including side and face cutters, end mill, form relieved milling cutters, flat, vee and circular form tools and hobs, slitting saws, and drills. 4.2. Parallel internal and/or external grinding is carried out. 4.3. Internal and/or external taper grinding is carried out to drawing specifications.
5. Check components for conformance to specification	5.1. Components are checked for conformance to specification using appropriate techniques, tools and equipment.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- reading, interpreting and following information on written job instructions, specifications, charts, lists, drawings and other applicable reference documents
- checking and clarifying task related information
- preparing operational work plan
- planning and sequencing operations
- performing numerical operations and calculations within the scope of this unit
- performing safety checks of equipment
- selecting tool and cutter grinding accessories
- balancing/dressing grinding wheels
- sharpening/shaping tools and cutters
- checking components for conformance with specifications
- using precision measurement equipment within the scope of this unit

Required knowledge

REQUIRED SKILLS AND KNOWLEDGE

Look for evidence that confirms knowledge of:
• reasons for selecting the chosen sequence of operations
• function of coolant and dust extraction devices
• criteria for grinding wheel selection:
  • grain size of abrasive particles
  • grade or strength of bond
  • bond material
• grinding wheel dressing procedures and wheel dressing tools
• source(s) of data on tool geometry for the full range of tools and cutters, including the terminology used to describe the tool geometry
• procedures to be followed when parallel grinding on a tool and cutter grinder
• procedures to be followed when grinding tapers on a tool and cutter grinder
• tools, techniques and equipment used to check ground components for conformance with the following specifications:
  • dimensions and tolerances
  • geometry and tolerances
  • surface finish
• hazards and control measures associated with tool and cutter grinding, including housekeeping
• use and application of personal protective equipment
• safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform tool and cutter grinding operations. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency

EVIDENCE GUIDE	
	in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing tool and cutter grinding operations or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work

RANGE STATEMENT	
situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Tool and cutter grinding wheels	Wheel selection criteria includes shape and grit/bond composition

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations

MEM07011B Perform complex milling operations

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing complex milling operations, including gear cutting and helical milling of a range of materials.

Application of the Unit

Application of the unit	This unit applies to a range of complex milling operations including those jobs requiring high precision or quality across a range of materials including non-standard metals and alloys. It also includes those operations requiring complex calculations. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07005C	Perform general machining
	MEM07007C	Perform milling operations
	MEM09002B	Interpret technical drawing

Prerequisite units		
	MEM12003B	Perform precision mechanical measurement
	MEM12023A	Perform engineering measurements
	MEM12024A	Perform computations
	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Select milling cutters	1.1. Correct milling cutter/s are selected for required operation. 1.2. Correct cutter inserts are selected as required using International Standard Organisation standards and mounted in cutter blank. 1.3. Cutter is mounted to machine spindle and checked for concentricity.
2. Set up work	2.1. Cutting parameters and steps required to mill given component/s are identified.

ELEMENT	PERFORMANCE CRITERIA
	2.2. Machine is set up with appropriate accessories as required for milling operation. 2.3. Work is set up to required level of accuracy.
3. Perform complex milling	3.1. Components are milled and associated calculations are performed as necessary to achieve specification. 3.2. Components are verified using appropriate precision measuring equipment and reworked as necessary to meet specification.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents
- planning and sequencing operations
- checking and clarifying work related information
- setting up work to the required level of accuracy
- determining cutting parameters
- selecting the correct milling cutter inserts for the cutting parameters in accordance with ISO standards
- calculating cutting parameters such as speeds, feeds and ratios
- setting up gear trains according to calculations and standard operating procedures
- safely operating milling machine
- performing complex milling operations using dividing heads and omniversal tables

Required knowledge

Look for evidence that confirms knowledge of:

- precision measuring equipment and their applications
- procedures for accurately setting up work
- ISO standards applicable to milling cutter inserts
- procedures for milling components such as racks and gears
- calculations, geometry and formulae relating complex milling activities

REQUIRED SKILLS AND KNOWLEDGE
• accessories used for complex milling • the applications and use of omniversal tables and differential dividing heads to complex milling operations • hazards and control measures associated with complex milling operations, including housekeeping • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform complex milling operations. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing complex milling operations or other units requiring the exercise of the skills and knowledge covered by this unit.

EVIDENCE GUIDE	
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Complex milling operations	Cutting of spur gears, racks, helical gears, radial uniform rise cam lobes etc.
Milling cutter/cutters	Ganged cutters, form cutters etc.
Set up	Set up is verified using instruments such as dial test indicators and sine bars etc.
Appropriate accessories	Omniversal tables, differential dividing heads etc.

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations

MEM07012B Perform complex grinding operations

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing complex grinding operations.

Application of the Unit

Application of the unit	This unit applies to high precision operations such as jig grinding, grinding eccentrics, thread grinding, gauges, shapes and forms etc. Work includes the use of a range of precision measuring instruments. Grinding operations are performed on a variety of materials to achieve high levels of precision for dimensions and finish. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07005C	Perform general machining
	MEM07008D	Perform grinding operations
	MEM09002B	Interpret technical drawing
	MEM12003B	Perform precision mechanical

Prerequisite units		
		measurement
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Determine job requirements	1.1. Job requirements are determined from specifications, and sequence of operations is determined.
2. Set up work	2.1. Grinding wheels are selected and dressed to form and size as required. 2.2. Work is set up to required level of accuracy as per specifications.
3. Perform complex grinding	3.1. Specialised grinding operations are performed on components such as jigs, tools and dies, eccentrics, threads, gauge shapes and forms.
4. Check components for conformance to	4.1. Components are checked for conformance to specification using appropriate techniques, tools and

ELEMENT	PERFORMANCE CRITERIA
specification	equipment.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • preparing an operational work plan • dressing grinding wheel to form and size • performing specialised grinding operations • reading, interpreting and following information on written job instructions, specifications, charts, lists, drawings and other applicable reference documents • planning and sequencing operations • checking and clarifying information • entering routine and familiar information onto proformas and standard workplace forms • checking for conformance to specifications • using precision measurement equipment within the scope of this unit • measuring components to specified tolerances • performing numerical operations, geometry and calculations/formulae for specialised complex grinding operations
Required knowledge
Look for evidence that confirms knowledge of: • reasons for selecting the chosen sequence of operations • function and application of work holding devices/accessories appropriate to complex grinding • appropriate techniques, tools and equipment to measure machined components • hazards and control measures associated with complex grinding, including housekeeping • use and application of personal protective equipment • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform complex grinding operations. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with complex grinding operations or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

EVIDENCE GUIDE	
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Grinding wheels	Wheel selection criteria includes shape and grit/bond composition

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations

MEM07013B Perform machining operations using horizontal and/or vertical boring machines

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing horizontal/vertical boring operations.

Application of the Unit

Application of the unit	This unit applies to a range of boring operations, using precision measuring instruments and standard engineering materials and cutting tools. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07005C	Perform general machining
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Observe safety precautions	1.1. Correct safety procedures are observed and protective clothing and safety glasses are worn.
2. Determine job requirements	2.1. Drawings are interpreted, sequence of operations is determined and tools are selected to produce component to specification using International Standard Organisation or standard operating procedures. 2.2. Cutting parameters are determined.
3. Perform boring operations	3.1. Horizontal and vertical boring operations are carried out including parallel line and taper boring, facing, turning, drilling and reaming to drawing specifications.
4. Check component for conformance to specification	4.1. Components are checked for conformance to specification using appropriate techniques, tools and equipment.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • reading, interpreting and following information on written job instructions, specifications, quality and standard operating procedures, charts, lists, drawings and other applicable reference documents • planning and sequencing operations • checking and clarifying task-related information • preparing an operational work plan • selecting, mounting and positioning cutting tools • calculating and selecting cutting parameters, including speeds and feeds • performing horizontal and/or vertical boring operations
Required knowledge
Look for evidence that confirms knowledge of: • reasons for selecting the chosen sequence of operations • geometry for cutting tools for a range of materials • calculations for determining cutting parameters and checking tolerances within the scope of this unit • consequences of varying the speeds and feeds from the optimum rates • procedures and techniques for carrying out horizontal and vertical boring operations • appropriate techniques, tools and equipment to measure components • hazards and control measures associated with horizontal and/or vertical boring, including housekeeping • use and application of personal protective equipment • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

EVIDENCE GUIDE	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform machining operations using horizontal and/or vertical boring machines. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the performance of machining operations using horizontal and/or vertical boring machines or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Horizontal boring machines	Table type, floor type
Vertical boring machines	Double column, single column

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations

MEM07015B Set computer controlled machines/processes

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers mounting work holding fixtures/devices/tools, conducting pre-start checks, setting numerical and computer controlled machines, instructing the operator and replacing worn or damaged tooling.

Application of the Unit

Application of the unit	The unit applies to the setting of any computer controlled machines/processes. Applications may include NC/CNC machines and industrial robots. Work is performed to established processes, practices, specifications and instructions as appropriate. Technical difficulties are resolved in consultation with appropriate technical advisers. For setting non-computer controlled machines or processes, refer to Unit MEM07003B (Perform machine setting [routine]). **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07024B	Operate and monitor machine/process
	MEM07028B	Operate computer controlled machine/processes
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM07024B	Operate and monitor machine/process
Path 2	MEM07005C	Perform general machining
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Obtain job instructions	1.1. Job sheets or equivalent instructions are understood and correctly followed.
2. Mount work holding fixtures/devices/tools	2.1. Machine is prepared to accept work holding fixtures/devices/tools. 2.2. Preset tooling is mounted as required into machine/equipment. 2.3. Work holding fixtures/devices are set on machine as required using standard operating procedures. 2.4. Tool offset or datum settings are identified/verified against job sheet using standard operating procedures. 2.5. Program is loaded, selected and verified in accordance with job instructions.
3. Conduct pre-start checks	3.1. Pre-start checks are undertaken to standard operating procedures. 3.2. Correct safety procedures are observed and all safety equipment is checked for correct operation.
4. Set machine	4.1. Machine is set/adjusted to meet operational requirements and specifications. 4.2. Production samples are checked for compliance with specifications using standard operating procedures.
5. Instruct machine operator	5.1. Operator is instructed, if necessary, ensuring that all safety procedures and devices are in place.
6. Replace worn/damaged tooling	6.1. Where appropriate, preset tools are replaced, tool offsets are adjusted or other corrective action is taken using standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in:

REQUIRED SKILLS AND KNOWLEDGE

- reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents
- planning and sequencing operations
- checking and clarifying task related information
- mounting work holding fixtures/devices/tooling
- mounting preset tooling
- verifying tool offsets and/or datum settings against job sheets or instructions
- loading and verifying programs
- conducting pre-start checks
- following safety procedures
- checking safety features and safety equipment for correct operation
- performing numerical operations and calculations/formulae within the scope of this unit
- setting and adjusting machines
- measuring and verifying first-off samples
- instructing machine operators on the sequence of operations
- identifying worn or damaged tooling and taking appropriate corrective action

Required knowledge

Look for evidence that confirms knowledge of:

- work holding fixtures/devices/tools and preset tooling for different machines/processes
- procedures for mounting work holding fixtures/devices/tools
- location of work holding fixtures/devices/tools relative to the machine datum or zero
- reasons for establishing tool offsets
- the purpose of datum settings
- the source(s) of information on tool offsets and datum settings
- procedures to locate and load programs
- procedures for verifying loaded programs
- pre-start checks
- safety features of the machine/process
- the purpose and function of safety features and/or safety equipment
- machine/process setting procedures
- machine operating procedures
- adjustments that can be made to the machine/process
- the effect of adjustments on machine and operational specifications
- product or part specifications in relation to the machining process
- measuring devices for checking parts or products

REQUIRED SKILLS AND KNOWLEDGE
• examples of worn or damaged tooling • the effects of worn or damaged tooling • the corrective action for worn or damaged tooling • hazards and control measures associated with numerical and computer controlled machines, including housekeeping • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to set computer controlled machines/processes. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with setting computer controlled machines/processes or other units requiring the exercise of the skills and knowledge covered by this unit.

EVIDENCE GUIDE	
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations

MEM07016C Set and edit computer controlled machines/processes

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers setting work holding fixtures/devices/tools, setting tooling offsets, trialling the program, instructing the operator and replacing worn or damaged tooling.

Application of the Unit

Application of the unit	The unit applies to any computer or numerically controlled machine or process. Applications may include NC/CNC machines and industrial robots. Editing applies to identifying and accessing programs in edit mode in order to make changes associated with speeds, feed and operational sequence. Changes are generally made in situ. Work is performed to established processes, practices and specifications. Machine operations may include welding, thermal cutting, metal cutting, forming and shaping etc. All work and work practices are performed to instructions, plans and specifications as appropriate. Technical difficulties are resolved in consultation with appropriate technical advisers. Work is carried out autonomously to predetermined standards of quality and safety. Where additional machining skills in excess of Unit MEM07005C (Perform general machining) are required then appropriate units should also be selected. For setting and editing computer controlled thermal cutting machines, see Unit MEM05053A (Set and edit computer controlled thermal cutting machines) This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit

	for progression to C7 (AQF level IV). **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07015B	Set computer controlled machines/processes
	MEM07024B	Operate and monitor machine/process
	MEM07028B	Operate computer controlled machines/processes
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
Path 2	MEM07005C	Perform general machining
	MEM07015B	Set computer controlled machines/processes
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify job requirements	1.1. Instructions/plans are understood and correctly followed.
2. Set work holding fixtures/devices/tools	2.1. Correct ancillary devices are selected and attached to machine using standard operating procedures. 2.2. Machine is prepared to accept work holding devices. 2.3. Work holding fixtures/devices/tools are set to zero or a datum using appropriate setting devices.
3. Set tooling offsets	3.1. Tooling offsets are measured and recorded in machine controller.
4. Trial program	4.1. Machine is operated to produce first-off samples, observing all safety procedures. 4.2. First-off samples are checked for compliance with specifications. 4.3. Program editing to change speeds, feed and operational sequence requirements is undertaken as required to ensure job conforms to specification.
5. Instruct machine operator	5.1. Operator is instructed if necessary ensuring that all safety procedures and devices are in place.
6. Replace worn or damaged tooling	6.1. Where appropriate, tools are replaced, tool offsets are adjusted or other corrective action is taken using

ELEMENT	PERFORMANCE CRITERIA
	standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents • planning and sequencing operations • checking and clarifying task related information • attaching ancillary devices • mounting work holding devices • measuring tool offsets • entering and verifying tool offsets • producing and checking first-off samples • editing programs • instructing machine operator on the sequence of operations • following safety procedures • identifying worn or damaged tooling and taking appropriate corrective action
Required knowledge
Look for evidence that confirms knowledge of: • ancillary equipment and its applications • procedures for attaching the ancillary device(s) to the NC/CNC machine • work holding devices, their application and procedures for mounting them • location of work holding fixtures/devices/tools relative to the machine zero or datum • reasons for establishing tool offsets • procedures and devices for measuring tool offsets • procedures for entering and verifying tool offset • procedures for adjusting tool offsets • operating procedures

REQUIRED SKILLS AND KNOWLEDGE
• safety features and equipment • measuring devices/ techniques for checking the parts or product • effects of changes to cutting feeds and speeds • the impact of changes to the sequence of operations on the part or product to be produced • procedures for editing programs via the machine controller • the sequence of operations of the machine/process • examples of worn or damaged tooling • the effects of worn or damaged tooling • the corrective action to be taken for worn or damaged tooling • hazards and control measures associated with computer controlled machines, including housekeeping • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to set and edit computer controlled machines/processes. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, i.e. the candidate is not in productive work, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not

EVIDENCE GUIDE	
	disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with setting and editing computer controlled machines/processes or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning should not require language, literacy and numeracy skills beyond those required in this unit. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	

RANGE STATEMENT	

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations

MEM07018C Write basic NC/CNC programs

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers identifying computer controlled machine program elements, writing a basic program and operation sheet, and trialling the program.

Application of the Unit

Application of the unit	This unit extends to writing a program to describe simple machine operations including tool paths using appropriate software for machines which may incorporate single spindles, single tools turrets, B axis angular, tool changers and component loaders of a pallet type, but excludes multiple spindles. The program may use common M and G codes but does not include the programming of advanced operations using canned cycles and sub-routines. Machine operations may include welding, thermal cutting, metal cutting, forming and shaping etc. Programs are trialled and edited as necessary to adjust operation of the machine. Technical difficulties are resolved in consultation with appropriate technical advisers. Work would be undertaken autonomously using predetermined standards of quality. If programming of advanced operations using canned cycles and sub-routines is required, see Unit MEM07019C (Program NC/CNC machining centre). Where additional machining skills in excess of Unit MEM07005C (Perform general machining) are required, then appropriate units should also be selected. For basic programming of computer controlled thermal cutting machines, see Unit MEM05054A (Write basic NC/CNC programs for thermal cutting machines). This unit has dual status and is to be regarded as both a specialisation band A unit and Specialisation band B unit

	for progression to C7 (AQF level IV). **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07015B	Set computer controlled machines/processes
	MEM07016C	Set and edit computer controlled machines/processes
	MEM07024B	Operate and monitor machine/process
	MEM07028B	Operate computer controlled machines/processes
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
Path 2	MEM07005C	Perform general machining
	MEM07015B	Set computer controlled machines/processes
	MEM07016C	Set and edit computer controlled machines/processes
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements

Prerequisite units		
	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Identify basic NC/CNC machine program elements	1.1. Appropriate program elements are selected for machine controller.
2. Write basic NC/CNC machine program	2.1. Engineering drawings are understood and interpreted to define basic machine function and tool path geometry. 2.2. Coordinates are calculated for simple tool path or basic machining functions. 2.3. Program is written in standard code format in accordance with standard operating procedures.
3. Write NC/CNC operation sheet	3.1. Operation sheets are produced to specification in accordance with standard operating procedures.
4. Trial program	4.1. Machine is operated in manual mode to test and prove program as required. 4.2. Program is edited if necessary to adjust operation as

ELEMENT	PERFORMANCE CRITERIA
	required. 4.3. Components are checked for conformance to specification as required.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents • planning and sequencing operations • checking and clarifying task related information • calculating coordinates of all relevant points on the part or product to be produced • writing NC/CNC program in standard code format • producing NC/CNC operation sheet(s) • operating NC/CNC machine safely in manual mode • editing NC/CNC program • checking parts or products for conformance to specifications
Required knowledge
Look for evidence that confirms knowledge of: • the elements of a basic NC/CNC program • the function of elements in controlling the operation of an NC/ CNC machine • machining operations • type(s) of NC/CNC machine and their applications • machining operations controlled by program • the tool path(s) to be followed when producing a part or product • the sequence of machining operations • the reasons for selecting tool path(s) and sequence of operations • the zero point of the NC/CNC machine • standard codes used in the writing of NC/CNC programs • applications of standard codes in NC/CNC programming

REQUIRED SKILLS AND KNOWLEDGE
• procedures for writing NC/CNC programs in standard code format • procedures for completing NC/CNC operation sheets • the information to be included in NC/CNC operation sheets • procedures for manual operation of the NC/CNC machine • reasons for testing and proving the NC/CNC program • procedures for editing the NC/CNC program via the machine controller • the effects of editing on the operation of the NC/CNC machine and the part or product to be produced • the measuring equipment/techniques used to check for conformance to specification • hazards and control measures associated with numerical and computer controlled machines, including housekeeping • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform basic NC/CNC programming. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment

EVIDENCE GUIDE	
	should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing basic NC/CNC programming or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Basic	Machines which incorporate single spindles, single tools turrets, B axis angular, tool changers and component loaders of a pallet type, but not multiple spindles

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations

MEM07019C Program NC/CNC machining centre

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers writing and trialling programs for NC/CNC machining centres.

Application of the Unit

Application of the unit	This unit extends to writing programs to describe machine operations including tool paths using appropriate software for machines which may incorporate single spindles, single tool turrets, tool changers, B axis angular, component loaders of the pallet type etc., but excludes multiple spindles and multiple axis. The program may use common M and G codes and includes the programming of advanced operations, using canned cycles and sub-routines. Programs are trialled and edited as necessary to adjust operation of centre. Technical difficulties are resolved in consultation with appropriate technical advisers. This unit has dual status and is to be regarded as both a specialisation band A unit and Specialisation band B unit for progression to C7 (AQF level IV). **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07015B	Set computer controlled machines/processes
	MEM07016C	Set and edit computer controlled machines/processes
	MEM07018C	Write basic NC/CNC programs
	MEM07024B	Operate and monitor machine/process
	MEM07028B	Operate computer controlled machines/processes
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
Path 2	MEM07005C	Perform general machining
	MEM07015B	Set computer controlled machines/processes
	MEM07016C	Set and edit computer controlled machines/processes
	MEM07018C	Write basic NC/CNC programs
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify basic NC/CNC machine program elements	1.1. Appropriate program elements are selected for machine controller.
2. Write basic NC/CNC machine program	2.1. Engineering drawings are understood and interpreted to define machine function and tool path geometry. 2.2. Coordinates calculated as required for tool path or machine functions. 2.3. Advanced operations using canned cycles and sub-routines are selected and applied appropriately. 2.4. Program is written in standard code format in accordance with standard operating procedures.
3. Write NC/CNC operation sheet	3.1. Operation sheets are produced to specification in accordance with standard operating procedures which includes appropriate Australian standard where required.
4. Trial program	4.1. Machine is operated in manual mode to test and prove program. 4.2. Program is edited if necessary to adjust operation. 4.3. Components are checked to conform to specification.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- interpreting engineering drawings, specifications and instructions
- calculating coordinates of all relevant points on the part or product to be produced
- writing NC/CNC program in standard code format and incorporating, where appropriate, canned cycles and sub-routines
- producing NC/CNC operation sheet(s)
- operating NC/CNC machine in manual mode
- editing NC/CNC program
- checking parts or products produced for conformance with specifications

Required knowledge

Look for evidence that confirms knowledge of:

- elements of an NC/CNC program
- the function of elements in controlling the operation of an NC/ CNC machine
- machining operations to be performed in the manufacture of the given part or product
- the appropriate type(s) of NC/CNC machine to perform the required machining operations
- the machining operations to be controlled by the program to be written
- the tool path(s) to be followed when producing the part or product
- the sequence of machining operations to be programmed
- reasons for selecting the chosen tool path(s) and sequence of operations
- the zero point of the NC/CNC machine
- the canned cycles and sub-routines accessible in the particular NC/CNC machine
- the application of each canned cycle and sub-routine available
- the canned cycles and/or sub-routines to be used in the NC/CNC program
- reasons for selecting the chosen canned cycles and/or sub-routines
- standard codes used in the writing of NC/CNC programs
- applications of standard codes in NC/CNC programming
- procedures for writing NC/CNC programs in standard code format
- procedures for completing NC/CNC operation sheets
- the information to be included in NC/CNC operation sheets
- relevant Australian standards
- procedures for manual operation of the NC/CNC machine
- the reasons for testing and proving the NC/CNC program
- the procedures for editing the NC/CNC program via the machine controller

REQUIRED SKILLS AND KNOWLEDGE
• the effects of editing on the operation of the NC/CNC machine and the part or product to be produced • the specifications of the part or product • the measuring equipment/techniques to be used to check for conformance with specifications

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to program a NC/CNC machining centre. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with programming a NC/CNC machining centre or other units requiring the exercise of the skills and knowledge covered by this unit.

EVIDENCE GUIDE	
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations

MEM07020C Program multiple spindle and/or multiple axis NC/CNC machining centre

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers identifying NC/CNC machine program elements, writing and trialling a machine program for multiple spindle and/or multiple axis NC/CNC machining centres, and preparing an operation sheet.

Application of the Unit

Application of the unit	This unit extends to writing programs to describe machine operations including tool paths using appropriate software for machines which include multiple spindles and/or multiple axis/B axis angular, multiple tool turrets, tool changers and may include component loaders of a pallet type etc. The program may use common M and G codes and include the programming of advanced operations, using canned cycles and sub-routines. Programs are trialled and edited as necessary to adjust operation of centre. Technical difficulties are resolved in consultation with appropriate technical advisers. Work would be undertaken autonomously using predetermined standards of quality. Where machining skills in excess of MEM07005C (Perform general machining) are required, then appropriate units should also be selected. This unit has dual status and is to be regarded as both a specialisation band A unit and Specialisation band B unit for progression to C7 (AQF level IV). **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07015B	Set computer controlled machines/processes
	MEM07016C	Set and edit computer controlled machines/processes
	MEM07018C	Write basic NC/CNC programs
	MEM07019C	Program NC/CNC machining centre
	MEM07024B	Operate and monitor machine/process
	MEM07028B	Operate computer controlled machines/processes
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
Path 2	MEM07005C	Perform general machining
	MEM07015B	Set computer controlled machines/processes
	MEM07016C	Set and edit computer controlled machines/processes
	MEM07018C	Write basic NC/CNC programs
	MEM07019C	Program NC/CNC machining centre

Prerequisite units		
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Identify NC/CNC machine program elements	1.1. Appropriate program elements are selected for machine controller.
2. Write NC/CNC machine program	2.1. Engineering drawings are understood and interpreted to define machine function and tool path geometry. 2.2. Coordinates are calculated as required for tool path or machine functions. 2.3. Advanced operations using canned cycles and sub-routines are selected and applied appropriately. 2.4. Program is written in standard code format in accordance with standard operating procedures.

ELEMENT	PERFORMANCE CRITERIA
3. Write NC/CNC operation sheet	3.1. Operation sheets are produced to specification in accordance with standard operating procedures which includes appropriate Australian standard where required.
4. Trial program	4.1. Machine is operated in manual mode to test and prove program. 4.2. Program is edited if necessary to adjust operation. 4.3. Components are checked to conform to specification.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents • planning and sequencing operations • checking and clarifying task related information • calculating coordinates of all relevant points on the part or product to be produced • writing NC/CNC program in standard code format and incorporating, where appropriate, canned cycles and sub-routines • producing NC/CNC operation sheet(s) • operating NC/CNC machine in manual mode • editing NC/CNC program • checking parts or products produced for conformance with specifications
Required knowledge
Look for evidence that confirms knowledge of: • elements of an NC/CNC program • the function of elements in controlling the operation of an NC/ CNC machine • machining operations to be performed in the manufacture of the given part or product • the appropriate type(s) of NC/CNC machine to perform the required machining operations

REQUIRED SKILLS AND KNOWLEDGE
• the machining operations to be controlled by the program to be written • the tool path(s) to be followed when producing the part or product • the sequence of machining operations to be programmed • reasons for selecting the chosen tool path(s) and sequence of operations • the zero point of the NC/CNC machine • the canned cycles and sub-routines accessible in the particular NC/CNC machine • the application of each canned cycle and sub-routine available • the canned cycles and/or sub-routines to be used in the NC/CNC program • reasons for selecting the chosen canned cycles and/or sub-routines • standard codes used in the writing of NC/CNC programs • applications of standard codes in NC/CNC programming • procedures for writing NC/CNC programs in standard code format • procedures for completing NC/CNC operation sheets • the information to be included in NC/CNC operation sheets • relevant Australian standards • procedures for manual operation of the NC/CNC machine • the reasons for testing and proving the NC/CNC program • the procedures for editing the NC/CNC program via the machine controller • the effects of editing on the operation of the NC/CNC machine and the part or product to be produced • the specifications of the part or product • the measuring equipment/techniques to be used to check for conformance with specifications • hazards and control measures associated with numerical and computer controlled machines, including housekeeping • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to program multiple spindle and/or multiple axis NC/CNC machining centres. Competency in this unit cannot be claimed until all prerequisites have been

EVIDENCE GUIDE	
	satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with programming multiple spindle and/or multiple axis NC/CNC machining centres or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations

MEM07021B Perform complex lathe operations

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers setting up work, selecting and preparing tooling and performing complex turning operations.

Application of the Unit

Application of the unit	This unit applies to complex, difficult or non-standard turning e.g. single-start and multi-start thread cutting, internal blind hole thread cutting, eccentrics, copy and taper turning, counterbalancing work on face plates, mandrel work, trepanning, heavy (multi-tonne) shafts etc. requiring high precision or quality using a range of materials including non-standard metals and alloys. Work would be performed autonomously using predetermined standards of quality and safety. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07005C	Perform general machining

Prerequisite units		
	MEM07006C	Perform lathe operations
	MEM09002B	Interpret technical drawing
	MEM12003B	Perform precision mechanical measurement
	MEM12023A	Perform engineering measurements
	MEM12024A	Perform computations
	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Determine sequence of operations	1.1. Sequence of operations including job set-up is determined for maximum efficiency and to meet job specifications.
2. Set up work on lathe	2.1. Work is set up on the lathe to required level of accuracy using precision instruments such as dial test

ELEMENT	PERFORMANCE CRITERIA
	indicators etc. 2.2. Work piece is balanced as required when using face plates to ensure accuracy in machining. 2.3. Work piece is set up to ensure that work piece is free of distortion following completion of machining.
3. Select and prepare tooling	3.1. Tooling, accessories and consumables are selected appropriate to task, specifications and material. 3.2. Where necessary, cutting tool modifications required to perform complex turning operations are determined. 3.3. Tooling and accessories are prepared and modified as required. 3.4. International Standard Organisation standards for cutting tools or other appropriate standards to suit cutting parameters are applied as necessary.
4. Perform complex turning	4.1. Speeds and feeds are correctly calculated using appropriate mathematical techniques and reference material. 4.2. Complex turning is undertaken to specifications and workplace procedures. 4.3. Work piece is measured and verified to be in accordance with specification using precision measuring equipment.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • setting up work to the required level of accuracy using appropriate precision measuring equipment • setting and supporting work to avoid distortion on release of clamping devices • selecting correct cutting tools or inserts as appropriate to turning operation • selecting and using appropriate feeds and speeds • performing complex turning operations - counter balancing work on face plates:

REQUIRED SKILLS AND KNOWLEDGE

- mandrel work
- trepanning
- heavy (multi-tonne) shafts
- calculating cutting parameters, speeds and feeds
- reading, interpreting and following information on written job instructions, specifications, charts, lists, drawings and other applicable reference documents
- planning and sequencing operations
- checking and clarifying task related information
- entering routine and familiar information onto proformas and standard workplace forms
- checking for conformance to specifications
- using precision measurement equipment
- measuring components to specified tolerances
- performing numerical operations, geometry and calculations/formulae within the scope of this unit
- following oral instructions
- orally reporting information

Required knowledge

Look for evidence that confirms knowledge of:

- precision measuring equipment and measuring techniques within the scope of this unit
- reasons for selecting different measuring equipment
- procedures for accurately setting up work for a variety of techniques
- ISO or other standards applicable to cutting tool inserts
- cutting parameters for the given task
- feeds and speeds for complex turning operation(s)
- formulae and data relating to feeds and speeds
- techniques and procedures for carrying out the following turning operations:
  - single-start thread cutting
  - multi-start thread cutting
  - internal blind hole thread cutting
  - eccentrics
  - copy turning
  - taper turning
- techniques and procedures for carrying out the following turning operations:
  - counter balancing work on face plates
  - mandrel work
  - trepanning

REQUIRED SKILLS AND KNOWLEDGE
• heavy (multi-tonne) shafts • hazards and control measures, including housekeeping • use and application of personal protective equipment • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform complex lathe operations. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing complex lathe operations or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be

EVIDENCE GUIDE	
	gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Lathe	Applicable to all classes of lathes used for complex turning operations
Tooling	Cutting tools, form tools, boring bars, drills, reamers, thread chasers, tapping heads, taps etc.
Complex turning	May include single-start and multi-start thread cutting, internal blind hole thread cutting, eccentrics, copy and taper turning, counterbalancing work on face plates, mandrel work, trepanning, heavy (multi-tonne) shafts etc.

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations

MEM07022C Program CNC wire cut machines

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers writing and trialling a program for a range of CNC wire cut machines. Programming includes 2 axis tool paths, 4 axis conical cutting, and auto multi-cavity work pieces.

Application of the Unit

Application of the unit	This unit extends to programming a range of CNC wire cut machines. Programming includes 2 axis tool paths, 4 axis conical cutting, and auto multi-cavity work pieces. Technical difficulties are resolved in consultation with appropriate technical advisers. Work is carried out autonomously using predetermined standards of quality and safety. This unit has dual status and is to be regarded as both a specialisation band A unit and Specialisation band B unit for progression to C7 (AQF level IV). **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units	

Prerequisite units		
Path 1	MEM07005C	Perform general machining
	MEM07015B	Set computer controlled machines/processes
	MEM07016C	Set and edit computer controlled machines/processes
	MEM07018C	Write basic NC/CNC programs
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
Path 2	MEM07015B	Set computer controlled machines/processes
	MEM07016C	Set and edit computer controlled machines/processes
	MEM07018C	Write basic NC/CNC programs
	MEM07024B	Operate and monitor machine/process
	MEM07028B	Operate computer controlled machines/processes
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Write program	1.1. Engineering drawings are understood and interpreted to define optimum tool path geometry. 1.2. Tool path is programmed using advanced operations, canned cycles and sub-routines or other appropriate sub-routines within system. 1.3. Program is written in standard code format, and confirmed and edited as necessary using appropriate routine and standard operating procedures. 1.4. Program is stored in accordance with standard operating procedures. 1.5. Operation sheet is produced to standard operating procedures.
2. Trial program	2.1. Program is downloaded, and machining parameters that may include wire offset, wire speed, power settings are selected. 2.2. Machine is prepared, work piece are loaded and aligned, datum and reference points are established in accordance with standard operating procedures. 2.3. Machine is operated in appropriate mode to test and prove program, work piece positioning. 2.4. Finished components are checked for conformance with drawing specifications.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- interpreting drawings, specifications and instructions
- calculating coordinates of all relevant points on the part or product to be produced
- storing programs
- producing NC/CNC operation sheet(s)
- downloading and verifying NC/CNC program
- setting machine parameters
- mounting work holding fixtures/ devices/tools
- testing and proving NC/CNC program
- checking parts or products produced for conformance with specifications

Required knowledge

Look for evidence that confirms knowledge of:

- the operations to be controlled by the program to be written
- the tool path(s) to be followed when producing the part or product
- the sequence of operations to be programmed
- the reasons for selecting the chosen tool path(s) and sequence of operations
- the zero point of the wire cut machine
- the canned cycles and sub-routines accessible in the particular NC/CNC machine
- the application of each canned cycle and sub-routine available
- where appropriate, the canned cycles and/or sub-routines to be used in the NC/CNC program
- the reasons for selecting the chosen canned cycles and/or sub-routines
- the standard codes used in the writing of NC/CNC programs
- the applications of standard codes in NC/CNC programming
- procedures for writing NC/CNC programs in standard code format
- procedures for storing NC/CNC programs
- procedures for completing NC/CNC operation sheets
- the information to be included in NC/CNC operation sheets
- procedures for downloading NC/CNC programs
- procedures for verifying downloaded NC/CNC programs
- the machining parameters that may be entered into the machine controller
- the effect of varying the machining parameters on the product or part produced
- work holding fixtures/devices/tools
- procedures for mounting work holding fixtures/devices tools
- the location of the required work holding fixtures/devices/tools relative to the

REQUIRED SKILLS AND KNOWLEDGE
machine datum or zero • purpose of datum setting • pre-start checks • safety features and equipment of the NC/CNC machine • the purpose and function of the safety features and/or equipment • the machine mode appropriate to the testing and proving of the NC/CNC program and the checking of the position of the work piece • the procedures to be followed when using the machine in this mode • the relative position of the work piece to the machine datum or zero • the specifications of the part or product • the measuring equipment/techniques to be used to check for conformance to specification

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform programming of CNC wire cut machines. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

EVIDENCE GUIDE	
	This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with programming of CNC wire cut machines or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Program	Includes setting of speeds, tolerances, taper angles, macros, nesting tool paths, chained linear tool paths and differential profiles

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations

MEM07024B Operate and monitor machine/process

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers obtaining the job instruction, conducting the pre-start checks, and operating and monitoring the machine or process.

Application of the Unit

Application of the unit	This unit applies to a range of production operations or continuous processes. The work is performed in accordance with clear step-by-step instructions and procedures documented on job sheets or similar process instruction documents. Operational adjustments to the machine or process by the operator are made using external controls. Basic operation (excluding setting and tool adjustments) of CNC machines is covered by this unit. Where production packaging and labelling of the finished goods or product is required, Unit MEM11006B (Perform production packaging) should be considered. This unit should not be selected with any of the following units unless the skills of this unit are being applied to an additional and different type of machine and or process: Unit MEM04001B (Operate melting furnaces), Unit MEM04002B (Perform gravity die casting), Unit MEM04003B (Operate pressure die casting machine), Unit MEM04006B (Operate sand moulding and core making machines), Unit MEM06001B (Perform hand forging), Unit MEM06002B (Perform hammer forging), Unit MEM08001B (Perform wire, jig and barrel load/unload work), Unit MEM08004B (Finish work using wet, dry and vapour deposition methods), Unit MEM08008B (Operate and control surface finishing waste treatment process)

	Band: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Obtain job	1.1. Job sheets or equivalent instructions are interpreted

ELEMENT	PERFORMANCE CRITERIA
instructions	correctly.
2. Conduct pre-start checks	2.1. Pre-start checks are undertaken to standard operating procedure. 2.2. Safety procedures are observed and all safety equipment is checked for correct operation.
3. Operate machine/process	3.1. Machine/process is started up safely and correctly in accordance with standard operating procedures. 3.2. Machine/process is operated in accordance with job instructions or standard operating procedures. 3.3. Components/feed stock are loaded and maintained consistent with production requirements. 3.4. Machine/process output is unloaded safely to standard operating procedures, as required. 3.5. Machine/process output is handled and stored in a manner not likely to cause damage, as required. 3.6. Production data is recorded to standard operating procedures.
4. Monitor machine/process	4.1. Machine/process is monitored for safe and correct operation, deviations and faults are identified and reported in accordance with standard operating procedures. 4.2. Emergency procedures are understood and followed in accordance with standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • following job sheets, standard operating procedures and other applicable workplace forms • manual handling • following oral instructions • entering routine and familiar information onto proformas and standard workplace forms

REQUIRED SKILLS AND KNOWLEDGE
• orally reporting routine information • identifying deviations and faults in machine operation/process
Required knowledge
Look for evidence that confirms knowledge of: • pre-start checks • machine/process start-up and unloading procedures • component/feed stock levels to ensure continuous process • production recording and reporting requirements • types of product fault/deviations • consequences of improper handling and storing of finished work • procedures to be followed in emergency situations • use and application of personal protective equipment • safe work practices and procedures • hazards and control measures associated with operating and monitoring machine/process

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to obtain the job instruction, conduct the pre-start checks, and operate and monitor the machine or process.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic

EVIDENCE GUIDE	
	workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with operating and monitoring machine/process or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Pre-start checks	Condition of machine before operation
Machine/process	Machines and processes used in pressing, punching, plastic moulding, extruding, bending,

RANGE STATEMENT	
	joining, rolling, forming, drawing, metal removal, pickling, cylinder filling, printing, painting etc.
Production data	Production schedules, job sheets, checklists

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations

MEM07028B Operate computer controlled machines/processes

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers obtaining the job instructions, conducting the pre-start checks, and operating and monitoring the computer controlled machine or process.

