



Australian Government

MEA362 Maintain aircraft vapour cycle air conditioning systems

Release: 1

MEA362 Maintain aircraft vapour cycle air conditioning systems

Modification History

Release 1 - New unit of competency

Application

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

Compliance with applicable regulations is required where refrigerant evacuation and recharging is performed.

Applications include all aircraft vapour cycle air conditioning 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/components
MEA246	Fabricate and/or repair aircraft electrical components 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 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 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. | 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 to line replacement level |
| | | 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 |

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| | 4.3 | 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 |
| | 4.4 | 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 while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | 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 |

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.

Vapour cycle air conditioning systems include:

- Refrigeration system compressor, condenser, receiver dryer, thermal expansion valve and evaporator
- Magnetic clutch and drive system (belt, power take-off, electric motor, hydraulic motor or pneumatic as applicable)
- Condenser extension and retraction system
- Blower
- Throttle system shutoff
- Temperature control system
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Procedures and requirements include:

Unit Mapping Information

Release 1 – equivalent to MEA362A Maintain aircraft vapour 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 MEA362 Maintain aircraft vapour 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 must include:

- applying relevant WHS procedures, including the selection and use of applicable PPE and MSDS
- 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.

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. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical.

This shall be demonstrated through application across a number of aircraft vapour cycle air conditioning systems.

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 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.

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 application of testing procedures and functional checks should 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.
- 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 a system and at least one (1) component in each of the following groups:
 - refrigeration system compressor, condenser, receiver dryer, thermal expansion valve and evaporator
 - magnetic clutch and drive system (belt, power takeoff, electric motor, hydraulic motor or pneumatic as applicable)
 - condenser extension and retraction system
 - blower
 - throttle system shutoff
 - temperature control system.
- 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.

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