



Australian Government

MEA320 Test and troubleshoot aircraft hydro-mechanical, gaseous and landing gear systems and components

Release: 2

MEA320 Test and troubleshoot aircraft hydro-mechanical, gaseous and landing gear systems and components

Modification History

Release 2. Equivalent to MEA320 Test and troubleshoot aircraft hydro-mechanical, gaseous and landing gear systems and components with amended codes in Assessment Conditions.

Application

This unit of competency requires application of hand skills, standard trade practices, and systems knowledge in the testing and troubleshooting of aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components of fixed wing aircraft during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

The unit is part of the Mechanical Aircraft Maintenance Engineer (AME) Certificate IV (Aircraft Maintenance Stream) training pathways and must be taken with MEA318 Inspect aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components.

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

MEA318	Inspect aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components
--------	--

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 for troubleshooting | 1.1 | Relevant maintenance documentation and modification status, including system defect/service difficulty reports, where relevant, are interpreted to identify an unserviceability |
| 2. | Test hydro-mechanical, mechanical, gaseous and landing gear systems and components | 2.1 | The aircraft and hydro-mechanical, mechanical, gaseous and landing gear systems are correctly prepared in accordance with specified procedures for the application of power |
| 2.2 | | Power is applied and system and components functionally tested in accordance with specified procedures for evidence of malfunction or leaks while applying all relevant work health and safety (WHS) procedures | |
| 2.3 | | System calibration or adjustments are performed in accordance with specified procedures | |
| 3. | Troubleshoot hydro-mechanical, mechanical, gaseous and landing gear systems and components | 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 | | Hydro-mechanical, mechanical, gaseous and landing gear system and component 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 or adjustment | |

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.

Hydro-mechanical systems include:	• Hydraulic systems • Fuel systems
Components of hydro-mechanical systems include:	• Hydraulic accumulators, filters, reservoirs, valves, pumps, motors, actuators, regulators and direct reading gauges • Fuel system filters, valves, pumps, rigid and flexible storage cells/tanks • Rigid and flexible pipelines, hoses and fittings
Landing gear systems include: (components of landing gear retraction, steering and braking systems are covered by hydro-mechanical and mechanical system components)	• Retraction systems • Steering systems • Brake systems, including anti-skid, where applicable
Landing gear components include:	• Wheel assemblies • Brake units • Struts/oleos
Gaseous systems include:	• Pneumatic • Air cycle air conditioning • Pressurisation • Fire-extinguishing
Gaseous system components include:	• Gauges (direct reading), temperature sensors, pressurisation controllers and temperature controllers • Heat exchangers, pressure vessels, condensers, compressors, expansion turbines, humidifiers, valves and actuators • Rigid and flexible pipelines and fittings • Ducting
Mechanical systems include:	• Mechanical operating and locking systems
Mechanical system components include:	• Cables, pulleys, guides, fairleads, tension regulators, chains and sprockets • Push/pull rods, torque tubes, bellcranks, screwjacks, clutches, springs, bearings and gears
Procedures and requirements include:	• Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 2. Equivalent to MEA320 Test and troubleshoot aircraft hydro-mechanical, gaseous and landing gear systems and components.

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 MEA320 Test and troubleshoot aircraft hydro-mechanical, gaseous and landing gear systems and components

Modification History

Release 2. Equivalent to MEA320 Test and troubleshoot aircraft hydro-mechanical, gaseous and landing gear systems and components with amended codes in Assessment Conditions.

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 all relevant WHS procedures
- using maintenance manuals to prepare the aircraft for testing and troubleshooting of hydraulic, fuel, gaseous, landing gear and mechanical systems and components
- using hand skills, tools and systems knowledge in the testing, adjustment and troubleshooting of hydraulic, fuel, gaseous, mechanical and landing gear systems
- using hand skills, tools and component knowledge in the adjustment and troubleshooting of hydraulic, fuel, gaseous and mechanical system components
- jacking of the aircraft, as required, for landing gear system testing, rigging and troubleshooting
- using hand skills, tools and system/component knowledge in the adjustment and troubleshooting of landing gear components
- effectively using maintenance documentation and relevant fault diagnosis guides in the troubleshooting process
- recognising external defects in hydro-mechanical, gaseous, mechanical and landing gear systems and components.