Application of the Unit

Application of the unit	This unit applies to a range of NC, CNC and robot operated machines or processes in a production environment. Work is performed to established processes, practices, specifications and instructions as appropriate. Technical difficulties are resolved in consultation with appropriate technical advisers. An appropriate level of measurement skill should be selected with this unit. Where it is required to use tools, then Unit MEM18001C (Use hand tools) should also be selected. Where basic operation excludes setting and tool adjustment skills, then Unit MEM07024B (Operate and monitor machine/process) should be selected. When operational maintenance is required, unit MEM07001B (Perform operational maintenance of machines/equipment) should be selected. **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07024B	Operate and monitor machine/process

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Obtain job instructions	1.1. Job sheets or equivalent instructions are understood and correctly followed.
2. Conduct pre-start checks	2.1. Pre-start checks are undertaken to standard operating procedures. 2.2. Correct safety procedures are observed and all safety equipment is checked for correct operation.
3. Operate computer	3.1. Installed computer controlled program is selected

ELEMENT	PERFORMANCE CRITERIA
controlled machine/process	and verified in accordance with job instructions. 3.2. Computer controlled machine is operated safely to product specifications using standard operating procedures. 3.3. Machine malfunctions are identified and reported. 3.4. Production samples are checked for compliance to specification using standard operating procedures.
4. Monitor machine/process	4.1. Tool wear is monitored and, where appropriate, preset tools are replaced, tool offsets are identified in computer controlled program and adjusted, or other corrective action is taken using standard operating procedures. 4.2. Product deviation from specification is reported in accordance with standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents
- planning and sequencing operations
- checking and clarifying task related information
- making pre-start checks
- checking safety equipment and guards for correct operation
- following safety procedures
- selecting and verifying the correct computer controlled program
- operating the computer controlled machine
- identifying and reporting machine malfunctions
- checking parts/products for conformance to specification
- monitoring the machine or process for signs of tool wear
- taking corrective action
- reporting part or product deviations from specification

REQUIRED SKILLS AND KNOWLEDGE
Required knowledge
Look for evidence that confirms knowledge of: • pre-start checks • safety equipment and features associated with the machine/process • safety procedures associated with the machine/process • procedures for accessing computer controlled programs installed in the machine controller • procedures for verifying the correct computer controlled program • computer controlled machine operating procedures • typical machine malfunctions • procedures for reporting machine malfunctions • measuring instruments/techniques • examples of tool wear and the effect on product or part specifications • procedures to be followed once tool wear has been detected • replacing preset tools • adjustments to tool offsets • the effect of adjustments on part or product specifications • procedures for reporting product or part deviations • hazards and control measures associated with operating computer controlled machines/processes, including housekeeping • safe workplace practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to operate computer controlled machine/processes. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required

EVIDENCE GUIDE	
	knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with operating computer controlled machine/processes or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating

RANGE STATEMENT	
conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations

MEM07030C Perform metal spinning lathe operations (basic)

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing basic metal spinning operations (excluding CNC), using a variety of processes, spinning tools and accessories.

Application of the Unit

Application of the unit	This unit applies to manual metal spinning of sheet metals. Spinning does not include hot spinning procedures. Tool use will include either hand and/or slide tooling of varying design and materials. Where operational maintenance requires dismantling and replacing components, Unit MEM18055B (Dismantle, replace and assemble engineering components) should also be selected. If annealing is required, the appropriate unit MEM05007C (Perform manual heating and thermal cutting) should also be selected. Where disc blanks are cut out using a dedicated circle cutter or similar, Unit MEM07032B (Use workshop machines for basic operations) should also be selected. If the interpretation of technical drawings is required Unit MEM09002B (Interpret technical drawings) should also be selected. **Band**: **A** **Unit Weight**: **8**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Observe safety precautions	1.1. Correct safety procedures are observed and protective clothing and safety glasses are worn.
2. Determine job requirements	2.1. Drawings are interpreted and sequence of operation is determined. 2.2. Tools are selected to produce components to

ELEMENT	PERFORMANCE CRITERIA
	specifications. 2.3. Disc size is determined in accordance with appropriate procedures.
3. Perform spinning operations	3.1. Spinning speeds are calculated for various metals and metal thicknesses using appropriate mathematical techniques and reference materials. 3.2. Correct back centre and form chucks are selected and mounted in accordance with procedures and specifications. 3.3. Prepared disc is mounted for forming. 3.4. A full range of spinning accessories is used including: back centre, various chucks, trimming accessories, blank centre equipment and tee-rest. 3.5. Spinning operations are performed to specifications.
4. Check components for conformance to specifications	4.1. Components are checked for conformance to specifications using appropriate techniques, tools and equipment.
5. Remove and store components	5.1. Components are removed from the spinning lathe without marking or any deformation. 5.2. Components are correctly stored and packaged to avoid oxidation and damage.
6. Adjust and maintain spinning lathe	6.1. Routine maintenance and adjustments are carried out as required.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • reading and interpreting routine information on written job instructions, specifications and standard operating procedures. May include drawings • following oral instruction • entering routine and familiar information onto proformas and standard workplace forms • using all basic metal spinning tools

REQUIRED SKILLS AND KNOWLEDGE
• minimising damage and defects • calculating disc size and lathe speed • undertaking manual handling related to spinning products • using appropriate techniques, tools and equipment to measure materials and spinnings
Required knowledge
Look for evidence that confirms knowledge of: • sequence of spinning operation • types of spinning tools, their functions and requirements for maintaining tools • types of damage and defects e.g. tool marks, cracking, stress marks, thinning and incorrect finish • spinning lathe operation • why and how lathe speed is calculated • reasons for types of form chuck mounting • function and operation of accessories for basic spinning • methods used for each process • methods for stacking and protecting finished product • use and application of personal protective equipment • safe work practices and procedures • hazards and control measures associated with metal spinning lathe operations (basic)

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform basic metal spinning lathe operations. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required

EVIDENCE GUIDE	
	knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing basic metal spinning lathe operations or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating

RANGE STATEMENT	
conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Tools	Spinning tools, planishing tools, backstick, trimming, beading tools etc.
Metals	Steel, aluminium, monel, copper, brass, zinc, pewter, silver, gold, tin, etc. of varying thicknesses
Reference materials	Workplace reference materials
Spinning operations	Spinning, beading, trimming, finishing, annealing and/or pickling
Maintenance and adjustments	Cleaning, lubrication etc.

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations

MEM07031C Perform metal spinning lathe operations (complex)

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing complex metal spinning operations (excluding CNC), using a variety of advanced processes, spinning tools and accessories.

Application of the Unit

Application of the unit	This unit applies to complex spinning operations which require preparation of form chucks, oval spinning, thread spinning, or jobs requiring higher precision or quality using mainly brass and brass alloys. This unit also requires the use of a wide range of spinning accessories and processes, including the use of annealing. Where there is a requirement to join spun materials or products in addition to, or instead of, (the spinning operation of) swaging, the following units may also be required: Unit MEM05003B (Perform soft soldering), Unit MEM05006B (Perform brazing and/or silver soldering), or Unit MEM05004C (Perform routine oxy acetylene welding [fuel gas welding]), or Unit MEM05012C (Perform routine manual metal arc welding) **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07030C	Perform metal spinning lathe operations (basic)
	MEM07032B	Use workshop machines for basic operations
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Observe safety precautions	1.1. Correct safety procedures are observed and protective clothing and safety glasses are worn.

ELEMENT	PERFORMANCE CRITERIA
2. Determine job requirements	2.1. Drawings are interpreted and sequence of operation is determined. 2.2. Tools are selected to produce components to specifications. 2.3. Disc size is determined according to relevant procedures. 2.4. Disc is cut to the correct size and tolerance.
3. Prepare form chucks for spinning	3.1. Metal turning lathe is set up for machining form chucks according to standard operating procedures and standards. 3.2. Form chuck is prepared for general spinning as per drawings and specifications. 3.3. Form chuck is prepared for seaming/swaging joints as per drawings and specifications.
4. Perform complex spinning operations	4.1. Spinning speeds are calculated for various metals and metal thicknesses using appropriate mathematical techniques and reference materials. 4.2. Correct back centre and form chucks are selected and mounted according to procedures and specifications. 4.3. Prepared disc is mounted for forming. 4.4. A full range of spinning accessories is used including: back centre, holding and sectional chucks, tee-rest, compound and additional slides, recessed and cranked followers, rollers and knurling wheels. 4.5. Spinning, beading, recessing, oval spinning, screw forming, (thread spinning) seaming, swaging, trimming finishing, annealing and pickling operations are performed to specification.
5. Check components for conformance to specifications	5.1. Components are checked for conformance to specifications using appropriate techniques, tools and equipment.
6. Remove and store components	6.1. Components are removed from the spinning lathe without marking or any deformation. 6.2. Components are correctly stored and packaged to avoid oxidation and damage.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- reading and interpreting information on written job instructions, specifications and standard operating procedures. May include drawings
- entering information onto proformas and standard workplace forms
- following oral instruction
- using all types of metal spinning tools and accessories
- calculating disc size and lathe speed including angles and radius
- manual handling related to spinning products
- coordinating use of multi-slides and tools, feeds and speeds
- producing complex spinning shapes using a variety of processes and techniques

Required knowledge

Look for evidence that confirms knowledge of:

- complex spinning operations, processes and techniques
- requirements for maintaining tools and manufacturing form chucks
- types of damage and defects e.g. tool marks, cracking, stress marks, thinning and incorrect finish
- function and operation of accessories
- methods used for each process
- methods for stacking and protecting finished product
- use and application of personal protective equipment
- safe work practices and procedures
- hazards and control measures associated with metal spinning lathe operations (complex)

Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

EVIDENCE GUIDE	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform complex spinning operations using a range of metal spinning lathes, accessories and measuring equipment. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing complex metal spinning lathe operations or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning should not require language, literacy and numeracy skills beyond those required in this unit. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Tools	Spinning tools, planishing tools, backstick, trimming, beading tools, back centre, holding and sectional chucks, tee-rest, compound and additional slides, recessed and cranked followers, rollers and knurling wheels etc.
Complex spinning operations	Spinning, beading, recessing, oval spinning, screw forming, (thread spinning) seaming, swaging, trimming finishing, annealing, pickling, combined angles and multi-radii
Metals	Steels, aluminium, monel, copper, brass, brass alloys, zinc, pewter, silver, gold, tin, etc., of varying thicknesses

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations

MEM07032B Use workshop machines for basic operations

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers basic machining in a maintenance or jobbing environment.

Application of the Unit

Application of the unit	The unit applies to machines that include but are not limited to lathe, radial arm drill, mills etc., and covers the sharpening of tools as required. This unit should not be selected when Unit MEM07005C (Perform general machining) or Unit MEM07024B (Operate and monitor machine/process) have already been selected. For hand held/power tools use Unit MEM18002B (Use power tools/hand held operations). **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM18001C	Use hand tools

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Identify job requirements.	1.1. Job requirements are interpreted from work instructions and standard operating procedures. 1.2. Appropriate machine is selected to meet requirements.
2. Set up machine	2.1. Tools are selected appropriate to the work requirements. 2.2. Cutting tools are sharpened as required. 2.3. Tools are correctly installed using standard operating procedures. 2.4. Guards are set and adjusted as required.
3. Operate machine	3.1. Material to be machined is mounted and secured using clamping device appropriate to the material and work requirements. 3.2. Machine is operated correctly to suit work and material requirements.

ELEMENT	PERFORMANCE CRITERIA
4. Check finished component	4.1. Machined component is checked against work requirements and predetermined finish.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • reading, interpreting and following routine and familiar information on written job instructions, standard operating procedures and other applicable reference documents • selecting the appropriate machine for the given task • setting up machines and tooling within the scope of this unit, including speeds and feeds • sharpening tools within the scope of this unit • operating machines within the scope of this unit • checking finished components • checking and clarifying task-related information • measuring components to specification within the scope of this unit
Required knowledge
Look for evidence that confirms knowledge of: • cutting tool sharpening methods and techniques • tool geometry within the scope of this unit • units of measurement, tool geometry and numerical operations within the scope of this unit • safe operation of tool sharpening equipment • consequences of incorrect sharpening • machine set-up • consequences of incorrect speeds and feeds • procedures for operating workshop machines • reasons for poor surface finish. • hazards and control measures • use and application of personal protective equipment • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to use workshop machines for basic operations. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with using workshop machines for basic operations or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be

EVIDENCE GUIDE	
	permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Machines	Lathe, radial arm drill, mill etc.
Cutting tools	Lathe tools, milling cutters, drills etc.
Materials	Ferrous and non ferrous
Clamping device	Chucks, vices, clamps, bars and packing etc.

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Co-requisite units		

Competency field

Competency field	Machine and process operations

MEM08001B Perform wire, jig and barrel load/unload work

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers loading barrels for mass finishing processes, undertaking jig work for non-electrolytic processes, undertaking wire jig and rack work for non-electrolytic processes, and unloading and removing jigs after finishing.

Application of the Unit

Application of the unit	This unit applies to loading and unloading in preparation for a wide variety of pre-treatment and finishing processes of multiples of similar items. Typical processes include degreasing, de-scaling, surface blasting, flame cleaning, wet blasting, grinding, polishing, wet coating, powder coating, electroplating, anodising, electroless plating, electrophoretic coating and hot dip metallising. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units	

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Load barrels etc., for mass finishing processes	1.1. Machinery is correctly loaded regarding load mass. 1.2. Machine access openings are safely secured.
2. Undertake jig work for non-electrolytic processes	2.1. Components are appropriately secured using standard operating procedures.
3. Undertake wire jig and rack work for electrolytic processes	3.1. Correct type and size of wire or rack is selected and inspected for conformance to specification. Damaged racks are identified for repair or replacement. 3.2. Components are secured presenting appropriate faces according to standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- correctly loading into the surface finishing machinery
- securing and positioning components to minimise damage
- securing machine access openings
- unloading and stacking components to minimise damage
- selecting the correct type and size of wire or rack
- planning and sequencing operations
- checking and clarifying task related information
- checking for conformance to specifications
- reading and interpreting routine information on written job instructions, specifications and standard operating procedures. May include drawings
- following oral instructions
- performing calculations using formulae

Required knowledge

Look for evidence that confirms knowledge of:

- the procedures for loading machinery for mass finishing processes
- the distribution of the components within the machinery
- reasons for distributing the components in a particular manner
- the procedures for securing machine access openings
- the consequences of not securing machine access openings
- the procedures for jigging work for non-electrolytic processes
- the precautions to be taken when jigging work for non-electrolytic finishing processes
- the appropriate types and sizes of wire or racks used in conjunction with surface finishing using electrolytic processes
- different faces to be surface finished/coated
- procedures for securing the components to be surface finished using electrolytic processes
- procedures for unloading and stacking surface finished components
- the damage that can be caused by inappropriate handling and storing of surface finished components
- hazard and control measures associated with wiring, jigging and barrel load/unloading work
- safe workplace practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform wire, jig and barrel load/unload work related to non-electrolytic processes.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing wire, jig and barrel load/unload work related to non-electrolytic processes or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be

EVIDENCE GUIDE	
	permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Non-electrolytic processes	Pre-treatment and finishing processes typical of which are degreasing, de-scaling, surface blasting, flame cleaning, wet blasting, grinding, polishing, wet coating, powder coating, electroplating, anodising, electroless plating, electrophoretic coating and hot dip metallising
Components	Refer to components supplied by the customer
Damaged racks	• Damage to plastic coating or contact points • Ensuring good electrical contact • Positioning to facilitate optimum thickness on significant surfaces • Avoidance of gas entrapment • The position of contact marks

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Surface finishing

MEM08002C Pre-treat work for subsequent surface coating

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers pre-treating common ferrous and non-ferrous work.

Application of the Unit

Application of the unit	This unit applies to pre-treatment of common ferrous and non-ferrous work for finishing by a wide variety of processes, such as wet coating, powder coating, electroplating, anodising, electroless plating, electrophoretic coating and hot dip metallising. In the pre-treatment process, adjustments to apparatus/equipment/controls include temperature settings, current/voltage and solution compositions. This unit should not be selected if Unit MEM08003C (Perform electroplating operations) has already been selected. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units	

Prerequisite units		
Path 1	MEM13003B	Work safely with industrial chemicals and materials

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Identify job material	1.1. Common metals, alloys and non-metals can be identified.
2. Identify job surface condition	2.1. Common surface soils and conditions can be identified.
3. Perform pre-treatment processes in correct sequence	3.1. Pre-treatment processes are carried out to standard operating procedures. 3.2. Pre-treatment process parameters are monitored to ensure they remain within specified limits.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- reading and following routine and familiar information on standard operating procedures
- recognising common surface soils and conditions from given samples
- carrying out appropriate pre-treatment processes
- monitoring and maintaining the pre-treatment process parameters within specified limits
- following verbal instructions
- orally reporting routine information

Required knowledge

Look for evidence that confirms knowledge of:

- characteristics of common metals, alloys and non-metals and procedures and techniques for identifying them
- common surface soils and conditions
- procedures for identifying the type(s) of soil on surfaces to be finished
- simple tests that can be used to assist in identifying surface soils and conditions
- pre-treatment processes applicable to a range of materials, surface soils and conditions
- procedures for carrying out pre-treatment processes
- parameters and procedures for monitoring pre-treatment processes
- hazards and control measures associated with pre-treatment
- use and application of personal protective equipment
- safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

EVIDENCE GUIDE	
Overview of assessment	A person who demonstrates competency in this unit must be able to pre-treat common ferrous and non-ferrous materials. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with pre-treating common ferrous and non-ferrous materials or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Common metals	Steel, copper, brass, zinc, cast iron, stainless steel
Surface soils and conditions	Oils, greases, drawing compounds, cutting lubricants, buffing lubricants, rust and scale
Pre-treatment processes	Solvent degreasing, alkaline cleaning, pickling, acid dipping
Process parameters	Temperature, time, currents, solution concentrate

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Surface finishing

MEM08003C Perform electroplating operations

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	

Application of the Unit

Application of the unit	This unit applies to a range of metal plating processes in the electroplating, electronics, jewellery manufacture, and metal fabrication industries. It covers the general operation, monitoring and adjustment of manual, semi and automatic electroplating processes. It includes volume production and 'jobbing' involving rack and barrel type processes. This unit should not be selected if Unit MEM07025B (Perform advanced machine/process operation) has already been selected. Where simple operating and monitoring of the electroplating process is required, Unit MEM07024B (Operate and monitor machine/process) should be considered **Band**: **A** **Unit Weight**: **6**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units	

Prerequisite units		
Path 1	MEM07001B	Perform operational maintenance of machines/equipment
	MEM08001B	Perform wire, jig and barrel load/unload work
	MEM13003B	Work safely with industrial chemicals and materials
	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Identify electroplating requirements	1.1. Electroplating requirements are identified. 1.2. Untreated materials and required electroplating treatment are identified.
2. Prepare for electroplating process	2.1. Materials and racking arrangement are checked for non-conformance to specifications/job requirements. 2.2. All plant and equipment relevant to process are checked for compliance with safety and operational

ELEMENT	PERFORMANCE CRITERIA
	requirements. 2.3. Instrumentation/gauges are checked for operation. 2.4. Condition of solution is checked.
3. Perform electroplating operations	3.1. Operation steps are carried out in correct sequence according to standard operating procedures or work instructions. 3.2. Safety precautions are observed.
4. Recognise and rectify process deviations	4.1. Compliance with operating parameters is ensured. 4.2. Uncontrollable variances are reported to appropriate persons. 4.3. Adjustments are made to rectify process deviation. 4.4. Finished products are visually inspected for compliance to specification.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • recognising deviations and faults in product/equipment/process • identifying machine process requirements, untreated materials and process sequences • identifying incorrectly loaded work • inspecting job surface conditions • checking plant and equipment for conformance to safety and operational requirements • checking solution levels and identifying visible contamination such as solution clarity, oil, surface contamination • maintaining required contacts and immersions while moving materials • monitoring operating parameters, identifying deviations and making required adjustments • adjusting settings such as voltage, current and temperature within permissible limits • correcting deviations within scope operator's control • reading and interpreting routine information on written job instructions,

REQUIRED SKILLS AND KNOWLEDGE
specifications and standard operating procedures. May include drawings • following oral instructions • performing calculations using formulae
Required knowledge
Look for evidence that confirms knowledge of: • basic knowledge of electroplating process, machine components, treatment solutions, process parameters • a basic knowledge of electroplating solutions and handling procedures • treatment stages • information relevant to plating products, treatment baths, settings • characteristics of a variety of base materials that can be plated • pre-treatment s, treatments and post treatments in relation to task requirements • required equipment checks • hazards and control measures associated with electroplating processes • operational requirements of all plant and equipment associated with the relevant process • the purpose and typical settings of different instruments/gauges • sequences and requirements involved in moving materials • the range of adjustments permissible for given operating parameters including voltage, current and temperature • variances outside the control of the operator • common faults and imperfections/deviations • adjustments to suit specific process deviations • effects of rust, corrosion and other contaminants • the reasons for rejecting incorrectly loaded work • safe operating procedures, safety and personal protective equipment, hazards of specific solutions

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to start up, operate and monitor an electroplating

EVIDENCE GUIDE	
	process. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with starting up, operating and monitoring an electroplating process or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Electroplating requirements	Coating thickness, appearance, ductility, hardness, corrosions resistance, wear
Untreated materials	Steel, copper, brass, cast iron, stainless steel
Electroplating treatment	• Pre-treatment • Electroplating operations • Post treatment
Checked	Equipment checking includes componentry, electrodes, circuitry equipment
Instruments and gauges	• Volt meters, AMP meters, temperature recorders/indicators • AMP per hour meters
Electroplating operations	Engineering coatings, protective finishes, decorative plating
Work instructions	Standard operating procedures, verbal and written job instructions, job cards, specifications, drawings
Adjustment	Time, temperature, current density, voltage
Visual inspection	Surface texture, brightness, free from roughness, pitting, cracking, machining marks

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Surface finishing

MEM08004B Finish work using wet, dry and vapour deposition methods

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit applies to finishing work using a range of wet and dry organic coatings.

Application of the Unit

Application of the unit	Processing may be carried out in manual, semi or fully automatic plant. Applications may be by hand or utilising a wide range of machines or plant. Work is conducted under supervision. Where straightforward monitoring of semi or automatic machine or process is undertaken, then Unit MEM07024B (Operate and monitor machine/process) should be considered. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM08002C	Pre-treat work for subsequent

Prerequisite units		
		surface coating
	MEM13003B	Work safely with industrial chemicals and materials

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Assess and prepare components for required coating process	1.1. Coating specifications are identified from operation sheets/work procedures. 1.2. Suitability of pre-treated components for finishing process is checked according to enterprise procedures. 1.3. Components are prepared as required for finishing application. 1.4. Components are positioned/located for finishing according to enterprise procedures.
2. Perform simple mixing and estimating operations	2.1. Mixing ratios are calculated and a range of wet coatings are mixed and thinned as required to standard operating procedures. 2.2. Required coating quantities are estimated using

ELEMENT	PERFORMANCE CRITERIA
	simple surface area calculations.
3. Perform coating operation	3.1. Equipment is set up to specification using standard operating procedures. 3.2. Coating and applied curing technique are monitored to standard operating procedures. 3.3. Coating application, thickness and colour are checked and maintained for compliance with specifications.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • obtaining all relevant drawings, specifications and/or instructions in accordance with work place procedures • racking the components to be coated correctly in accordance with standard operating procedures • calculating the correct mixing ratios for given wet coatings accurately • where appropriate, mixing and thinning the given wet coatings • calculating the surface area to be coated correctly • where appropriate, estimating the quantities of wet coating materials correctly • setting up the appropriate coating equipment • applying the coating correctly using the appropriate technique • curing the coating correctly using the appropriate technique • maintaining the coating thickness and colour in accordance with specifications throughout the coating operation • checking the coating thickness and colour • reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents • planning and sequencing operations • checking and clarifying task-related information • checking for conformance to specifications • performing numerical operations, geometry and calculations/formulae within the

REQUIRED SKILLS AND KNOWLEDGE
scope of this unit
Required knowledge
Look for evidence that confirms knowledge of: • work to be undertaken • coating process to be used • coating specifications • appropriate type of racking for the coating process • reasons for selecting the chosen rack type • procedures for racking components to be coated • source of data on mixing ratios for wet coatings • mixing ratio for the given task(s) • function of thinners as applied to the application of wet coatings • procedures to be followed when mixing wet coatings • surface area to be coated • coverage rate of the coating material to be applied • procedures for estimating quantities of coating materials • types of equipment used for a variety of coating processes • appropriate coating equipment for the given task(s) • reasons for selecting the chosen equipment • operating procedures applicable to the selected coating equipment • a range of coating techniques • a range of curing techniques • appropriate coating and curing technique for the given task(s) • reasons for selecting the chosen coating and curing techniques • monitoring procedures to be followed • examples of coating defects • the causes of coating defects • where appropriate, procedures for rectifying coating defects • where appropriate, procedures for reporting coating defects • coating thickness and colour to be achieved • the means of checking coating thickness and colour • frequency at which checks are undertaken • hazards and control measures associated with finishing work using wet, dry and vapour deposition methods, including housekeeping • safe work practices and procedures • use of personal protective equipment

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to finish work using wet, dry and vapour deposition methods. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with finishing work using wet, dry and vapour deposition methods or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

EVIDENCE GUIDE	
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Coating	Electrostatic powder coating, electrophoretic coating, industrial spray coating and lacquering, electroless (auto catalytic) nickel or copper plating, phosphating, chromating, galvanising, hot tinning, sputter deposition, vacuum evaporation, ion plating, paints, stains and other liquid finishes
Prepared	Visual inspection for contamination, masking out, racking, identification of correct materials to be used, ensuring cleanliness of work area and equipment, operational testing of equipment
Coating operation	Spray application, dip coating

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Surface finishing

MEM08006B Produce clear and/or coloured and/or sealed anodised films on aluminium

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers producing anodised coatings on aluminium

Application of the Unit

Application of the unit	This unit applies to the production of sealed anodised films on aluminium and its alloys. Films may be clear or coloured. Colouring is produced by dyeing or by 'in-bath' processes. Applications include electrical, decorative, mechanical and architectural purposes. **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM08002C	Pre-treat work for subsequent surface coating

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Perform a series of anodising steps	1.1. All steps are carried out in the correct sequence to standard operating procedures. 1.2. Masking techniques are correctly applied, where required. 1.3. Contact marks and shielding are minimised.
2. Assess preparation of work for correct jigging/loading	2.1. Work is correctly connected for the required current flow and minimum contact marks and shielding. 2.2. All incorrectly loaded work is rejected.
3. Anodise work by a series of treatment steps	3.1. All steps are carried out in the correct sequence to standard operating procedures.
4. Seal or dye and seal anodised work	4.1. All steps on work are carried out in the correct sequence to standard operating procedures.
5. Monitor and control operating parameters	5.1. Process parameters are maintained within specified limits.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- reading and following routine and familiar information on standard operating procedures
- following all steps in the anodising process
- applying the correct masking materials and techniques
- minimising contact marks and shielding
- correctly connecting the work to the required electrical current
- identifying incorrectly loaded work
- maintaining process parameters within specified limits
- following verbal instructions
- orally reporting routine information

Required knowledge

Look for evidence that confirms knowledge of:

- process for anodising aluminium
- materials, techniques and procedures for masking materials during anodising
- causes of contact marks and shielding during the anodising process
- procedures for minimising contact marks and shielding
- procedures for connecting the work to the required electrical current
- the electrical current required for the anodising process
- methods for correctly loading work
- examples of incorrectly loaded work
- reasons for rejecting incorrectly loaded work
- steps to be carried out in the seal/dye and seal process
- procedures and reasons for monitoring and maintaining the process parameters within the specified limits
- hazards and control measures associated with anodising operations, including housekeeping
- use and application of personal protective equipment
- safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to produce clear and coloured and sealed anodised films on aluminium and its alloys for decorative, mechanical and architectural purposes. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, i.e. the candidate is not in productive work, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with anodising aluminium or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning should not require language, literacy and numeracy skills beyond those required in this unit. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

EVIDENCE GUIDE	
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Anodising steps	Pre treatment, anodising, dyeing, sealing
Masking techniques	Taping, waxing
Process parameters	Temperature, current density, time

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Surface finishing

MEM08012B Prepare surfaces by abrasive blasting (basic)

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing a basic level of skill in surface preparation by abrasive blasting.

Application of the Unit

Application of the unit	This unit applies to surface preparation/cleaning on both ferrous and non-ferrous masonry and cementatious materials/components. Reference is made to supplier information and specifications as well as accepted and appropriate Australian and international standards. The majority of work is in a team environment and uses predetermined procedures and standards for safety and quality with all work and work practices undertaken to regulatory and legislative requirements. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM08016B	Control blast coating by-products, materials and emissions

Prerequisite units		
	MEM13003B	Work safely with industrial chemicals and materials

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Determine job requirements	1.1. Work requirements are determined from job sheet, instructions or other predetermined specifications in accordance with standard operating procedures. 1.2. Appropriate abrasive blasting process, equipment and blasting media are identified to meet job specification. 1.3. Work site is prepared for surface cleaning activities.
2. Set up equipment	2.1. Appropriate equipment and any required consumables are assembled, set up and prepared correctly and safely in accordance with manufactures' specifications and standard operating procedures. 2.2. Correct rust inhibitor for use in wet abrasive blast methods is selected where required.

ELEMENT	PERFORMANCE CRITERIA
	2.3. Pre-operational checks are carried out on equipment and faults and are rectified or reported for further action.
3. Prepare surfaces using abrasive blasting	3.1. Blasting equipment is operated in accordance with standard operating procedures. 3.2. Emergency shut-down procedures can be undertaken. 3.3. Work procedures are undertaken to appropriate environmental requirements. 3.4. Abrasive media disposal is carried out in accordance with standard operating procedures. 3.5. Blasting equipment is cleaned and disassembled and inspected in accordance with manufacturers' specifications and standard operating procedures. 3.6. Equipment faults are recorded and reported in accordance with standard operating procedures.
4. Inspect prepared surface	4.1. Surface preparation is assessed for cleanliness and conformance with specifications. 4.2. Faults or defects are rectified where required and inspection results are recorded and reported in accordance with standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • planning and sequencing operations • undertaking numerical operations within the scope of this unit • selecting blasting equipment and media • setting up equipment and consumables • selecting rust inhibitor • conducting pre-operational checks • preparing surfaces using abrasive blasting • disposing of abrasive media

REQUIRED SKILLS AND KNOWLEDGE
• maintaining blasting equipment • identifying, recording and reporting of faults • inspecting prepared surface • performing rectification work • checking for conformance to specifications
Required knowledge
Look for evidence that confirms knowledge of: • reason for selecting the chosen sequence of operations • blasting equipment and media required • equipment, consumables for various methods • importance of using an appropriate rust inhibitor • process for undertaking pre-operational checks • procedures or using abrasive blasting equipment • procedures for abrasive media disposal • procedures for maintaining and storing blasting equipment • recording/reporting procedures; faulty equipment • checking prepared surfaces • rectification techniques • safe work practices and procedures • hazards and control measures related to abrasive blasting

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to prepare surfaces by abrasive blasting (at a basic level). Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency

EVIDENCE GUIDE	
	in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, i.e. the candidate is not in productive work, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with preparing surfaces by abrasive blasting (basic) or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning should not require language, literacy and numeracy skills beyond those required in this unit. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and

RANGE STATEMENT	
regional contexts) may also be included.	
Blasting processes	Surface preparation using propelled abrasives including water, air steam, grits and blasting mediums
Blasting media	Abrasives, shot, glass beads, sand, steel shot, garnet, and other mediums accepted by industry and all regulatory bodies
Rust inhibitor	A substance which, when added to a corrosive liquid in small amounts, reduces the rate of corrosion
Blasting equipment	Electric and diesel compressors, blast pots, blast rooms, centrifugal blast machines, water pressure washers to 35,000 kpa, air hoses and nozzles, and specified hand and power tools, etc.

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	

MEM08013B Prepare surfaces by abrasive blasting (advanced)

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing an advanced level of skill in surface preparation using abrasive blasting.

Application of the Unit

Application of the unit	This unit is designed to be used where an advanced level of skill is desired in surface preparation using abrasive blasting. The operation and maintenance of compressed air systems and associated items, including emergency shut-down procedures, is included. Work is undertaken autonomously or as part of a team environment using accepted standards for safety, quality and procedures. All work and work practices are undertaken to regulatory and legislative requirements. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units	

Prerequisite units		
Path 1	MEM08012B	Prepare surfaces by abrasive blasting (basic)
	MEM08016B	Control blast coating by-products, materials and emissions
	MEM13003B	Work safely with industrial chemicals and materials

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Determine job requirements	1.1. Work requirements are determined from job sheet, instructions or other specifications in accordance with standard operating procedures. 1.2. Appropriate abrasive blasting process and equipment are selected to meet job specification. 1.3. Appropriate abrasive blasting media and equipment are selected to meet job specification. 1.4. Work site is prepared for surface cleaning activities.
2. Set up equipment	2.1. Appropriate equipment and any required

ELEMENT	PERFORMANCE CRITERIA
	consumables are assembled, set up and prepared correctly and safely in accordance with manufacturers' specifications and standard operating procedures. 2.2. Correct rust inhibitor for use in wet abrasive blast methods is selected where required. 2.3. Pre-operational checks are carried out on equipment and faults and are rectified or reported for further action.
3. Inspect surface prior to cleaning	3.1. Work piece is inspected prior to cleaning in accordance with standard operating procedures. 3.2. Identified faults/defects requiring remedial or pre-treatment action are reported as required.
4. Prepare surfaces using abrasive blasting	4.1. Blasting equipment is operated in accordance with standard operating procedures. 4.2. Emergency shut-down procedures can be carried out. 4.3. Work procedures are undertaken to appropriate environmental requirements. 4.4. Abrasive media disposal is carried out in accordance with standard operating procedures. 4.5. Blasting equipment is cleaned and disassembled and inspected in accordance with manufacturers' specifications and standard operating procedures. 4.6. Equipment faults are recorded and reported in accordance with standard operating procedures.
5. Inspect prepared surface	5.1. Surface preparation is assessed for cleanliness and conformance with specifications. 5.2. Faults or defects are rectified where required and inspection results are recorded and reported in accordance with standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills

REQUIRED SKILLS AND KNOWLEDGE
Look for evidence that confirms skills in: • preparing and sequencing operational work plan • selecting blasting process and equipment • selecting appropriate blasting media • setting up equipment • undertaking surface inspection prior to cleaning • reading and interpreting routine information on written job instructions, specifications and standard operating procedures. • following verbal instructions • orally reporting routine information • identifying faults and defects • checking and clarifying task-related information • checking for conformance to specifications
Required knowledge
Look for evidence that confirms knowledge of: • calculations and numerical operations within the scope of this unit • blasting media features • equipment for the selected method • inspection procedures • procedures for using abrasive blasting equipment • procedures for abrasive media disposal • safe work practices and procedures • hazards and control measures associated with preparing surfaces by abrasive blasting, including housekeeping

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to prepare surfaces by abrasive blasting (at an advanced level). Competency in this unit cannot be claimed until all prerequisites have been satisfied.

EVIDENCE GUIDE	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with preparing surfaces by abrasive blasting (advanced) or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Blasting process	Wet, dry, vacuum automatic rotary, centrifugal and water blasting (including HP and UHP)
Blasting media	Garnet, ilmenite, slags, steel grit, steel shot, water, glass bead and soda
Equipment	Blast nozzles, compressors, blast and helmet ventilation, air hoses, blast pots, nozzles, safety equipment etc.

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Surface finishing

MEM08016B Control blast coating by-products, materials and emissions

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers identifying, evaluating and controlling blaster coating by-products, materials and emissions.

Application of the Unit

Application of the unit	This unit applies to common containment practices and regulatory waste removal processes, documentation and implementation related to blaster coating by-products, materials and emissions in accordance with regulatory and legislative requirements. **Band**: **A** **Unit Weight**: **1**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM13003B	Work safely with industrial chemicals and materials

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Apply specific health and safety considerations to surface preparation	1.1. Products, hazardous materials and processes used in blaster cleaning and coating operations are identified. 1.2. Safety procedures appropriate to the work requirements are applied. 1.3. Unsafe working conditions are identified and reported to appropriate personnel.
2. Control by-products, materials and emissions	2.1. By-products, materials and emissions are contained using established procedures. 2.2. By-products, materials and emissions are monitored and directed to appropriate treatment or storage area. 2.3. Monitoring devices are checked for correct/continuous operation. 2.4. Status/reports are recorded and reported.
3. Dispose of by-product, materials and emissions	3.1. Waste treatment processes are applied in accordance with standard operating procedures. 3.2. Treatment processes are carried out in accordance with standard operating procedures and to meet relevant authority waste requirements.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • collecting, storing and removing samples of by-products • monitoring and transferring by-product and emissions • checking monitoring devices • implementing waste treatment process • recording and reporting of all results • collecting, storing, removing and sampling by-products
Required knowledge
Required knowledge • Look for evidence that confirms knowledge of: • products, hazardous materials and processes within the scope of this unit • regulatory and legislative requirements relating to control of blast coating by-products, materials and emissions • procedures for collecting samples • by-product collection equipment operation methods • waste control monitoring equipment and procedures • waste treatment processes • requirements and procedures for recording and reporting process status reports • hazards and control measures associated with controlling blast coating by-products, materials and emissions • use and application of personal protective equipment • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment

EVIDENCE GUIDE	
Guidelines for the Training Package.	
Overview of assessment	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with controlling blast coating by-products, materials and emissions or other units requiring the exercise of the skills and knowledge covered by this unit.
Context of and specific resources for assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Method of assessment	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Products, **hazardous materials and processes**	All products, hazardous materials and processes that are subject to codes and/or regulations in use
Monitoring devices	pH meters, probes
Waste treatment processes	Neutralisation, metals precipitation, solid separation-gravity/centrifuging

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Surface finishing

MEM08018B Electroplate engineering coatings

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers applying engineering metallic/ceramic coatings to ferrous and non-ferrous metals and some non-metallic materials e.g. plastics.

Application of the Unit

Application of the unit	This unit applies to producing engineering coatings designed to promote wear resistance, protect against corrosion, reclaim worn components. It also applies to manufacturing components (electroforming). For surface preparation operations, Unit MEM08011B (Prepare surfaces using solvents and/or mechanical means) and Unit MEM08012B (Prepare surfaces by abrasive blasting [basic]) should be selected as appropriate. Straightforward operation of electroplating process is covered by Unit MEM08003C (Perform electroplating operations). Where pre-treatment operations only are carried out, Unit MEM08002C (Pre-treat work for subsequent surface coating) should be selected. For basic inspection of completed or partly completed products produced by others, Unit MEM15004B (Perform inspection) should be selected. For construction of anodes, shields/robbers etc., the appropriate fabrication units should be selected. Where dogging/lifting is undertaken, the appropriate materials handling units should be selected. **Band**: **A**

	Unit Weight: **6**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07001B	Perform operational maintenance of machines/equipment
	MEM08001B	Perform wire, jig and barrel load/unload work
	MEM08003C	Perform electroplating operations
	MEM13003B	Work safely with industrial chemicals and materials
	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Select treatments and processes/equipment for producing engineering finishes	1.1. Appropriate treatment processes are selected according to base metal type, surface condition and relevant job specifications. 1.2. Operating/process parameters are selected to achieve required coating. 1.3. Appropriate equipment is selected.
2. Prepare work for engineering finishes	2.1. Products are correctly masked (stopped off) for selective plating. 2.2. Where applicable, conforming anodes are constructed and fitted correctly. 2.3. Where applicable, shields and robbers are constructed and fitted. 2.4. Pre-treatment processes are carried out, where applicable.
3. Monitor and control operating conditions and processes for engineering coatings	3.1. Operating/process parameters are set to produce required surface conditions/specifications. 3.2. Surface conditions of finished components are monitored and confirmed and abnormalities are identified. 3.3. Corrective actions are taken to rectify non-conforming conditions.
4. Maintain solutions for engineering finishes	4.1. Solution compositions are checked and confirmed to specification/operating range. 4.2. Adjustment requirements/additions are determined. 4.3. Additions are made to adjust solution composition to correct operating range.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in:

REQUIRED SKILLS AND KNOWLEDGE

- selecting treatments and processes/equipment for producing engineering finishes
- preparing work for engineering finishes
- calculating process parameters
- determining current densities
- assessing material condition for suitability for plating
- selecting equipment, masking, materials
- correctly sizing positioning and securing anodes
- sizing, positioning and securing shields and robbers
- carrying out mechanical/chemical pre-treatment
- setting times voltages/currents and temperature
- monitoring and controlling operating conditions and processes for engineering coatings
- maintaining solutions for engineering finishes

Required knowledge

Look for evidence that confirms knowledge of:

- effects of plating process on different materials
- conditions affecting engineering finishes
- base metal types
- surface finish of untreated material
- mechanical/chemical and specialised pre-treatment processes
- process parameters for achieving different coatings
- characteristics of different surface finishes
- masking materials and masking techniques
- safe operation of equipment to produce engineering finishes
- current distribution principles
- methods of constructing/fabricating, fitting anodes
- current-capacity of conforming/auxiliary anodes
- the role, construction, properties, applications, and positioning of shields and robbers
- finish requirements, permissible tolerances
- the causes of abnormalities and their related corrective actions
- purpose and application of simple tests including pH, titration, density
- calculations related to additions/adjustments to solution and of product surface area
- safe work practices and procedures, including handling chemicals

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply electroplate engineering coatings. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication materials handling, recording and reporting associated with applying electroplate engineering coatings or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

EVIDENCE GUIDE	
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Treatment processes	Electroplating, electroforming, electroless plating
Operating/process parameters	Treatment times and currents, bath pH temperatures and densities, anode conditions, addition agent content, cleanliness of contacts etc., make-up, maintenance of solution levels and purity
Coating	Hard chroming, heavy nickel, electroless nickel, nickel composites, heavy deposits of nickel, copper, bronze up to 10 mm
Equipment	Wire racks, handling equipment, barrels, jigs, shields, robbers, etc.
Products	Base materials such as cast iron, brass, steels with machine welded sections, etc.
Masking materials	Wax, lacquers, tapes, foils
Anodes	Soluble, insoluble auxiliary anodes, etc.
Solution compositions	Cleaning, pickling, electroplating, chromate, acid dips
Checks	Density, titration, pH
Adjustment	Strength of solutions, temperature range

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Surface finishing

MEM09002B Interpret technical drawing

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers interpreting technical drawing applying to any of the full range of engineering disciplines.

