



Australian Government

MEA422A Repair/modify aircraft metal structure

Release: 1

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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.
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Elements and Performance Criteria

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| 1 Prepare to undertake repair | <ul style="list-style-type: none"> 1.1 The extent of damage is correctly assessed to assist in determining <i>repair procedure</i> 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 | <ul style="list-style-type: none"> 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 jiggling 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.

<p>Overview of assessment</p>	<p>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.</p>
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>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.</p> <p>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.</p> <p>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.</p>
<p>Context of and specific resources for assessment</p>	<p>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.</p>
<p>Method of assessment</p>	
<p>Guidance information for assessment</p>	

Range Statement

<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
<p>Note</p>	<p>The Range Statements below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide</p>
<p>Repair procedures</p>	<p>Repair procedures may include:</p> <ol style="list-style-type: none"> 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
<p>Procedures and requirements</p>	<p>Refer to industry standard specified by manufacturers, regulatory authorities or the enterprise</p>

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.