



Australian Government

MEA422 Repair/modify aircraft metal structure

Release: 2

MEA422 Repair/modify aircraft metal structure

Modification History

Release 2 – Assessment Conditions amended to permit assessment in a simulated workplace

Application

This unit of competency requires application of hand skills, the use of special tools, structural repair manuals and approved repair schemes to repair aircraft structure during scheduled or unscheduled maintenance. Where fabrication of replacement components is required the applicable units are MEA420 Fabricate basic structural components for aircraft and MEA421 Fabricate advanced structural components for aircraft. Where major structural disassembly is required the applicable unit is MEA423 Aircraft structure major disassembly and reassembly.

Work may be performed individually or as part of a team.

Applications include the metal structure of fixed and rotary wing aircraft.

The unit is part of the Aeroskills Structures Maintenance Certificate IV training pathway. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA401 Inspect aircraft structures

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
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 while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | | 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 |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

- Repair procedures include:**
- Removing corrosion by chemical and mechanical methods
 - Restoring protective coatings

Procedures and requirements include:

- Applying sealants and jointing compounds
- Freehand precision hole generation
- Removing and installing structural hardware, fastening devices, bushes, bearings and bearing surfaces
- Removing and repairing damaged sections and reinstall
- Industry standard specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 2 - Assessment Conditions amended to permit assessment in a simulated workplace. Equivalent.

Release 1 – equivalent to MEA422A Repair/modify aircraft metal structure

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA422 Repair/modify aircraft metal structure

Modification History

Release 2 – Assessment Conditions amended to permit assessment in a simulated workplace

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS 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
- correctly supporting 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.

The underlying skills inherent in this unit should be transferable into other areas that require similar techniques. 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.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include 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
- WHS precautions associated with repair of aircraft structure
- MSDS
- PPE.

Assessment Conditions

- 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.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) item from each of the following groups:
 - remove corrosion by chemical and mechanical methods
 - restore protective coatings

- apply sealants and jointing compounds
- freehand precision hole generation
- remove and install structural hardware, fastening devices, bushes, bearings and bearing surfaces
- remove and repair damaged sections and reinstall.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>