Application of the Unit

Application of the unit	Technical drawings may utilise perspective, exploded views or hidden view techniques. Drawings are provided to Australian Standard 1100 and/or Australian Standard 1102 and their equivalents from the full range of engineering disciplines. Standard symbols to Australian Standard 1100 and/or Australian Standard 1102 or equivalent are recognised in field of employment. Technical drawings may include symbol glossaries. Where any drawing, sketch, chart, diagram is only used as the technique for communication, then this unit does not apply: see Unit MEM12023A (perform engineering measurements) or Unit MEM16006A (Organise and communicate information). **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Select correct technical drawing	1.1. Drawing is checked and validated against job requirements or equipment. 1.2. Drawing version is checked and validated.
2. Interpret technical drawing	2.1. Components, assemblies or objects are recognised as required. 2.2. Dimensions are identified as appropriate to field of employment. 2.3. Instructions are identified and followed as required. 2.4. Material requirements are identified as required. 2.5. Symbols are recognised in the drawing as appropriate.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- checking the drawing against job requirements/related equipment in accordance with standard operating procedures
- confirming the drawing version as being current in accordance with standard operating procedures
- where appropriate, obtaining the current version of the drawing in accordance with standard operating procedures
- reading, interpreting information on the drawing, written job instructions, specifications, standard operating procedures, charts, lists and other applicable reference documents
- checking and clarifying task related information
- undertaking numerical operations, geometry and calculations/formulae within the scope of this unit

Required knowledge

Look for evidence that confirms knowledge of:

- application of AS1100.101 in accordance with standard operating procedures
- relationship between the views contained in the drawing
- objects represented in the drawing
- units of measurement used in the preparation of the drawing
- dimensions of the key features of the objects depicted in the drawing
- understanding of the instructions contained in the drawing
- the actions to be undertaken in response to those instructions
- the materials from which the object(s) are made
- any symbols used in the drawing as described in range statement
- hazard and control measures associated with interpreting technical drawings, including housekeeping
- safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to interpret technical drawings as described.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with interpreting technical drawings or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning should not require language, literacy and numeracy skills beyond those required in this unit. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Interpret technical drawing	AS1100.101 is an extensive work and the candidate is not required to have complete familiarity with all its contents, the application of AS1100 would usually be in line with standard operating procedures; interpretation may require guidance particularly in respect to any geometric tolerancing

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Drawing, drafting and design

MEM09003B Prepare basic engineering drawing

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers identifying the drawing requirements, preparing or making changes to engineering drawings, preparing an engineering parts list and issuing the drawings

Application of the Unit

Application of the unit	The unit applies to the fields of mechanical, electrical/electronic, fabrication, and fluid power. Specifications may be obtained from design information, customer requirements, sketches and preliminary layouts. Manual drafting and drawing equipment is used, or where a Computer Aided Design (CAD) system is used other units should also be considered. This unit applies to any of the full range of engineering disciplines. Where a more extensive Computer Aided Drafting System is used for design, then Unit MEM09009C (Create 2D drawings using computer aided design system), should also be considered. **Band**: **A** **Unit Weight**: **8**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM09002B	Interpret technical drawing

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Identify drawing requirements	1.1. Requirements and purpose of drawing are determined from customer and/or work specification and associated documents. 1.2. All data necessary to produce the drawing is identified and collected. 1.3. Drawing requirements are confirmed with relevant personnel and timeframes for completion are established.
2. Prepare or make changes to engineering drawing	2.1. Drafting equipment is selected appropriate to the drawing method chosen. 2.2. Drafting principles are applied to produce a drawing that is consistent with standard operating procedures

ELEMENT	PERFORMANCE CRITERIA
	within the enterprise. 2.3. All work is undertaken safely and to prescribed procedure. 2.4. Completed drawing is approved in accordance with standard operating procedures.
3. Prepare engineering parts list	3.1. Components parts are identified and organised by component type and/or in accordance with organisation/customer requirements.
4. Issue drawing	4.1. Drawings and or parts lists records are completed in accordance with standard operating procedures. 4.2. Approved drawings and or parts lists are copied and issued to relevant personnel in accordance with standard operating procedures. 4.3. Approved drawings and or parts lists are stored and catalogued in accordance with standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- obtaining all relevant job requirements, data/information and specifications necessary to produce the drawing in accordance with workplace procedures
- using drafting equipment appropriate to the drawing method chosen
- producing/changing the drawing to conform with the relevant standard
- undertaking all work safely and in accordance with workplace procedures
- checking the completed drawing in accordance with standard operating procedures
- producing the component parts list with part name, description of part, material specification or part number, quantities and all other details specified by the customer and/or organisational procedures
- recording completed drawings and or parts lists in accordance with standard operating procedures
- where appropriate, copying and issuing approved drawings and or parts lists in accordance with standard operating procedures

REQUIRED SKILLS AND KNOWLEDGE

- handling and storing the approved drawings and or parts lists in accordance with standard operating procedures
- reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents
- planning and sequencing operations
- checking and clarifying task related information
- undertaking numerical operations, geometry and calculations/formulae within the scope of this unit

Required knowledge

Look for evidence that confirms knowledge of:

- requirements and purpose of the drawing to be produced
- requirements and purpose of the engineering parts list
- sources of relevant data/ information
- timeframe for completion of the drawing(s)
- person(s) who can confirm drawing requirements
- method of drawing preparation
- the reasons for selecting the chosen drawing method
- procedures for producing an initial drawing
- procedures for changing an existing drawing
- drafting principles to be applied to the production/changing of a drawing
- standards to which the drawing is to be produced
- procedures for checking drawings
- the persons responsible for checking and approving drawings
- consequences of inappropriate/incomplete components parts lists
- procedures and reasons for recording completed drawings and or parts lists
- procedures for copying approved drawings and or parts lists
- procedures for issuing approved drawings and or parts lists
- the personnel to whom copies of approved drawings and or parts lists can be issued
- procedures for filing approved drawings and or parts lists
- procedures for safe handling and storage of drawings and or parts lists
- consequences of inappropriate handling and storage of approved drawings and or parts lists
- safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to prepare basic engineering drawings. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with preparing basic engineering drawing or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

EVIDENCE GUIDE	
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Relevant personnel	Technical personnel, supervisors, manufacturers, suppliers, contractors, customers
Drafting equipment	Drafting and drawing equipment includes the use of Computer Aided Drafting systems
Drafting principles	Drawings are prepared in accordance with Australian Standard 1100.101, or equivalent, as required Interpretation of AS1100.101 or other problems are resolved in consultation with a supervisor
Records	Drawing records may include cataloguing, issuing security classifications, filing, preparing distribution lists
Issued	In hard copy, photographic, slide or transparency form including presentation as a single drawing and/or with other drawings, support documentation as a package

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Drawing, drafting and design

MEM09009C Create 2D drawings using computer aided design system

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers preparing the CAD environment, creating 2D drawings, and producing output including linked bills of materials.

Application of the Unit

Application of the unit	This unit applies to the production of 2D drawings using a CAD system, linked bills of material, file management and associated customisation of installed software including the use of macros, menus and default settings; file formats may include IGES, DXF, HPGL. The unit applies to the fields of mechanical, electrical/electronic, fabrication, and fluid power. 2D drawings may be produced from 3D models created using computer aided design system. This unit covers CAD skills only. Where detail drafting skills are required, the following units should be considered: Unit MEM09004B (Perform electrical/electronic detail drafting), Unit MEM09005B (Perform basic engineering detail drafting), Unit MEM09006B (Perform advanced engineering detail drafting). **Band**: **B** **Unit Weight**: **8**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM09002B	Interpret technical drawing
	MEM16008A	Interact with computing technology

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Prepare CAD environment	1.1. System variables are customised to suit standard operating procedures. 1.2. Menus are customised to suit standard operating procedures. 1.3. Drawing defaults are customised to standard operating procedures. 1.4. Macros are developed to standard operating procedures.

ELEMENT	PERFORMANCE CRITERIA
2. Create 2D drawings	2.1. Drawings are created using the full capability of the available software system. 2.2. Drawing entities are linked to database attributes to suit job requirements. 2.3. Detailed views are created using various scales to meet job requirements.
3. Produce output	3.1. Files are saved in various formats to standard operating procedures. 3.2. Linked entities are listed in a bill of materials format to meet job requirements. 3.3. Supplementary data is extracted from drawing to meet job requirements and may include area, lengths, angles and perimeters.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- obtaining all relevant manuals, instructions and operation procedures for the CAD software and hardware being used
- where appropriate, customising the relevant system variables to suit the applicable drafting standards/procedures
- where appropriate, customising menus to suit the applicable drafting standards/procedures
- where appropriate, customising the system defaults to suit the applicable drafting standards/procedures
- where appropriate, developing macros
- creating drawings using the appropriate drawing features of the software system
- where appropriate, linking drawing entities to database attributes
- producing detailed views of the object being drawn
- printing drawing files at the appropriate scale
- saving drawing files in the appropriate format
- producing bills of material from the drawing files/database
- extracting supplementary data from the drawing file to meet job requirements

REQUIRED SKILLS AND KNOWLEDGE

- reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents
- planning and sequencing operations
- checking and clarifying task related information
- checking for conformance to specifications
- undertaking numerical operations, geometry and calculations/formulae within the scope of this unit

Required knowledge

Look for evidence that confirms knowledge of:

- CAD software system
- system variables that can be customised
- procedures for customising identified system variables
- reasons for customising the system variables
- applicable drafting standards/procedures
- procedures for customising menus
- reasons for customising menus
- procedures for customising system defaults
- reasons for customising system defaults
- procedures for developing macros
- reasons for developing macros
- drawing features of the CAD software system
- reasons for using specialised software features
- procedures for linking drawing entities to database attributes
- appropriate drawing scales
- procedures for printing drawing files
- procedures for creating additional views of the object being drawn
- procedures for saving drawing files
- various formats in which drawing files can be saved
- reasons for using different formats when saving drawing files
- procedures to produce bills of material
- procedures to extract data with respect to drawn shapes/features
- properties of shapes/sections/ features that can be extracted from the drawing file
- hazards and control measures associated with using computer aided design system, including housekeeping
- safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to create 2D drawings using computer aided design system. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with creating 2D drawings using computer aided design system or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

EVIDENCE GUIDE	
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Drawing	Include plans, diagrams, charts, electrical/electronic circuits
Entities	Mean any single item created on the screen and includes for example lines, arcs, circles, text, hatch and dimensions
Attributes	Mean properties associated with an entity and includes for example layer or level, line type, line width, colour and text

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Co-requisite units		

Competency field

Competency field	Drawing, drafting and design

MEM11011B Undertake manual handling

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers lifting and moving materials manually.

Application of the Unit

Application of the unit	This unit applies to lifting and moving materials manually and/or using basic manual handling equipment in a wide range of environments. Maximum manual lifting weight is limited to National Occupational Health and Safety Commission (NOHSC) recommendations. **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Lift materials manually	1.1. Material weight is determined correctly utilising most appropriate technique, and risks associated with lifting are assessed. 1.2. Lifting techniques are undertaken to National Occupational Health and Safety Commission (NOHSC) and standard operating procedures. Types of movement, methods, storage, height and position are considered.
2. Move/shift materials manually	2.1. Appropriate equipment is selected where required. 2.2. Material is placed safely and securely on moving equipment. 2.3. Material is relocated ensuring safety of personnel and security of material. 2.4. Material is unloaded from moving equipment and placed in a safe and secure manner.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • identifying relevant standards and lifting techniques • assessing weight of material • selecting lifting equipment • working and communicating in teams • assessing risks • planning • reading and interpreting routine information on written job instructions, specifications and standard operating procedures. May include drawings • following oral instructions
Required knowledge
Look for evidence that confirms knowledge of: • manual handling techniques • hazards of incorrect procedures • NOHSC standards for manual handling • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to move loads manually using appropriate aids.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.

EVIDENCE GUIDE	
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with moving loads manually or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

RANGE STATEMENT	
Material weight	Material weight is determined using scales or interpreting signage
Lifting techniques	Individual or team lifting, use of appropriate lifting equipment
Appropriate equipment	Hand trolleys, wheelbarrows, motorised/hand pallet trucks (not sit on), scissor lifts, boom lifts, hand carts, dedicated production or process lifting equipment such as baskets, spreader bars, cradles or the like attached to lifting equipment

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Materials handling

MEM12001B Use comparison and basic measuring devices

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers sorting items using basic comparison measuring equipment, and maintaining the equipment.

Application of the Unit

Application of the unit	Measurements are conducted in a production environment or at a work station. Work is undertaken autonomously or as part of teamwork. All comparative measurements are undertaken to standard operating procedures and to regulatory and legislative requirements. **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Use comparison and/or basic measuring devices	1.1. Measuring devices are identified and used to undertake required comparisons or measurements using standard operating procedures. 1.2. Checking or sorting of items is undertaken using comparison and/or basic measuring device according to standard operating procedures.
2. Maintain comparison and/or basic measuring devices	2.1. Basic care and storage is maintained to manufacturers' standards or standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills

REQUIRED SKILLS AND KNOWLEDGE
Look for evidence that confirms skills in: • using device in accordance with standard operating procedures • storing and maintaining devices • using basic numeracy skills for undertaking comparison measurements • following oral instructions and written standard operating procedures
Required knowledge
Look for evidence that confirms knowledge of: • use and application of various comparison or measurement devices • procedures for the correct use of devices • procedures for maintaining and storing devices • hazards and control measures associated with conducting measurements, including housekeeping • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to use comparison and basic measuring devices.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment

EVIDENCE GUIDE	
	should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with using comparison and basic measuring devices or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Basic measuring devices	Linear measuring devices measuring to within 1mm graduation - may include rules, tapes and retractable tapes
Comparisons	Comparison of length, angle, size, temperature, pressure, weight, voltage, resistance and amperage

RANGE STATEMENT	
Comparison measuring devices	Go/no-go devices, thread angle and taper gauges, temperature gauges, pressure gauges, measuring gauges and overlay indicators, templates, digital devices and pre-set verniers and micrometers

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Measurement

MEM12003B Perform precision mechanical measurement

Modification History

Unit application corrected to include missing notes relating to dual band status.

Unit Descriptor

Unit descriptor	This unit covers performing precision mechanical measurement by using precision measuring equipment, setting comparison measuring devices and maintaining precision equipment.

Application of the Unit

Application of the unit	The unit applies to precision and/or complex use of strip gauges, engineering squares, lasers, angle dekkors, sine bars, angle gauges, polygons, dividing heads, rotary tables, precision levels, micrometers, height gauges, hardness testers, and texture measuring equipment etc. Work is undertaken autonomously or as part of team environment. Work is undertaken in the field (in situ) or in a workshop/laboratory environment. This unit covers comprehensive measuring skills where judgement is required in the selection of the most appropriate techniques/devices and where results are interpreted/analysed. All specifications are obtained from engineering drawings and data sheets and/or manufacturers' instructions/data. All measurement/test procedures are undertaken to standard operating procedures or manufacturers' recommended procedures. **Band**: **A** This unit has dual status and is to be regarded as both a Specialisation Band A unit and Specialisation Band B unit for progression to C7 (AQF level IV) **Unit Weight**: **2**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM12023A	Perform engineering measurements

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Use precision measurement equipment	1.1. Appropriate precision equipment is selected to achieve specified outcome. 1.2. Correct and appropriate measuring techniques are used for the measurement task. 1.3. Measurements are taken accurately to the finest

ELEMENT	PERFORMANCE CRITERIA
	graduation of instrument. 1.4. Readings and measurements are interpreted correctly and accurately.
2. Set comparative measuring devices	2.1. Measuring equipment is set to specifications using manufacturer guidelines or standard operating procedures and techniques.
3. Maintain precision equipment	3.1. Measuring equipment is adjusted and maintained to required accuracy, using manufacturer or standard operating procedures and techniques. 3.2. Equipment is stored to manufacturer specifications or standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- reading and interpreting text and numerical information on manufacturer specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents
- selecting/using precision mechanical measuring devices
- setting measuring devices to specification
- obtaining specified mechanical measurements to the finest graduation of the device
- measuring components to specified tolerances
- reading and interpreting measurements
- maintaining and adjusting precision mechanical measuring devices
- storing precision mechanical measuring devices
- undertaking calculations and numerical operations for measurement using precision mechanical measuring equipment

Required knowledge

Look for evidence that confirms knowledge of:

- the appropriate precision mechanical measuring device for given measurement requirements
- procedures to verify equipment being used has been recently calibrated

REQUIRED SKILLS AND KNOWLEDGE
• suitability of environmental conditions for the measurements being carried out • procedures/techniques for obtaining a range of mechanical measurements • the accuracy to which a range of precision mechanical measuring devices can be read • procedures for reading graduated mechanical measuring devices • units of measurement and numerical operations within the scope of this unit • procedures for setting precision mechanical measuring devices • specifications of the equipment to be set • tools and equipment for setting mechanical measuring devices • the adjustments that can be made to a range of precision mechanical measuring devices • procedures for adjusting and maintaining precision mechanical measuring devices • procedures for storing precision mechanical measuring devices • hazards and control measures associated with precision mechanical measurement, including housekeeping • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform precision mechanical measurement. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic

EVIDENCE GUIDE	
	workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with other units addressing the safety, quality, communication, materials handling, recording and reporting associated with precision mechanical measurement or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning should not require language, literacy and numeracy skills beyond those required in this unit. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Equipment	Strip gauges, engineering squares, angle dekkors, sine bars, angle gauges, polygons, dividing heads, rotary tables, precision levels, micrometers, height gauges, hardness testers, and texture measuring

RANGE STATEMENT	
	equipment
Appropriate measuring techniques	Includes considerations of the suitability of the environmental conditions for measurements being taken
Measurements	Length, circular, straightness, flatness, hardness, angles, finishes, textures, roundness, squareness, alignment and coordinate measurement etc. on components or equipment

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Measurement

MEM12005B Calibrate measuring equipment

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers checking measuring equipment for correct operation, and validating/calibrating precision measuring equipment in accordance with predetermined procedures.

Application of the Unit

Application of the unit	This unit applies to the calibration skills used in the setting, adjustment, validation or verification of precision mechanical and/or electrical/electronic measuring instruments using reference standards in accordance with predetermined standard procedures. This may involve the use of electronic setting equipment and the selection or determination of an appropriate external standard in accordance with standard operating procedures. This unit is not meant to apply to simple zeroing, external adjustment or manual adjustment for size range e.g. micrometers etc; these skills are covered by Unit MEM12023A (Perform engineering measurements), Unit MEM12003B (Perform precision mechanical measurement) or Unit MEM12004B (Perform precision electrical/electronic measurement) as appropriate. There may be occasions when both pathways MEM12003B and MEM12002B will be required. Where additional electrical/electronic measurement skills are required, then Unit MEM12004B (Perform precision electrical/electronic measurement) should be considered. Competence in this unit does not require the level of skill that applies to calibration as defined in ISO 9000 and/or carried out by personnel accredited under ISO/IEC 17025/NATA certification or similar. Unit MEM15010B (Perform laboratory procedures) should be considered for this level of calibration.

	Where reference standards only are to be verified under laboratory conditions, then MEM15022B (Verify reference standards) should be considered. **Band**: **B** **Unit Weight**: **6**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM12003B	Perform precision mechanical measurement
	MEM12023A	Perform engineering measurements
Path 2	MEM12002B	Perform electrical/electronic measurement
	MEM12023A	Perform engineering measurements

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range

	statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Check equipment for correct operation	1.1. Appropriate checks are made of components, leads, fasteners, etc. for wear, loose connections or other faults.
2. Validate/calibrate precision measuring equipment	2.1. Calibration of precision measuring equipment is assessed to manufacturers' specifications and/or standard operating procedures. 2.2. Equipment is calibrated against appropriate physical standards using correct calibration devices, equipment, techniques using predetermined procedures. 2.3. Equipment is recommissioned in accordance with standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- interpreting work requirements
- using appropriate tools and equipment to check measuring equipment for faults
- using appropriate techniques to check the calibration of the measuring equipment for conformance to specifications
- calibrating the measuring equipment against the appropriate physical standard
- recommissioning the measuring equipment
- using literacy and numeracy skills to enable correct completion of calibration records

Required knowledge

REQUIRED SKILLS AND KNOWLEDGE
Look for evidence that confirms knowledge of: • measuring equipment specifications, operation, wearing parts, connections and components • checks that are to be made of the measuring equipment and the tools and equipment to be used when checking the measuring equipment • common fault(s) that may be found in the measuring equipment • effects of faults on the performance/accuracy of the measuring equipment • general knowledge of standards, legislative or regulatory requirements applicable to the measuring equipment and/or its calibration • standard operating procedures for calibrating the measuring equipment and the tools and equipment required to do so • standard operating procedures for commissioning the measuring equipment • calibration records to be kept/maintained in accordance with standard operating procedures • hazards and controls associated with calibrating measuring equipment

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to check equipment for correct operation and validate/calibrate precision measuring equipment. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must

EVIDENCE GUIDE	
	be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with calibrating measuring equipment or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Calibration	To standardise the quantities of a measuring instrument

RANGE STATEMENT	
Physical standards	Reference standards of mass length, time, temperature, pressure, volume, process characteristics etc.
Calibration devices, **equipment**	Micrometer, vernier caliper, voltmeter, oscilloscope, all types of comparators, jigs and fixtures, templates and patterns etc.
Techniques	In standard operating procedures, manufacturers' manuals
Recommissioned	Sealing, tagging, identification or storage in accordance with standard operating procedures

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Measurement

MEM12023A Perform engineering measurements

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing measurement skills requiring straightforward use of mechanical measuring devices and associated calculations.

Application of the Unit

Application of the unit	This unit covers straightforward measurement using devices which incorporate visual indications representing units of measurement. It applies to the use of measuring devices in a range of manufacturing, engineering and related environments. It includes, where required, adjustment of measuring devices through simple means and typically includes zeroing or scale adjustment. Measurements may be expressed in metric or imperial units. All measurements are undertaken to standard operating procedures. Electrical/electronic devices used are those not requiring the connection or disconnection of circuitry. Work is undertaken autonomously or part of team environment, in the field, work station or workshops. For straightforward use of comparison or pre-set measuring devices, Unit MEM12001B (Use comparison and basic measuring devices) should be accessed. **Band**: **A** **Unit Weight**: **5**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Select appropriate device or equipment	1.1. Measurement requirements are determined from specifications. 1.2. Appropriate device or equipment is selected according to standard operating procedures, to achieve required outcome.
2. Obtain measurements using a range of measuring devices	2.1. Correct and appropriate measuring technique is used. 2.2. Measurements are accurately obtained .

ELEMENT	PERFORMANCE CRITERIA
	2.3. Dimensions are determined or verified using basic calculations, where required.
3. Maintain measuring devices	3.1. Routine care and storage of devices is undertaken to manufacturers' specifications or standard operating procedures. 3.2. Routine adjustments to devices are made and checked.
4. Communicate measurements as required	4.1. Measurements are accurately recorded, where required. 4.2. Freehand sketch which depicts required information is prepared, as required.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- selecting the appropriate measuring device for given measuring tasks
- using appropriate measuring technique
- reading all measurements taken accurately to the finest graduation of the selected measuring device
- handling and storing measuring devices in accordance with manufacturers' specifications or standard operating procedures
- verifying all measuring devices before use
- making, where appropriate, routine adjustments to measuring devices
- reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents
- planning and sequencing operations
- checking and clarifying task related information
- checking for conformance to specifications
- undertaking numerical operations involving addition, subtraction, multiplication, division, fractions and decimals within the scope of this unit
- preparing drawings as required

REQUIRED SKILLS AND KNOWLEDGE
Required knowledge
Look for evidence that confirms knowledge of: • correct application of a range of measuring devices • correct and appropriate measuring technique for a range of measuring devices • addition, subtraction, multiplication, division, fractions, decimals to the scope required by this unit • procedures for handling and storing a range of measuring devices • procedures for adjusting and zeroing a range of measuring devices • methods of communicating measurements by drawings, as required • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform engineering measurements.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication,

EVIDENCE GUIDE	
	materials handling, recording and reporting associated with performing engineering measurements or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Specifications	Drawings, sketches, job instructions, schematics, diagrams, technical manuals
Range of measuring devices	Protractors, combination squares, set squares, dial indicators, thermometers, tapes, rules, micrometers, vernier-scaled measuring equipment
Basic calculations	Calculations needed to assist in determining measurements where a reading of the graduated device is not sufficient, for example subtracting one measurement from another to give a third

RANGE STATEMENT	
	measurement. Examples of calculations needed are addition, subtraction, multiplication, division, fractions and decimals. Calculations may be made using a calculator
Routine adjustments	Validating the device using simple zeroing or scale adjustment
Measurements	Measuring length, squareness, flatness, angle, roundness, clearances or any other measurements that can be read off analog, digital or other measuring device
Information	Dimensions, instructions, base line or datum points

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Measurement

MEM12024A Perform computations

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers estimating approximate answers to arithmetical problems, carrying out basic calculations involving percentages and proportions, and determining simple ratios and averages. The unit includes producing and interpreting simple charts and graphs.

Application of the Unit

Application of the unit	This unit applies in manufacturing, engineering or related environments. It includes the application of the four rules of algebraic expressions, extracting information from drawings, diagrams, graphs and charts and producing simple charts and graphs. Data may be derived from readings taken or may be computer generated. Applications can include computations associated with pressure, volume, temperature, heat, speed, power, elasticity, density, mass, force etc. Calculations may be performed using pen and paper or on a calculator. **Band**: **A** **Unit Weight**: **3**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Determine work requirement	1.1. Required outcomes are established from job instructions. 1.2. Data is obtained from relevant sources and interpreted correctly. 1.3. Required calculation method is determined to suit the application, including selection of relevant arithmetic operations and/or formulae. 1.4. Expected results are estimated, including rounding off, as appropriate.
2. Perform calculations	2.1. Calculation method is applied correctly. 2.2. Correct answer is obtained. 2.3. Answer is checked against estimation.

ELEMENT	PERFORMANCE CRITERIA
3. Produce charts and graphs from given information	3.1. Data is transposed accurately to produce charts or graphs. 3.2. Charts or graphs accurately reflect data on which they are based.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- performing calculations involving whole numbers using all four basic rules
- performing calculations involving length, perimeter, area and volume
- checking calculated answers for accuracy
- rounding off estimated answers
- expressing information presented in fractional or decimal format as a percentage
- selecting appropriate formulae for the given application
- substituting the correct values for each term in the relevant formulae
- using appropriate mathematical operations
- performing calculations involving ratios or proportions
- determining required information from appropriate charts or graphs
- producing simple charts or graphs from given information or observations made
- selecting appropriate scales and using them in the production of charts and graphs
- marking appropriate limits clearly on the graph or chart
- reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents
- planning and sequencing operations
- checking and clarifying task related information
- checking for conformance to specifications
- undertaking numerical operations, geometry and calculations/formulae within the scope of this unit

Required knowledge

Look for evidence that confirms knowledge of:

- formula applicable to the determination of perimeter, area and volume of simple

REQUIRED SKILLS AND KNOWLEDGE
geometric shapes • techniques for estimating approximate answers • reasons for using dimensions with the same units when calculating length, perimeter, area and volume • concepts of perimeter, area and volume • procedures for rounding off figures when estimating approximate answers • mixed numbers, decimals, fractions and whole numbers • concept of percentage • procedures to be followed in converting a decimal to a percentage • procedures for carrying out calculations involving fractions and using each of the four basic rules • procedures to be followed on converting a fraction to a percentage • sources of appropriate formulae • reasons for ensuring that the units of each term are consistent with the formulae selected • procedures for converting given units to those required for use in formulae • concepts of ratio and proportion • given ratios and proportions can be expressed in terms of whole numbers, fractions and decimal fractions • scales applicable to the axes of the graphs or charts • three types of charts and/or graphs used in the individual's field of work • where appropriate, upper and lower limits of acceptability applicable to data entered on a graph or chart • where appropriate, the trends indicated by the slope or gradient of a graph • where appropriate, the action to be taken when given trends occur or set limits are approached on graphs or charts • procedures for drawing 'lines of best fit' • the trends indicated by the graphs or charts drawn • hazards and control measures associated with performing computations, including housekeeping • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

EVIDENCE GUIDE	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform computations.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing computations or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Relevant sources	Charts, graphs, diagrams, measurement data, reference manuals and specifications
Application	Applications can include computations associated with pressure, volume, temperature, heat, speed, power, elasticity, density, mass, force etc.
Arithmetic operations	• Application of subtraction, addition, multiplication and division • Manipulation of decimals, fractions and mixed numbers and whole numbers • Determining of percentages • Performing of algebraic expressions • Calculation of proportions and ratios
Charts and graphs	Simple histograms, control charts, pie charts etc.

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Measurement

MEM13003B Work safely with industrial chemicals and materials

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers using personal protective equipment (PPEs), identifying the particular hazards and emergency procedures, and observing safe working practices in that environment.

Application of the Unit

Application of the unit	This unit may be applied in a workplace in which materials and chemicals which are subject to codes and regulations are stored and used, for example, chemicals, solvents, dangerous materials, acids, noxious waste products etc. Evidence of competency is to encompass the satisfactory application of current State/Territory OHS legislation, standards and codes of practice, and the hierarchy of hazard control measures with elimination, substitution, isolation and engineering control measures being selected before safe work practices and PPEs. This unit describes the competencies which are beyond those safety requirements normally applied in the workplace as described in Unit MEM13014A (Apply principles of occupational health and safety in the work environment) or specifically described in individual units such as welding. **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Use personal protective equipment	1.1. Correct and appropriate safety clothing including personal protective equipment is selected and used correctly based on information in relevant material safety data sheet (MSDS).
2. Identify emergency procedures	2.1. Emergency procedures and plan relevant to the particular work environment are documented, understood and demonstrated as laid down in approved safety instructions.

ELEMENT	PERFORMANCE CRITERIA
3. Observe safe working practices	3.1. Hazardous areas and materials are identified and special handling procedures are identified and understood. 3.2. Permits to work (if necessary) are obtained. 3.3. All equipment and hazardous materials are used in accordance with relevant OHS legislation, manufacturers' instructions and standard operating procedures. 3.4. All site-specific safety policies, safety signs, symbols and labels are correctly identified and understood. 3.5. Material safety data sheets are understood and applied. 3.6. Safe manual handling procedures (including equipment) are used. 3.7. Decanted chemicals and storage is to State/Territory dangerous goods and OHS legislation and requirements. 3.8. Housekeeping duties are performed according to standard operating procedures to maintain a safe working environment.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • undertaking risk assessment • communicating with others • performing proper manual handling techniques • interpreting safety signage, labelling and placarding
Required knowledge
Look for evidence that confirms knowledge of: • dangerous goods classification and labelling/placarding • testing, use and maintenance of PPE

REQUIRED SKILLS AND KNOWLEDGE
• inherent hazardous properties of the chemicals to be used • interpretation of the relevant MSDS • basic fire fighting procedures • site-specific emergency plan procedures • chemical spill confinement procedures • dangerous occurrence (near miss) reporting procedures • hierarchy of control

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to work safely and efficiently with various chemicals.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with working safely with industrial chemicals and materials or other units requiring the exercise of the skills and knowledge covered by this unit.

EVIDENCE GUIDE	
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Personal protective equipment	Personal protective may include appropriate: • goggles/face shields • respirators • air supplied or self-contained helmets • safety boots, gloves and appropriate clothes/garments
Safe working practices	• Environment is inspected • Hazards (and chemical reactive hazards) are assessed and controlled using hierarchy of hazard control • Properly maintained PPE is available • Emergency management plan is documented/understood

RANGE STATEMENT	
	• Work to be undertaken in safe 'thermal' environments and all possible ignition sources are to be identified and controlled
Storage	All storage containers (minor quantities and in consumer packages) are suitable for chemical exposure and are properly labelled and/or placarded. Chemical manifests are updated at completion of work activity
State or Territory legislative requirements	Appropriate OHS, dangerous goods acts and regulations, Australian standards, Australian Code for the Transport of Dangerous Goods by Road and Rail (ADGC), NOHSC codes of practice

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Occupational health and safety

MEM13013B Work safely with ionizing radiation

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers working safely with ionizing radiation when performing radiographic testing in a range of industrial applications.

Application of the Unit

Application of the unit	This unit applies to safely working with ionizing radiation in open or closed sites: on fabrications, structures and components across a wide range of industries. It is a prerequisite to undertaking any other radiographic competency standards unit. The work can relate to scheduled and unscheduled maintenance activities, using general tools, specific radiographic testing equipment as specified in maintenance documentation, testing procedures or operator instructions. All testing must be completed with particular attention to personal and OH&S regulations. Certification against Australian standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712. Materials and chemicals which are subject to codes and regulations - for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products - must be subject to safe work habits must be stored and used in accordance with safe work practices. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify the hazards and effects of ionizing radiation in the workplace	1.1. The source of ionizing radiation is identified in accordance with relevant organisational policy and procedures. 1.2. Production of X-rays and gamma rays is explained in relation to radiographic testing activities. 1.3. Attenuation factors of ionizing radiation and the biological effects on living tissue are outlined. 1.4. The biological effects of radiation are identified.
2. Apply radiation safety procedures/plans	2.1. Appropriate ionizing radiation protective measures are employed in accordance with relevant organisational policy and procedures.

ELEMENT	PERFORMANCE CRITERIA
	2.2. SI units of radiation are explained as per the National Health and Medical Research Council/ statutory requirements. 2.3. Exposure limits for personnel as laid down by the radiation authorities in Australia are stated and adhered to. 2.4. Minimum exposure rates/distances are determined from calculations and charts. 2.5. Ionizing radiation sources are operated in accordance with legislation, standards and/or organisational policy, procedures or guidelines.
3. Select and use radiation monitoring equipment	3.1. The tools and equipment necessary to monitor radiation are selected and used as required. 3.2. Techniques and system verification checks necessary to monitor radiation are selected and applied. 3.3. Safety breaches are documented and/or reported in accordance with organisational policy and procedures.
4. Respond to emergency situations	4.1. Procedures for dealing with both X-ray and gamma ray emergency situations are demonstrated.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • calculating and numerical operations within the scope of this unit • reading and interpreting charts, written job instructions, specifications, standard operating procedures, lists, drawings and other applicable reference documents • planning and sequencing operations • checking and clarifying task-related operations • checking for conformance to specifications • using monitoring equipment • calculating and monitoring radiation

REQUIRED SKILLS AND KNOWLEDGE

- handling emergencies
- following safety requirements
- assessing risk

Required knowledge

Look for evidence that confirms knowledge of:

- properties of X-rays and gamma rays and principal radioactive sources used in industrial radiography
- attenuation factors
- known biological effects of radiation
- general principles of gas ionisation, photographic effect, luminescence
- use of film, film badges, ionisation chamber devices, quartz fibre, fluorescent, electronic devices accuracy limits (energy/range)
- different SI units of radiation including becquerel, sievert and gray
- exposure limits for personnel as laid down by the radiation authorities in Australia
- the three exposure reduction factors including: time, distance and shielding
- procedures for establishing safe working barriers
- relevant techniques and checks
- emergency procedures
- safety procedures including for:
  - types of X-ray equipment
  - types of isotope cameras
  - shielding materials
  - design and requirements for exposure areas
  - requirements for storage of radioisotopes
- emergency situations, causes and appropriate responses
- hazards and control measures associated with ionizing radiation, including housekeeping
- storage requirements of equipment and materials
- use and application of personal protective equipment
- safe workplace practices and procedures
- legal requirements including;
  - Australian/NSW regulations, code of practice (detail)
  - ICRP recommended limits for various persons and various parts of the body for short-term, long-term and accumulated exposure
  - background radiation
  - duties of RSO
  - requirements for transport
  - IATA regulations

REQUIRED SKILLS AND KNOWLEDGE
• obligations of the licensee

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to safely work with ionizing radiation when performing radiographic testing.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with radiographic testing or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate

EVIDENCE GUIDE	
	must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Relevant organisational policy and procedures	• Legislation • Standard operating procedures (SOPs) • Australian or international standards • Risk assessments • Previous testing reports • Manufacturer specifications
Production of X-rays and gamma rays	• Atomic structure, protons, neutrons, electrons, atomic number, mass number, isotopes • Electromagnetic radiation wavelength, frequency, energy relationships, intensity • Construction and operation of X-ray tube anode, cathode, target • Gas and coolidge tubes • Glass and ceramic tubes • X-ray spectrum • Characteristic and continuous spectra effect of voltage and current on continuous spectra • Efficiency • Natural and artificial radioisotopes • Production of radioisotopes

RANGE STATEMENT	
	• Decay mechanisms, alpha, beta-, beta+, and gamma • Concept of half life, decay constants • Selection of gamma ray sources • Units definition of curie, becquerel, conversion of units, multiple units (e.g. GBq), nuclide chart
Biological effects of radiation	• Ionisation, absorption, scatter (Compton, Rayleigh, photo-electric, pair production) • Attenuation coefficient, absorption edges • Units roentgen, rad, coulomb/kg, gray conversions • Effects of varying doses on living tissue • Somatic effects, genetic effects, cell biology nucleus, cytoplasm • DNA, chromosome, mitosis; symptoms, effect of time, ICRP recommendations • Dose, dose equivalent, RBE, rem, seivert, conversions • Occupancy factor
Protective measures	• Personal protective equipment (PPE) including for risks other than ionizing radiation • Safety protocols of workplace (e.g. flame limitations in refineries) • Signage, barriers/guards • Limitations on operation of specific equipment/machines
Minimum exposure	• Time, distance, shielding effect of distance, inverse square law • Half and tenth value layers • Emergency procedures, company procedure codes

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Occupational health and safety

MEM15004B Perform inspection

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers inspecting products, keeping records and providing feedback on the conformance of product to specifications.

Application of the Unit

Application of the unit	This unit applies to basic inspection of completed or partly completed products produced by others. Inspection is carried out according to a site quality plan or specifications; it applies to a range of manufacturing enterprises; and requires application of a range of measuring equipment/devices/tools. Location and frequency of checks/tests and measurements are undertaken to standard operating procedures. In general, verification should be made as close as possible to the point of production of the feature or characteristic. Inspection may involve 'first piece inspection', fixed interval, sample etc. Depending on the inspection process, other technical units may need to be accessed, for example, appropriate measurement units. This unit is not intended to be applied to maintenance personnel carrying out their day-to-day activities, for example, fault finding, remedial and checking activities. These skills are covered by other units such as Unit MEM18006C (Repair and fit engineering components). This unit should not be selected for the purposes of non destructive testing, where Unit MEM24002B (Perform penetrant testing), Unit MEM24004B (Perform magnetic particle testing), Unit MEM24006B (Perform eddy current testing), Unit MEM24008B (Perform ultrasonic testing) or Unit MEM24010B (Perform radiographic testing) have already been selected.

	Band: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**

ELEMENT	PERFORMANCE CRITERIA
1. Inspect products	1.1. Products are tested for conformance to specifications in accordance with standard operating procedures.
2. Keep records	2.1. Test status identification is made on conforming and non-conforming products and records are accurately kept using standard operating procedures.
3. Provide feedback	3.1. Products are tested/inspected/measured after rework or repair. 3.2. Deficiencies or deviations are reported according to standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- reading, interpreting and following information on written job instructions, standard operating procedures and other applicable reference documents
- testing products for conformance to specifications in accordance with job instructions
- testing reworked/repaired products for conformance to specification, in accordance with job instructions
- entering routine and familiar information onto proformas and standard workplace forms

Required knowledge

Look for evidence that confirms knowledge of:

- the procedures as defined by job instructions to be used to check conformance to specifications
- the data to be recorded and the frequency of recording required
- the consequences of not keeping accurate records
- non-conformances of given products that can be removed by rework/repair in accordance with job instructions
- hazards and control measures associated with performing basic inspection activities
- use and application of personal protective equipment
- safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform inspection (basic).
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing inspection (basic) or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes,

EVIDENCE GUIDE	
	standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Tested for conformance to specifications	Visual inspection, physical measurements, chemical tests, checks against patterns, templates and guides etc.