The underlying skills inherent in this unit should be transferable across a range of testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with aircraft hydro-mechanical, gaseous, mechanical and landing gear systems and their components. It is essential that system test procedures take into account all safety precautions applicable to the system being maintained, especially where system operation/switching interrelates to other systems being maintained.

Ability to interpret system performance specifications (allowable limits) and apply them in practice is critical and shall be demonstrated through application across the range of systems 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:

- hydraulic, fuel, gaseous, mechanical and landing gear system layout, operation and characteristics and system component operation and construction, including electrical system interfaces
- how to configure the aircraft for testing and troubleshooting of hydraulic, fuel, gaseous, mechanical and landing gear systems and components
- standard trade practices relating to tool usage and installation/securing of aircraft hardware
- fluid power theory
- hydraulic system layout, operation and characteristics (including electrical and instrument system interfaces) and system component construction and operation for:
 - landing gear retraction systems
 - brake and anti-skid systems
 - nose wheel steering systems
- fuel system and component layout, operation and characteristics (including electrical system interfaces) and system component operation and construction
- gaseous (pneumatic, air conditioning, pressurisation and fire-extinguishing system and component layout, operation and characteristics (including electrical and instrument interfaces) and system component operation and construction
- construction and operation of landing gear components, including:
 - wheel assemblies
 - struts/oleos
 - uplocks and downlocks
- mechanical systems and linkages, including those related to the above systems
- how to configure the aircraft for inspection, testing and troubleshooting of hydraulic, fuel, gaseous and landing gear systems and components
- maintenance requirements and troubleshooting procedures
- relevant WHS practices relating to hydraulic, fuel, gaseous, mechanical and landing gear systems and components, including lifting and handling of heavy items
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment, using procedures, tools and equipment specified in maintenance documentation. It is also expected that applicable general-purpose tools, test and ground support 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 approved aerospace assessor that the relevant elements and performance criteria of this unit of competency are being achieved under routine supervision on each type of system and on at least one (1) component of each group, as follows:
 - hydraulic systems – a system and at least one (1) component from each of the following hydro-mechanical system component groups:
 - hydraulic accumulators, filters, reservoirs, valves, pumps, motors, actuators, regulators and direct reading gauges
 - rigid and flexible pipelines, hoses and fittings
 - fuel systems – a system and at least one (1) component from each of the following fuel system component groups:
 - fuel system filters, valves, pumps, rigid and flexible storage cells/tanks
 - rigid and flexible pipelines, hoses and fittings
 - landing gear systems – each of the following systems:
 - retraction systems
 - steering systems
 - brake systems, including anti-skid, where applicable
 - landing gear components – one (1) each of:
 - wheel assemblies
 - brake units
 - struts/oleos
 - gaseous systems – each of the following systems:
 - pneumatic
 - air cycle air conditioning
 - pressurisation
 - fire-extinguishing
 - gaseous system components - at least one (1) component from each of the following gaseous system component groups:
 - gauges (direct reading), temperature sensors, pressurisation controllers and temperature controllers
 - heat exchangers, pressure vessels, condensers, compressors, expansion turbines, humidifiers, valves and actuators
 - rigid and flexible pipelines and fittings
 - ducting
 - mechanical systems – a mechanical operating and locking system and at least one (1) component from each of the following mechanical system component groups:
 - cables, pulleys, guides, fairleads, tension regulators, chains and sprockets
 - push/pull rods, torque tubes, bellcranks, screwjacks, clutches, springs, bearings and gears.
- 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.
- Individuals being assessed who have already attained the following related units will have met the Performance Criteria and Range of Conditions variables for Elements listed:
 - Element 1 – any one of MEA309 Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components, or MEA310 Inspect, test and troubleshoot aircraft pneumatic systems and components
 - Elements 2 and 3 – MEA309 Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components, for hydro-mechanical system variables, and MEA310 Inspect, test and troubleshoot aircraft pneumatic systems and components, for gaseous system variables.
- The Log of Industrial Experience and Achievement records relating to the listed units may be accepted as also meeting the evidence requirements for this unit in the applicable Elements for systems and components as listed in the Range of Conditions variables. Advice in MEA310 Inspect, test and troubleshoot aircraft pneumatic systems and components, regarding MEA355 Maintain light aircraft air cycle air conditioning systems, and MEA3000 Maintain small piston engine aircraft pressurisation systems, may also be taken into consideration where applicable.

Links

Companion Volume implementation guides are found in VETNet -

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