



Australian Government

MEA355 Maintain light aircraft air cycle air conditioning systems

Release: 1

MEA355 Maintain light aircraft air cycle air conditioning systems

Modification History

Release 1 - New unit of competency

Application

This unit of competency 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 during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

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 MEA303 Remove and install aircraft pneumatic system components and MEA310 Inspect, test and troubleshoot aircraft pneumatic systems and components.

The unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway.

Where a Civil Aviation Safety Authority (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

MEA201	Remove and install miscellaneous aircraft electrical hardware and components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts

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. | 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 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) |
| | | 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 to line replacement level |
| | | 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 |

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| 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 while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | | 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 |

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.

- Air cycle air conditioning system components include:**
- Valves and regulators
 - Heat exchangers, water separators and humidifiers
 - Expansion turbines
 - Rigid and flexible pipelines, hoses and fittings
 - Ducting

Procedures and requirements include:

- Temperature sensors, temperature controllers and electrical control circuit wiring/components
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA355A Maintain light aircraft air cycle air conditioning systems

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 MEA355 Maintain light aircraft air cycle air conditioning systems

Modification History

Release 1 - New unit of competency

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 include:

- 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 of Conditions
- 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 WHS procedures including the use of PPE and MSDS.

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 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.

This shall be demonstrated through application across air cycle air conditioning systems and components as listed in the Assessment Conditions.

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:

- WHS precautions relevant to light aircraft air cycle air conditioning system maintenance and how to obtain PPE and MSDS
- 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.

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 applicable general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- 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.
- 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 this unit of competency are being achieved under routine supervision on an air cycle air conditioning system and on a representative range of the following components:
 - valves and regulators
 - heat exchangers, water separators and humidifiers
 - expansion turbines
 - rigid and flexible pipelines, hoses and fittings
 - ducting
 - temperature sensors, temperature controllers, and electrical control circuit wiring/components.
- 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>