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Quality

MEM15010B Perform laboratory procedures

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers working under laboratory conditions, performing calibration of equipment and writing reports on the results.

Application of the Unit

Application of the unit	This unit applies to the use of a range of sophisticated equipment that provides independent feedback on quality processes and procedures. Individuals are likely to be working autonomously and following scientific procedures under controlled conditions. All work would be carried out to predetermined standard operating procedures. This unit would be taken in conjunction with appropriate technical units. **Band**: **B** **Unit Weight**: **8**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units	

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Work under laboratory conditions	1.1. Independent tests are conducted under controlled conditions.
2. Perform calibration	2.1. Equipment is verified and calibrated to agreed quality standards. 2.2. Calibration status is safeguarded against unauthorised adjustment. 2.3. Accurate records are kept for reference purposes. 2.4. Test equipment is periodically recalled for adjustment, repair and re-calibration. 2.5. Documentary evidence is maintained, covering identification of equipment; frequency of re-calibration; calibration status and procedures for recall, handling and storage, adjustment, repair,

ELEMENT	PERFORMANCE CRITERIA
	calibration, installation and use. 2.6. Calibration to reference standards of known accuracy such as national or international standards is traced, or where these do not exist, is set to specifically developed criteria.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • obtaining, reading and interpreting relevant drawings, circuits, specifications, instructions and data in accordance with standard operating procedures • planning and sequencing operations • checking and clarifying task-related operations • using calculations and numerical operations within the scope of this unit • conducting independent tests under controlled conditions • checking measuring equipment for correct calibration against the agreed quality standards • safeguarding the calibration status of the equipment against unauthorised adjustment • completing and maintaining records of measuring equipment calibrated • recalling test equipment for adjustment, repair and re-calibration • using reference standards or specific criteria as the basis for calibration. • documenting test results • preparing reports on the tests carried out • conducting inspections, tests and audits in accordance with standard • using results of inspections, tests and audits to inform the design and service
Required knowledge
Look for evidence that confirms knowledge of: • the tests to be undertaken • the conditions under which the tests are to be undertaken • the testing procedures to be followed • the reasons for conducting tests under controlled conditions

REQUIRED SKILLS AND KNOWLEDGE
• the need for tests to be conducted independently • the quality standards against which the measuring equipment is to be calibrated • the correct operation of the measuring equipment • the specifications of the measuring equipment • the tools and equipment required to check the calibration of the measuring equipment • the procedures for checking the calibration of the measuring equipment • any codes, standards, legislative or regulatory requirements applicable to the measuring equipment and/or calibration • the procedures for preventing unauthorised adjustment of equipment • the reasons for protecting equipment against unauthorised adjustment • the records to be kept with respect to the calibration of measuring equipment • the reasons for keeping accurate calibration records • the procedures for recalling test equipment for adjustment, repair and re-calibration • the frequency of test equipment recall • the reasons test equipment may be recalled • all relevant documentation relating to the calibration/re-calibration of test equipment • the procedures for completing the relevant documentation • sources of reference standards and procedures to be used in the absence of reference standards • the reports to be prepared/provided with respect to the test equipment being tested • the procedures for preparing/ providing reports on tests carried out on test equipment • the auditing processes to be applied to testing procedures • the use of information from the inspections, tests and audits conducted in the development of design and servicing of products/equipment • hazards and control measures associated with performing laboratory procedures, including housekeeping • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

EVIDENCE GUIDE	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform laboratory procedures.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing laboratory procedures or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Tests	Tests will be conducted to a standard method and may be: • mechanical tests such as for hardness, tensile and impact • electrical tests such as for resistance, capacitance and inductance • semiconductor or other electronic tests
Calibration	Calibration refers to those calibrations which are conducted to a specified standard using equipment available in the workplace/laboratory. It may include the testing of known standard samples
Test equipment	May be mechanical, electrical or electronic or some combination
Documentary evidence	Documentary evidence of calibration will be sufficient to satisfy the needs the certifying body (e.g. NATA) or as otherwise specified in the calibration standard or in accordance with manufacturers' recommendation
Documented	Documentation of test/calibration results will conform to good laboratory practice and will allow for the verification of results and for a historical record of results such as might be required for verification of results, quality audits and legal inquiries.

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Quality

MEM15017B Use and maintain reference standards

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	The unit covers caring for and maintaining reference standards and test equipment used to undertake trade measurement activities.

Application of the Unit

Application of the unit	This unit is designed for those performing trade measurement inspection/certification activities in public or private enterprises. This unit may be applied in relation to inspection of pre-packed articles, examining trading practices, auditing servicing licensees, investigating consumer complaints, performing verification/certification and in-service inspection. Reference material relevant to this competency includes Australian standards, handbook of verifying authority, manufacturers' operating manuals, organisational procedures and quality assured manual. Workplace and health and safety considerations include storage and transportation of test equipment, handling of test equipment, handling of hazardous materials, safety clothing, manual handling techniques and site/premises conditions. **Band**: **B** **Unit Weight**: **3**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM11011B	Undertake manual handling
	MEM12003B	Perform precision mechanical measurement
	MEM12004B	Perform precision electrical/electronic measurement
	MEM12005B	Calibrate measuring equipment
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify the appropriate class of reference standard suitable to verify a range of trade measuring instruments	1.1. Tolerances required for reference standards are researched in relation to testing a range of trade measuring instruments and legislation. 1.2. The correct classes of reference standards are selected to test a range of trade measuring instruments.
2. Use reference standards and test equipment in a safe and metrologically sound manner	2.1. Standards Laboratory purpose and function are explained. 2.2. An operational assessment on reference standards and test equipment is performed prior to use. 2.3. Documented operating policies and procedures for reference standards and test equipment are accessed and followed. 2.4. Safety requirements for the use of reference standards and test equipment within the work environment are demonstrated.
3. Store and transport reference standards and test equipment to maintain their integrity	3.1. Specialised equipment and reference standards are stored in accordance with organisational procedures. 3.2. Specialised equipment and reference standards are transported in accordance with organisational procedures.
4. Perform required maintenance of reference standards and test equipment	4.1. Maintenance requirements of reference standards and test equipment are identified. 4.2. Regular maintenance of reference standards and test equipment is undertaken in accordance with maintenance register. 4.3. Defective reference standards and test equipment are identified and reported for repair.
5. Interpret documentation relating to the use of maintenance of reference standards and test equipment	5.1. Information contained in the certificate of verification is checked and compared with reference standards and test equipment being used. 5.2. Reference standards are used in accordance with documented instructions and certificates.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- accessing correct reference manuals for appropriate information concerning tolerances for reference standards
- identifying correct class of reference standard and matching with the appropriate trade measuring instrument
- accessing documented operating procedures for reference standards and test equipment
- using reference standards and test equipment
- calibrating/maintaining reference standards and test equipment
- maintaining maintenance register
- identifying and recording/reporting malfunction of or damage to reference standards or test equipment
- interpreting certificates of verification in relation to the use of reference standards
- using graphs and tables within certificates

Required knowledge

Look for evidence that confirms knowledge of:

- definition of 'legal metrology'
- the hierarchy of reference standards in relation to legal metrology
- Australian legal units of measurement used for trade
- the organisations involved in legal metrology in Australia
- application of different classes of reference standards used to test measuring instruments
- maintenance requirements for reference standards and test equipment
- major function and purpose of the Standards Laboratory
- the actions to be taken if reference standards and test equipment are found to be defective
- test equipment and reference standards storage specifications and procedures
- personal responsibility for workplace, health and safety requirements
- specialised equipment, reference standards and transport specifications and procedures
- transport specifications and procedures
- variations from storage specifications and procedures requiring appropriate approval
- variations from transport specifications and procedures requiring appropriate approval

REQUIRED SKILLS AND KNOWLEDGE
• maintenance required for test equipment where manufacturers' requirements are unavailable • a range of maintenance and calibration procedures • procedure for reporting faults • action to be taken where legal traceability can not be confirmed • the purpose of certificates of verification issued under the national legislation • information in graphs and tables within certificates • workplace, health and safety requirements relating to reference standards and test equipment

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to use and maintain reference standards. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated

EVIDENCE GUIDE	
	with using and maintaining reference standards, or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Reference standards	Mass, volume, density, area, length, master meters, temperature
Legislation	Enabling legislation, workplace, health and safety, environmental legislation
Operating policies and procedures	Manufacturers' specifications, industry guidelines, Australian standards, legislation, organisational procedures and guidelines
Specialised equipment	Reference standards, measuring devices, safety equipment

RANGE STATEMENT	
Maintenance requirements of reference standards and test equipment	Cleaning and painting, electrical safety testing and tagging, continuity and pressure testing, manufacturers' service requirements

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Quality

MEM16002C Conduct formal interviews and negotiations

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers planning and conducting interviews, participating in interviews and taking part in negotiations.

Application of the Unit

Application of the unit	This unit applies to effective communication in more formal on-site or small group situations where ideas are defined and specific outcomes are sought. The topics covered are often formally identified and records may be kept. Interviews could include job recruitment and progression, performance reviews, grievance, etc. This unit does not cover the skills needed for participation in formal group processes such as meetings which are covered by Unit MEM16001B (Give formal presentations and take part in meetings). For interviews associated with training and assessment, refer to the appropriate units. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan and conduct interviews	1.1. Interview is planned and initiated to achieve a specified purpose. 1.2. Suitable questions appropriate to the purpose are used. 1.3. Discretion and confidentiality are exercised where appropriate.
2. Participate in interviews	2.1. Appropriate preparation is undertaken. 2.2. Active listening skills are employed. 2.3. Self-presentation is applied appropriate to the purpose. 2.4. Questions are asked where appropriate. 2.5. Follow-up activities are clarified and reported in accordance with standard operating procedure.
3. Take part in negotiations	3.1. Language appropriate to the other party is used.

ELEMENT	PERFORMANCE CRITERIA
	3.2. Own and others' needs/wants are stated and clarified. 3.3. The views of fellow employees, including own group or team, are represented to others. 3.4. The appropriate communication medium is selected. 3.5. Follow-up activities are clarified and reported in accordance with standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- planning and formatting interviews
- developing open and closed interview questions to gain required information
- building rapport
- maintaining discretion and confidentiality
- preparing for interviews
- using active listening skills
- identifying interview goals
- identifying selection/assessment criteria
- clarifying follow-up activities
- reporting follow-up activities
- using appropriate language to the other party(s)
- clarifying needs/wants of others
- representing the views of fellow team or group members during negotiations
- selecting appropriate communication media during the negotiations

Required knowledge

Look for evidence that confirms knowledge of:

- the purpose of the interview
- the assessment criteria for the interview
- the procedures to be followed in planning and conducting the interview
- the detail/information to be obtained from the interview
- questions appropriate to the detail/information to be obtained

REQUIRED SKILLS AND KNOWLEDGE
• active listening techniques that can be applied in interview situations • the effect(s) of the individual's presentation during the interview upon the interview • the effect(s) of the timing of questions on the interviewee • the need to follow-up issues raised during the interview and negotiations • the procedures for reporting the outcomes of follow-up activities • the parties to be involved in the negotiations • the reasons for using appropriate language • the reasons for maintaining confidentiality • the reasons for clarifying the needs/wants of others • the needs/wants of the individual • the views of fellow team or group members • a range of communication media • the appropriate communication medium • safe workplace practices

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to conduct formal interviews and negotiations.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment

EVIDENCE GUIDE	
	should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with conducting formal interviews and negotiations or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Preparation	• Identifying and inviting co-interviewers • Planning interview • Preparation of interview room • Accessing required documents and materials • Introductions and explanations
Active listening skills	• Appropriate body language

RANGE STATEMENT	
	• Acknowledgements • Clarification questions • Appropriate responses
Communication medium	• Face-to-face meeting • Telephone • Email • Written • Advocacy

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Communication

MEM16006A Organise and communicate information

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers accessing, organising and communicating information related to processes or tasks.

Application of the Unit

Application of the unit	This unit applies in manufacturing, engineering or related environments. It may include information related to production, maintenance or associated processes. Information may be drawn from a variety of sources. This unit includes the ability to communicate using common workplace terminology. For access and recording of data requiring system knowledge and judgement, see Unit MEM16008A (Interact with computing technology). **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units	

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Access information and/or records	1.1. Information requirements of tasks are determined and relevant information is accessed from a range of sources. 1.2. Workplace terminology is correctly recognised.
2. Organise and analyse information	2.1. Information is interpreted and organised in accordance with enterprise and work requirements. 2.2. Information is analysed according to enterprise and work requirements.
3. Communicate organised information using established workplace methods	3.1. Information is communicated using established workplace methods.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • accessing relevant information from a range of sources • recording, where appropriate, the accessed information • recognising and using workplace terms • reading, interpreting and following information in workplace documentation • checking and clarifying information • organising, categorising and sequencing information
Required knowledge
Look for evidence that confirms knowledge of: • types of information • available sources of information • information analysis techniques • methods of categorising and organising information • methods of recording and communicating information

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to organise, analyse and communicate information.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency

EVIDENCE GUIDE	
	in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with organising, analysing and communicating information or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work

RANGE STATEMENT	
situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Range of sources	Job instructions, specifications, standard operating procedures, charts, lists, documents, computer data, drawings, sketches, tables, technical manuals and/or charts and other applicable reference material
Workplace terminology	Terminology - referring to equipment, processes, workplace areas, staff and procedures - specific to the processes and equipment used in the workplace
Analyse	Analysis for this unit involves simple determinations of relevance and implication for the employee's immediate work requirements
Established workplace methods	• Proforma reports • Data entry e.g. bar coding and simple keyboard operations • Verbal • Drawings

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Communication

MEM16010A Write reports

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers writing technical or non-technical reports that include some level of analysis and/or research.

Application of the Unit

Application of the unit	The term report is used to denote any required written communication that goes beyond a simple recording of facts (such as completion of a pro forma shift production schedule) and which is based on a level of analysis and/or research. Where reports include technical information or details, then the writer would have the required technical knowledge/capability. Conclusions and/or recommendations where required are based on prior research or analysis of data. The analysis and conclusions should be consistent with the level of skill and knowledge of an employee working at that level. Simple analysis and research would be required. If data research and analysis is necessary to produce information for the report, Unit MEM16009A (Research and analyse engineering information should also be selected). For preparation of simple technical reports, see unit MEM16014A (Report technical information). **Band**: **B** **Unit Weight**: **2**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM14005A	Plan a complete activity

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Identify report requirements	1.1. Requirements for a written report are identified and confirmed with appropriate persons. 1.2. Information for the report is accessed according to workplace procedures. 1.3. Information is assessed for currency, accuracy and relevance for inclusion in the report.
2. Prepare and produce report	2.1. A structure and outline of the report are developed according to identified report requirements.

ELEMENT	PERFORMANCE CRITERIA
	2.2. The report is written using terminology appropriate to the reader and established principles of report writing. 2.3. Findings and conclusions are based on factual analysis. 2.4. Recommendations, alternatives/suggestions are given, and supporting evidence supplied, where required. 2.5. Protocols, conventions and legal requirements related to acknowledgements and intellectual property are applied where necessary.
3. Finalise and distribute report	3.1. The report is checked for accuracy and edited as required. 3.2. The completed report is consistent with objectives and requirements. 3.3. The report is copied, distributed and stored according to instructions and workplace procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents • following instructions • checking and clarifying information • sorting information/data • assessing information/data for relevance • using terminology and language appropriate to the target audience • structuring and writing reports • applying principles of report writing • presenting findings and conclusions based on factual analysis • making recommendations

REQUIRED SKILLS AND KNOWLEDGE
• managing own time • planning and sequencing information • reviewing and editing
Required knowledge
Look for evidence that confirms knowledge of: • principles of report writing • report types and purposes • structure, style and parts of a report • use of language and expression in reports • common pitfalls, such as ambiguity, truisms, tautology, verbosity, circumlocution etc. • report numbering systems • techniques for reviewing and editing • importance and benefits of preparing reports appropriate for the intended audience • referencing and the importance of acknowledging sources • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to write reports. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must

EVIDENCE GUIDE	
	be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with writing reports or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Requirements	Purpose, expected outcomes, scope and nature, timeframe, required resources
Report	• Reports types:

RANGE STATEMENT	
	• accident/injury • equipment report • memo and letter reports • information report • analytical report • Report structure: • title page • table of contents • summary • introduction • body (findings and conclusions) • recommendations • references • appendices • glossary • Report content: • text • graphs • charts • tables • diagrams
Principles of report writing	• Use of headings, subheadings, sectioning and numbering • Objectivity • Expression • Language and grammar • Sentence and paragraph structure • Logical ordering and sequencing • Summarising and editing • Layout and spacing • Content relevancy • Use of graphics, charts, tables, illustrations etc.

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Communication

MEM17002B Conduct workplace assessment

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers identifying, planning and carrying out assessment; recording the results; and reviewing the procedure. Methods of assessment may include observation, documentation, demonstration, projects, oral tests, computer based assessment, written tests, etc.

Application of the Unit

Application of the unit	Appropriate assessment techniques will be selected based on assessor knowledge of the competency to be assessed or in conjunction with someone who is competent (technical expert). Assessment may be undertaken on an individual basis or in groups. This unit is intended to equate to national competency standards Assessment Standard Unit: Conduct assessment to an established procedure, and the Extension Unit: Plan and review assessment. This competency also meets the assessment skills required to be recognised by Manufacturing Skills Australia as a workplace assessor. This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V). **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Identify and plan assessment requirements	1.1. Area and purpose of assessment are identified in consultation with appropriate personnel and person/s being assessed. 1.2. Appropriate competency standard/s and assessment guides are identified and selected as required. 1.3. Evidence required to establish competency is determined according to industry and enterprise assessment procedure.

ELEMENT	PERFORMANCE CRITERIA
	1.4. Evidence required and assessment arrangements are discussed and confirmed in an appropriate way with person being assessed.
2. Carry out assessment	2.1. Agreed assessment procedure is implemented in a manner, time and location to maximise active participation from assessment candidate/s. 2.2. Evidence consistent with the agreed assessment procedure is gathered using appropriate and specified methods and tools, and is documented according to agreed industry or site procedures. 2.3. Evaluation and assessment decisions are made according to agreed assessment procedures. 2.4. Clear and appropriate feedback is provided to person/s assessed. 2.5. Advice is provided to assessment candidate/s on training needs, appeal mechanisms, as appropriate.
3. Record results and review the procedure	3.1. Assessment results are recorded according to industry or site procedures. 3.2. Records are kept/stored in a manner appropriate to maintenance of confidentiality and safety. 3.3. Assessment procedure are reviewed in cooperation with person being assessed and revised, if appropriate.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • obtaining and interpreting relevant competency standards and assessment guides • discussing and confirming evidence required and the assessment arrangements • performing assessments • gathering and documenting evidence • evaluating evidence and making assessment decisions • providing clear and appropriate feedback

REQUIRED SKILLS AND KNOWLEDGE
• advising on training needs and/or the appeals procedures • recording assessment results • storing records • reviewing and revising the assessment procedure
Required knowledge
Look for evidence that confirms knowledge of: • area and purpose of the assessment • persons to be consulted when determining the assessments to be carried out • relevant competencies • evidence required to establish competency • reasons for identifying the evidence to be obtained • industry assessment procedure • reasons for discussing and confirming the assessment arrangements with the assessment candidate • time and location of the assessment • reasons for selecting the time/location for the assessment • methods of gathering the evidence • reasons for using the selected methods of obtaining evidence • procedures for documenting the assessment • procedures for evaluating the gathered evidence • need to provide clear and positive feedback to the assessment candidate • appeals procedure • any further training required by the assessment candidate • procedures for recording assessment results • need to keep records securely stored • procedures for storing assessment records • procedures for reviewing assessments undertaken • reasons for evaluating assessment methods/procedures • procedures for revising assessment procedures

Evidence Guide

EVIDENCE GUIDE
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment

EVIDENCE GUIDE	
Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to conduct workplace assessment.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with conducting workplace assessment or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Purpose of assessment	Recognition of prior learning, determination of award classification level or identification of training needed
Evidence required	Should address task skills, task management, contingency management application
Assessment procedure	Observation, documentation, demonstration, projects, oral tests, computer based assessment, written tests
Appropriate and specified methods and tools	Should address issues such as clarity, reliability, validity of results, fairness in assessment application, and cost effectiveness of process

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Training

MEM18001C Use hand tools

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers using a range of hand tools for a variety of general engineering applications.

Application of the Unit

Application of the unit	Applications may include hand tools used for adjusting, dismantling, assembling and finishing of items or components, and the finishing, cutting, scraping of metallic and non-metallic material to size and shape. This includes simple tapping and threading and routine maintenance of hand tools. This unit should not be selected if the hand tool is dedicated to a single operation or machine and if only a machine specific/customised tool is used. When using hand held power tools or power tools used for hand held operations, refer to Unit MEM18002B (Use power tools/hand held operations). **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Use hand tools	1.1. Hand tools are selected appropriate to the task requirements. 1.2. Hand tools are used to produce desired outcomes to job specifications which may include finish, tension, size or shape. 1.3. All safety requirements are adhered to before, during and after use. 1.4. Unsafe or faulty tools are identified and marked for repair according to designated procedures before, during and after use. 1.5. Routine maintenance of tools, including hand sharpening is undertaken according to standard

ELEMENT	PERFORMANCE CRITERIA
	operational procedures, principles and techniques. 1.6. Hand tools are stored safely in appropriate location according to standard operational procedures and manufacturers' recommendations.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • reading and following information on standard operating procedures • following verbal instructions • selecting hand tools appropriate to the task • using hand tools safely • identifying hand tool defects and marking for repair • maintaining/sharpening hand tools using appropriate techniques • storing hand tools in accordance with manufacturers'/standard operating procedures
Required knowledge
Look for evidence that confirms knowledge of: • applications of different hand tools in a general engineering context • common faults and/or defects in hand tools • procedures for marking unsafe or faulty tools for repair • routine maintenance requirements for a range of hand tools • storage location and procedures for a range of hand tools • hazards and control measures associated with using hand tools • use and application of personal protective equipment • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to use hand tools for a range of general engineering applications.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with using hand tools or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Hand tools	Hacksaws, hammers, punches, screwdrivers, sockets, wrenches, scrapers, chisels, gouges, wood planes and files of all cross-sectional shapes and types
Job specifications	Finish, tension, size or shape etc.
Routine maintenance	Cleaning, lubricating, tightening, simple tool repairs, hand sharpening and adjustments using engineering principles, tools, equipment and procedures

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Maintenance and diagnostics

MEM18002B Use power tools/hand held operations

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers using a range of hand held power tools and fixed power tools for hand held operations for a variety of general engineering applications.

Application of the Unit

Application of the unit	This unit applies to loosening and fastening items or components and shaping, finishing, cutting, grinding metallic and non-metallic materials and/or tool bits to size and shape. This unit should not be selected if the power tools used are dedicated to an operation or machine, e.g. nut-runner, air drill, power driver, etc. For using hand tools, see Unit MEM18001C (Use hand tools). **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units	

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Use power tools	1.1. Power tools are selected appropriate to the task requirements. 1.2. Power tools are used for a determined sequence of operations - which may include clamping, alignment and adjustment to produce desired outcomes - to job specifications which may include finish, size or shape. 1.3. All safety requirements are adhered to before, during and after use. 1.4. Unsafe or faulty tools are identified and marked for repair before, during and after use according to designated procedures. 1.5. Operational maintenance of tools, including hand sharpening, is undertaken according to standard

ELEMENT	PERFORMANCE CRITERIA
	workplace procedures, principles and techniques. 1.6. Power tools are stored safely in appropriate location according to standard workshop procedures and manufacturers' recommendations.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • reading and following information on standard operating procedures • following verbal instructions • selecting power tools appropriate to the task • using power tools safely • using clamping/securing devices • identifying power tool defects • maintaining power tools using appropriate techniques • sharpening tools/tool bits within the scope of this unit • storing power tools according to manufacturers'/ standard operating procedures.
Required knowledge
Look for evidence that confirms knowledge of: • application of different power tools • clamping/securing methods • adjustments/alignments to a range of power tools • common faults and/or defects in power tools • procedures for marking unsafe or faulty power tools for repair • routine maintenance requirements of a range of power tools • tool sharpening techniques for a range of power tools • storage location and procedures of a range of power tools • hazards/control measures associated with power tools • use and application of personal protective equipment • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to use power tools/hand held operations.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with using power tools/hand held operations or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning should not require language, literacy and numeracy skills beyond those required in this unit. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

EVIDENCE GUIDE	
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Power tools	Electric or pneumatic/hydraulic drills, grinders, jigsaws, nibblers, cutting saws, sanders, planers, routers, pedestal drills and pedestal grinders
Clamping	Multigrips, vices, jigs and fixtures, clamps etc.
Job specifications	Finish, size or shape etc.
Operational maintenance	Hand sharpening, cleaning, lubricating, tightening Simple tool repairs and adjustments using engineering principles, tools, equipment and procedures to statutory and regulatory requirements

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Maintenance and diagnostics

MEM24001B Perform basic penetrant testing

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing basic penetrant testing procedures in a range of industrial applications.

Application of the Unit

Application of the unit	This unit applies to basic penetrant testing techniques on fabrications, structures and components across a wide range of industries and restricted to basic visible dye and/or process penetrant line methods. The work can relate to scheduled and unscheduled maintenance activities, using general tools, specific penetrant testing equipment as specified in maintenance documentation, testing procedures or operator instructions. Actual and potential defects are to be considered, together with ongoing abnormalities in fabrications, components and structures. Penetrant testing is performed on critical component or structural zones. All testing must be completed with particular attention to personal safety and OH&S regulations. Certification against Australian standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712. Materials and chemicals which are subject to codes and regulations - for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products - must be subject to safe work habits and must be stored and used in accordance with safe work practices. This unit should not be selected when Unit MEM24002B

	(Perform penetrant testing) has already been selected. Where power tools are required, Unit MEM18002B (Use power tools/hand held operations) should also be selected. **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare inspection areas for basic penetrant testing	1.1. Inspection areas are cleaned and prepared for testing using appropriate procedures and materials. 1.2. Preparation processes are carried out in accordance with the relevant procedures and OH&S requirements. 1.3. Inspection areas are visually assessed and obvious discontinuities are identified.
2. Perform basic penetrant testing	2.1. Nominated test is identified from standard operating procedures. 2.2. Test equipment is prepared in accordance with standard operating procedures. 2.3. Test media is selected and applied in accordance with workplace practices and specifications. 2.4. Penetrant test is carried out in accordance with relevant work instructions and OH&S requirements. 2.5. Penetrant testing equipment is maintained and stored in accordance with standard operating procedures and OH&S requirements.
3. Report the results of penetrant test(s)	3.1. Basic indications are checked and defects are identified in accordance with enterprise standards and/or procedures. 3.2. Basic indications are confirmed in accordance with enterprise standards and/or procedures. 3.3. Test results are reported in accordance with enterprise standards and/or procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • preparing inspection areas • identifying discontinuities • applying procedures

REQUIRED SKILLS AND KNOWLEDGE

- applying test media
- applying principles of penetrant testing techniques
- identifying defects
- reading and interpreting routine information on written job instructions, specifications and standard operating procedures.
- following oral instructions
- entering routine and familiar information onto proformas and standard workplace forms

Required knowledge

Look for evidence that confirms knowledge of:

- cleaning and preparation processes
- precleaning methods and their areas of use - solvents, vapour degrease, etching, detergents, paint removers, mechanical methods
- consequences of incorrect preparation
- procedures and OH&S requirements in relation to the preparation process
- basic concepts and principles of NDT; general terms, purpose of NDT and areas of application of NDT
- scope and basic description of test
- general properties of penetrants - penetrability, removability, visibility
- emulsifier types
- developer types
- use of standard test panels
- established inspection procedures and techniques
- types of discontinuities and their consequences
- procedure for carrying out penetrant testing
- penetrant application
- dwell times
- penetrant removal
- developer application
- dry powder
- development time
- factors affecting indications
- non-relevant indications
- post-cleaning methods and their areas of use
- basic maintenance and storage procedures for testing equipment
- OH&S requirements including storage requirements
- definition of a defect and common basic defects
- methods/procedures for reporting test results

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform basic penetrant testing. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing basic penetrant testing or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures,

EVIDENCE GUIDE	
	product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Preparation processes	Surface cleaning and drying
Obvious discontinuities	Observed changes in material homogeneity
Reported	Accurate identification of location and size of discontinuities

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Non-destructive testing

MEM24002B Perform penetrant testing

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing penetrant testing in a range of industrial applications.

Application of the Unit

Application of the unit	This unit applies to penetrant testing techniques on fabrications, structures and components across a wide range of industries to Level 2 (AS 3669 and AS 3998) or equivalent by portable penetrant testing, processing on a dedicated penetrant line, visible dye and fluorescent methods. The work can relate to scheduled and unscheduled maintenance activities using general tools and specific penetrant testing equipment as specified in maintenance documentation, testing procedures or operator instructions. Actual and potential defects are to be considered, together with ongoing abnormalities in fabrications, components, structures and/or aircraft components. Penetrant tests are performed on critical component or structural zones, and may require re-assessment of competency at regular intervals in accordance with Australian standards and/or other relevant standards. All testing must be completed with particular attention to personal safety and OH&S regulations. Certification against Australian Standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712. Materials and chemicals which are subject to codes and regulations - for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products - are subject to safe work habits and must be stored and used in accordance with safe work practices.

	Where power tools are required, Unit MEM18002B (Use power tools/hand held operations) should also be selected. Where tests require the interpretation of drawings, Unit MEM09002B (Interpret technical drawings) should also be selected. This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V). **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM18001C	Use hand tools
	MEM24012C	Apply metallurgy principles

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range

	statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare inspection areas for penetrant testing	1.1. Inspection areas are identified, cleaned and prepared for testing using appropriate procedures and materials. 1.2. Preparation processes are carried out in accordance with the relevant procedures, statutory and OH&S requirements. 1.3. Inspection areas are visually assessed and obvious discontinuities are identified.
2. Perform penetrant testing	2.1. The most appropriate penetrant test for the material/application is selected. 2.2. Test equipment is selected and prepared in accordance with standards and/or procedures. 2.3. Appropriate test media is selected and applied in accordance with workplace/industry practices. 2.4. Penetrant test is carried out in accordance with relevant standards, specifications and OH&S requirements. 2.5. Penetrant test equipment is checked for defects, maintained and stored in accordance with procedures, OH&S requirements and manufacturer instructions.
3. Interpret and report the results of penetrant test(s)	3.1. Indications are assessed and defects are detected and classified in accordance with national and international codes and standards. 3.2. Defects are confirmed in accordance with enterprise procedures and industry practices. 3.3. Test results are reported in accordance with enterprise procedures, accepted industry practices and customer service requirements.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- interpreting and following procedures
- identifying inspection areas
- conducting visual inspections
- identifying discontinuities and defects
- selecting appropriate testing techniques and procedures
- using decision making skills
- assessing risk
- performing measurements needed to meet the requirements of this unit
- entering routine and familiar information onto proformas and standard workplace forms
- locating, reading and interpreting information on written job instructions, specifications, drawings, charts, lists and other reference documentation
- planning, sequencing operations

Required knowledge

Look for evidence that confirms knowledge of:

- cleaning and preparation processes for a range of test surfaces
- procedure, statutory and OH&S requirements in relation to the preparation process
- established assessment procedures and techniques
- types of discontinuities and their consequences/effect on the material
- penetrant testing techniques and procedures for a range of situations
- tools, equipment, techniques
- principles and applications of penetrant testing techniques
- hazards and safety requirements associated with penetrant testing
- maintenance and storage procedures for test equipment
- common faults and damage
- range of defects
- meaning and application of national and international codes and standards
- methods/procedures for reporting test results
- implications of test results for the particular material/application
- any applicable industry standards, national/Australian standards, NOHSC guides, State/Territory regulatory codes of practice/standards
- use and application of personal protective equipment
- safe work practices and procedures
- relevant hazards and control measures related to the competency

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform penetrant testing. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing penetrant testing in a range of industrial applications or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning should not require language, literacy and numeracy skills beyond those required in this unit. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any

EVIDENCE GUIDE	
	relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Preparation processes	Surface cleaning and drying
Obvious discontinuities	Observed changes in material homogeneity
Reported	Accurate identification of location and size of discontinuities

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Co-requisite units		

Competency field

Competency field	Non-destructive testing

MEM24003B Perform basic magnetic particle testing

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing basic magnetic particle testing procedures in a range of industrial applications. It covers the principles of magnetism and the associated application of basic magnetic particle testing techniques in the field of non-destructive testing. Knowledge of metallurgy associated with the level of application in this unit is required.

Application of the Unit

Application of the unit	This unit applies to portable and fixed ('yoke' or 'bench') basic magnetic particle testing techniques on fabrications, structures and components across a wide range of industries. The work can relate to scheduled and unscheduled maintenance activities using general tools and specific magnetic testing equipment as specified in maintenance documentation, testing procedures or operator instructions. Actual and potential defects are considered, together with ongoing abnormalities in fabrications, components and structures. Magnetic particle testing is performed on critical component or structural zones. All testing must be completed with particular attention to personal safety and OH&S regulations. Certification against Australian standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712. Materials and chemicals which are subject to codes and regulations - for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products - must be subject to safe work habits and must be stored and used in accordance with safe work practices.

	This unit should not be selected when Unit MEM24004B (Perform magnetic particle testing) has already been selected. Where power tools are required, Unit MEM18002B (Use power tools/hand held operations) should also be selected. Where tests require the interpretation of drawings, Unit MEM09002B (Interpret technical drawings) should also be selected. **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range

	statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare inspection areas for basic magnetic particle testing	1.1. Inspection areas are cleaned and prepared for testing using appropriate procedures and materials. 1.2. Preparation processes are carried out in accordance with the relevant specifications and OH&S requirements. 1.3. Inspection areas are visually assessed and obvious discontinuities are identified.
2. Perform basic magnetic particle testing	2.1. Nominated 'yoke' or 'bench' magnetic particle testing procedure is identified from standard operating procedures. 2.2. Test equipment is prepared in accordance with relevant standards and/or procedures. 2.3. Magnetic particle test is carried out in accordance with relevant work instructions and OHS requirements. 2.4. Magnetic particle testing equipment is maintained and stored in accordance with standard operating procedures and OH&S requirements.
3. Report the results of magnetic particle test(s)	3.1. Basic indications are checked and defects are identified in accordance with enterprise standards and/or procedures. 3.2. Basic indications are confirmed in accordance with enterprise standards and/or procedures. 3.3. Test results are reported in accordance with enterprise standards and/or procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.

REQUIRED SKILLS AND KNOWLEDGE

Required skills

Look for evidence that confirms skills in:

- interpreting and following procedures
- identifying inspection areas
- identifying discontinuities and defects
- selecting appropriate testing techniques and procedures
- assessing risks
- entering routine and familiar information onto proformas and standard workplace forms
- locating, reading and interpreting information on written job instructions, specifications, charts, lists and other reference documentation
- planning, sequencing operations

Required knowledge

Look for evidence that confirms knowledge of:

- surface preparation
- procedures and OH&S requirements in relation to the preparation process
- established assessment procedures and techniques
- types of discontinuities and their consequences
- scope and basic principles of magnetic particle testing
- procedure for carrying out magnetic particle test using either the 'yoke' or 'bench'
- advantages and limitations of magnetic particle testing
- hazards and safety precautions associated with magnetic particle testing
- basic maintenance and storage procedures for testing equipment
- common basic defects
- methods/procedures for reporting test results
- advantages, limitations of various equipment
- magnetic particle application - methods for wet, dry particles
- recording and reporting results of simple tests
- safety precautions in testing
- use of toxic, flammable materials, electrical hazards
- use and application of personal protective equipment
- safe work practices and procedures
- relevant hazards and control measures related to the competency

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform basic magnetic particle testing. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing basic magnetic particle testing procedures in a range of industrial applications or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

EVIDENCE GUIDE	
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Preparation processes	Surface cleaning and drying

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Non-destructive testing

MEM24004B Perform magnetic particle testing

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing magnetic particle testing in a range of industrial applications.

Application of the Unit

Application of the unit	This unit applies to magnetic particle testing techniques on fabrications, structures and components across a wide range of industries to Level 2 (AS 3669 and AS 3998) or equivalent. The work can relate to scheduled and unscheduled maintenance activities using general tools specific testing equipment as specified in maintenance documentation, testing procedures or operators instructions. Actual and potential defects are to be considered, together with ongoing abnormalities in fabrications, components, structures and/or aircraft components. Magnetic particle testing is performed on critical component or structural zones, and may require re-assessment of competency at regular intervals in accordance with Australian standards and/or other relevant standards. All testing must be completed with particular attention to personal and OH&S regulations. Certification against Australian Standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712. Materials and chemicals which are subject to codes and regulations - for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products - are subject to safe work habits and must be stored and used in accordance with safe work practices. Where power tools are required, Unit MEM18002B (Use power tools/hand held operations) should also be selected.

	Where tests require the interpretation of drawings, Unit MEM09002B (Interpret technical drawings) should also be selected. This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V). **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM18001C	Use hand tools
	MEM24012C	Apply metallurgy principles

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare inspection areas for magnetic particle testing	1.1. Inspection areas are identified, cleaned and prepared for testing using appropriate procedures and materials. 1.2. Preparation processes are carried out in accordance with the relevant procedures, statutory and OH&S requirements. 1.3. Inspection areas are visually assessed and obvious discontinuities are identified.
2. Perform magnetic particle testing	2.1. The most appropriate magnetic particle test for the material/application is selected. 2.2. Testing equipment is selected and prepared in accordance with standards and/or procedures. 2.3. Magnetic particle test is carried out in accordance with relevant standards, specifications and OH&S requirements. 2.4. Magnetic particle testing equipment is checked for defects, and maintained and stored in accordance with procedures, OH&S requirements and manufacturer instructions.
3. Interpret and report the results of magnetic particle tests	3.1. Indications are assessed and defects are detected and classified in accordance with national and international codes and standards. 3.2. Defects are confirmed in accordance with enterprise procedures and industry practices. 3.3. Test results are reported in accordance with enterprise procedures, accepted industry practices and customer service requirements.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills

REQUIRED SKILLS AND KNOWLEDGE

Look for evidence that confirms skills in:

- interpreting and following procedures
- identifying inspection areas
- identifying discontinuities and defects
- selecting appropriate testing techniques, equipment and procedures
- reading, interpreting and applying relative testing standards
- reading, interpreting and applying relative conformance standards
- assessing risk
- undertaking calculations using formulae
- entering routine and familiar information onto proformas and standard workplace forms

Required knowledge

Look for evidence that confirms knowledge of:

- cleaning and preparation processes
- procedures and OH&S requirements in relation to the preparation process
- established assessment procedures and techniques
- types of discontinuities and their consequences
- magnetic particle testing techniques and procedures for a range of situations
- system verification checks necessary to carry out the magnetic particle test
- principles and applications of magnetic particle testing
- advantages and limitations of magnetic particle testing
- hazards and safety precautions associated with magnetic particle testing
- basic maintenance and storage procedures for testing equipment
- types of magnetism;
- magnetic properties
- magnetic materials
- magnetic circuits
- relative permeability of common engineering materials
- magnetic discontinuity, leakage fields
- types of equipment - portable, stationary, automated etc.
- equipment features
- nature and properties of the various types of magnetising current
- current requirements for testing
- media types - advantages and limitations of dry powders and fluid suspensions
- quality control of media, viewing conditions
- disposal procedures
- environment care
- preparation of parts

REQUIRED SKILLS AND KNOWLEDGE
• effect of surface coatings on sensitivity • effect of surface roughness • dressing of welds • interpretation of indications • lighting conditions • use of magnification • factors influencing appearance • spurious indications, false indications • surface and sub-surface indications • common basic defects • methods/procedures for reporting test results • any applicable industry standards, national/Australian standards, NOHSC guides, State/Territory regulatory codes of practice/standards • use and application of personal protective equipment • safe work practices and procedures • relevant hazards and control measures related to the competency

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform magnetic particle testing. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must

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	be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing magnetic particle testing in a range of industrial applications or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Preparation processes	Surface cleaning and drying

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Non-destructive testing

MEM24005B Perform basic eddy current testing

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers operating eddy current testing equipment and performing basic testing procedures in a specific range of industrial applications. Knowledge of metallurgy, electricity, magnetism and electromagnetism associated with the level of application in this unit is required.

