



Australian Government

MEA371 Perform major repairs and modifications to small aircraft metal structure

Release: 1

MEA371 Perform major repairs and modifications to small aircraft metal structure

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, applicable tools, maintenance publications and repair drawings to perform major repairs and modifications to small aircraft structure, including the replacement of primary structure components of both fixed and rotary wing aircraft. This may occur during scheduled or unscheduled maintenance activities and may involve individual or team-related activities.

The unit is part of the Aeroskills Mechatronics Certificates III and IV small aircraft maintenance training pathways.

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).

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 Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA369	Inspect and maintain structures and related components of non-pressurised small aircraft
MEA370	Repair the structure of non-pressurised small aircraft

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.

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| 1. | Prepare to undertake repair or modification | 1.1 | Modification or the repair scheme is identified in accordance with structural repair manual and/or approved data |
| | | 1.2 | 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 |
| | | 1.3 | All materials and equipment required are organised |
| | | 1.4 | Structure is supported and prepared in accordance with the applicable maintenance manual to ensure personnel safety and freedom from damage |
| | | 1.5 | Jigs, fixtures or bracing are used, as required, to maintain shape and/or alignment |
| 2. | Repair/modify aircraft structure | 2.1 | Structural repairs/modifications are performed, in accordance with approved repair scheme or modification drawings and instructions, 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 | Required mensuration/alignment checks are completed and 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 maintenance 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.

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| Repair tasks include: | <ul style="list-style-type: none">• Removing and installing structural hardware and fastening devices• Repairing by replacement major load-carrying structural members, such as skins, longerons, spars, frames and bulkheads |
| Assembly stress defects include: | <ul style="list-style-type: none">• Oil canning• Buckling• Contour misalignment |
| Procedures and requirements include: | <ul style="list-style-type: none">• Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise |

Unit Mapping Information

Release 1 – partially replaces MEA311D Inspect and repair/modify aircraft structures

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 MEA371 Perform major repairs and modifications to small aircraft metal structure

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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 regulations and practices, including the use of MSDS and PPE
- using approved maintenance documentation and aircraft publications relating to aircraft structure
- identifying aircraft structural assembly fasteners 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 jiggling methods
- performing mensuration checks after structure reassembly.

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 the major repair and modification of aircraft structure is essential. This may be demonstrated through application across a number of aircraft systems or aircraft types. Ability to interpret repair/modification 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.

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 structural component attachment methods for primary structure:
 - fuselage
 - wings and attachment fittings
 - horizontal and vertical stabilisers and attachment fittings
 - pylons and attachment fittings
 - flight control surfaces
 - engine mounts and nacelles and attachment fittings
 - undercarriage attachments
- 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
 - undercarriage attachment fittings
- aircraft mensuration checks – when required and methodology
- repair of integral fuel tanks and sealing of faying surfaces, including specific WHS and PPE requirements
- surface finishes and methods of restoration
- how to obtain MSDS
- relevant maintenance and structural repair manuals and modification data
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- 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.
- 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 tasks involving repairing by replacement or modifying major load-carrying structural members, such as skins, longerons, spars, frames and bulkheads.
- 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).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

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