



Australian Government

MEAMEC0077 Maintain aircraft vapour cycle air conditioning systems

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Modification History

Release	Comments
1	This unit of competency was first released in MEA Aeroskills Training Package Release 6.0.

Application

This unit of competency describes the skills and knowledge required to maintain aircraft vapour cycle air conditioning systems. Maintenance involves inspection, testing, fault diagnosis, and parts replacement during scheduled and unscheduled maintenance. Work may be performed individually or as part of a team.

This unit applies to a range of types of aircraft vapour cycle air conditioning systems and components.

Licensing/Regulatory Information

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Civil Aviation Safety Authority (CASA) and the Defence Aviation Safety Authority (DASA).

Any other relevant legislation, industry standards and codes of practice within Australia must be applied.

Pre-requisite unit(s)

MEA201 Remove and install miscellaneous aircraft electrical hardware/components

MEA246 Fabricate and/or repair aircraft electrical components or parts

Competency field(s)

Aviation maintenance

Unit sector(s)

N/A

Elements and Performance Criteria

Elements	Performance criteria
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Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1. Inspect vapour cycle air conditioning systems	1.1 Check isolation tags already attached to the system or related systems and configure aircraft/engine for safe system inspection and operation in accordance with applicable maintenance manual 1.2 Check vapour cycle air conditioning systems 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 safety data sheets (SDS) and items of personal protective equipment (PPE)
2. Test vapour cycle air conditioning systems	2.1 Prepare aircraft and system in accordance with applicable maintenance manual 2.2 Test vapour cycle air conditioning system 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 Use available information from maintenance documentation and inspection and test results to assist in fault determination 3.2 Use maintenance manual fault diagnosis guide and logical processes to ensure efficient and accurate troubleshooting to line replacement level 3.3 Locate vapour cycle air conditioning system faults and identify and record the causes of the faults in maintenance documentation 3.4 Determine fault rectification requirements to assist in planning the repair
4. Remove vapour cycle air conditioning system components	4.1 Render aircraft and vapour cycle air conditioning system safe, including fitting of isolation tags where required, in accordance with applicable maintenance manual, to ensure safety of personnel prior to removal of any components 4.2 Perform refrigerant evacuation in accordance with regulatory requirements and maintenance manual procedures 4.3 Carry out component removal in accordance with the applicable maintenance manual while observing all relevant WHS requirements, including the use of SDS and items of PPE 4.4 Tag and prepare components for transport or storage in accordance with the specified procedures 4.5 Complete and process required maintenance documentation in accordance with standard enterprise procedures

5. Install vapour cycle air conditioning system components	5.1 Check components to be installed to confirm correct part or model numbers, modification status and serviceability 5.2 Carry out installation in accordance with the applicable maintenance manual while observing all relevant WHS requirements, including the use of SDS and items of PPE 5.3 Recharge vapour cycle air conditioning system with refrigerant, in accordance with regulatory requirements and maintenance manual procedures 5.4 Test vapour cycle air conditioning system for correct function and freedom from refrigerant leaks 5.5 Complete and process required maintenance documentation in accordance with standard enterprise procedures
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Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance but not explicit in the performance criteria.

- Reading skills to interpret maintenance manuals, inspection procedures and specifications (allowable limits).
- Writing skills to record and report on defects and faults and their causes.
- Numeracy skills to interpret and communicate technical information including wiring diagrams and take and interpret system measurements.

Range of conditions

No conditions apply to this unit of competency at the time of publication.

Unit Mapping Information

Current Code and Title	Previous Code and Title	Comments	Equivalence
MEAMEC0077 Maintain aircraft vapour cycle air conditioning systems	MEA362 Maintain aircraft vapour cycle air conditioning systems	Superseded	Equivalent

Assessment Requirements for MEAMEC0077 Maintain aircraft vapour cycle air conditioning systems

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Performance Evidence

There must be evidence the candidate has completed the tasks outlined in the elements and performance criteria of this unit, and demonstrated the ability to:

- maintain aircraft vapour cycle air conditioning systems on at least one (1) component in at least four (4) 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
- During the above work, demonstrate the following:
 - apply relevant WHS procedures, including the selection and use of applicable safety data sheets (SDS) and items of personal protective equipment (PPE)
 - comply with regulatory requirements regarding the de-gassing of vapour cycle air conditioning systems
 - use relevant maintenance documentation and aircraft manual
 - recognise external and internal signs of defects in vapour cycle air conditioning systems and system components through visual or physical inspection
 - test vapour cycle air conditioning system operation, be able to operate systems and leak testing equipment, monitor indications and recognise correct function
 - use specialist equipment to evacuate and recharge refrigerant
 - use 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 remove and install 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.

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 SDS
- 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 specified by manufacturers, regulatory authorities and the enterprise.

Assessment Conditions

The following conditions of assessment represent the requirements of the regulators Defence Aviation Safety Authority (DASA) and Civil Aviation Safety Authority (CASA) and maintenance stakeholders and must be rigorously observed.

Competency must have been demonstrated under routine supervision in the workplace or in a simulated environment that reflects workplace conditions and contingencies encountered in repairing and overhauling aircraft mechanical system components. The following conditions must be met for this unit:

- use of suitable facilities, equipment and resources, including:
 - tools and equipment specified in maintenance documentation
 - workplace procedures, manufacturing specifications, codes, standards, manuals, and reference materials relevant to repairing and overhauling aircraft mechanical system components
 - general-purpose tools and test equipment found in most routine situations.

All persons carrying out activities connected to gassing and degassing of refrigerants must hold the appropriate refrigerant handlers license as issued by the Australian Refrigeration Council.

Evidence of tasks demonstrating competency must be recorded in a log of industrial experience and achievement.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors. Where the unit is to be used for CASA or DASA licensing purposes the assessor must also meet the criteria specified in the respective CASR or DASR Part 147 regulation.

Link

Companion volumes, including implementation guides, are found on the national training register - <https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>.