Application of the Unit

Application of the unit	This unit applies to the preparation and performance of eddy current testing on fabrications, structures and components across a wide range of industries. It includes wheel bead seat, production line, tube production line and conductivity measurement methods. The work can relate to scheduled and unscheduled maintenance activities using general tools and specific eddy current testing equipment as specified in maintenance documentation, testing procedures or operator instructions. Actual and potential defects are to be considered, together with ongoing abnormalities in fabrications, components and structures. Eddy current testing is performed on critical component or structural zones, and may require re-assessment of competency at regular intervals in accordance with relevant standards. All testing must be completed with particular attention to personal safety and OH&S regulations. Certification against Australian standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712. Materials and chemicals which are subject to codes and regulations - for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products - are subject to safe work habits and must be stored and used in accordance with safe work practices.

	This unit should not be selected when Unit MEM24006B (Perform eddy current testing) has already been selected. Where tests require the interpretation of drawings, Unit MEM09002B (Interpret technical drawings) should also be selected. Where power tools are required, Unit MEM18002B (Use power tools/hand held operations) should also be selected. **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent

	with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare inspection areas for basic eddy current testing	1.1. Inspection areas are cleaned and prepared for testing using appropriate procedures and materials. 1.2. Preparation processes are carried out in accordance with the relevant procedures and OH&S requirements. 1.3. Inspection areas are visually assessed and obvious discontinuities are identified.
2. Perform basic eddy current testing	2.1. Nominated test is identified from standard operating procedures. 2.2. Test equipment is prepared in accordance with standards and/or procedures. 2.3. Eddy current test procedure is carried out in accordance with relevant work instructions and OH&S requirements. 2.4. Eddy current test equipment is maintained and stored in accordance with standard operating procedures and OH&S requirements.
3. Report the results of basic eddy current test(s)	3.1. Basic indications are checked and defects are identified in accordance with enterprise standards and/or procedures. 3.2. Basic indications are confirmed in accordance with enterprise standards and/or procedures. 3.3. Test results are reported in accordance with enterprise standards and/or procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills

REQUIRED SKILLS AND KNOWLEDGE

Look for evidence that confirms skills in:

- interpreting and following procedures
- identifying inspection areas
- identifying discontinuities and defects
- selecting appropriate testing techniques, equipment and procedures
- documenting and reporting
- assessing risk
- reading and interpreting routine information on written job instructions, specifications and standard operating procedures. May include drawings
- performing calculations using formulae

Required knowledge

Look for evidence that confirms knowledge of:

- cleaning and preparation processes
- procedures and OH&S requirements in relation to the preparation process
- visual inspection
- eddy current instrument set-up
- probe selection
- established assessment procedures and techniques
- types of discontinuities and their consequences
- procedure for carrying out basic eddy current testing
- system verification checks necessary to carry out basic eddy current testing
- testing and compliance standards (enterprise specific)
- standard recording and reporting formats
- standard defects and comparative techniques
- basic principles of electricity, magnetism, electromagnetism and eddy current testing
- basic electrical principles
- test principles
- overview of factors affecting eddy current response
- basic metallurgy
- limitations of eddy current testing
- hazards and safety precautions associated with eddy current testing
- basic maintenance and storage procedures for testing equipment
- common basic defects (these are industry-specific and relevant workplace defects should be chosen)
- methods/procedures for reporting test results
- use and application of personal protective equipment

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform basic eddy current testing. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with operating eddy current testing equipment and applying basic testing procedures in a specific range of industrial applications, or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be

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	permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Preparation processes	Surface cleaning and drying

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Non-destructive testing

MEM24006B Perform eddy current testing

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing eddy current testing in a range of industrial applications.

Application of the Unit

Application of the unit	This unit applies to inspection, interpretation, classification and reporting of results of eddy current testing on fabrications, structures and components across a wide range of industries to Level 2 (AS 3669 and AS 3998) or equivalent. The work can relate to scheduled and unscheduled maintenance activities using general tools and specific testing eddy current testing tools and equipment as specified in maintenance documentation, testing procedures or operator instructions. Actual and potential defects are considered, together with ongoing abnormalities in fabrications, components, structures and/or aircraft components. Eddy current tests are performed on critical component or structural zones, and may require re-assessment of competency at regular intervals in accordance with Australian standards and/or other relevant standards. All testing must be completed with particular attention to personal safety and OH&S regulations. Certification against Australian standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712. Materials and chemicals which are subject to codes and regulations - for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products - are subject to safe work habits and must be stored and used in accordance with safe work practices. Where power tools are required, Unit MEM18002B (Use power tools/hand held operations) should also be selected.

	Where tests require the interpretation of drawings, Unit MEM09002B (Interpret technical drawings) should also be selected. This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V). **Band**: **A** **Unit Weight**: **6**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM18001C	Use hand tools
	MEM24012C	Apply metallurgy principles

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare inspection areas for eddy current testing	1.1. Inspection areas are identified, cleaned and prepared for testing using appropriate procedures and materials. 1.2. Preparation processes are carried out in accordance with the relevant procedures, statutory and OH&S requirements. 1.3. Inspection areas are visually assessed and obvious discontinuities are identified.
2. Perform eddy current testing	2.1. The most appropriate eddy current test for the material/application is selected. 2.2. Test equipment is selected and prepared in accordance with standards and/or procedures. 2.3. Eddy current test is carried out in accordance with relevant standards, specifications and OH&S requirements. 2.4. Eddy current test equipment is checked for defects, and maintained and stored in accordance with procedures, OH&S requirements and manufacturer instructions.
3. Interpret and report the results of eddy current tests	3.1. Indications are assessed and defects are detected and classified in accordance with national and international codes and standards. 3.2. Defects are confirmed in accordance with enterprise procedures and industry practices. 3.3. Test results are reported in accordance with enterprise procedures, accepted industry practices and customer service requirements.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills

REQUIRED SKILLS AND KNOWLEDGE

Look for evidence that confirms skills in:

- interpreting and following procedures
- identifying inspection areas
- identifying discontinuities and defects
- selecting appropriate testing techniques and procedures
- reading, interpreting and applying relative testing standards
- reading, interpreting and applying relative conformance standards
- using calculations relating to eddy current testing
- assessing risk
- entering routine and familiar information onto proformas and standard workplace forms

Required knowledge

Look for evidence that confirms knowledge of:

- cleaning and preparation processes
- procedures and OH&S requirements in relation to the preparation process
- established assessment procedures and techniques
- types of discontinuities and their consequences
- procedure for carrying out eddy current testing
- tools, equipment, techniques and system verification checks necessary to carry out eddy current testing
- basic principles of electricity, magnetism, electromagnetism and eddy current testing:
  - Reactance - field made by eddy current
  - Biot and Savant law - Definition, Practical (right hand) rules
  - Amperes law - Definition, Applications (toroid, infinite coil, flat coil)
  - Lenz law - Definition, Auto-induction factor, Mutual induction factor, Coupling factor
- induced currents - short circuit coil, metallic mass, skin effect, reactance
- cylindrical bars
- theory of eddy currents
- tubes
- geometric defect characterisation
- multiple defects
- characteristics of eddy current probes
- eddy current equipment:
  - transmission
  - reception
  - data presentation

REQUIRED SKILLS AND KNOWLEDGE
• equipment controls • types of equipment: • physical properties of materials • electrical conductivity • magnetic permeability • applications of eddy curry testing • influence of various parameters on eddy current measurement • defect position and orientation • compensation • structure and geometry of test part • coupling influence • relative speed • limitations of eddy current testing • hazards and safety precautions associated with eddy current testing • basic maintenance and storage procedures for testing equipment • common basic defects • methods/procedures for reporting test results • any applicable industry standards, national/Australian standards, NOHSC guides, State/Territory regulatory codes of practice/standards • use and application of personal protective equipment • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform eddy current testing. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency

EVIDENCE GUIDE	
	in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing eddy current testing in a range of industrial applications, or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work

RANGE STATEMENT	
situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Preparation processes	Surface cleaning and drying
Obvious discontinuities	Observed changes in material homogeneity
Defects	Corrosion, metal fatigue, deformation in non-ferrous/ferrous alloys steels, fatigue cracks, stress corrosion cracking, heat damage, metal properties sorting, manufacturing defects, coating thickness measurement etc.

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Non-destructive testing

MEM24007B Perform ultrasonic thickness testing

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing ultrasonic thickness testing in a range of industrial applications. Knowledge of metallurgy associated with the level of application in this unit is required.

Application of the Unit

Application of the unit	This unit applies to inspecting, interpreting and reporting on ultrasonic testing techniques of fabrications, structures and components. Testing is across a wide range of industries and includes identifying abnormalities such as thickness measurement of corrosion, laminations of non-ferrous/ferrous alloys steels, composite materials. The work can relate to scheduled and unscheduled maintenance activities using general tools and specific ultrasonic testing equipment as specified in maintenance documentation, testing procedures or operators instructions. Actual and potential defects are to be considered, together with ongoing abnormalities in fabrications, components and structures on a wide range of applications. Ultrasonic tests are performed on critical component or structural zones, and may require re-assessment of competency at regular intervals in accordance with Australian standards and/or other relevant standards. All testing must be completed with particular attention to personal safety and OH&S regulations. Certification against Australian standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712. Materials and chemicals which are subject to codes and regulations - for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products -

	are subject to safe work habits and must be stored and used in accordance with safe work practices. This unit should not be selected when Unit MEM24008B (Perform ultrasonic testing) has already been selected. Where tests require the interpretation of drawings, Unit MEM09002B (Interpret technical drawings) should also be selected. Where power tools are required, Unit MEM18002B (Use power tools/hand held operations) should also be selected. **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the

unit of competency.	required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare inspection areas for ultrasonic thickness testing	1.1. Inspection areas are cleaned and prepared for testing using appropriate procedures and materials. 1.2. Preparation processes are carried out in accordance with the relevant procedures and OH&S requirements. 1.3. Inspection areas are visually assessed for obvious discontinuities.
2. Perform ultrasonic thickness testing	2.1. Nominated ultrasonic thickness test is identified from standard operating procedures. 2.2. Test equipment is prepared in accordance with standard operating procedures. 2.3. Ultrasonic tests are carried out in accordance with relevant standards and OH&S requirements. 2.4. Ultrasonic test equipment is maintained and stored in accordance with standard operating procedures and OH&S requirements.
3. Report the results of ultrasonic thickness tests	3.1. Basic thicknesses are identified and explained in accordance with enterprise standards and/or procedures. 3.2. Basic thicknesses are confirmed in accordance with enterprise standards and/or procedures. 3.3. Test results are reported in accordance with enterprise standards and/or procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills

REQUIRED SKILLS AND KNOWLEDGE

Look for evidence that confirms skills in:

- interpreting and following procedures
- identifying inspection areas
- identifying discontinuities and defects
- selecting appropriate testing techniques, equipment and procedures
- performing calculations
- assessing risk
- entering routine and familiar information onto proformas and standard workplace forms

Required knowledge

Look for evidence that confirms knowledge of:

- cleaning and preparation processes for a variety of test surfaces
- procedures and OH&S requirements in relation to the preparation process
- established assessment procedures and techniques
- basic principles of ultrasonic thickness testing
- properties and behaviour of ultrasound
- basic concepts associated with frequency, velocity, wavelength, amplitude
- generation of ultrasound
- types of discontinuities and their consequences
- procedures for carrying out ultrasonic thickness tests
- tools, equipment, techniques and system verification checks necessary to carry out the ultrasonic thickness test
- advantages and limitations of ultrasonic thickness testing
- hazards and safety requirements associated with ultrasonic thickness testing
- basic maintenance and storage procedures for testing equipment
- common basic defects
- indications and thicknesses
- methods/procedures for reporting test results
- ultrasonic thickness testing equipment
- types of displays:
  - a-scan display
  - b-scan display
- types of couplants, desirable characteristics
- straight beam testing method:
- calibration of thickness testing equipment
- frequency
- probe size and shape
- thickness testing

REQUIRED SKILLS AND KNOWLEDGE

• plate testing
  • acceptance standards within the scope of this unit
• recording and reporting:
  • job records
  • routine reports
  • codes and standards
• variables affecting test results
• methods of controlling variables
• component variables:
  • size and geometry
  • distance location from entry surface
  • orientation to entry surface
  • reflecting characteristics of back wall
• any applicable industry standards, national/Australian standards, NOHSC guides, State/Territory regulatory codes of practice/standards
• use and application of personal protective equipment
• safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform ultrasonic thickness testing. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not

EVIDENCE GUIDE	
	in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing ultrasonic thickness testing in a range of industrial applications, or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Preparation processes	Surface cleaning and drying

RANGE STATEMENT	
Obvious discontinuities	Observed changes in material homogeneity
Reported	Accurate identification of location and size of discontinuities

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Non-destructive testing

MEM24008B Perform ultrasonic testing

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers operating ultrasonic testing equipment and applying the testing procedure in a range of industrial applications.

Application of the Unit

Application of the unit	This unit applies to inspecting, interpreting, classifying and reporting on ultrasonic testing techniques of fabrications, structures and components. Testing is across a wide range of industries to Level 2 (AS 3669 and AS 3998) or equivalent and includes identifying abnormalities. The work can relate to scheduled and unscheduled maintenance activities using general tools and specific ultrasonic testing equipment as specified in maintenance documentation, testing procedures or operator instructions. Actual and potential defects are to be considered, together with ongoing abnormalities in fabrications, components and structures on a wide range of applications. Ultrasonic tests are performed on critical component or structural zones, and may require re-assessment of competency at regular intervals in accordance with Australian standards and/or other relevant standards. All testing must be completed with particular attention to personal safety and OH&S regulations. Certification against Australian standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712. Materials and chemicals which are subject to codes and regulations - for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products - are subject to safe work habits and must be stored and used in accordance with safe work practices.

	Where power tools are required, Unit MEM18002B (Use power tools/hand held operations) should also be selected. Where tests require the interpretation of drawings, Unit MEM09002B (Interpret technical drawings) should also be selected. This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V). **Band**: **A** **Unit Weight**: **6**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM18001C	Use hand tools
	MEM24012C	Apply metallurgy principles

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range

	statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare inspection areas for ultrasonic testing	1.1. Inspection areas are identified, cleaned and prepared for testing using appropriate procedures and materials. 1.2. Preparation processes are carried out in accordance with the relevant procedures, statutory and OH&S requirements. 1.3. Inspection areas are visually assessed and obvious discontinuities are identified.
2. Perform ultrasonic testing	2.1. The most appropriate ultrasonic test for the material/application is selected. 2.2. Testing equipment is selected and prepared in accordance with standards and/or procedures. 2.3. Ultrasonic test is carried out in accordance with relevant standards, specifications and OH&S requirements. 2.4. Ultrasonic testing equipment is checked for defects, and maintained and stored in accordance with procedures, OH&S requirements and manufacturer instructions.
3. Interpret and report the results of ultrasonic tests	3.1. Indications are assessed and defects are detected and classified in accordance with national and international codes and standards. 3.2. Defects are confirmed in accordance with enterprise procedures and industry practices. 3.3. Test results are reported in accordance with enterprise procedures, accepted industry practices and customer service requirements.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- interpreting and following procedures
- identifying inspection areas
- identifying discontinuities and defects
- selecting appropriate testing techniques, equipment and procedures
- analysing test results
- reading, interpreting and applying relative testing standards
- reading, interpreting and applying relative conformance standards
- performing calculations relating to ultrasonic testing
- assessing risk
- entering routine and familiar information onto proformas and standard workplace forms

Required knowledge

Look for evidence that confirms knowledge of:

- cleaning and preparation processes for a variety of test surfaces
- procedures and OH&S requirements in relation to the preparation process
- established assessment procedures and techniques
- principles of ultrasonic testing
- variables affecting test selection
- variables affecting test results
- ultrasound - frequency, velocity, wavelength, amplitude
- behaviour of ultrasound at interfaces
- characteristics of ultrasound in materials
- generation of ultrasound
- detection of ultrasound
- the flaw detector
- basic test methods:
  - pulse-echo and transmission methods
  - resonance methods
  - a, b, c, and p scan
  - types of coupling
  - single, dual and two-probe methods
- characteristics and applications associated with probes
- calibration methods
- variables

REQUIRED SKILLS AND KNOWLEDGE

• contact and immersion test methods
• testing methods and their application
• flaw size evaluation
• interpretation and evaluation:
  • defect types as related to product
  • codes and standards
• recording and reporting:
  • job records
  • routine reports
  • codes and standards
• written procedures:
  • presentation
  • use of standards
• types of discontinuities and their consequences
• procedures for carrying out ultrasonic tests
• tools, equipment, techniques and system verification checks necessary to carry out the ultrasonic test
• advantages and limitations of ultrasonic testing
• hazards and safety requirements associated with ultrasonic thickness testing
• maintenance and storage procedures for testing equipment
• range of defects
• methods/procedures for reporting test results
• any applicable industry standards, national/Australian standards, NOHSC guides, State/Territory regulatory codes of practice/standards
• use and application of personal protective equipment
• safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform ultrasonic testing. Competency in this unit cannot be claimed until all prerequisites have been

EVIDENCE GUIDE	
	satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with operating ultrasonic testing equipment and the application of the testing procedure in a range of industrial applications, or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Preparation processes	Surface cleaning and drying
Obvious discontinuities	Observed changes in material homogeneity
Defects	Corrosion, metal fatigue, deformation in non-ferrous/ferrous alloys steels, composite materials, fatigue cracks, stress corrosion cracking, manufacturing defects, thickness measurement and fit, mechanical and bonded repairs, laminar tearing, welding defects and casting defects and/or aircraft components
Reported	Accurate identification of location and size of discontinuities

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Non-destructive testing

MEM24009B Perform basic radiographic testing

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing basic radiographic testing procedures in a range of industrial applications. Knowledge of metallurgy associated with the level of application in this unit is required.

Application of the Unit

Application of the unit	This unit applies to working with ionizing radiation in open or closed sites; on fabrications, structures and components across a wide range of industries. The work can relate to scheduled and unscheduled maintenance activities using general tools and specific radiographic testing equipment as specified in maintenance documentation, testing procedures or operators instructions. All testing must be completed with particular attention to personal and OH&S regulations. Ionizing radiation equipment materials and chemicals, which are subject to codes and regulations, must be stored, used, and transported in accordance with safe work practices. Certification against Australian standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712. This unit should not be selected when Unit MEM24010B (Perform radiographic testing) has already been selected. Where power tools are required, Unit MEM18002B (Use power tools/hand held operations) should also be selected. Where tests require the interpretation of drawings, Unit MEM09002B (Interpret technical drawings) should also be selected. **Band**: **A**

	Unit Weight: **2**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM13013B	Work safely with ionizing radiation
	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Prepare inspection areas ready for basic radiographic testing	1.1. Radiographic specimens are cleaned and prepared for testing using appropriate procedures and materials.

ELEMENT	PERFORMANCE CRITERIA
	1.2. Preparation processes are carried out in accordance with the relevant procedures and OH&S requirements. 1.3. Inspection areas are visually assessed and obvious discontinuities are identified.
2. Set up radiographic test equipment	2.1. Nominated test is identified from standard operating procedures. 2.2. Radiation testing and processing equipment is set up in accordance with standard operating procedures.
3. Carry out basic radiographic tests	3.1. Basic properties of X-rays and gamma rays are identified. 3.2. Safety practices and controls for minimising radiation exposure are applied. 3.3. Radiographic testing and safety equipment is operated in accordance with relevant work instructions and OH&S requirements. 3.4. Films are processed to achieve optimum results.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • interpreting and following procedures • identifying inspection areas • identifying discontinuities and defects • selecting appropriate testing techniques, equipment and procedures • calculating and producing optimum quality radiographs • effectively designing exposure and storage areas • calculating shielding thicknesses • reading, interpreting and applying relative testing standards • reading, interpreting and applying relative conformance standards • documenting and reporting • assessing risk

REQUIRED SKILLS AND KNOWLEDGE

Required knowledge

Look for evidence that confirms knowledge of:

- cleaning and preparation processes for a range of test surfaces
- cleaning and preparation processes for a range of test surfaces
- assessment procedures and techniques
- types of discontinuities and their consequences/effect on the material
- procedure for carrying out each radiographic test
- principal types of X-ray generators and radioisotopes and their effect on radiographic sensitivity
- tools, equipment, techniques and system verification checks
- relevant standards, regulations and codes
- hazards associated with radiographic testing
- procedures for specialised radiographic applications
- principles of image formation, film and chemical properties and processing techniques
- various types of films and screens, their properties and effects on image quality
- maintenance and storage procedures for test equipment
- common faults and damage
- safety features of radioisotope cameras and X-ray equipment
- production of X-rays and gamma rays
- absorption of ionizing radiation by matter and the biological effects on living
- X-ray equipment
- gamma ray sources
- comparison of X-ray and gamma ray sources on basis of energy and intensity
- shielding thickness
- exposure calculations
- reciprocity law
- preparation and use of exposure charts, radiographic equivalence charts
- exposure techniques
- equipment types
- recording and reporting
- safety aspects
- types of materials
- industrial applications
- set-up procedures
- methods/procedures for reporting test results
- implications of test results for the particular material/application
- any applicable industry standards, national/Australian standards, NOHSC guides, State/Territory regulatory codes of practice/standards

REQUIRED SKILLS AND KNOWLEDGE
• use and application of personal protective equipment • safe work practices and procedures • relevant hazards and control measures related to the competency

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform basic radiographic testing. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing basic radiographic testing procedures in a range of industrial applications, or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be

EVIDENCE GUIDE	
	gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Preparation processes	Surface cleaning and drying
Obvious discontinuities	Observed changes in material homogeneity

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Non-destructive testing

MEM24010B Perform radiographic testing

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers operating radiographic testing equipment and applying the testing procedures in a range of industrial applications.

Application of the Unit

Application of the unit	This unit applies to inspecting, interpreting, classifying and reporting on radiographic testing techniques of fabrications, structures and components. Testing is across a wide range of industries to Level 2 (AS 3669 and AS 3998) or equivalent and includes identifying abnormalities such as corrosion, metal fatigue, deformation in non-ferrous/ferrous alloys steels, composite materials, fatigue cracks, stress corrosion cracking, manufacturing defects, thickness measurement and fit, mechanical and bonded repairs, welding defects and casting defects and/or aircraft components. The work can relate to scheduled and un-scheduled maintenance activities using general tools and specific radiographic testing equipment as specified in maintenance documentation, testing procedures or operators instructions. Actual and potential defects are to be considered, together with ongoing abnormalities in fabrications, components and structures on a wide range of applications. Radiographic tests are performed on critical component or structural zones, and may require re-assessment of competency at regular intervals in accordance with Australian standards and/or other relevant standards. All testing must be completed with particular attention to personal and OH&S regulations. Ionizing radiation equipment materials and chemicals, which are subject to codes and regulations, must be stored,

	used, and transported in accordance with safe work practices. Certification against Australian standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712. Where power tools are required, Unit MEM18002B (Use power tools/hand held operations) should also be selected. Where tests require the interpretation of drawings, Unit MEM09002B (Interpret technical drawings) should also be selected. This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V). **Band**: **A** **Unit Weight**: **6**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM13013B	Work safely with ionizing radiation
	MEM18001C	Use hand tools
	MEM24012C	Apply metallurgy principles

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare inspection areas for radiographic testing	1.1. Inspection areas are identified, cleaned and prepared for testing using appropriate procedures and materials. 1.2. Preparation processes are carried out in accordance with the relevant procedures, statutory and OH&S requirements. 1.3. Inspection areas are visually assessed and obvious discontinuities are identified.
2. Select and prepare radiographic test	2.1. The most appropriate radiographic test for the material/application is selected. 2.2. Appropriate testing and processing equipment is selected and set up for various geometrise in accordance with standards and/or procedures. 2.3. Quality of radiographic test is optimised.
3. Perform radiographic testing	3.1. Radiographic tests are carried out in accordance with relevant standards, codes, specifications and OH&S requirements. 3.2. Radiographs are set up and carried out for specialised applications. 3.3. Films are processed to maximise quality of image. 3.4. Films are processed to achieve optimum results.
4. Maintain radiographic testing equipment	4.1. Radiographic testing equipment is checked for defects, maintained and stored in accordance with procedures, OH&S requirements and manufacturer instructions.
5. Monitor and ensure radiation safety	5.1. Safety controls are set up and maintained. 5.2. Exposure to radiation employees and general public is minimised. 5.3. Radiation monitoring equipment is selected and

ELEMENT	PERFORMANCE CRITERIA
	used.
6. Interpret and report the results of radiographic tests	6.1. Conditions necessary to view and interpret radiographs are established. 6.2. Radiographs are interpreted/evaluated in accordance with applicable codes, standards and specifications. 6.3. Test results are reported in accordance with enterprise procedures, accepted industry practices and customer service requirements.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • interpreting and following procedures • identifying inspection areas • identifying discontinuities and defects • selecting appropriate testing techniques, equipment and procedures • calculating and producing optimum quality radiographs • effectively designing exposure and storage areas • calculating shielding thicknesses • reading, interpreting and applying relative testing standards • reading, interpreting and applying relative conformance standards • documenting and reporting • assessing risk
Required knowledge
Look for evidence that confirms knowledge of: • cleaning and preparation processes for a range of test surfaces • cleaning and preparation processes for a range of test surfaces • assessment procedures and techniques • types of discontinuities and their consequences/effect on the material • procedure for carrying out each radiographic test • principal types of X-ray generators and radioisotopes and their effect on

REQUIRED SKILLS AND KNOWLEDGE
radiographic sensitivity • tools, equipment, techniques and system verification checks • relevant standards, regulations and codes • hazards associated with radiographic testing • procedures for specialised radiographic applications • principles of image formation, film and chemical properties and processing techniques • various types of films and screens, their properties and effects on image quality • maintenance and storage procedures for test equipment • common faults and damage • safety features of radioisotope cameras and X-ray equipment • production of X-rays and gamma rays • absorption of ionizing radiation by matter and the biological effects on living • X-ray equipment • gamma ray sources • comparison of X-ray and gamma ray sources on basis of energy and intensity • shielding thickness • exposure calculations • reciprocity law • preparation and use of exposure charts, radiographic equivalence charts. • exposure techniques • equipment types • recording and reporting • safety aspects • types of materials • industrial applications • set-up procedures • methods/procedures for reporting test results • implications of test results for the particular material/application • any applicable industry standards, national/Australian standards, NOHSC guides, State/Territory regulatory codes of practice/standards • use and application of personal protective equipment • safe work practices and procedures • relevant hazards and control measures related to the competency

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform radiographic testing. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with operating radiographic testing equipment and applying testing procedures or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

EVIDENCE GUIDE	
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Preparation processes	Surface cleaning and drying

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Non-destructive testing

MEM24011B Establish non-destructive tests

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers researching, analysing, developing, approving and evaluating non-destructive tests (NDT).

Application of the Unit

Application of the unit	This unit applies to research, development, approval and evaluation of applicable non-destructive tests on fabrications, structures and components across a wide range of industries to Level 3 (AS 3669 and AS 3998) or equivalent. The work can relate to scheduled and unscheduled maintenance activities using general tools and specific testing equipment, test development procedures or guidelines. Activities should replicate 'in-service' tasks due to the high level of self-supervision and the critical nature of the work. Actual and potential defects are considered, together with ongoing abnormalities in fabrications, components, structures from a wide range of applications by the selection of relevant testing method. Tests are validated/evaluated on critical component or structural zones. All testing must be developed and completed with particular attention to personal safety and OH&S regulations. Certification against Australian standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712. Materials and chemicals which are subject to codes and regulations - for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products - are subject to safe work habits and must be stored and used in accordance with safe work practices. This unit should not be selected when Unit MEM05025C

	(Perform welding fabrication inspection) has already been selected. **Band**: **B** **Unit Weight**: **12**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM13013B	Work safely with ionizing radiation
	MEM16010A	Write reports
	MEM18001C	Use hand tools
	MEM24002B	Perform penetrant testing
	MEM24004B	Perform magnetic particle testing
	MEM24006B	Perform eddy current testing
	MEM24008B	Perform ultrasonic testing
	MEM24010B	Perform radiographic testing
	MEM24012C	Apply metallurgy principles

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Assess requirements for non-destructive test	1.1. Inspection area is assessed for testing and all possible failure sites are identified utilising metallurgical analysis. 1.2. Relevant information for test development is collected from available sources using accepted techniques. 1.3. Information is analysed and interpreted. 1.4. Test requirements are determined.
2. Establish non-destructive test techniques and procedures	2.1. Test methods, techniques and procedures to be used for specific NDT work are designated. 2.2. Codes, standards, specifications and procedures are interpreted. 2.3. Test procedures are developed in accordance with established techniques and metallurgical principles.
3. Validate/confirm non-destructive tests	3.1. General and specific test procedures are validated in accordance with established techniques. 3.2. Inspection results are interpreted and evaluated in terms of existing codes, standards and specifications.
4. Approve non-destructive test procedures	4.1. Procedures are approved in accordance with workplace procedures and relevant codes and standards. 4.2. Procedures are documented and distributed in accordance with workplace requirements and relevant codes and standards.
5. Evaluate non-destructive test procedures	5.1. Procedures are evaluated for effectiveness. 5.2. Evaluation results are documented and reported according to workplace requirements. 5.3. Changes/amendments to non-destructive test

ELEMENT	PERFORMANCE CRITERIA
	procedures are made and distributed as necessary.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • conducting metallurgical assessment of inspection areas • designating most appropriate method, technique or procedure • referencing information • developing and validating test procedures • applying safety procedures, standard operating procedures and legislative requirements to all work • reading/interpreting/applying relative testing standards • reading/interpreting/applying relative conformance standards • documenting procedure and results
Required knowledge
Look for evidence that confirms knowledge of: • application of metallurgical analysis to assess inspection areas • NDT methods, techniques and procedures • meaning and validity of relevant codes, standards, specifications and procedures • test procedure for testing techniques and specimen • validation processes • process for approval of procedures • process for documentation/distribution of procedures • evaluation procedures • process for documentation of evaluation results • process for amending tests and distributing amendments • any applicable industry standards, national/Australian standards, NOHSC guides, State/Territory regulatory codes of practice/standards • use and application of personal protective equipment • safe work practices and procedures • relevant hazards and control measures related to the competency

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to establish non-destructive tests. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the research, analysis, development, approval and evaluation of non-destructive tests, or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and

EVIDENCE GUIDE	
	documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Non-destructive testing

MEM24012C Apply metallurgy principles

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers applying basic metallurgy principles related to selecting appropriate non-destructive testing techniques (NDT) and interpreting the results of NDT tests for metallurgical processes.

Application of the Unit

Application of the unit	This unit applies to knowledge of metallurgy principles, and the relationship between the various non-destructive testing methods and their capabilities and limitations when applied to the detection of specific discontinuities in metals and alloys. The unit applies to employees other than NDT technicians such as metallurgists, welding supervisors etc. who select and order NDT tests and who interpret results provided by tests for metal manufacturing, casting, shaping, and joining processes. The unit does not apply to the conduct of NDT tests. Such variables as the type of discontinuity, manufacturing process and limitations will assist in determining the sequence of testing and the ultimate selection of one non-destructive test method in preference to another. Any testing that may be carried out must be completed with particular attention to personal and OH&S regulations. Where materials and chemicals which are subject to codes and regulations are stored and used - for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products - safe work habits must be considered. This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V).

	Band: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**

ELEMENT	PERFORMANCE CRITERIA
1. Interpret and apply the principles of solidification and crystal structures in metals and alloys	1.1. Principles of solidification and crystal structures in metals and alloys are interpreted and applied in relation to NDT techniques.
2. Interpret equilibrium diagrams for metals and alloys	2.1. Equilibrium diagram for metal or alloy is correctly sourced 2.2. Equilibrium diagrams are correctly interpreted.
3. Interpret and apply the principles of fusion welding of metals and alloys	3.1. Principles and methods for fusion welding of metals and alloys are applied to NDT test selection. 3.2. Defects in weldments are identified and classified from NDT test results.
4. Interpret and apply the principles of the formation of castings	4.1. Principles and methods used to produce metal castings are applied to NDT test selection. 4.2. Defects in metal and alloy castings are identified and classified from NDT test results.
5. Interpret and apply the principles of steel forging	5.1. Principles and methods used to produce steel forgings are applied to NDT test selection. 5.2. Defects in steel forgings are identified and classified from NDT test results.
6. Interpret and apply the principles of mechanical testing	6.1. Principles of mechanical testing are applied to NDT test selection. 6.2. Defects in metal product are identified and classified from NDT test results

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • research • understanding and applying metallurgy principles • selecting NDT test appropriate to metal or alloy and manufacturing process

REQUIRED SKILLS AND KNOWLEDGE

Required knowledge

Look for evidence that confirms knowledge of:

- principles of solidification and crystal structures in metal:
  - classification of materials
  - structure of atoms
  - process of solidification
  - crystal structures
  - defects formed during solidification
  - modification of crystal structure
  - heat treatment processes
  - defects formed during heat treatment
- meaning of equilibrium diagrams representative of a range of metals including aluminium, iron, steel and common non-ferrous alloys:
  - alloy systems
  - solid and liquid solubility
  - basic equilibrium diagrams
  - equilibrium diagrams for common alloys
- principles of fusion welding in relation to NDT testing
- defects in fusion welding:
  - processing defects
  - grinding cracks
  - pickling cracks
  - heat treatment cracks
  - service defects
  - fatigue cracks
  - corrosion and stress corrosion cracks
- principles of the formation of castings
- defects in castings
- principles of steel forging
- defects in steel forging
- principles of mechanical testing:
  - mechanical testing
  - tensile testing
  - impact testing
  - hardness testing
  - fatigue testing
- other tests

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply metallurgy principles to NDT test selection and interpretation. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with applying basic metallurgy principles as related to non-destructive testing techniques, or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate

EVIDENCE GUIDE	
	must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Principles and methods for fusion welding of metals and alloys	• MMAW • SAW • GMAW • GTAW • FCAW
Defects in weldments	Cracks, lack of fusion, cavities, imperfect shape, solid inclusions, miscellaneous
Defects in metal and alloy castings	Shrinkage cavities, hot tears, cold cracks, gas holes
Principles and methods used to produce steel forgings	Deformations, strengthening mechanisms, annealing
Principles of mechanical testing	Impact, tensile, hardness testing

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Non-destructive testing

MEM30007A Select common engineering materials

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers recognising common materials used in engineering, assisting in the selection of a material for a specific application, and using test results to evaluate the properties of materials.

Application of the Unit

Application of the unit	This unit applies to technician level activities in manufacturing and engineering environments. Work is carried out under supervision. **Band**: **0** **Unit Weight**: **0**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify common engineering materials by their principal properties	1.1. The principal properties of ferrous and non-ferrous metals are identified. 1.2. The principal properties of thermosetting and thermoplastic polymers are identified. 1.3. The principal properties of ceramics and composite materials are identified. 1.4. The effects of different types of bonding in materials are identified. 1.5. The effects of mechanical and thermal processes on the principal properties of materials are identified.
2. Select materials for specific applications	2.1. The engineering requirement for the specific application is determined in consultation with others. 2.2. Material is selected based on the requirement and consideration of principal properties and further processing. 2.3. Selection is confirmed according to standard operating procedures.
3. Verify selected material as fit for purpose	3.1. Appropriate tests for the required properties are identified. 3.2. Testing of materials is arranged with appropriate persons, if necessary. 3.3. Test results are analysed and material choices are

ELEMENT	PERFORMANCE CRITERIA
	confirmed or modified as appropriate.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • undertaking research • selecting/carrying out tests appropriate to the material • communicating • documenting • planning and sequencing operations • reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents
Required knowledge

Look for evidence that confirms knowledge of:
• classification of materials:
  • metals and non-metals
  • ferrous and non-ferrous metals
  • polymers (thermoplastics, thermosetting and elastomers)
  • ceramics
  • composite materials
• structure of materials
• physical properties of materials:
  • electrical conductivity/resistivity
  • specific gravity/density
  • thermal conductivity/expansion
  • specific heat
  • melting/boiling points
• magnetic properties
• optical properties
• mechanical properties:

REQUIRED SKILLS AND KNOWLEDGE

- strength - yield, tensile, compressive
- stress/strain data
- hardness
- toughness (impact and slow strain)
- elasticity
- plasticity
- ductility
- malleability
- fatigue
- creep

- chemical properties:
  - corrosion of metals, corrosion processes, mechanisms
  - degradation of polymers
- materials testing methods - destructive testing and applications:
  - tensile
  - compressive
  - shear
  - torsion
  - hardness
  - impact
  - fatigue
  - creep
  - visual
  - corrosion testing
- engineering materials
- engineering applications of ferrous metals:
  - cast irons
  - carbon and alloy steels
  - stainless steels
- engineering applications of non-ferrous metals:
  - aluminium and its alloys
  - copper, brass and bronze
  - nickel alloys, zinc, titanium
  - magnesium
  - refractory metals
- engineering applications of polymers:
  - thermosetting polymers
  - thermoplastic polymers

REQUIRED SKILLS AND KNOWLEDGE

• ceramics and glasses
• effects of mechanical and thermal processes on the properties of materials:
  • casting
  • forging, rolling and extrusion
  • cold forming
  • powder processes
  • heat treatment
  • joining - fasteners
  • soldering
  • brazing
  • welding
  • adhesives
  • finishing - coatings, metallic and non-metallic
• hazards and control measure associated with selecting common engineering materials, including housekeeping
• safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to select common engineering materials.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this

EVIDENCE GUIDE	
	unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with selecting common engineering materials, or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning should not require language, literacy and numeracy skills beyond those required in this unit. The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Common engineering materials	Includes ferrous metals, cast irons, carbon and alloy steels, stainless steels, coated steels, non-ferrous metals, aluminium and its alloys, copper and its alloys, nickel alloys, zinc, titanium, magnesium, refractory metals, polymers,

RANGE STATEMENT	
	thermosetting polymers, thermoplastic polymers, ceramics and glasses
Appropriate tests	Tests which can be undertaken by a technician within the organisation as well as those required to be undertaken by external organisations, including simple tests
Required properties	Properties to be tested include tensile strength, compression, shear characteristics, torsion, hardness, impact resistance, fatigue resistance, creep resistance, visual appearance and colour, magnetic properties, corrosion resistance
Appropriate persons	Internal technicians and/or external organisations

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Engineering technician

MEM30012A Apply mathematical techniques in a manufacturing engineering or related environment

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers applies the *concepts of mathematics* to appropriate and simple engineering situations within the individual's area of engineering expertise.

Application of the Unit

Application of the unit	This unit applies to technician level work that requires basic algebraic, trigonometric and statistical knowledge and skill. **Band**: **0** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Use concepts of arithmetic in the solution of engineering problems	1.1. Units of physical quantities are converted to facilitate engineering calculations. 1.2. Calculations are performed to solve problems involving rational and irrational numbers. 1.3. Scientific notation is used to represent numbers. 1.4. Calculations are checked for reasonableness using estimating and approximating techniques.
2. Solve engineering problems involving algebraic expressions with one independent variable	2.1. Algebraic expressions are manipulated using mathematical operations in their correct order.
3. Use two-dimensional geometry to solve practical problems	3.1. Angles expressed in degrees are correctly converted to radians and vice versa. 3.2. The perimeter, area, length and angles of a range of two-dimensional figures are correctly calculated. 3.3. The volume and surface area of complex figures are correctly calculated. 3.4. Points identified in terms of cartesian coordinates can be converted to polar coordinates and vice versa.
4. Use trigonometry to solve practical	4.1. Basic trigonometry functions are used to calculate the lengths of the sides of right-angled triangles.

ELEMENT	PERFORMANCE CRITERIA
problems	4.2. Inverse trigonometry functions are used to determine angles in a right-angled triangle given the lengths of two sides. 4.3. The sine rule is used to determine the lengths of the sides of acute and obtuse angled triangles given one side and two angles. 4.4. The cosine rule is used to determine the lengths of the sides of acute and obtuse angled triangles given two sides and one angle.
5. Graph linear functions	5.1. Linear functions are solved graphically and equations of straight lines are determined from the slope and one point, or two points. 5.2. Two linear functions are solved simultaneously both algebraically and geometrically. 5.3. The length and mid point of a line segment are determined.
6. Solve quadratic equations	6.1. Quadratic equations are solved. 6.2. Simultaneous linear and quadratic equations are solved.
7. Perform basic statistical calculations	7.1. Mean, median and mode are calculated from given data. 7.2. Standard deviation is calculated and interpreted employing graphical representation.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills

Look for evidence that confirms skills in:
• using and applying mathematical formulas:
  • logical thinking
  • problem solving
  • calculating
  • applying statistics

REQUIRED SKILLS AND KNOWLEDGE
• using computer numerical methods • drawing graphs
Required knowledge
Look for evidence that confirms knowledge of: • transposing and evaluating formulae • polynomials • straight line coordinate geometry • introduction to indices • introduction to trigonometry • circular functions • trigonometry of oblique triangles • trigonometric identities • introduction to functions and their graphs

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply mathematical skills and knowledge to simple engineering applications. Evidence from tasks and projects should/may be used to complement and demonstrate integration of competency.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic

EVIDENCE GUIDE	
	workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with applying mathematical concepts to engineering applications, or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Concepts of mathematics	Include arithmetic, algebraic expressions with one independent variable, two-dimensional geometry, trigonometry, linear functions, basic quadratic functions, basic statistical methods

RANGE STATEMENT	
Correct order	Refers to the correct procedure when expanding brackets, factorising algebraic expressions, factorising quadratic expressions, simplifying algebraic fractions, transposing formulae, solving simple one variable equations, finding the quotient and remainder given a linear division
Complex figures	May include cones, pyramids, spheres, frustums and intersections of figures singularly or in combination

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Engineering technician

MSAENV272B Participate in environmentally sustainable work practices

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers the outcomes required to effectively measure current resource use and carry out improvements including those reducing negative environmental impacts of work practices. This unit is based on the sustainability guideline standard GCSSUS01A Participate in environmentally sustainable work practices.

Application of the Unit

Application of the unit	This competency applies to operators/team members who are required to follow procedures so as to work in an environmentally sustainable manner. This ensures regulatory compliance and also aims at minimising environmental risks and maximises the environmental performance of the process and the organisation. It includes: • Resources used • Potential environmental hazards • Improving environmental performance (within scope of competency and authority). This competency applies to all sectors of the manufacturing industry and members of its value chain. It may also be applied to all sections of an organisation, including office, warehouse etc. This unit will need to be appropriately contextualised as it is applied across an

	organisation and across different industry sectors.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	This unit has **no** prerequisites	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Identify current resource use and environmental issues.	1.1. Identify workplace ***environmental and resource efficiency issues***. 1.2. Identify resources used in own work role. 1.3. ***Measure*** and record current usage of resources using ***appropriate techniques***.

ELEMENT	PERFORMANCE CRITERIA
	1.4. Identify and report workplace environmental hazards to appropriate personnel.
2. Comply with environmental regulations.	2.1. Follow ***procedures*** to ensure ***compliance***. 2.2. Report environmental **incidents** to appropriate personnel.
3. Seek opportunities to improve environmental practices and resource efficiency.	3.1. Follow ***enterprise plans*** to improve environmental practices and resource efficiency. 3.2. Make ***suggestions*** for improvements to workplace practices in own work area.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Required skills include the ability to: • report as required by procedures • follow procedures and instructions and respond to change • ask questions and seek clarifications relating to work requirements Reading and writing is required in order to interpretrequired procedures and complete required workplace forms/reports. Numeracy is required to interpret numeric workplace information, readings and measurements, handle data as required and complete numeric components of workplace forms/reports.
Required knowledge
Competency includes sufficient knowledge to: • have a basic understanding of sustainability • know the environmental hazards/risks, resource use and inefficiencies associated with own workplace (at an appropriate level) • know the relevant environmental and resource efficiency systems and procedures for own work area • know the impact of laws and regulations to a level relevant to the work context

Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competence in this unit must be able to provide evidence of the ability to follow workplace procedures according to instructions given and to participate in the improvement of environmental and resource efficient work practices at own level of responsibility. Evidence must be strictly relevant to the particular workplace role.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to: • identify and measure resources used in their job • identify situations likely to lead to an environmental incident • follow procedures related to environmental performance. Consistent performance should be demonstrated. For example, look to see that: • work is routinely to procedures • the minimum of resources is used consistent with the job requirements, good practice and the procedures.
Context of and specific resources for assessment	Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge. Depending on the selected methods of assessment access may be required to: • workplace procedures and plans • documentation in relation to production, waste, overheads, hazard control/management • reports from supervisors/managers • case study/scenarios
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed: • by demonstration in the workplace

EVIDENCE GUIDE	
	• using targeted questioning for appropriate portions • by use of a suitable simulation and/or a range of case studies/scenarios • by a combination of these techniques. In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment.
Guidance information for assessment	Assessors need to be aware of any cultural issues that may affect responses to questions. Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Procedures	All operations are performed in accordance with procedures including all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.
Environmental and resource efficiency issues	Environmental and resource efficiency issues include minimisation of environmental risks and maximisation of opportunities to improve business environmental performance and to promote more efficient production and consumption of natural resources, for example by: • minimisation of waste, through implementation of the waste management hierarchy

RANGE STATEMENT	
	• efficient and effective use of energy and other resources • seeking alternative sources of energy • efficient use of materials and appropriate disposal of waste • use of controls to minimise the risk of environmental damage from hazardous substances • efficient water use • reducing emissions • life cycle analysis applied to issues such as energy supply, materials, transport, production
Measure	Measure should be interpreted in a manner consistent with the scope of the job and may include things like: • counting the number of items entering/leaving a work area • reading indicators in the work area • obtaining relevant information from support personnel • other simple means
Appropriate techniques	Appropriate techniques include: • material fed to/consumed by plant/equipment • plant meters and gauges • job cards including kanbans • examination of invoices from suppliers • measurements made under different conditions • examination of relevant information and data.
Compliance	Compliance includes meeting relevant federal, state and local government laws, by-laws, regulations and mandated codes of practice. It also includes any codes and standards that the enterprise applies voluntarily.
Incidents	Incidents include: • breaches or potential breaches of regulations • occurrences outside of standard procedure which may lead to lower environmental performance.
Enterprise plans	Enterprise plans include:

RANGE STATEMENT	
	• documented policies and procedures • work plans to minimise waste, increase efficiency of water/energy use, minimise environmental hazards
Suggestions	Suggestions include ideas that help to: • prevent and minimise environmental risks and maximise opportunities • reduce emissions of greenhouse gases • reduce use of non-renewable resources • improve energy efficiency • increase use of renewable, recyclable, reusable and recoverable resources • reduce waste • increasing the reusability/recyclability of wastes/products • reduce water usage and/or water wastage.

Unit Sector(s)

Unit sector	

Competency field

Competency field	Competitive manufacturing tools

Co-requisite units

Co-requisite units		

MSAENV472B Implement and monitor environmentally sustainable work practices

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers the outcomes required to effectively analyse the workplace in relation to environmentally sustainable work practices and to implement improvements and monitor their effectiveness. This unit is based on the sustainability guideline standard GCSSUS02A Implement and monitor environmentally sustainable work practices.

Application of the Unit

Application of the unit	This competency applies to those who have responsibility for a specific area of work or who lead a work group or team. It addresses the knowledge, processes and techniques necessary to implement and monitor environmentally sustainable work practices, including the development of processes and tools. It includes: • Identifying areas for improvement • Developing plans to make improvements • Implementing and monitoring improvements in environmental performance. This competency applies to all sectors of the manufacturing industry and members of its value chain. It may also be applied to all sections of an organisation, including office, warehouse etc. This unit will need to be appropriately contextualised as it is applied across an organisation and across different industry sectors.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	This unit has **no** prerequisites	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Investigate current practices in relation to resource usage.	1.1 Identify environmental regulations applying to the enterprise. 1.2 Assess procedures for assessing ***compliance*** with environmental regulations. 1.3 Collect information on environmental and resource efficiency systems and procedures, and provide to the work group where appropriate. 1.4 Measure and record current resource usage by members of the work group.

ELEMENT	PERFORMANCE CRITERIA
	1.5 Analyse and record current purchasing strategies. 1.6 Analyse current work processes to access information and data and assist in identifying areas for improvement.
2. Set targets for improvements.	2.1 Seek input from stakeholders, key personnel and specialists. 2.2 Access external sources of information and data as required. 2.3 Evaluate alternative solutions to workplace environmental issues. 2.4 Set efficiency targets.
3. Implement performance improvement strategies.	3.1 Source ***techniques***/***tools*** to assist in achieving targets. 3.2 Apply continuous improvement strategies to own work area of responsibility and communicate ideas and possible solutions to the work group and management. 3.3 Integrate environmental and resource efficiency improvement plans for own work group with other operational activities and implement them. 3.4 Seek suggestions and ideas about environmental and resource efficiency management from stakeholders and act upon them where appropriate. 3.5 Implement costing strategies to fully value environmental assets.
4. Monitor performance.	4.1 Document outcomes and communicate reports on targets to key personnel and stakeholders. 4.2 Evaluate strategies. 4.3 Set new targets and investigate and apply new tools and strategies. 4.4 Promote successful strategies and reward participants where possible.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Required skills include:

REQUIRED SKILLS AND KNOWLEDGE
• using relevant environmental and resource efficiency systems, tools and procedures • applying quality assurance systems relevant to own work area • applying relevant supply chain procedures • measurement and calculation techniques • communication/consultation skills to ensure information is supplied to the work group Reading and writing is required to comprehend documentation and interpret environmental and energy efficiency requirements and to document and maintain records Numeracy is required to interpret numeric workplace information, readings and measurements, handle data as required and complete numeric components of workplace forms/reports.
Required knowledge
Required knowledge includes: • how to access and use relevant environmental and resource efficiency systems, tools and procedures • understanding of best practice approaches relevant to own area of responsibility • strategies to maximise opportunities and minimise impacts relevant to own work area • relevant environmental and resource efficiency issues specific to industry practices • methods for measuring and calculating resource usage

Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competence in this unit must be able to provide evidence of the ability to implement and monitor integrated environmental and resource efficiency management policies and procedures within an organisation.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

EVIDENCE GUIDE	
	• monitor and investigate current resource usage • develop plans to improve sustainability • implement environmental improvements. Consistent performance should be demonstrated. For example, look to see that: • environmental performance is routinely monitored and investigated • areas for improvements are followed through and the implemented changes are in turn monitored and investigated.
Context of and specific resources for assessment	This section should be read in conjunction with the range of variables for this unit of competency. Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required. Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed: • by demonstration in the workplace • using targeted questioning for appropriate portions • through use of specific project(s) • by use of a suitable simulation and/or a range of case studies/scenarios • by a combination of these techniques. In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or

EVIDENCE GUIDE	
	similar assessment.
Guidance information for assessment	Assessors need to be aware of any cultural issues that may affect responses to questions. Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Procedures	All operations are performed in accordance with procedures. Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards. Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Environmental and resource efficiency issues	Environmental and resource efficiency issues include:
	
	• addressing environmental and resource sustainability initiatives such as Environmental Management Systems, action plans, surveys and audits
	• reference to standards, guidelines and approaches such as:
	  • ISO 14001 Environmental Management Systems
	  • Life Cycle Analyses

RANGE STATEMENT	
	• Cradle to cradle • Global Reporting Initiative • Ecological footprinting • Triple Bottom Line reporting • Product Stewardship • determining enterprise's most appropriate waste treatment including waste to landfill, recycling, re-use and wastewater treatment • applying the waste management hierarchy in the workplace • initiating and/or maintaining appropriate enterprise procedures for operational energy consumption, including stationary energy and non stationary (transport) • efficient use of water • minimising greenhouse gas emissions • use of controls to minimise the risk of environmental damage from hazardous substances
Measure	Measuring techniques include: • material fed to/consumed by plant/equipment • plant meters and gauges • job cards including kanbans • examination of invoices from suppliers • measurements made under different conditions • examination of relevant information and data • others as appropriate to the specific industry contexts.
Techniques and tools	Techniques and tools may includeÂ : • visual workplace concepts • measurement, display and/or recording devices • changed work practices/procedures • competence development and awareness training • process and equipment items
Compliance	Compliance includes meeting relevant federal, state and local government laws, by-laws, regulations and codes of practice.
Incidents	Incidents include:

RANGE STATEMENT	
	• breaches or potential breaches of regulations • occurrences outside of standard procedure which may lead to lower environmental performance
Purchasing strategies	Purchasing strategies include: • influencing suppliers to take up environmental sustainability • selecting materials/components with a lower environmental profile.
Stakeholders, **key personnel and specialists**	Stakeholders, key personnel and specialists include individuals and groups both inside and outside the organisation that have some direct interest in the enterprise's conduct, actions, products and services, including: • employees at all levels of the organisation • customers • suppliers • other organisations • key personnel within the organisation, and specialists outside it who may have particular technical expertise
Suggestions	Suggestions includes ideas that help to: • prevent and minimise environmental risks and maximise opportunities • reduce emissions of greenhouse gases • reduce use of non-renewable resources • make more efficient use of energy, water and other resources • maximise opportunities to re use and recycle materials • identify strategies to offset or mitigate environmental impacts. e.g. purchasing of carbon credits • express purchasing power through the selection of suppliers with improved environmental performance. e.g. purchasing renewable energy and materials with lower embedded carbon • eliminate the use of hazardous and toxic materials increasing the reusability/recyclability of wastes/products.

Unit Sector(s)

Unit sector	

Competency field

Competency field	Competitive manufacturing tools

Co-requisite units

Co-requisite units		

MSAENV672B Develop workplace policy and procedures for environmental sustainability

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers the outcomes required to develop and implement a workplace sustainability policy, including the modification of the policy to suit changed circumstances. This unit is based on the sustainability guideline standard GCSSUS03A Develop workplace policy and procedures for sustainability.

Application of the Unit

Application of the unit	This competency applies to team leaders/supervisors/managers who are required to develop approaches to environmental sustainability within workplaces, including the development and implementation of policy. It includes: • Communicating with relevant stakeholders • Developing and monitoring sustainability policies • Reviewing and improving sustainability policies. This competency applies to all sectors of the manufacturing industry. It may also be applied to all sections of an organisation, including office, warehouse etc. This unit will need to be appropriately contextualised as it is applied across an organisation and across different industry sectors.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	This unit has **no** prerequisites	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Develop workplace sustainability policy.	1.1 Define ***scope of sustainability policy***. 1.2 Identify and consult ***stakeholders*** as a key component of the policy development process. 1.3 Review environmental sustainability ***strategies*** relevant to all stages of work covered by the policy 1.4 Make recommendations for policy options based on likely effectiveness, timeframes and cost. 1.5 Develop policy is that reflects the organisation's commitment to sustainability as an integral part of the

ELEMENT	PERFORMANCE CRITERIA
	business planning and as a business opportunity. 1.6 Agree upon appropriate methods of implementation.
2. Communicate the policy.	2.1 Promote the policy, including its expected outcome to key stakeholders. 2.2 Inform those involved in implementing the policy as to outcomes expected, activities to be undertaken and responsibilities assigned.
3. Implement the policy.	3.1 Develop and communicate procedures to help implement the policy. 3.2 Implement ***strategies*** for continuous improvement in resource efficiency. 3.3 Establish record systems for tracking continuous improvements in sustainability approaches and assign responsibilities.
4. Review policy implementation	4.1 Record outcomes and provide feedback to key personnel and stakeholders. 4.2 Investigate success or otherwise of policy. 4.3 Monitor records to identify trends that may require remedial action, and use to promote continuous improvement of performance. 4.4 Modify policy and or ***procedures*** as required to ensure improvements are made.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- developing and implementing systems and procedures to aid in the achievement of sustainability in the workplace
- applying quality assurance systems relevant to own enterprise
- accessing and applying other relevant enterprise polices, procedures and protocols
- relevant industry competency
- interpreting business/strategic plans

This unit requires the ability to:

REQUIRED SKILLS AND KNOWLEDGE
• read and evaluate complex and formal documents such as policy and legislation • research, analyse and present information • prepare written reports requiring precision of expression and language and structures suited to the intended audience • adjust communication to suit different audiences • deal with different points of view and dissenting stakeholders.
Required knowledge
Required knowledge includes: • understanding of relevant policy development and implementation processes and practices • understanding of the principles, practices and available tools and techniques of sustainability management relevant to the particular industry context • best practice approaches relevant to own work area • equal employment opportunity, equity and diversity principles and occupational health and safety implications of policy/s being developed

Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competence in this unit must be able to provide evidence of the ability to develop and implement integrated sustainability policies and procedures within an enterprise. The review of the policy after implementation will also need to be evidenced.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to: • develop relevant policy and procedures that comply with the regulatory requirements and business plans • develop a workable implementation strategy • include measurable criteria for reviewing improvement. Consistent performance should be demonstrated. For

EVIDENCE GUIDE	
	example, look to see that: • policy implementation is reviewed • policy is developed to be become part of the routine practices of the organisation.
Context of and specific resources for assessment	This section should be read in conjunction with the range of variables for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required. Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.
Method of assessment	Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge. A holistic approach should be taken to the assessment. Competence in this unit may be assessed: • by demonstration in the workplace • using targeted questioning for appropriate portions • through use of specific project(s) • by use of a suitable simulation and/or a range of case studies/scenarios • by a combination of these techniques. In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment.
Guidance information for assessment	Assessors need to be aware of any cultural issues that may affect responses to questions. Assessment processes and techniques must be culturally

EVIDENCE GUIDE	
	appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Procedures	All operations are performed in accordance with procedures. Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards. Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Scope of sustainability policy	Scope of sustainability policy include:
	• The area/s of environmental sustainability to be targeted and whether social and economic sustainability will be incorporated
	• The parts of the enterprise to which it is to apply, including whether it is for the whole enterprise, one site, one work area or combinations of these
	• An investigation of the particular business and market context of the industry/ enterprise
	• Addressing sustainability initiatives through reference to standards, guidelines and approaches such as:
	  • ISO 14001 Environmental Management Systems
	  • Life Cycle Analyses

RANGE STATEMENT	
	• Cradle to grave/cradle to cradle • Global Reporting Initiative • Ecological Footprint Assessment • Triple Bottom Line reporting • Product Stewardship.
Stakeholders	Stakeholders include individuals and groups both inside and outside the organisation that have some direct interest in the enterprise's conduct, actions, products and services, including: • employees at all levels of the organisation • customers • suppliers • regulators • other organisations.
Strategies	Implementation strategies include: • awareness raising among stakeholders • training of staff in principles and techniques of sustainability • promotional activities. Continuous improvement strategies include ongoing measuring, improving and monitoring such as: • Plan, do, check, act cycles • Kaizen (continuous improvement) • Kaizen blitz (breakthrough improvement event) • Six sigma approaches Environmental sustainability strategies include: • reducing toxic material and hazardous chemical use • minimising resource use through changes in processes, facility design and management • supply chain and life cycle management approaches • sourcing renewable energy and low carbon footprint materials • reducing, re-using, recycling and waste

RANGE STATEMENT	
	reduction • product and process improvements • carbon offsets • reducing greenhouse gas and other emissions

Unit Sector(s)

Unit sector	

Competency field

Competency field	Competitive manufacturing tools

Co-requisite units

Co-requisite units		

PMBPROD262B Operate tyre curing equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the operation of tyre curing equipment in a tyre manufacturing plant or retreading situation where the 'green' tread is laid on the tyre casing.

Application of the Unit

Application of this unit

This competency applies to operators who are involved in curing 'green' tyres and 'hot cap' retreads (ie retreads made using green treads), assembled from a number of intermediate components and stored. This competency is typically performed by operators working independently.

The operator:

- takes product off machine
- checking product for quality and conformity to specifications
- checks raw material feed
- notices any problems and takes required action (eg reporting)
- deal with non-conforming products, waste and scrap
- complete logs and reports.

This unit does not include the use of pre-cured treads - see *PROD263A Operate retread curing equipment*

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has **no** prerequisites.

Employability Skills Information

Employability Skills

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes of a unit of competency	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
ELEMENT	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
1. Check work requirements.	1.1 Identify work requirements from production plan or request. 1.2 Check product, materials and equipment meet requirements for job(s). 1.3 Recognise requirements which may not be in accordance with usual practice. 1.4 Ask questions of appropriate person to confirm unusual practice. 1.5 Identify hazards associated with the job and take appropriate action. 1.6 Perform other pre-operational checks in accordance with procedures.
2. Start up tyre curing equipment to procedures.	2.1 Conduct pre-start checks. 2.2 Start up tyre curing equipment.
3. Operate equipment to procedures.	3.1 Start machine safely and correctly when required. 3.2 Check process is operating within required limits.

ELEMENT ELEMENT	PERFORMANCE CRITERIA Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
	3.3 Check product is in specification and to required quality standard. 3.4 Ensure product is consistently ready for next operation. 3.5 Maintain supply of material(s) as required. 3.6 Complete logs and records when as required. 3.7 Collect and segregate scrap, trim and other materials as required in accordance with procedures. 3.8 Keep equipment and work area clean area in accordance with procedures. 3.9 Pause machine cycle and perform emergency stop, as required by procedures.
4. Respond to routine problems in accordance with procedures.	4.1 Recognise known faults that occur during the operation. 4.2 Identify and take action on causes of routine faults. 4.3 Log problems as required. 4.4 Identify non-routine process and quality problems and take appropriate action.

Required Skills and Knowledge

This describes the essential skills and knowledge and their level required for this unit.

Application of an operational knowledge of the materials, equipment and process sufficient to recognise out of specification products, process problems and materials faults. For example temperature measurements are essential for curing of tyres, where the temperature must be kept constant during the process. Monitoring the temperature inside the mould is too difficult; therefore the temperature of the condensate is monitored using specialised equipment.

Knowledge of organization procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.

Application of the knowledge of managing risks using the hierarchy of controls applied to the tyre curing process. Application of approved hazard control and safety procedures and the use of PPE in relation to handling materials, equipment operation and cleanup.

Knowledge of and skills in the operation of tyre curing equipment and main components sufficient for consistent production of quality products including:

- production workflow sequences and materials demand
- the reasons for checking process control panels and reporting readings which are outside of normal range of process variability
- accurately monitoring equipment operation and product quality
- the potential effects of variations in raw materials and equipment operation in relation to quality of product
- processing behaviour of polymers and the role of additives
- waste management and knowing the importance of reusing non-conforming products wherever possible
- correct selection and use of equipment, materials, processes and procedures
- explain the effect of unauthorised or emergency shutdown in relation to safety and production requirements
- identify factors which may affect product quality or production output and appropriate remedies.

Competence also includes the ability to:

- plan own work, including predicting consequences and identifying improvements
- identify when the operator is able to rectify faults, when assistance is required and who is the appropriate source for assistance
- identify and describe own role and role of others involved directly in the curing process.

Language, **literacy and numeracy requirements**

This unit requires the ability to read and interpret typical product specifications, job sheets, procedures, material labels and safety information as provided to operators.

Writing is required to the level of completing workplace forms.

Basic numeracy is required, eg to determine that two 25 kg bags are needed to make up a requirement for 50 kg.

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, required skills and knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

Overview of assessment

A holistic approach should be taken to the assessment.

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- apply the required skills and knowledge to operate a tyre curing machine
- apply approved procedures.

Consistent performance should be demonstrated. For example, look to see that:

- tyre curing production standards are met consistently
- all safety procedures are followed.

Assessment method and context

Assessment will occur on an industrial curing machine(s) equipment and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- by using an appropriate, industrial tyre curing machine requiring demonstration of operation and emergency stop procedures
- in a situation allowing for the generation of evidence of the ability to respond to problems
- by using a suitable simulation and/or a range of case studies/scenarios
- through a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Specific resources for assessment

This section should be read in conjunction with the Range Statement for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

Range Statement

RANGE STATEMENT

The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts.

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Context

This competency unit includes curing operations.

This competency applies to all work environments within the tyre manufacture sector. It also includes the operation of all relevant ancillary equipment.

Procedures

All operations are performed in accordance with procedures.

Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

Tools and equipment

This competency includes use of equipment and tools such as:

- curing press (eg bagomatic, collapsible bladder or shear strip, solid bladder
- ancillary equipment (eg screens/strainers, computer data systems, ball float steam traps, condensate temperature and steam trap monitoring system)
- curing agents (eg sulphur sources, peroxides, metal oxides, amines, and phenolic resins)
- relevant personal protective equipment.

Hazards

Typical hazards include:

- manual handling
- noise
- humidity
- temperatures (eg from air and steam)
- fumes/vapours (eg from curing agents)
- cleaning equipment (eg screens/strainers)
- stationary and moving machinery.

Problems

'Respond to routine problems' means 'apply known solutions to a limited range of predictable problems'. Typical process problems may include:

- poorly aligned guides
- mould incorrectly placed on machine
- poor mould closure/alignment
- poorly prepared mould (dirty/mould release)
- incorrect temperature settings
- mould temperature/steam pressure/air blinded/waterlogged
- mould/air pressure.

Typical product problems may include:

- contaminated green tyres
- squashed or distorted green tyres
- scorched rubber
- curing time/cycle

- product
- excessive trim/spue
- out of round/eccentric.
-

Unit Sector(s)

Not applicable.

PMBPROD263B Operate retread curing equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the operation of tyre curing equipment in retreading workplaces where pre-vulcanised tread is laid on the retread tyre.

Application of the Unit

Application of this unit

This competency applies to operators who are involved in curing retread tyres assembled from a prepared carcass and a pre-vulcanised tread. This competency is typically performed by operators working independently.

The operator:

- takes product off the machine
- checking product for quality and conformity to specifications
- checks raw material feed
- notices any problems and takes required action (eg reporting)
- deal with non-conforming products, waste and scrap
- complete logs and reports.

This unit does not include retread processes where the green extruded tread is laid onto the buffed casing. This unit also does not include:

- inspection - see *PROD324 Inspect tyres for retreading*
- preparation - see *PROD266 Prepare tyre casings for retreading*
- laying retreads - see *PROD325A Lay on tyre retreads*
-

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has **no** prerequisites.

Employability Skills Information

Employability Skills

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes of a unit of competency	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
ELEMENT	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
1. Check production plan.	1.1 Identify work requirements from production plan or request. 1.2 Check product, materials and equipment meet requirements for job(s). 1.3 Recognise requirements which may not be in accordance with usual practice. 1.4 Ask questions of appropriate person to confirm unusual practice 1.5 Identify hazards associated with the job and take appropriate action. 1.6 Perform other pre-operational checks in accordance with procedures.
2. Prepare retreads for	2.1 Check stretch height and roundness of tyres.

ELEMENT ELEMENT	PERFORMANCE CRITERIA Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
curing to procedures.	2.2 Insert equipment used to pressurise inside of tyre to specifications. 2.3 Place tyre within rubber envelope.
3. Start up retread curing equipment to procedures.	3.1 Conduct pre-start checks. 3.2 Start up retread curing equipment.
4. Operate equipment to procedures.	4.1 Check process is operating within required limits. 4.2 Check product is in specification and to required quality standard. 4.3 Ensure product is consistently ready for next operation. 4.4 Maintain supply of material(s) as required. 4.5 Complete logs and records as required. 4.6 Collect and segregate scrap, trim and other materials as required. 4.7 Keep equipment and work area clean. 4.8 Pause machine cycle and perform emergency stop, as required.
5. Respond to routine problems in accordance with procedures.	5.1 Recognise known faults that occur during the operation. 5.2 Identify and take action on causes of routine faults. 5.3 Log problems as required. 5.4 Identify non-routine process and quality problems and take appropriate action.

Required Skills and Knowledge

This describes the essential skills and knowledge and their level required for this unit.

Application of an operational knowledge of the materials, equipment and process sufficient to recognise out of specification products, process problems and materials faults. For example high pressure is required to secure the retread and cushion gum to the casing to ensure adequate bonding. Therefore the correct amount of pressure applied by such equipment as envelopers and sealing rings needs to be monitored.

Knowledge of organisation procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.

Application of the knowledge of managing risks using the hierarchy of controls applied to the retread curing process. Application of approved hazard control and safety procedures and the use of PPE in relation to handling materials, equipment operation and cleanup.

Knowledge of and skills in the operation of retread curing equipment and main components sufficient for consistent production of quality products including:

- production workflow sequences and materials demand
- the reasons for checking process control panels and reporting readings which are outside of normal range of process variability
- accurately monitoring equipment operation and product quality
- the potential effects of variations in raw materials and equipment operation in relation to quality of product
- processing behaviour of polymers and the role of additives
- waste management and knowing the importance of reusing non-conforming products wherever possible
- correct selection and use of equipment, materials, processes and procedures
- explain the effect of unauthorised or emergency shutdown in relation to safety and production requirements
- identify factors which may affect product quality or production output and appropriate remedies.

Competence also includes the ability to:

- plan own work, including predicting consequences and identifying improvements
- identify when the operator is able to rectify faults, when assistance is required and who is the appropriate source for assistance
- identify and describe own role and role of others involved directly in the retreading process.

Language, **literacy and numeracy requirements**

This unit requires the ability to read and interpret typical product specifications, job sheets, procedures, material labels and safety information as provided to operators.

Writing is required to the level of completing workplace forms.

Basic numeracy is required, e.g. to determine that two 25 kg bags are needed to make up a requirement for 50 kg.

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, required skills and knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

Overview of assessment

A holistic approach should be taken to the assessment.

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- apply the required skills and knowledge to operate retread curing equipment
- apply approved procedures.

Consistent performance should be demonstrated. For example, look to see that:

- retread curing production standards are met consistently
- all safety procedures are followed.

Assessment method and context

Assessment will occur on an industrial retread curing machine(s) equipment and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- by using appropriate, industrial retread curing equipment requiring demonstration of operation and emergency stop procedures
- in a situation allowing for the generation of evidence of the ability to respond to problems
  - by using a suitable simulation and/or a range of case studies/scenarios
  - through a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Specific resources for assessment

This section should be read in conjunction with the Range Statement for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

Range Statement

RANGE STATEMENT

The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts.

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Context

This competency unit includes curing operations in retreading operations. Curing is mainly of bonding agents.

This competency applies to most work environments within the tyre retreading sector, but does not include retread processes where the green extruded tread is laid onto the buffed casing. It includes the operation of all relevant additional equipment where that equipment is integral to the retreading process.

Procedures

All operations are performed in accordance with procedures.

Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

Tools and equipment

This competency includes use of equipment and tools such as:

- autoclave (such as electric and steam curing chambers)
- envelopers
- sealing rings
- prepared casings
- relevant personal protective equipment.

Hazards

Typical hazards include:

- manual handling
- noise
- humidity
- temperatures (such as from air and steam)
- fumes/vapours
- hazards from high pressures
- stationary and moving machinery, parts and components

Problems

'Respond to routine problems' means 'apply known solutions to a limited range of predictable problems'. Typical process problems may include:

- equipment malfunction
- high humidity in curing oven
- air not being extracted properly from the envelope
- air blinding of steam equipment
- material contamination
- contaminated treads
- poorly prepared/contaminated casing
- poor quality bonding material
- curing time/cycle
- incorrect temperature settings
- incorrect air pressure settings.

Typical product problems may include:

- poor product finish
- poor binding of retread to buffed casing
- excessive trim/spue
- out of round/eccentric.
-

Unit Sector(s)

Not applicable.

PMBPROD264C Check recycle wash process

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the use of recycle wash equipment and checking of the process.

Application of the Unit

Application of this unit

This competency applies to operators who are required to use recycle wash equipment and checking of the process. This competency is typically performed by operators working either independently or as part of a work team.

The operator will:

- discuss work progress with other team members
- ensure appropriate raw materials are available
- check the operation of the process
- check product for quality and conformity to specifications
- complete logs and reports.
-

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has **no** prerequisites.

Employability Skills Information

Employability Skills

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes of a unit of competency	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
ELEMENT	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
1. Check work requirements.	1.1 Identify work requirements from workplace approved operating procedures. 1.2 Recognise requirements which may not be in accordance with usual practice. 1.3 Ask questions of appropriate person to confirm unusual practice. 1.4 Ensure housekeeping is to requirements. 1.5 Identify hazards associated with the job and take appropriate action.
2. Conduct pre-checks as required.	2.1 Inspect and sample products in line with workplace procedures. 2.2 Check equipment components and component function is to the required quality standard. 2.3 Check and test fluid circuits, pumps, shutoffs and control valves.
3. Operate recycle washer equipment in accordance with procedures.	3.1 Start machine safely and correctly when required. 3.2 Check process is operating with required limits. 3.3 Collect product samples and store. 3.4 Check product is in specification / to required quality standard. 3.5 Maintain supply of material(s) as required.

ELEMENT ELEMENT	PERFORMANCE CRITERIA Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
	3.6 Complete logs and records as required. 3.7 Collect and reprocess/discard scrap/trim and other materials in accordance with workplace procedures. 3.8 Check readouts against standard statistical process information and enter production data into the control system. 3.9 Keep equipment and work area clean. 3.10 Pause machine cycle and perform emergency stop, as required.
4. Identify product quality requirements.	4.1 Check process and note conditions which may affect product quality standards. 4.2 Interpret reports from quality inspections and rectify or report as appropriate equipment conditions within workplace procedures. 4.3 Note and implement authorised changes in standard operating procedures and specifications.
5. Respond to routine problems in accordance with procedures.	5.1 Recognise known faults that occur during the operation. 5.2 Identify and take action on causes of routine faults. 5.3 Log problems as required. 5.4 Identify non-routine process and quality problems and take appropriate action.

Required Skills and Knowledge

This describes the essential skills and knowledge and their level required for this unit.

Application of knowledge of the materials, equipment and process sufficient to recognise out of specification products, process problems and materials faults.

A knowledge of organisation procedures, relevant regulatory requirements and the ability to implement them within appropriate time constraints and work standards.

Application of the knowledge of managing risks using the hierarchy of controls applied to the recycle wash process. Application of approved hazard control and safety procedures and the use of PPE in relation to handling materials, equipment operation and cleanup.

Knowledge of and skills in the operation of recycle wash equipment and its main components sufficient for consistent production of quality products including:

- impact of incorrect or faulty materials
- focus of operation of work systems and equipment
- hazards of the materials and process and appropriate hazard control procedures
- accurately monitor equipment operation
- identify factors which may affect product quality or production output and appropriate remedies
- explain the effect of unauthorised or emergency shutdown in relation to safety and production requirements.

Competence also includes the ability to:

- plan own work, including predicting consequences and identifying improvements
- identify when the operator is able to rectify problems, when assistance is required and who is the appropriate source for assistance
- identify and describe own role and role of others involved directly in the recycle wash process.

Language, **literacy and numeracy requirements**

This unit requires the ability to read and interpret typical product specifications, job sheets, procedures, material labels and safety information as provided to operators.

Writing is required to the level of completing workplace forms.

Basic numeracy is required, eg to determine that two 25 kg bags are needed to make up a requirement for 50 kg.

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, required skills and knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

Overview of assessment

A holistic approach should be taken to the assessment.

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- apply the required skills and knowledge to operate recycle wash equipment
- apply approved procedures.

Consistent performance should be demonstrated. For example, look to see that recycle wash standards are met consistently.

Assessment method and context

Assessment will occur on industrial equipment and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- by using an appropriate, operating plant requiring demonstration of operation and emergency stop procedures
- in a situation allowing for the generation of evidence of the ability to respond to problems
  - by using a suitable simulation and/or a range of case studies/scenarios
  - through a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Specific resources for assessment

This section should be read in conjunction with the Range Statement for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

Range Statement

RANGE STATEMENT

The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts.

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Context

This competency applies to all work environments and sectors within the plastics industry. It includes the operation of all relevant ancillary equipment.

Procedures

All operations are performed in accordance with procedures.

Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

Tools and equipment

This competency includes use of equipment and tools such as:

- hand carts and trolleys and other manual handling aids
- knives and basic hand tools required for opening of material packaging
- hoists/lifting equipment not requiring any special permits or licences
- bung spanners and similar
- relevant personal protective equipment.

Hazards

Typical hazards include:

- spills
- hazardous materials
- moving equipment
- manual handling hazards.

Problems

'Respond to routine problems' means 'apply known solutions to a limited range of predictable problems'. Typical process and product problems may include:

- equipment malfunction
- variations in materials or contamination of materials.
- incorrect raw materials/additives
- incorrect quantity of materials/additives.

Appropriate action for non-routine problems may be reporting to designated person or other action specified in procedures.

Unit Sector(s)

Not applicable.

PMBPROD265C Operate portable vulcanising equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the application of technical expertise, work planning and problem solving to set up and operate portable vulcanising equipment.

This competency is typically performed by operators working either independently or as part of a work team.

Application of the Unit

Application of this unit

This competency applies to operators who set up and operate portable vulcanising equipment either in a production facility or an on-site work environment. The key factors are the establishment of the appropriate safe working environment, obtaining the necessary power and other supplies, conducting vulcanising operations and assessing and taking appropriate action at the end of the operations.

It includes:

- planning the curing job
- identifying hazards and applying appropriate controls
- obtaining all necessary clearances and permissions for site work
- setting up equipment and materials
- conducting vulcanising operations
- assessing the finished work and identifying and taking action on routine process problems
- completing logs and reports.
-

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has **no** prerequisites.

Employability Skills Information

Employability Skills

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes of a unit of competency	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
ELEMENT	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
1. Identify work requirements for vulcanising operations.	1.1 Identify the job and vulcaniser characteristics and product quality outcomes required. 1.2 Obtain specifications relevant to the material being vulcanised. 1.3 Identify and obtain equipment and materials required for the vulcanising process. 1.4 Identify hazards associated with the job and take appropriate action. 1.5 Check materials, ancillary supplies, and equipment for quality, access and condition. 1.6 Identify and check emergency stops, gauges, guards and controls.
2. Plan vulcanising operations.	2.1 Identify time, pressure and temperature requirements. 2.2 Plan the task sequences 2.3 Plan for waste management, maintenance and housekeeping requirements.

ELEMENT ELEMENT	PERFORMANCE CRITERIA Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
3. Prepare vulcanising equipment.	3.1 Check vulcaniser, ancillary, equipment and attachments are fit for purpose. 3.2 Set up vulcanising press according to procedures. 3.3 Set equipment control parameters to specifications. 3.4 Obtain appropriate clearances for vulcanising to commence.
4. Conduct and monitor vulcanising operations.	4.1 Start the unit and commence vulcanising. 4.2 Monitor the unit operation throughout the entire process 4.3 Note and report non-conformity to specifications to procedures. 4.4 Make adjustments as required. 4.5 Shut down unit when cycle completed. 4.6 Follow procedure to disassemble equipment as required. 4.7 Assess the outcome of the vulcanising process and take remedial action as necessary and report to the appropriate person. 4.8 Brand splice as per company policy 4.9 Clean up, lubricate and adjust equipment as required. 4.10 Complete waste removal or recycling as required.
5. Respond to routine problems to procedure.	5.1 Recognise known faults that occur during the operation. 5.2 Identify and take action on causes of routine faults. 5.3 Log problems as required. 5.4 Identify non-routine process and quality problems and take appropriate action.

Required Skills and Knowledge

This describes the essential skills and knowledge and their level required for this unit.

Application of knowledge of the materials, equipment and process sufficient to recognise out of specification products, process problems and materials faults.

Knowledge of organization procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.

Application of the knowledge of managing risks using the hierarchy of controls applied to the vulcanising process. Application of approved hazard control, safety procedures and the use of PPE in relation to handling materials, equipment operation and cleanup.

Knowledge of and skills in the operation of portable vulcanising equipment and main components sufficient for consistent production of quality products including:

- importance of correct selection and use of equipment, materials, processes and procedures
- identifying the function of vulcanising equipment, components and the materials used
- describing changes to materials during the vulcanising process
- explaining the impact of vulcanising speed, pressure, time, temperature and tension on product quality and production output
- describing the role of heat and pressure in relation to providing strength, stiffness, resistance to deformation, fatigue and abrasion
- explaining any differences in vulcanising processes and additives for natural, synthetic and mixed rubber compounds
- deciding if they (the operator) are able to rectify the fault or if assistance is required
- explaining the effect of unauthorised or emergency shutdown of equipment on the vulcanising process
- understand the underlying risks in the process and how best to manage them.

Competence includes the ability to:

- plan own work sequence, including identification of key checkpoints for equipment monitoring and product quality checks
- operate equipment and monitor product quality
- identify factors which may influence product quality and production output and appropriate remedies
- make appropriate authorised alterations to own work plan and equipment to maintain both product quality and required production output
- locate, interpret and apply relevant information and maintain workplace records
- identify and safely handle products and materials, read relevant safety information and apply safety precautions appropriate to the task.

Distinguish between causes of faults such as:

- equipment condition
- materials (eg. contaminated or wrong raw materials/additives/catalyst)
- process conditions (eg incorrect temperatures or pressures and entrapped air in the vulcanised area).

Language, **literacy and numeracy requirements**

This unit requires the ability to read and interpret typical product specifications, job sheets and material labels as provided to operators.

Writing is required to the level of completing workplace forms.

Basic numeracy is also required, eg to determine that two 25 kg bags are needed to make up a requirement for 50 kg.

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, required skills and knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

Overview of assessment

A holistic approach should be taken to the assessment.

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- understand the inherent risk associated with using a vulcaniser and the potential consequences of incorrect use
- understand procedures
- understand the importance of critical material properties and quantities
- recognise potential situations requiring action
- implement appropriate action and explain logic.

Consistent performance should be demonstrated. For example, look to see that:

- production standards are met consistently
- wire or reinforcing is not visible in the finished product
- bonding is achieved in accordance with specifications.

Assessment method and context

Assessment will occur on industrial equipment in a work-like environment.

Competence in this unit may be assessed:

- by using an appropriate, portable vulcanising equipment
- in a situation allowing for the generation of evidence of the ability to respond to problems
- by using a suitable simulation and/or a range of case studies/scenarios
- through a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Specific resources for assessment

This section should be read in conjunction with the Range Statement for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

Range Statement

RANGE STATEMENT

The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts.

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Context

This competency applies to all work environments and sectors within the rubber industry. It includes the operation of all relevant additional equipment where that equipment is integral to the vulcanising process.

Procedures

All operations are performed in accordance with procedures.

Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

Tools and equipment

This unit of competency includes use of equipment and tools such as:

- portable vulcanising equipment (including dispersion plates, pressure bags, edge bars, controllers)
- knives and other rubber cutting and shaping equipment
- hoists/lifting equipment not requiring any special permits or licences
- manual handling aids such as handcarts
- relevant personal protective equipment
- powered equipment/aids.

Hazards

Typical hazards include:

- pressure
- heat and hot rubber
- chemical splashes or spills
- dust or vapours/fumes
- manual handling hazards
- knife hazards.

Task sequences

Task sequences include:

- location of vulcaniser
- process monitoring
- quality checks.

Monitoring of vulcanisation

Monitoring of vulcanisation includes noting:

- times,
- vulcanisation quality,
- equipment operating temperatures and times
- additional pressures applied.

Problems

'Respond to routine problems' means 'apply known solutions to a limited range of predictable problems'. Typical process and product problems may include:

- incorrect vulcaniser set-up
- variations in materials
- contamination of materials
- unsuccessful vulcanising processes
- entrapped gasses
- wire or reinforcing exposure
- inappropriate material specification.

Variables

Key variables to be monitored include:

- heat
- pressure
- time
- tension.
-

Unit Sector(s)

Not applicable.

PMBPROD266B Prepare tyre casings for retreading

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the preparation (buffing) of used tyres prior to the laying on of retread. It applies to the tyre retreading sector of the industry.

Application of the Unit

Application of this unit

This competency applies to operators who buff residual tread from used tyres to prepare a carcass for laying retread. The key factors are the removal of sufficient but not excessive old rubber from the used tyre to establish a sound platform for the new tread. This competency is typically performed by operators working either independently or as part of a work team.

The operator will:

- check job sheets for work requirements
- check product for quality and conformity to specifications
- check materials required
- check machine set-up
- buff the tyre
- deal with non-conforming products, waste and scrap
- notice any problems and take required action (eg repair holes or areas where the steel radial becomes exposed)
- complete logs and reports.
-

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has **no** prerequisites.

Employability Skills Information

Employability Skills

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes of a unit of competency	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
ELEMENT	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
1. Check work requirements.	1.1 Identify work requirements from production plan. 1.2 Identify specific requirements of the tyre being retreaded 1.3 Identify required equipment including handling, buffing, inspection and repair equipment. 1.4 Ask questions of appropriate person to confirm unusual practice. 1.5 Identify hazards associated with the job and take appropriate action. 1.6 Perform other pre-operational checks in accordance with procedures.
2. Start up of tyre buffer to procedures.	2.1 Conduct pre-start checks 2.2 Start up tyre buffer.
3. Operate buffing equipment to procedures.	3.1 Start machine safely and correctly when required. 3.2 Monitor buffing operations noting process stages, depth of cut (according to standard operating procedures) and abrasion.

ELEMENT ELEMENT	PERFORMANCE CRITERIA Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
	3.3 Check against workplace standards for colour and texture before completing process. 3.4 Make adjustments to remedy non-conformity to buffing requirements. 3.5 Buzz out areas around exposed steel radials with hand held stone grinder. 3.6 Collect and reprocess/discard scrap/trim and other materials, as required. 3.7 Keep equipment and work area clean. 3.8 Pause machine cycle and perform stop, as required.
4. Repair imperfections.	4.1 Locate casing imperfections from previous inspection. 4.2 Repair casings (especially exposed steel areas) with rubber plugs in accordance with standard operating procedures. 4.3 Complete logs and records as required.
5. Complete operations.	5.1 Check casings for compliance with specifications. 5.2 Create job card, tyre ID, other tracking/information items needed as specified by procedures. 5.3 Adhere the metal tag/s to the tyre wall with uncured rubber.
6. Respond to routine problems to procedures.	6.1 Recognise known faults that occur during the operation. 6.2 Identify and take action on causes of routine faults. 6.3 Log problems as required. 6.4 Identify non-routine process and quality problems and take appropriate action.

Required Skills and Knowledge

This describes the essential skills and knowledge and their level required for this unit.

Application of knowledge of the materials, equipment and process sufficient to recognise out of specification products, process problems and materials faults.

A knowledge of organization procedures, relevant regulatory requirements and the ability to implement them within appropriate time constraints and work standards. For example the minimum allowable depth of cover over the belt before retreading.

Application of the knowledge of managing risks using the hierarchy of controls applied to the buffing process. Application of approved hazard control and safety procedures and the use of PPE in relation to handling materials, equipment operation and cleanup.

Show knowledge of and skills in the preparation of tyre casings for retreading and its main components sufficient for the consistent production of quality products including:

- different mould part types
- types of releasing agents
- role of releasing agents
- procedures
- factors which may affect product quality or production output and appropriate remedies

Competence includes knowledge of:

- production workflow sequences and materials demand
- the reasons for checking process controls
- the normal range of process variability
- the potential effects of variations in materials and equipment operation in relation to quality of product.
- purpose of the buffing and repair processes
- correct selection and use of equipment, materials, processes and procedures.

Competence also includes the ability to:

- check process controls and report readings which are outside the normal range of process variability
- identify factors which may affect product quality or production output and appropriate remedies
- recognise pre-cure retreads and cured recaps, remould retreads and the relevant procedures to buff casings for each type
- explain the effect of unauthorised or emergency shutdown in relation to safety and production requirements
- plan own work, including predicting consequences and identifying improvements
- accurately monitor equipment operation and product quality
- identify when the operator is able to rectify faults, when assistance is required and who is the appropriate source for assistance
- identify and describe own role and role of others involved directly in the preparation of tyre casing for retreading process.

Language, **literacy and numeracy requirements**

This unit requires the ability to read and interpret typical product specifications, job sheets, procedures, basic machine control panels, material labels and safety information as provided to operators.

Writing is required to the level of completing workplace forms.

Basic numeracy is required, eg to determine that two 25 kg bags are needed to make up a requirement for 50 kg.

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, required skills and knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

Overview of assessment

A holistic approach should be taken to the assessment.

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- apply the required skills and knowledge to prepare tyre casings for retreading
- apply approved procedures.

Consistent performance should be demonstrated. For example, look to see thatproduction standards are met consistently.

Assessment method and context

Assessment will occur on an industrial buffing machine(s) equipment and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- by using an appropriate, industrial tyre buffing machine requiring demonstration of operation and start/stop procedures
- in a situation allowing for the generation of evidence of the ability to respond to problems
  - by using a suitable simulation and/or a range of case studies/scenarios
  - through a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Specific resources for assessment

This section should be read in conjunction with the Range Statement for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

Range Statement

RANGE STATEMENT

The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts.

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Context

This competency unit includes the use of manual handling aids and various powered equipment/aids. This competency applies to work environments and sectors within the rubber industry. It includes the operation of all relevant ancillary equipment.

Procedures

All operations are performed in accordance with procedures.

Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards. These may include:

- movement of materials
- stacking of materials
- basic measurement of quantities
- basic pre-blending of materials.

Tools and equipment

This competency includes use of equipment and tools such as:

- hand carts and trolleys
- knives and other bag opening equipment
- hoists/lifting equipment not requiring any special permits or licences
- bung spanners and similar
- basic hand tools required for opening of material packaging
- relevant personal protective equipment.

Hazards

Typical hazards include:

- spills
- dusts/vapours
- hazardous materials (including rubber dust produced during the buffing process)
- manual handling hazards
- knife hazards.

Problems

Respond to routine problems' means 'apply known solutions to a variety of predictable problems'. Typical process and product problems may include:

- variations in tyres
- contamination of tyres
- damaged tyres.
- wrong raw materials
- inappropriate blade selection
- insufficient or too deep buffing.
-

Unit Sector(s)

Not applicable.

PMBPROD324B Inspect tyres for retreading

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the inspection of used tyres to determine their suitability for retreading and the resolving of routine and non-routine problems.

Application of the Unit

Application of this unit

This competency is typically performed by advanced operators applying knowledge of materials, product purpose and processes to the inspection of second hand tyres for defects that would preclude use as a retread. It also requires using a range of well developed skills requiring some discretion and judgment to recognise and resolve a range of problems.

The operator will:

- check settings and adjustments of inspection equipment
- inspect tyres by eye and/ or electronically
- repair minor holes and cracks in the casing
- solve inspection equipment and process problems, seeking guidance where necessary or appropriate.
-

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has **no** prerequisites.

Employability Skills Information

Employability Skills

The required outcomes described in this unit contain applicable Employability Skills. The Employability Skills Summary of the qualification(s) in which this unit is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes of a unit of competency	Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
ELEMENT	Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.
1. Plan own work requirements.	1.1 Identify the most appropriate equipment to be used for inspection and upstream and downstream operations from production plan or request. 1.2 Identify tyres to be inspected and check equipment to be used. 1.3 Implement measures to control identified hazards in line with procedures and duty of care.
2. Conduct tyre inspection.	2.1 Identify quality specifications and standard operating procedures for rejecting tyres for retreading 2.2 Check casings for conformity with specification requirements. 2.3 Tag tyres suitable for retreading following workplace procedures 2.4 Discard non-conforming tyres in accordance with workplace procedures. 2.5 Repair minor holes in casings of retreadables, as required. 2.6 Clean, adjust and lubricate equipment as required.

ELEMENT ELEMENT	PERFORMANCE CRITERIA Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.
4. Anticipate and solve problems.	4.1 Recognise a problem or a potential problem. 4.2 Determine problems needing priority action. 4.3 Refer problems outside area of responsibility to appropriate person, with possible causes. 4.4 Seek information and assistance as required, to solve problems. 4.5 Solve problems within area of responsibility. 4.6 Follow through items initiated until final resolution has occurred.

Required Skills and Knowledge

This describes the essential skills and knowledge and their level required for this unit.

Application of knowledge of tyre construction and technology, inspection methods and equipment sufficient to recognise tyre conditions which may lead to out of specification retreads. For example, weather checking can be difficult when a tire is under-inflated. The inspector will need to stress the sidewalls by hand or with an inspection spreader.

Knowledge and ability to implement organization procedures, quality requirements at each inspection stage, and relevant regulatory requirements, within appropriate time constraints and work standards.

Application of the knowledge of managing risks using the hierarchy of controls applied to tyre inspection methods. Application of approved hazard control and safety procedures and the use of PPE in relation to handling materials, equipment operation and cleanup.

Knowledge and skills in tyre inspection and retreading process sufficient for consistent identification of good quality tyres for retreading:

- characteristics of finished and second hand tyres in relation to the impact of the retread process on product quality and safety
- importance of tyre size, speed rating and aspect ration markings of tyres on inspection decisions
- function and operating principles of inspection equipment
- impact of significantly faulty tyres falsely passing inspection
- correct selection and use of equipment, materials, processes and procedures.

Competence also includes the ability to:

- plan own work, including predicting consequences and identifying improvements
- maintain inspection output and product quality using appropriate instruments, controls, test information and readings
- identify and describe own role and role of others involved directly in the retreading process.
- identify factors which may affect product quality or production output and appropriate remedies
- identify when assistance is required to solve problems.

Language, literacy and numeracy requirements

This unit requires the ability to read and interpret typical product specifications, job sheets and material labels as provided to operators.

Writing is required to the level of completing workplace forms and production reports.

Basic numeracy is required, eg to determine how many 2 kg, 3 kg and 5 kg bags are needed to make up a requirement for 50 kg.

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, the range statement and the assessment guidelines for this training package.

Overview of assessment

A holistic approach should be taken to the assessment.

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- identify critical tyre properties and tyre inspection criteria in relation to the retreading process and the end product
- make adjustments to the inspection process as required
- identify and take appropriate action on inspection problems and potential problems.

Consistent performance should be demonstrated. For example, look to see that:

- inspection is done thoroughly and consistently
- all safety procedures are always followed.

Assessment method and context

Assessment will occur using industrial tyre inspection methods and equipment and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- by using an appropriate tyre inspection method and/ or machine
- in a situation allowing for the generation of evidence of the ability to respond to problems
- by using a suitable simulation and/or a range of case studies/scenarios
- through a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Specific resources for assessment

This section should be read in conjunction with the Range Statement for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts.

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Context

The competency applies to the initial inspection of tyres for retreading. It covers the operation of inspection equipment and all relevant additional equipment where that equipment is integral to the tyre inspection process.

Procedures

All operations are performed in accordance with procedures.

Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

Tools and equipment

This competency includes use of equipment and tools such as:

- inspection equipment (such as NDI scanning equipment, nail hole detector, high pressure tester, x-ray or ultrasound)
- manual handling aids such as handcarts and overhead tracks
- hand held lights
- basic hand tools required for inspecting holes in the tyre casing
- relevant personal protective equipment.

Hazards

Typical hazards include:

- dust
- manual handling hazards
- noise.

Problems

'Anticipate and solve problems' means resolve a wide range of routine and non-routine problems, using product and process knowledge to develop solutions to problems which do not have a know solution/s recorded in the procedures.

Typical process and product problems may include:

- equipment malfunction
- detecting hidden damage
- blow-outs
- punctures
- broken chords
- cord body fabric damage
- wear patterns.

Appropriate action for problems outside area of responsibility may be reporting to an appropriate person.

Appropriate action for solving problems within area of responsibility includes asking questions and seeking assistance from appropriate persons/sources.

Variables

Key variables to be monitored include:

- tire size
- speed ratings
- aspect ration markings
- pressure
- discolouration.
-

Unit Sector(s)

Not applicable.

PMBPROD325B Lay on tyre retreads

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the laying of retread on casings prepared from used tyres and the solving of routine problems. It applies to the rubber sector of the industry.

Application of the Unit

Application of this unit

This competency is typically performed by advanced operators applying knowledge of materials, product purpose and processes to the operation of laying tyre retreads to produce product conforming to requirements. It also requires using a range of well developed skills requiring some discretion and judgement to recognise and resolve a range of problems.

The operator:

- start up tyre retread laying machinery
- check settings and adjustments of equipment
- monitor equipment and process operation
- make appropriate adjustments to correct materials, equipment or process variations
- solve retread laying equipment, material and process problems, seeking guidance where necessary or appropriate.

This unit does not include:

- inspection - see *PROD324 Inspect tyres for retreading*
- preparation - see *PROD266 Prepare tyre casings for retreading*.
-

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has **no** prerequisites.

Employability Skills Information

Employability Skills

The required outcomes described in this unit contain applicable Employability Skills. The Employability Skills Summary of the qualification(s) in which this unit is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes of a unit of competency	Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
ELEMENT	Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.
1. Plan own work requirements.	1.1 Identify the most appropriate equipment to be used for production and upstream and downstream operations from production plan or request. 1.2 Identify and check materials required. 1.3 Implement measures to control identified hazards in line with procedures and duty of care. 1.4 Identify requirements for materials, quality, production and equipment checks.
2. Start up retread laying process to procedures.	2.1 Identify process settings required for product. 2.2 Set process to required settings. 2.3 Check materials are correct. 2.4 Take appropriate action for non-conforming materials. 2.5 Set up date, batch and materials markings to

ELEMENT ELEMENT	PERFORMANCE CRITERIA Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.
	specifications, as required. 2.6 Complete pre-start checks. 2.7 Start up retread laying process.
3. Operate and make adjustments to the retread laying process to procedures.	3.1 Operate retread laying process, noting key variables. 3.2 Monitor product/process quality. 3.3 Make adjustments to remedy faults and non-conformity as required. 3.4 Establish a stable retread laying process. 3.5 Adjust process to minimise scrap and trim. 3.6 Clean, adjust and lubricate equipment as required.
4. Shut down equipment to procedures.	4.1 Determine type of shut down. 4.2 Leave machine in appropriate condition and with appropriate locks, tags or notices. 4.3 Complete relevant documentation. 4.4 Ensure area is clean and clear after the shutdown, in readiness for the next start-up.
5. Anticipate and solve problems.	5.1 Recognise a problem or a potential problem 5.2 Determine problems needing priority action. 5.3 Refer problems outside area of responsibility to appropriate person, with possible causes. 5.4 Seek information and assistance as required to solve problems. 5.5 Solve problems within area of responsibility. 5.6 Follow through items initiated until final resolution has occurred.

Required Skills and Knowledge

This describes the essential skills and knowledge and their level required for this unit.

Application of knowledge of the materials, equipment and process sufficient to recognise material and equipment conditions which may lead to out of specification production. For example, the inspection and preparation of casings is crucial to the quality if a retreaded tyre. Therefore, it is important to check, once the casings have been prepared that there are no further problems with the casings prior to laying the retread.

Knowledge of organization procedures, quality requirements at each production stage and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.

Application of the knowledge of managing risks using the hierarchy of controls applied to the retread laying process. Application of approved hazard control and safety procedures and the use of PPE in relation to handling materials, equipment operation and cleanup.

Competence includes the ability for the practical completion of the job to apply and explain:

- characteristics of materials and behaviour in relation to heat, pressure, flow rate and time
- function and operating principles of retread laying processes, equipment, machine components and ancillary equipment
- impact of tyre size, faulty tyres, speed rating, finished and second hand tyres, and aspect ration markings of tyres on product quality and production output
- phases of the retread laying cycle and the effect of the key variables on product quality, in order to make appropriate adjustments to process and equipment settings. For example, the adhesive laying phase is needed when laying pre-cured treads to the casings to bond tread during vulcanisation.
- processing behaviour of those polymers which are used in the workplace
- changes to materials at various stages of production
- waste management and importance of non-conforming materials
- impact of variations in raw materials and equipment operation in relation to final product.

Skill to identify the range of possible causes of product faults.

Competence also includes the ability to:

- plan own work, including predicting consequences and identifying improvements
- maintain output and product quality using appropriate instruments, controls, test information and readings
- identify and describe own role and role of others involved directly in the retread laying process
- identify factors which may affect product quality or production output and appropriate remedies
- identify when the when assistance is required to solve problems.

Language, **literacy and numeracy requirements**

This unit requires the ability to read and interpret typical product specifications, job sheets and material labels as provided to operators.

Writing is required to the level of completing workplace forms and production reports.

Basic numeracy is required, eg to determine how many 2 kg, 3 kg and 5 kg bags are needed to make up a requirement for 50 kg.

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, the range statement and the assessment guidelines for this training package.

Overview of assessment

A holistic approach should be taken to the assessment.

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- identify critical materials properties and retread laying process variables in relation to the process requirements and the end product
- make adjustments to the process as required
- identify and take appropriate action on problems and potential problems.

Consistent performance should be demonstrated. For example, look to see that:

- the process runs consistently and smoothly, with the minimum need for human intervention
- all safety procedures are always followed.

Assessment method and context

Assessment will occur on an industrial retread laying machine(s) and equipment and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- by use of appropriate, industrial retread laying equipment and machinery requiring demonstration of start up, operation and shut down procedures
- in a situation allowing the generation of evidence of the ability to recognise, anticipate and resolve problems
- by use of a suitable simulation and/or a range of case studies/scenarios
- by a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Specific resources for assessment

This section should be read in conjunction with the Range Statement for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts.

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Context

This competency applies to tyre retreading. It includes the operation of all relevant additional equipment where that equipment is integral to the tread lay-up process.

Procedures

All operations are performed in accordance with procedures.

Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

Tools and equipment

This unit of competency includes use of equipment and tools such as:

- manual handling aids (eg hand carts and trolleys)
- powered equipment/aids (eg compression rollers, staplers, cutting instruments and stone grinders)
- tread application equipment (eg semiautomatic builders to applying cured or uncured tread)
- moulds (for mould cure process)
- ancillary equipment (eg guide lights)
- hand tools (eg for roughing the surface, cutting and stapling the tread)
- raw materials (eg moulded tread and cushion gum)
- relevant personal protective equipment.

Hazards

Typical hazards include:

- fumes/vapours
- cutting tools
- manual handling hazards
- noise
- moving components of machinery and equipment.

Problems

'Anticipate and solve problems' means resolve a wide range of routine and non-routine problems, using product and process knowledge to develop solutions to problems which do not have a known solution/a solution recorded in the procedures.

Typical routine faults include:

- incorrect tread selected
- incorrect tyre inflation pressure.

Non-routine faults, which may have multiple causes include:

- faulty casings
- contamination of materials.

Typical process and product problems may include:

- equipment malfunction
- poorly aligned tread
- tread too long/short
- wrong tread profile.

Appropriate action for problems outside of area of responsibility may be reporting to an appropriate person.

Appropriate action for solving problems within area of responsibility includes asking questions and seeking assistance from appropriate persons/sources.

Variables

Key variables to be monitored include:

- speed (including equipment speed, laying of cured and uncured tread)
- pressure
- colour
- tyre components
- tread alignment
- product integrity and general conformance to specification and quality sample.
-

Unit Sector(s)

Not applicable.

PMBPROD326B Inspect tyres

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the testing and inspection of tyres and the solving of routine and non-routine problems.

Application of the Unit

Application of this unit

This competency is typically performed by advanced operators applying knowledge of materials, product purpose and processes in tyre inspection and testing to ensure quality, in both performance and safety, of finished tyres. It also requires using a range of well developed skills requiring some discretion and judgement to recognise and resolve a range of problems.

The operator will:

- inspect tyres visually, manually and by use of inspection equipment
- check settings and adjustments of equipment
- monitor equipment operation and correct variations
- identify non-conforming products and take appropriate action (eg ensuring discarded products are repaired where possible and/or scraped tyres are disposed of in accordance with workplace instructions)
- solve inspection and equipment problems, seeking guidance where necessary or appropriate.
-

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has **no** prerequisites.

Employability Skills Information

Employability Skills

The required outcomes described in this unit contain applicable Employability Skills. The Employability Skills Summary of the qualification(s) in which this unit is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes of a unit of competency	Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
ELEMENT	Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.
1. Plan own work requirements.	1.1 Identify the most appropriate equipment and processes to be used for tyre inspection and testing. 1.2 Identify different tyre types, identification codings and quality standards required. 1.3 Implement measures to control identified hazards in line with procedures and duty of care. 1.4 Identify repair, scrap tyre and housekeeping needs
2. Start up testing process to procedures.	2.1 Conduct visual inspection of tyres to spot obvious defects. 2.2 Manually locate bumps or dips. 2.3 Check inspection equipment settings and make adjustments as required. 2.4 Complete other pre-start checks in accordance with procedures.
3. Operate tyre testing	3.1 Operate machine to rotate and test tyres, following

ELEMENT ELEMENT	PERFORMANCE CRITERIA Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.
machines to procedures.	standard operating procedures and State OHS requirements. 3.2 Monitor product quality in accordance with procedures. 3.3 Clean, adjust and lubricate equipment as required. 3.4 Shut down equipment to procedures, in normal or emergency situations. 3.5 Complete relevant documentation.
4. Respond to faults.	4.1 Identify possible routine and non-routine faults in the tyre. 4.2 Determine tyres needing action. 4.3 Determine possible fault causes. 4.4 Report faults outside area of responsibility to designated person. 4.5 Maintain appropriate records and log books to meet procedures/work instructions.
5. Stamp, label and sort tyres.	5.1 Stamp identification number on each tyre. 5.2 Label tyres with weekly code. 5.3 Sort passed tyres by coding. 5.4 Sort tyres for repair or scrap.

Required Skills and Knowledge

This describes the essential skills and knowledge and their level required for this unit.

Application of knowledge of the materials, equipment and testing process sufficient to recognise material and equipment conditions which may lead to out of specification production.

Knowledge and ability to implement organization procedures, the quality requirements at each production stage and relevant regulatory requirements, within appropriate time constraints and work standards.

Application of the knowledge of managing risks using the hierarchy of controls applied to the tyre inspection/testing processes. Application of approved hazard control and safety procedures and the use of PPE in relation to handling materials. equipment operation and cleanup.

Knowledge and skills in tyre inspection and testing equipment, including:

- different tyre types and their construction and material content
- quality requirements for the different types of tyres
- function and operating principles of tyre testing equipment, machine components and ancillary equipment
- correct selection and use of equipment and inspection/testing procedures
- waste management and importance of repairing non-conforming products.

Competence also includes the ability to:

- plan own work, including predicting consequences and identifying improvements
- maintain output and product quality using appropriate instruments, controls, test information and readings
- identify and describe own role and role of others involved directly in the inspection/testing process
- identify what faults the operator is able to recognise manually and when assistance by equipment is required.

Language, **literacy and numeracy requirements**

This unit requires the ability to read and interpret typical product specifications, job sheets and machine control panels such as those displaying SPC information..

Writing is required to the level of completing workplace forms and production reports.

Basic numeracy is required, eg to determine how many 2 kg, 3 kg and 5 kg bags are needed to make up a requirement for 50 kg.

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, the range statement and the assessment guidelines for this training package.

Overview of assessment

A holistic approach should be taken to the assessment.

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- identify critical tyre properties and inspection criteria in relation to the end product
- make adjustments to inspections/testing process and equipment as required
- identify and take appropriate action on problems and potential problems.

Consistent performance should be demonstrated. For example, look to see that:

- tyre inspection and testing standards are met consistently
- all safety procedures are always followed.

Assessment method and context

Assessment will occur on an industrial tyre inspection/testing equipment and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- by observation over a range of tyre inspection/testing procedures undertaken in the workplace
- in a situation allowing for the generation of evidence of the ability to respond to problems
- by using a suitable simulation and/or a range of case studies/scenarios
- through a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Specific resources for assessment

This section should be read in conjunction with the Range Statement for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts.

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Context

This competency applies to the inspection and testing of tyres within the rubber industry. It includes the operation of all relevant additional equipment where that equipment is integral to the inspection/testing process.

Procedures

All operations are performed in accordance with procedures.

Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

Tools and equipment

This competency includes use of equipment and tools such as:

- tyre testing machines such as x-ray, uniformity, bulge test, and tyre balance test machines
- hand tools used in the inspection/testing process
- material loading equipment used for loading of tyres
- relevant personal protective equipment.

Hazards

Typical hazards include:

- manual handling hazards
- equipment operations
- dust/ vapours.

Problems

'Anticipate and solve problems' means resolve a wide range of routine and non-routine problems, using product and process knowledge to develop solutions to problems which do not have a known solution/s recorded in the procedures.

Typical routine faults include:

- bulges in sidewalls
- deformation
- damaged carcass
- offset
- snaking
- cuts.

Typical inspection/testing problems may include:

- equipment malfunction
- incorrect set-up of testing machine to tyre type
- detecting hidden damage.

Appropriate action for problems outside area of responsibility may be reporting to an appropriate person.

Appropriate action for solving problems within area of responsibility includes asking questions and seeking assistance from appropriate persons/sources.

Variables

Key variables to be monitored include:

- colour
- product weight
- product integrity and general conformance to specification/sample.
-

Unit Sector(s)

Not applicable.

PSPMNGT610A Manage public sector financial resources

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This unit covers input into public sector budgeting, financial forecasting and reporting requirements, and the allocation and management of resources to achieve the required outputs of the business unit. It includes contributing to financial bids and estimates, allocating funds, managing budgets and reporting on financial activity.

In practice, the management of public sector financial resources may occur in the context of other generalist or specialist public sector workplace activities such as managing compliance with legislation, maintaining and enhancing ethical practice, managing people, policy etc.

This unit is one of 6 units of competency in the *Working in Government* and *Management* Competency fields that deal with resources.

Related units are:

PSPGOV204B Access and use resources

PSPGOV305B Access and use resources and financial systems

PSPGOV403B Use resources to achieve work unit goals

PSPGOV503B Coordinate resource allocation and usage

This is a new unit of competency, added to the *Management* Competency field of the Training Package in 2004.

Application of the Unit

Not applicable.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

Employability skills This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements are the essential outcomes of the unit of competency.

Together, performance criteria specify the requirements for competent performance. Text in *bold italics* is explained in the Range Statement following.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Contribute to financial bids and estimates	1.1 Organisational initiatives requiring the preparation of *bids* and *estimates* are identified in accordance with resource constraint s and organisational needs
	1.2 *Information* for bids/estimates is substantiated, contains logical assumptions and takes account of strategic plans, government policies and priorities
	1.3 Information for bids/estimates is prepared in accordance with government *budgetary requirements* including a timeframe to meet critical submission dates
	1.4 *Documentation* to support bids/estimates is prepared in accordance with budget guidelines
2. Allocate funds	2.1 *Budgets* are approved and financial resources are allocated according to organisational priorities/business plan
	2.2 Allocations are made in accordance with organisational policy and procedures and take account of any statutory requirements or constraints
	2.3 Audit trails are maintained to ensure accurate tracking and to identify variances between agreed and actual allocations

ELEMENT	PERFORMANCE CRITERIA
	2.4 Financial allocation is monitored against organisational objectives and priorities and *corrective action* is taken as required in accordance with organisational policy and procedures
3. Manage budgets	3.1 Budget management is undertaken that meets the financial accountability requirements of the organisation
	3.2 Expenses are monitored against budget and authorised in accordance with financial *delegation* and organisational *financial controls*
	3.3 *Financial reports* are obtained and provided in accordance with organisational requirements
	3.4 Expenses are monitored through analysis of financial information/reports and problems are resolved or referred in accordance with organisational procedures and financial delegation
	3.5 Expenditure is aligned with service delivery milestones/expectations
	3.6 Changes to the budget are negotiated to account for potential under-spending, delays in service/program delivery, overruns and unneeded line items in accordance with organisational policy and procedures
4. Report on financial activities	4.1 Requirements for financial management and reporting are identified in accordance with the public sector *financial management framework*
	4.2 Financial management and reporting are undertaken in accordance with organisational requirements and *public sector financial management policy and procedures*

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the essential skills and knowledge and their level, required for this unit.

Skill requirements

Look for evidence that confirms skills in:

preparing information and reports requiring precision of expression

meeting formatting and process requirements for bids and estimates and linkages to strategic plans

REQUIRED SKILLS AND KNOWLEDGE

monitoring financial information

interpreting and signing off on financial reports

interpreting organisational information in financial terms

adjusting communication to suit different audiences

using cross-cultural communication relating to financial management - across professional cultures such as accounting, IT, arts, policy areas

responding to diversity, including gender and disability

accessing information and legislation electronically or in hard copy

applying environmental, sustainability and occupational health and safety procedures relating to working in the public sector

Knowledge requirements

Look for evidence that confirms knowledge and understanding of:

financial management principles

legislation, policies and processes relating to public sector financial management, such as conflicts of interest, procurement, value for money

the organisation's financial accountability mechanisms

corporate governance requirements

internal controls and why they are used

delegations and why the public sector uses them

public sector financial management framework (detailed knowledge) and the relationship between the elements of the framework

documents that make up the financial management framework

legislation related to working in the public sector such as equal employment opportunity, environmental, sustainability and occupational health and safety requirements

Evidence Guide

EVIDENCE GUIDE

The Evidence Guide specifies the evidence required to demonstrate achievement in the unit of competency as a whole. It must be read in conjunction with the Unit descriptor, Performance Criteria, the Range Statement and the Assessment Guidelines for the Public Sector Training Package.

Units to be assessed together

- *Pre-requisite* unitsthat must be achieved prior to this unit:*Nil*
- *Co-requisite* unitsthat must be assessed with this unit:*Nil*
- *Co-assessed units* that may be assessed with this unit to increase the efficiency and realism of the assessment process

EVIDENCE GUIDE

include, but are not limited to:

PSPETHC601B Maintain and enhance confidence in public service

PSPLEGN601B Manage compliance with legislation in the public sector

PSPMNGT603B Facilitate people management

PSPMNGT602B Manage resources

PSPMNGT608B Manage risk

PSPMNGT609B Formulate business strategies

PSPPOL603A Manage policy implementation

Overview of evidence requirements

In addition to integrated demonstration of the elements and their related performance criteria, look for evidence that confirms:

- the knowledge requirements of this unit
- the skill requirements of this unit
- application of the Employability Skills as they relate to this unit (see Employability Summaries in Qualifications Framework)
- management of public sector financial resources in a range of (2 or more) contexts (or occasions, over time)

Resources required to carry out assessment

These resources include:

- public sector and organisational financial procedures and protocols
- workplace scenarios and case studies to capture the range of situations likely to be encountered when managing public sector financial resources
- financial legislation and guidelines such as central agency guidelines
- budget process and guidelines

Where and how to assess evidence

Valid assessment of this unit requires:

- a workplace environment or one that closely resembles normal work practice and replicates the range of conditions likely to be encountered when managing public sector financial resources, including coping with difficulties, irregularities and breakdowns in routine
- management of public sector financial resources in a range of (2 or more) contexts (or occasions, over time)

Assessment methods should reflect workplace demands, such as literacy, and the needs of particular groups, such as:

- people with disabilities
- people from culturally and linguistically diverse backgrounds

EVIDENCE GUIDE

- Aboriginal and Torres Strait Islander people
- women
- young people
- older people
- people in rural and remote locations

Assessment methods suitable for valid and reliable assessment of this competency may include, but are not limited to, a combination of 2 or more of:

- case studies
- portfolios
- projects
- questioning
- scenarios
- authenticated evidence from the workplace and/or training courses

For consistency of assessment

Evidence must be gathered over time in a range of contexts to ensure the person can achieve the unit outcome and apply the competency in different situations or environments

Range Statement

RANGE STATEMENT

The Range Statement provides information about the context in which the unit of competency is carried out. The variables cater for differences between States and Territories and the Commonwealth, and between organisations and workplaces. They allow for different work requirements, work practices and knowledge. The Range Statement also provides a focus for assessment. It relates to the unit as a whole. Text in *italics* in the Performance Criteria is explained here.

Bids may include

- program discretionary bids
- program, sub-program, section, business unit bids
- portfolio managed bids

Estimates may include

- budget estimates
- additional estimates
- forward estimates
- long-term estimates
- forecasts

Information may include

- historical information
- cost-benefit analysis

RANGE STATEMENT

	• staff requirements • contractual information • efficiency/sustainability requirements
Budgetary requirements may include	• zero-based budgeting • accrual budgeting • activity-based costing/management • output-based budgeting • top-down/bottom-up approach • base plus increment
Supporting documentation may include	• phasing for liability and expenditure/cash flow implications • impact statements • reasons for major variations to financial guidance • staffing resources
Budgets may include	• capital expenses • recurrent expenses • staffing costs • cash flow • forward estimates
Corrective action may include	• re-prioritising activities • funds transfer • re-phasing liability/expenditure
Delegations are	• functions or powers (under an act) assigned to others • limited to specified powers or amounts • made to persons in specified positions
Financial controls should	• identify, record and measure revenue, expenses, assets, liabilities and equity • ensure assets are safeguarded and used to avoid waste, extravagance, loss and misuse • ensure liabilities are not incurred without proper authority • ensure correct valuation, cut-off, presentation and disclosure of financial balances and transactions • be linked to the organisation's risk management strategy
Financial reports may include	• program, sub-program, section, business unit financial reports • accrual reports • monthly/quarterly financial reports including cost/unit, costs incurred compared with share of program delivered • annual reports
Elements of the public sector financial management framework	• internal controls • segregation of duties • delegations

RANGE STATEMENT

may include	• corporate governance requirements • service level agreements • internal and external reporting • risk management
Public sector financial policies and procedures may include	• financial management acts and regulations • financial administration and audit acts • Treasury guidelines • public sector finance standards • financial management benchmarking studies • the organisation's: • financial management practice manual • delegation manual • budget manual/instructions • style manual • quality manual • government financial policy statements

Unit Sector(s)

Not applicable.

Competency field

Competency field Management

TAEASS401B Plan assessment activities and processes

Modification History

Version	Comments
TAEASS301B	Released with *TAE10 Training and Education Training Package version 2.0*

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to plan and organise the assessment process, including recognition of prior learning (RPL), in a competency-based assessment system. It also includes the development of simple assessment instruments.

Application of the Unit

This unit typically applies to assessors and workplace supervisors with assessment planning responsibilities; and trainers or other assessors responsible for planning assessment, including RPL.

The unit is suitable for those with an existing assessment strategy which documents the overall framework for assessment.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes of a	*Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text*

ELEMENT	PERFORMANCE CRITERIA
unit of competency.	*is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.*

Elements and Performance Criteria

1. Determine assessment approach	1.1 Identify candidate and confirm ***purposes and context of assessment/RPL*** with relevant people according to l***egal, organisational and ethical requirements***
	1.2 Identify and access ***benchmarks for assessment/RPL*** and any specific assessment guidelines
2. Prepare the assessment plan	2.1 Determine evidence and ***types of evidence*** needed to demonstrate competence, according to the ***rules of evidence***
	2.2 Select ***assessment methods*** which will support the collection of defined evidence, taking into account the context in which the assessment will take place
	2.3 Document all aspects of the ***assessment plan*** and confirm with relevant personnel
3. Develop assessment instruments	3.1 Develop ***simple assessment instruments*** to meet target group needs
	3.2 Analyse ***available assessment instruments*** for their suitability for use and modify as required
	3.3 ***Map assessment*** instruments against unit or course requirements
	3.4 Write clear instructions for candidate about the use of the instruments
	3.5 Trial draft assessment instruments to validate content and applicability, and record outcomes

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- cognitive interpretation skills to:
  - interpret competency standards and other assessment documentation, including material

relating to reasonable adjustment
    - identify opportunities for integrated competency assessment
    - contextualise competency standards to the operating assessment environment, including RPL
    - consider access and equity needs of diverse candidates
- technology skills to use appropriate equipment and software to communicate effectively with others
- research and evaluation skills to:
    - obtain competency standards, assessment tools and other relevant assessment resources
    - research candidate characteristics and any reasonable adjustment needs
    - evaluate feedback, and determine and implement improvements to processes
- literacy skills to read and interpret relevant information to design and facilitate assessment and recognition processes
- communication skills to discuss assessment, including RPL processes with clients and other assessors
- interpersonal skills to:
    - demonstrate sensitivity to access and equity considerations and candidate diversity
    - promote and implement equity, fairness, validity, reliability and flexibility in planning an assessment processes.
- **Required knowledge**
- ethical and legal requirements of an assessor
- competency-based assessment, including:
    - work focused
    - criterion referenced
    - standards based
    - evidence based
- different purposes of assessment and different assessment contexts, including RPL
- how to read and interpret the identified competency standards as the benchmarks for assessment
- how to contextualise competency standards within relevant guidelines
- four principles of assessment and how they guide the assessment process
- purpose and features of evidence, and different types of evidence used in competency-based assessments, including RPL
- rules of evidence and how they guide evidence collection
- different types of assessment methods, including suitability for collecting various types of evidence
- assessment instruments and their purpose; different types of instruments; relevance of different instruments for specific evidence-gathering opportunities.

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	

Critical aspects for assessment and evidence required to demonstrate competency in this unit	• Evidence of the ability to:
	• plan and organise the assessment process on a minimum of two occasions
	• collect evidence that demonstrates:
	  • documented assessment plans
	  • having covered a range of assessment events
	  • catering for a number of candidates
	  • different competency standards or accredited curricula
	  • an RPL assessment
	  • contextualisation of competency standards and the selected assessment tools, where required
	  • incorporation of reasonable adjustment strategies
	  • development of simple assessment instruments for use in the process
	  • organisational arrangements.

Context of and specific resources for assessment	Evidence must be gathered in the workplace wherever possible. Where no workplace is available, a simulated workplace must be provided. Assessment must ensure access to training products, such as training packages and accredited course documentation.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Purposes of assessment/ RPL may include:	• recognising current existing competence of candidates • determining if competence has been achieved following learning • establishing candidate progress towards achievement of competence • determining language, literacy and numeracy needs of candidates • certifying competence through a qualification or Statement of Attainment • licensing or regulatory requirements.

Context of assessment/ RPL may include:	• environment in which the assessment/RPL will be carried out, including real or simulated workplace
	• opportunities for collecting evidence in a number of situations
	• relationships between competency standards and:
	  • evidence to support RPL
	  • work activities in the candidate's workplace
	  • learning activities
	• who carries out the assessment/RPL.

Organisational, legal and ethical requirements may include:	• assessment system policies and procedures
	• assessment strategy requirements
	• reporting, recording and retrieval systems for assessment, including RPL
	• quality assurance systems
	• business and performance plans
	• access and equity policies and procedures
	• collaborative and partnership arrangements
	• defined resource parameters
	• mutual recognition arrangements
	• industrial relations systems and processes, awards, and enterprise agreements
	• Australian Quality Training Framework
	• registration scope
	• human resources policies and procedures
	• legal requirements, including:
	  • anti-discrimination
	  • equal employment opportunity
	  • job role, responsibilities and conditions
	• relevant industry codes of practice
	• confidentiality and privacy requirements
	• OHS considerations, including:
	  • ensuring OHS requirements are adhered to during the

	assessment process • identifying and reporting OHS hazards and concerns to relevant personnel.
Benchmarks for assessment/RPL may include:	• criterion against which the candidate is assessed or prior learning recognised, which may be: • competency standard/unit of competency • assessment criteria of course curricula • performance specifications of an enterprise or industry • product specifications.
Types of evidence may include:	• direct • indirect • supplementary.
Rules of evidence ensure that evidence collected is:	• valid • sufficient • authentic • current.
Assessment methods are the particular techniques used to gather evidence and may include:	• direct observation, for example: • real work/real time activities at the workplace • work activities in a simulated workplace environment • structured activities, for example: • simulation exercises and role-plays • projects • presentations • activity sheets • questioning, for example: • written questions, e.g. on a computer • interviews • self-assessment • verbal questioning • questionnaires • oral or written examinations (applicable at higher AQF levels) • portfolios of evidence, for example: • collection of work samples compiled by candidate • product with supporting documentation • historical evidence • journal or log book • information about life experience • review of products, for example: • testimonials and reports from employers and supervisors

	• evidence of training • authenticated prior achievements • interview with employer, supervisor, or peer.
Assessment plan may include:	• overall planning document describing: • what is to be assessed • when assessment is to take place • where assessment is to take place • how assessment is to take place.
Simple assessment instruments may include:	• instruments developed by an assessor as part of formative or summative assessment activities, including: • profiles of acceptable performance measures • templates and proformas • specific questions or activities • evidence and observation checklists • checklists for the evaluation of work samples • recognition portfolios • candidate self-assessment materials • instruments developed elsewhere that have been modified by the assessor for use with a particular client group.
Available assessment instruments may include:	• commercially available instruments • those created by others inside the registered training organisation.
Map assessment means:	• showing a clear relationship between the evidence and the requirements of the unit.

Unit Sector(s)

Assessment

Custom Content Section

Not applicable.

TAEASS402B Assess competence

Modification History

Version	Comments
TAEASS402B	Released with *TAE10 Training and Education Training Package version 2.0*

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to assess the competence of a candidate.

Application of the Unit

This unit typically applies to assessors.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes of a unit of competency.	*Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.*

Elements and Performance Criteria

1. Prepare for assessment	1.1 Interpret ***assessment plan*** and confirm organisational, legal and ethical requirements for conducting assessment with relevant people 1.2 Access and interpret relevant ***benchmarks for assessment*** and nominated ***assessment tools*** to confirm the requirements for evidence to be collected 1.3 Arrange identified material and physical resource requirements according to assessment system policies and procedures 1.4 Organise ***specialist support*** required for assessment 1.5 Explain, discuss and agree details of the assessment plan with candidate
2. Gather quality evidence	2.1 Use agreed ***assessment methods*** and instruments to gather, organise and document evidence in a format suitable for determining competence 2.2 Apply the principles of assessment and rules of evidence in gathering quality evidence 2.3 Determine opportunities for evidence gathering in actual or simulated activities through consultation with the candidate and relevant personnel 2.4 Determine opportunities for integrated assessment activities and document any changes to assessment instruments where required
3. Support the candidate	3.1 Guide candidates in gathering their own evidence to support recognition of prior learning (RPL) 3.2 Use appropriate communication and interpersonal skills to develop a professional relationship with the candidate that reflects sensitivity to ***individual differences*** and enables two-way ***feedback*** 3.3 Make decisions on reasonable adjustments with the candidate, based on candidate's needs and characteristics 3.4 Access required specialist support in accordance with the assessment plan 3.5 Address any OHS risk to person or equipment immediately
4. Make the assessment decision	4.1 Examine collected evidence and evaluate it to ensure that it reflects the evidence required to demonstrate competence 4.2 Use judgement to infer whether competence has been demonstrated, based on the available evidence 4.3 Make assessment decision in line with agreed assessment procedures and according to agreed assessment plan 4.4 Provide clear and constructive feedback to candidate regarding

	the assessment decision and develop any follow-up action plan required
5. Record and report the assessment decision	5.1 Record assessment outcomes promptly and accurately 5.2 Complete and process an assessment report according to agreed assessment procedures 5.3 Inform other relevant parties of the assessment decision according to confidentiality conventions
6. Review the assessment process	6.1 Review the assessment process in ***consultation*** with relevant people to improve own future practice 6.2 Document and record the review according to relevant assessment system policies and procedures

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- analysis and interpretation skills to:
  - break down competency standards
  - interpret assessment tools and other assessment information, including those used in RPL
  - identify candidate needs
  - make judgements based on assessment of available evidence
- observation skills to:
  - recognise candidate's prior learning
  - determine candidate's performance
  - identify when candidate may need assistance during the assessment processes
- research and evaluation skills to:
  - access required human and material resources for assessment
  - access assessment system policies and procedures
  - access RPL policies and procedures
  - evaluate evidence
  - evaluate assessment process
- cognitive skills to:
  - weigh up the evidence and make a judgement
  - consider and recommend reasonable adjustments
- decision-making skills to:
  - recognise a candidate's prior learning

    - make a decision on a candidate's competence
- literacy skills to:
    - read and interpret relevant information to conduct assessment
    - prepare required documentation and records or reports of assessment outcomes in required format
- communication and interpersonal skills to:
    - explain the assessment, including RPL process
    - give clear and precise instructions
    - ask effective questions
    - provide clarification
    - discuss process with other relevant people
    - give appropriate feedback
    - discuss assessment outcome
    - use language appropriate to candidate and assessment environment
    - establish a working relationship with candidate.

Required knowledge

- competency-based assessment, including:
    - vocational education and training as a competency-based system
    - criterion-referenced assessment as distinct from norm-referenced assessment
    - competency standards as the basis of qualifications
    - structure and application of competency standards
    - principles of assessment and how they are applied
    - rules of evidence and how they are applied
    - range of assessment purposes and assessment contexts, including RPL
    - different assessment methods, including suitability for gathering various types of evidence, suitability for content of units, and resource requirements and associated costs
    - reasonable adjustments and when they are applicable
    - types and forms of evidence, including assessment instruments that are relevant to gathering different types of evidence used in competency-based assessment, including RPL
    - potential barriers and processes relating to assessment tools and methods
    - assessment system, including policies and procedures established by the industry, organisation or training authority
- RPL policies and procedures established by the organisation
- cultural sensitivity and equity considerations
- relevant policy, legislation, codes of practice and national standards, including commonwealth and state or territory legislation that may affect training and assessment in the vocational education and training sector, such as:
    - copyright and privacy laws in terms of electronic technology
    - security of information

  - plagiarism
  - training packages and competency standards
  - licensing requirements
  - industry and workplace requirements
  - duty of care under common law
  - recording information and confidentiality requirements
  - anti-discrimination, including equal employment opportunity, racial vilification and disability discrimination
  - workplace relations
  - industrial awards and enterprise agreements
- OHS responsibilities associated with assessing competence, such as:
  - requirements for reporting hazards and incidents
  - emergency procedures
  - procedures for use of relevant personal protective equipment
  - safe use and maintenance of relevant equipment
  - sources of OHS information.
-

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	

Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to:
	• assess competence of a number of candidates within the vocational education and training context against different units of competency or accredited curricula, following the relevant assessment plan
	• assess at least one candidate for RPL
	• consider reasonable adjustment and the reasons for decisions in at least one assessment
	• cover an entire unit of competency and show:
	  • the application of different assessment methods and instruments involving a range of assessment activities and events
	  • two-way communication and feedback
	  • how judgement was exercised in making the assessment decision
	  • how and when assessment outcomes were recorded and reported

	• assessment records and reports completed in accordance with assessment system and organisational, legal and ethical requirements • how the assessment process was reviewed.
Context of and specific resources for assessment	Evidence must be gathered in the workplace whenever possible. Where no workplace is available, a simulated workplace must be provided.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Assessment plan may include:	• overall planning, describing:
	  • what is to be assessed
	  • when assessment is to take place
	  • where assessment is to take place
	  • how assessment is to take place.

Benchmarks for assessment:	• refer to a criterion against which the candidate is assessed • may be a competency standard/unit of competency, assessment criteria of course curricula, performance specifications, or product specifications.
Assessment tools include:	• the learning or competency unit(s) to be assessed • the target group, context and conditions for the assessment • the tasks to be administered to the candidate • an outline of the evidence to be gathered from the candidate • the evidence criteria used to judge the quality of performance (i.e. the assessment decision-making rules) • the administration, recording and reporting requirements • the evidence of how validity and reliability have been tested and built into the design and use of the tool.

Specialist support may include:	• assistance by third party, such as carer or interpreter • support from specialist educator • provision of developed online assessment activities • support for remote or isolated candidates and assessors • support from subject matter or safety experts • advice from regulatory authorities • assessment teams and panels • support from lead assessors • advice from policy development experts.

Assessment methods include:	• particular techniques used to gather different types of evidence, such as:
	  • direct observation
	  • structured activities
	  • oral or written questioning
	  • portfolios of evidence
	  • review of products
	  • third-party feedback.

Individual differences may include:	• English language, literacy and numeracy barriers • physical impairment or disability • intellectual impairment or disability • medical condition that may impact on assessment, such as arthritis, epilepsy, diabetes and asthma • learning difficulties • mental or psychological disability • religious and spiritual observances • cultural images and perceptions • age • gender.
Feedback may include:	• ensuring assessment/RPL process is understood • ensuring candidate concerns are addressed • enabling questions and answers • confirming outcomes • identifying further evidence to be provided • discussing action plans • confirming gap training needed • providing information regarding available appeal processes • suggesting improvements in evidence gathering and

	presentation.
Consultation may involve:	• moderation with other assessors, or training and assessment coordinators • discussions with client, team leaders, managers, RPL coordinators, supervisors, coaches and mentors • technical and subject experts • English language, literacy and numeracy experts.

Unit Sector(s)

Assessment

Custom Content Section

Not applicable.

TAEASS403B Participate in assessment validation

Modification History

Version	Comments
TAEASS403B	Released with *TAE10 Training and Education Training Package version 2.0*

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to participate in an assessment validation process.

Application of the Unit

This unit typically applies to those participating in assessment validation. It does not address leading the validation process.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes of a unit of competency.	*Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.*

Elements and Performance Criteria

1. Prepare for validation	1.1 Discuss and confirm the approach to validation according to defined purposes, context, and relevant ***assessment system policies and procedures***
	1.2 Analyse relevant ***benchmarks for assessment*** and agree on the evidence needed to demonstrate competence
	1.3 Arrange ***materials*** for ***validation activities***
2. Contribute to validation process	2.1 Demonstrate active ***participation*** in validation sessions and activities using appropriate communication skills
	2.2 Participate in validation sessions and activities by applying the principles of assessment and rules of evidence
	2.3 Check all documents used in the validation process for accuracy and version control
3. Contribute to validation outcomes	3.1 Collectively discuss validation findings to support improvements in the quality of assessment
	3.2 Discuss, agree and record recommendations to improve assessment practice
	3.3 Implement changes to own assessment practice, arising from validation

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- planning skills to participate in validation activities within agreed timeframes
- problem-solving skills to identify information that is inconsistent, ambiguous or contradictory
- evaluation skills to:
  - determine evidence requirements from competency standards
  - review assessment process, tools and methods
  - review collected evidence
- communication skills to share information in validation meetings.

Required knowledge

- how to interpret competency standards and other related assessment information to determine the evidence needed to demonstrate competence, including:
  - criterion-referenced assessment as distinct from norm-referenced assessment

  - various reasons for carrying out validation and the different approaches to validation that may be appropriate before, during and after assessment
  - critical aspects of validation, including validation of assessment processes, methods and products
  - relevant OHS legislation, codes of practice, standards and guidelines, impacting on assessment
  - legal and ethical requirements of assessors, particularly in relation to validation activities
- principles of assessment
- rules of evidence.

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • actively participate in a minimum of two validation sessions or meetings which, in combination, address the critical aspects of validation using different validation approaches and activities • clearly explain purposes of validation and the legal and ethical responsibilities of assessors • collate documentation relating to validation process in a logical manner • demonstrate communication and liaison with relevant people • provide feedback and interpret documentation in validation sessions • record contribution to validation findings.
Context of and specific resources for assessment	Evidence must be gathered in the workplace wherever possible. Where no workplace is available, a simulated workplace must be provided. Assessment must ensure access to: • assessment reports and records • other documentation relevant to validation.
Method of assessment	
Guidance information	

for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Assessment system policies and procedures may include:	• candidate selection • rationale and purpose of competency-based assessment • assessment records, and data and information management • recognition of current competency, recognition of prior learning and credit arrangements • assessment reporting procedures • assessment appeals • candidate grievances and complaints • validation • evaluation and internal audit • costs and resourcing • access and equity, and reasonable adjustment • partnership arrangements • links with human resource or industrial relations system • links with overall quality management system.
Benchmarks for assessment:	• refers to criterion against which the candidate is assessed • may be one or more units of competency or assessment criteria of course curricula.
Materials may include:	• assessment tools • samples of collected evidence • documentation outlining the basis of assessment decisions • reports and records of assessment decisions • samples of benchmarks of appropriate evidence • Assessment Guidelines of the relevant training packages • information from the evidence guide of the relevant units of competency.

Validation activities may include:	• analysing and reviewing:
	  • assessment tools
	  • collected evidence
	  • assessment decisions and records of assessment outcomes

	• other aspects of assessment policies, processes and outcomes • recording evidence of validation processes and outcomes.
Participation may include comparison and evaluation of:	• assessment practices • assessment plans • interpretation of units of competency • assessment methods and instruments • assessment decisions • collected evidence.

Unit Sector(s)

Assessment

Custom Content Section

Not applicable.

TAEASS502B Design and develop assessment tools

Modification History

Version	Comments
TAEASS502B	Released with *TAE10 Training and Education Training Package version 2.0*

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to design and develop assessment tools, including tools used in formative, summative and recognition of prior learning (RPL) assessment.

Application of the Unit

An assessment tool is used to guide the collection of quality evidence in the assessment process. It includes the specific instruments for collecting evidence, as well as information about assessment methods and the procedures to be followed in conducting the assessment.

This unit typically applies to those involved in training and assessment or in the development of learning resources or products, assessors, learning resource or product developers, and training and assessment consultants.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes of a	*Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text*

ELEMENT	PERFORMANCE CRITERIA
unit of competency.	*is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.*

Elements and Performance Criteria

1. Determine focus of the assessment tool	1.1 Identify target group of candidates, purposes of ***assessment tool,*** and ***contexts*** in which the tool will be used 1.2 Access relevant ***benchmarks for assessment*** and interpret them to establish evidence required to demonstrate competence 1.3 Identify, access and interpret ***organisational, legal and ethical requirements*** and relevant ***contextualisation guidelines*** 1.4 Identify other ***related documentation*** to inform assessment tool development
2. Design assessment tool	2.1 Select assessment methods that support the collection of defined evidence, taking into account the context in which the assessment will take place and meeting the principles of assessment 2.2 Enable candidates to show or support their claim for recognition of current competency through selected assessment methods 2.3 Consider different ***assessment instruments*** for the selected assessment methods to generate options for collection of evidence 2.4 Consider how the assessment instruments will be administered
3. Develop assessment tool	3.1 Develop specific assessment instruments that address the evidence to be collected 3.2 Define and document clear and specific ***procedures*** instructing assessor and candidate on the administration and use of the instruments 3.3 Consider requirements of ***assessment system policies and procedures*** and address storage and retrieval needs, and review, evaluation and version control procedures as part of this process
4. Review and trial assessment tool	4.1 Check draft assessment tools against ***evaluation criteria*** and amend as required 4.2 Trial assessment tools to validate content and applicability 4.3 Collect and document feedback from relevant people involved in trialling 4.4 Make amendments to final tool based on analysis of feedback

	4.5 Appropriately format and file finalised assessment tool according to assessment system policies and procedures and organisational, legal and ethical requirements

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- analysis and interpretation skills to review and evaluate assessment tools
- critical thinking skills to translate the interpreted competency standards and other relevant assessment information into meaningful assessment instruments
- design skills to develop different assessment tool designs
- research and evaluation skills to evaluate assessment tools on the basis of trials and feedback.

Required knowledge

- principles of assessment and how they are applied when developing assessment tools
- different types and rules of evidence
- different assessment contexts and relationship to developing assessment tools
- components of competency and dimensions of competency
- contextualisation of competency standards and contextualisation guidelines
- Assessment Guidelines of training packages as relevant to developing assessment tools
- different assessment methods, their purposes and uses
- evaluation methodologies appropriate to the trial and review of assessment tools
- principles of reasonable adjustment
- relevant workplace information, including:
  - organisational policies and procedures
  - workplace tasks and activities
  - standard operating procedures
  - procedures for use of relevant personal protective equipment.

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	

Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to:
	• develop assessment tools that support different assessment methods and address at least three units of competency packaged at different Australian Qualifications Framework (AQF) levels
	• develop assessment tools that:
	  • include the instruments for collecting evidence, reflecting the principles of assessment and the rules of evidence, and the related instructions to assessor/s and candidates
	  • show how the contextual needs of different environments are addressed
	• report on the trial and review of the assessment tools, including proposed changes.

Context of and specific resources for assessment	Evidence must be gathered in the workplace wherever possible. Where no workplace is available, a simulated workplace must be provided. Assessment must ensure access to: • training products, such as training packages and accredited course documentation.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Assessment tool includes:	• the learning or competency unit(s) to be assessed • the target group, context and conditions for the assessment • the tasks to be administered to the candidate • an outline of the evidence to be gathered from the candidate • the evidence criteria used to judge the quality of performance (i.e. the assessment decision-making rules) • the administration, recording and reporting requirements • the evidence of how validity and reliability have been tested and built into the design and use of the tool.
Contexts of assessment/RPL may include:	• environment in which the assessment/RPL will be carried out, including real or simulated workplace • opportunities for collecting evidence in a number of situations • relationships between competency standards and evidence to support RPL • who carries out the assessment/RPL • relationships between competency standards and work activities in the candidate's workplace • relationships between competency standards and learning activities.
Benchmarks for assessment:	• refer to criteria against which the candidate is assessed which may be a unit of competency, assessment criteria of course curricula, performance specifications, or product specifications • where the benchmark is one or more units of competency the standards may be contextualised to reflect the immediate operating environment.

Organisational, legal and ethical requirements may include:	• assessment system policies and procedures
	• industrial relations systems and processes, awards and enterprise agreements
	• licensing and legal ramifications of assessing competence
	• reporting, recording and retrieval systems for assessment
	• requirements of training, assessment and validation, including the AQTF Standards for Registered Training Organisations
	• human resource policies, procedures and legal requirements, including:
	  • anti-discrimination
	  • equal employment opportunity
	  • job role, responsibilities and conditions
	• relevant industry codes of practice
	• confidentiality and privacy requirements of information relating to completed assessments

	• OHS considerations, including:
	  • ensuring assessment methods and tools incorporate appropriate measures to maintain the health, safety and welfare of candidates
	  • ensuring OHS requirements and specified benchmarks are accounted for within evidence requirements and assessment materials
	  • identifying hazards and relevant risk control procedures associated with the assessment environment.

Contextualisation guidelines relate to:	• relevant training package or accredited course contextualisation guidelines.

Related documentation may include:	• requirements set out in the Assessment Guidelines of the relevant training packages
	• information from the competency standards about:
	  • resources required for assessment
	  • assessment context
	  • appropriate assessment methods
	• assessment activities identified in accredited modules derived from the relevant competency standards
	• assessment activities in support materials related to the relevant competency standards
	• any requirements of OHS, legislation, codes of practice, standards and guidelines
	• indicators and levels of competence of the Australian Core Skills Framework
	• organisational requirements for demonstration of work performance
	• product specifications.

Assessment instrument may be:	• profiles of acceptable performance measures • templates and proformas • specific questions or activities • evidence and observation checklists • checklists for the evaluation of work samples • recognition portfolios • candidate self-assessment materials.

Procedures may include:	• those that guide the application of the instruments, such as: • instructions for the candidates • instructions for administering the assessment tool, including resources needed to conduct assessment and the context for the use of tools • guidance for development or review of decision-making process • guidance on reasonable adjustments • specified variations or restrictions on the tools • rules for verifying assessment decisions • OHS requirements, for example, identified hazards in the assessment environment and appropriate controls and reporting mechanisms • information on access and equity considerations.
Assessment system policies and procedures may include:	• assessment records, and data and information management • recognition of current competency, RPL and credit arrangements • assessor needs, qualifications and maintenance of currency • assessment reporting procedures • assessment appeals • candidate grievances and complaints • validation • evaluation and internal audit • costs and resourcing • access and equity, and reasonable adjustment • partnership arrangements • links with human resource or industrial relations systems • links with overall quality management system.
Evaluation criteria may include:	• effectiveness and relevance to the competency standards • whether assessment tool is appropriate to selected assessment methods • whether assessment tool is appropriate to target group and assessment context • appropriateness of language and literacy for intended audience.

Unit Sector(s)

Assessment

Custom Content Section

Not applicable.

TAEDEL301A Provide work skill instruction

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to conduct individual and group instruction and demonstrate work skills, using existing learning resources in a safe and comfortable learning environment. The unit covers the skills and knowledge required to determine the success of both the training provided and one's own personal training performance. It emphasises the training as being driven by the work process and context.

Application of the Unit

Application of the unit	This unit supports a wide range of applications across any workplace setting and so can be used by any organisation. Its use is not restricted to training organisations.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Organise instruction and demonstration	1.1. Gather information about ***learner characteristics*** and learning needs 1.2. Confirm a ***safe learning environment*** 1.3. Gather and check ***instruction and demonstration objectives*** and seek assistance if required 1.4. Access and review relevant ***learning resources*** and ***learning materials*** for suitability and relevance, and seek assistance to interpret the contextual application 1.5. Organise access to necessary equipment or physical resources required for instruction and demonstration 1.6. Notify learners of ***details*** regarding the implementation of the learning program and/or delivery plan
2. Conduct instruction and demonstration	2.1. Use interpersonal skills with learners to establish a safe and comfortable learning environment 2.2. Follow the learning program and/or delivery plan to cover all learning objectives 2.3. Brief learners on any ***OHS procedures*** and requirements prior to and during training 2.4. Use ***delivery techniques*** to structure, pace and enhance learning 2.5. Apply ***coaching*** techniques to assist learning 2.6. Use communication skills to provide information,

ELEMENT	PERFORMANCE CRITERIA
	instruct learners and demonstrate relevant work skills 2.7. Provide opportunities for practice during instruction and through work activities 2.8. Provide and discuss feedback on learner performance to support learning
3. Check training performance	3.1. Use ***measures*** to ensure learners are acquiring and can use new technical and generic skills and knowledge 3.2. Monitor learner progress and outcomes in consultation with learner 3.3. Review relationship between the trainer/coach and the learner and adjust to suit learner needs
4. Review personal training performance and finalise documentation	4.1. Reflect upon personal performance in providing instruction and demonstration, and document strategies for improvement 4.2. Maintain, store and secure learner records according to organisational and legal requirements

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- verbaland non-verbal communication techniques, such as:
  - asking relevant and appropriate questions
  - providing explanations
  - demonstrating
  - using listening skills
  - providing information clearly
- safety skills to implement OHS requirements, by acting and responding safely in order to:
  - identify hazards
  - conduct prestart-up checks if required
  - observe and interpret learner behaviour that may put people at risk
- time-management, skills to:

REQUIRED SKILLS AND KNOWLEDGE

- ensure all learning objectives are covered
- pace learning

- reflection skills in order to:
  - identify areas for improvement
  - maintain personal skill development
- literacy skills to:
  - complete and maintain documentation
  - read and follow learning programs and plans
  - read and analyse learner information
- technology skills to operate audio-visual and technical equipment
- interpersonal skills to:
  - engage, motivate and connect with learners
  - provide constructive feedback
  - maintain appropriate relationships
  - establish trust
  - use appropriate body language
  - maintain humour
  - demonstrate tolerance
  - manage a group
  - recognise and be sensitive to individual difference and diversity
- observation skills to:
  - monitor learner acquisition of new skills, knowledge and competency requirements
  - assess learner communication and skills in interacting with others
  - identify learner concerns
  - recognise learner readiness to take on new skills and tasks

Required knowledge

- learner characteristics and needs
- content and requirements of the relevant learning program and/or delivery plan
- sources and availability of relevant learning resources and learning materials
- content of learning resources and learning materials
- training techniques that enhance learning and when to use them
- introductory knowledge of learning principles and learning styles
- key OHS issues in the learning environment, including:
  - roles and responsibilities of key personnel
  - responsibilities of learners
  - relevant policies and procedures, including hazard identification, risk assessment, reporting requirements, safe use of equipment and emergency

REQUIRED SKILLS AND KNOWLEDGE
procedures • risk controls for the specific learning environment

Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	Assessment must address the scope of this unit and reflect all components of the unit. A range of appropriate assessment methods and evidence-gathering techniques must be used to determine competency. A judgement of competency should only be made when the assessor is confident that the required outcomes of the unit have been achieved and that consistent performance has been demonstrated.

Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to:
	• carry out aminimum of three training sessions, involving demonstrating and instructing particular work skills for different groups; with each session addressing:
	  • different learning objectives
	  • a range of techniques and effective communication skills appropriate to the audience.

Context of and specific resources for assessment	Evidence must be gathered in the workplace wherever possible. Where no workplace is available, a simulated workplace must be provided.
Method of assessment	
Guidance information for assessment	For further information about assessment of this and other TAE units, refer to relevant implementation guidance published on the IBSA website (www.ibsa.org.au).

Range Statement

RANGE STATEMENT

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Learner characteristics may include:	• language, literacy and numeracy levels • learning styles • past learning and work experiences • specific needs • workplace culture.
Safe learning environment may include:	• exit requirements • personal protective equipment • safe access • safe use of equipment.

Instruction and demonstration objectives may include:	• competencies to be achieved
	• generic and technical skills, which may be:
	  • provided by the organisation
	  • developed by a colleague
	  • individual or group objectives
	  • learning outcomes.

Learning resources may include:	• any material used to support learning, such as:
	  • learner and user guides
	  • trainer and facilitator guides
	  • example training programs
	  • specific case studies
	  • professional development materials
	  • assessment materials
	• a variety of formats
	• those produced locally
	• those acquired from other sources.

Learning materials may include:	• handouts for learners • materials sourced from the workplace, e.g. workplace documentation, operating procedures, and specifications.
Details may include:	• location and time • outcomes of instruction or demonstration • reason for instruction or demonstration • who will be attending instruction session.

RANGE STATEMENT	
OHS procedures may include:	• emergency procedures • hazards and their means of control • incident reporting • use of personal protective equipment • safe work practices • safety briefings • site-specific safety rules.
Delivery techniques may include:	• coaching • demonstration • explanation • group or pair work • providing opportunities to practise skills and solve problems • questions and answers.
Coaching may include:	• learning arrangements requiring immediate interaction and feedback • on-the-job instruction and 'buddy' systems • relationships targeting enhanced performance • short-term learning arrangements • working on a one-to-one basis.
Measures may include:	• informal review or discussion • learner survey • on-the-job observation • review of peer coaching arrangements.

Unit Sector(s)

Unit sector	Delivery and facilitation

Competency field

Competency field	

Co-requisite units

Co-requisite units		

TAEDEL402A Plan, organise and facilitate learning in the workplace

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to plan, organise and facilitate learning for individuals in a workplace.

Application of the Unit

Application of the unit	This unit typically applies to a person working as an entry level trainer, teacher or facilitator, team leader or workplace supervisor, or any employee responsible for guiding learning through work.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Establish effective work environment for learning	1.1. Establish and agree upon objectives and scope of the work-based learning 1.2. Analyse work practices and routines to determine their effectiveness in meeting established learning objectives 1.3. Identify and address ***OHS implications*** of using work as the basis for learning
2. Develop a work-based learning pathway	2.1. Address ***contractual requirements*** and responsibilities for learning at work 2.2. Arrange for integration and monitoring of external learning activities with the ***work-based learning pathway*** 2.3. Obtain agreement from relevant personnel to implement the work-based learning pathway
3. Establish the learning-facilitation relationship	3.1. Identify context for learning and individual's learning style 3.2. Select appropriate technique or process to facilitate learning and explain the basis of the technique to learner 3.3. Develop, document and discuss ***individualised learning plan*** with learner 3.4. Access, read and interpret documentation outlining the OHS responsibilities of the various parties in the

ELEMENT	PERFORMANCE CRITERIA
	learning environment 3.5. Monitor supervisory arrangements appropriate to learner's levels of knowledge, skill and experience to provide support and encouragement and ensure learner's health and safety
4. Implement work-based learning pathway	4.1. Sequence introduction of workplace tasks, activities and processes to reflect the agreed work-based learning pathway 4.2. Explain objectives of work-based learning and the processes involved to learner 4.3. Encourage learner to take responsibility for learning and to self-reflect 4.4. Develop techniques that facilitate learner's transfer of skills and knowledge
5. Maintain and develop the learning/facilitation relationship	5.1. Prepare for each session 5.2. Structure learning activities to support and reinforce new learning, build on strengths, and identify areas for further development 5.3. Observe learner cues and change approaches where necessary to maintain momentum 5.4. Practise ***ethical behaviour*** at all times 5.5. Monitor effectiveness of the learning/facilitation relationship through regular meetings between the parties
6. Close and evaluate the learning/facilitation relationship	6.1. Carry out the closure smoothly, using appropriate interpersonal and communication skills 6.2. Seek feedback from learner on the outcomes achieved and value of the relationship 6.3. Evaluate and document process, including ***impact***, ***self evaluation and reflection***, and file according to legal and organisational requirements
7. Monitor and review the effectiveness of the work-based learning pathway	7.1. Document work performance and learning achievement and keep records according to organisational requirements 7.2. Evaluate effectiveness of the work-based pathway against the objectives, processes and techniques used 7.3. Recommend improvements to work-based practice in light of the review process

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- oral communication and language skills to:
  - motivate the learner
  - transfer skills and knowledge
- interpersonal skills to maintain appropriate relationships
- observation skills to monitor individual progress
- literacy skills to:
  - read and interpret organisational documents, legal documents and contracts
  - complete and maintain documentation
- organisational skills to provide guidance and feedback to individuals
- communication skills, including:
  - using effective verbal and non-verbal language
  - using critical listening and questioning techniques
  - giving constructive and supportive feedback
  - assisting learners to paraphrase advice or instructions back to the trainer/facilitator
  - providing clear and concrete options and advice
  - using appropriate industry/profession terminology and language
  - ensuring language, literacy and numeracy used is appropriate to learners

Required knowledge

- systems, processes and practices within the organisation where work-based learning is taking place
- operational demands of the work and impact of changes on work roles
- organisational work culture, including industrial relations environment
- systems for identifying skill needs
- introductory knowledge of different learning styles and how to encourage learning in each, for example:
  - visual learners
  - audio learners
  - kinaesthetic learners
  - theoretical learners
- relevant policy, legislation, codes of practice and national standards that may affect training and assessment in the vocational education and training sector
- OHS relating to the work role, including:
  - hazards relating to the industry and specific workplace

REQUIRED SKILLS AND KNOWLEDGE
• reporting requirements for hazards and incidents • specific procedures for work tasks • safe use and maintenance of relevant equipment • emergency procedures • sources of OHS information

Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	Assessment must address the scope of this unit and reflect all components of the unit. Arange of appropriate assessment methods and evidence-gathering techniques must be used to determine competency. A judgement of competency should only be made when the assessor is confident that the required outcomes of the unit have been achieved and that consistent performance has been demonstrated.

Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to:
	• prepare and facilitate work-based learning
	• provide evidence of a minimum of two examples of developing work-based learning pathways, that include:
	  • identifying needs for learning
	  • analysing work practices, work environment and work activities
	  • organising and allocating work in a way that reflects learning needs and provides effective learning opportunities through work processes
	• provide a minimum of two examples of a learning facilitation relationship being conducted:
	  • with different individuals
	  • demonstrating communication skills and flexibility
	  • demonstrating one or more of the processes or techniques identified.

Context of and specific resources for assessment	Evidence must be gathered in the workplace wherever possible. Where no workplace is available, a simulated workplace must be

EVIDENCE GUIDE	
	provided. Assessment must ensure access to information about work activities.
Method of assessment	
Guidance information for assessment	For further information about assessment of this and other TAE units, refer to relevant implementation guidance published on the IBSA website (www.ibsa.org.au).

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
OHS implications may include:	• OHS obligations • workplace OHS policies and procedures • ensuring work practices, routines and proposed changes do not pose a risk to learners and others.
Contractual requirements may include:	• training plans under apprenticeships/traineeships • requirements of government-funded training programs, such as Workplace English Language and Literacy (WELL).
Work-based learning pathway may include:	• identifying specific goals for work-based learning • identifying job tasks or activities to be included in learning process • appropriate sequencing of job tasks/activities to reflect learner incremental development • direct guidance and modelling from experienced co-workers and experts • opportunities for practice.
Individualised learning plan may include:	• information about individual's learning style, learner characteristics, and the context for learning • clear boundaries and expectations of the learning/facilitation relationship • documented equity or additional support needs for the

RANGE STATEMENT	
	learner • performance benchmarks to be achieved • activities and processes which together will achieve the benchmarks.
Ethical behaviour includes:	• trust • integrity • privacy and confidentiality of the session • following organisational policies • knowing own limitations • having a range of other intervention referrals ready when needed • honesty • fairness to others.
Impact may be:	• successful achievement, rate of achievement, or lack of achievement of identified goals • achievement of other outcomes as a result of the relationship • development of new goals • new or increased motivation to learn • greater capacity to learn • increase in learner's self-confidence.

Self-evaluation and reflection may include:	• asking critical questions about:
	  • own ability
	  • what worked or didn't work
	  • how the relationship building process could be improved
	• reviewing records and journals on sessions and critically evaluating own performance
	• reviewing feedback from learner and identifying critical aspects and areas for improvement.

Unit Sector(s)

Unit sector	Delivery and facilitation

Competency field

Competency field	

Co-requisite units

Co-requisite units		

TAEDES401A Design and develop learning programs

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to conceptualise, design, develop and review learning programs to meet an identified need for a group of learners. The unit addresses the skills and knowledge needed to identify the parameters of a learning program, determine the design, outline the content and review its effectiveness.

Application of the Unit

Application of the unit	This unit typically applies to a trainer or facilitator who designs or develops learning programs. A learning program can be discrete, providing a planned learning approach that relates to specific learning and training needs, or it may form part of the learning design for a qualification.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Define parameters of the learning program	1.1. Clarify ***purpose*** and type of learning program with key stakeholders 1.2. Access and confirm the competency standards and ***other training specifications*** on which to base the learning program 1.3. Identify language, literacy and numeracy requirements of the program 1.4. Identify and consider characteristics of the target learner group
2. Work within the vocational education and training (VET) policy framework	2.1. Access relevant ***VET policies*** and frameworks, and apply to work practices 2.2. Identify changes to training packages and accredited courses and apply these to program development 2.3. Conduct work according to organisational quality assurance policies and procedures
3. Develop program content	3.1. Research, develop and document specific subject matter content according to agreed design options 3.2. Evaluate existing learning resources for content relevance and quality 3.3. Specify assessment requirements of the learning program

ELEMENT	PERFORMANCE CRITERIA
4. Design structure of the learning program	4.1. Break the learning content into manageable segments and document timeframe for each segment 4.2. Determine and confirm ***delivery strategies*** and required assessment methods and tools 4.3. Document complete learning program in line with organisational requirements 4.4. Review complete program with key stakeholders and adjust as required 4.5. Ensure a safe learning progression by analysing risks in the learning environment and including a risk control plan

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- organisational skills to ensure resources are available and suitable
- evaluation skills to determine the time required for each learning segment and the overall timelines of the learning program
- cognitive skills to develop the learning program content and design its structure
- language and literacy skills to read and interpret a range of documentation, including technical and subject matter documents, references and texts

Required knowledge

- information about training package developers and course accreditation agencies responsible for specific learning program parameters
- training packages and relevant competency standards to be used as the basis of the learning program
- other performance standards and criteria to be used as the basis of the learning program, where relevant
- distinction and relationship between a training package/accredited course, learning strategy and learning program, where linked
- different purposes and focus of learning programs
- sound knowledge of learning principles
- instructional design principles relating to different design options for learning program design and structure
- availability and types of different relevant learning resources, learning materials

REQUIRED SKILLS AND KNOWLEDGE
and pre-developed learning activities • methodology relating to developing and documenting new learning activities and related learning materials • different delivery modes and methods • relevant policies, legal requirements, codes of practice and national standards, including commonwealth and state or territory legislation that may affect training and assessment in the VET sector • relevant OHS knowledge relating to the work role, and OHS considerations that need to be included in the learning program

Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	Assessment must address the scope of this unit and reflect all components of the unit. Arange of appropriate assessment methods and evidence-gathering techniques must be used to determine competency. A judgement of competency should only be made when the assessor is confident that the required outcomes of the unit have been achieved and that consistent performance has been demonstrated.

Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to:
	• design, develop and review learning programs within the VET context
	• prepare and develop a minimum of two learning programs:
	  • that contain differentiated learning program designs to reflect particular needs, contexts and timelines
	  • at least one of which must be based on competency standards or accredited courses and must cover at least one entire unit of competency or accredited course module.

Context of and specific resources for assessment	Evidence must be gathered in the workplace whenever possible. Where no workplace is available, a simulated workplace must be provided.
Method of assessment	
Guidance information for	For further information about assessment of this and other TAE

EVIDENCE GUIDE	
assessment	units, refer to relevant implementation guidance published on the IBSA website (www.ibsa.org.au).

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Purpose may include:	• developing vocational competency or vocational skills • developing language, literacy and numeracy skills • developing general education • meeting legislative, licensing and registration requirements, such as OHS requirements.
Other training specifications may include:	• curriculum specifications • product specifications • organisational work requirements and training needs • induction needs • language, literacy and numeracy development needs • regulatory and licensing requirements.
Vocational education and training policies may include:	• policies and procedures set by national organisations, such as the National Quality Council • Australian Quality Training Framework • other relevant policies.

Delivery strategies may include:	• focus of delivery in terms of size and type of group
	• context of delivery, for example:
	  • in the workplace
	  • in a training room
	  • in a community setting
	• mode of delivery, for example:
	  • face-to-face
	  • online
	  • blended delivery mode
	• delivery methods, for example:

RANGE STATEMENT	
	• lock-step, learner-paced and mixed • interactive, participative and collaborative • blended delivery methods.

Unit Sector(s)

Unit sector	Learning design

Competency field

Competency field	

Co-requisite units

Co-requisite units		