



Australian Government

Department of Education, Employment and Workplace Relations

MEA309C Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components

Release: 2

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Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills, standard trade practices and systems knowledge in the inspection, testing and troubleshooting of aircraft hydro-mechanical and landing gear systems and components.

Applications include hydro-mechanical and landing gear systems and components fitted to both fixed and rotary wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA302C	Remove and install aircraft hydro-mechanical system and landing gear components
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Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.
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Elements and Performance Criteria

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| 1. Inspect hydro-mechanical systems and components | 1.1. Isolation tags already attached to the system or related systems are checked and configured for safe system inspection and operation in accordance with specified procedures
1.2. Hydro-mechanical system and system components are visually or physically inspected for external signs of defects in accordance with specified procedures |
| 2. Inspect landing gear systems and components | 2.1. Isolation tags already attached to the system or related systems are checked and configured, including jacking, where necessary, for safe system inspection and operation in accordance with specified procedures
2.2. Landing gear system and system components are visually or physically checked for signs of defects in accordance with specified procedures |
| 3. Test hydro-mechanical and landing gear systems | 3.1. The aircraft and hydro-mechanical systems are correctly prepared in accordance with specified procedures for the application of power
3.2. Power is applied and system functionally tested in accordance with specified procedures for evidence of malfunction or leaks
3.3. System calibration or adjustments are performed in accordance with specified procedures |
| 4. Prepare for troubleshooting | 4.1. Relevant maintenance documentation and modification status, including service difficulty reports where relevant, are interpreted to identify an unsafe condition |
| 5. Troubleshoot hydro-mechanical and landing gear systems | 5.1. Available information from maintenance documentation and inspection and testing is used, where necessary, to assist in fault determination
5.2. Maintenance manual fault diagnosis guide and logical processes are used to identify faults and accurate troubleshooting
5.3. Specialist advice is obtained, where required, to assist with the troubleshooting
5.4. Hydro-mechanical and landing gear system faults are located and the cause is clearly identified and correctly recorded in maintenance documentation, where applicable
5.5. Fault rectification requirements are determined to assist in planning the repair |

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- using hand skills and tools in the inspection, adjustment and troubleshooting of hydraulic, fuel and landing gear systems
- using hand skills and tools in the inspection, adjustment and troubleshooting of hydraulic and fuel system components
- jacking of the aircraft as required for landing gear system inspection, testing and troubleshooting
- using hand skills and tools in the inspection, adjustment and troubleshooting of landing gear components
- using of maintenance manuals to prepare the aircraft for inspection, testing and troubleshooting of hydro-mechanical and landing gear systems and components
- effectively using maintenance documentation and relevant fault diagnosis guides in the troubleshooting process
- recognising external defects in hydro-mechanical and landing gear systems and components
- applying standard procedures
- observing all relevant OHS practices, including the use of MSDS and PPE

Required knowledge

Look for evidence that confirms knowledge of:

- standard trade practices relating to tool usage and installation/securing of aircraft hardware
- fluid power theory
- hydraulic system layout, operation and characteristics (including electrical system interfaces) and system component construction and operation for:
 - flight control systems including primary controls, flaps, speed brakes and spoilers
 - landing gear retraction systems
 - brake and anti-skid systems
 - nosewheel steering systems
- fuel system and component layout, operation and characteristics (including electrical system interfaces) and system component operation and construction
- construction and operation of landing gear components, including:
 - wheel assemblies
 - skids
 - floats
 - struts/oleos
 - uplocks and downlocks
 - mechanical linkages
- how to configure the aircraft for inspection, testing and troubleshooting of hydraulic, fuel and landing gear systems and components
- maintenance requirements and troubleshooting procedures

- relevant OHS practices relating to hydraulic systems, fuel systems and landing gear components, including lifting and handling of heavy items
- how to obtain MSDS
- selection and use of PPE
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment

A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot a range of hydraulic and fuel system and landing gear components that are representative of the scope of the listed variables in accordance with relevant maintenance manual instructions while applying all relevant OHS procedures and standard procedures. Coverage of brakes and struts/oleos are not required where the aircraft is rotary wing and is fitted with skids or floats.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

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 aircraft hydro-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 inter-relates to other systems being maintained. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical.

Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This may be demonstrated through application across a number of aircraft systems or aircraft types. 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 (including safe handling of heavy components) and quality requirements in accordance with the industry and regulatory standards.

A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of this unit of competency are being achieved under routine supervision on:

- each type of system (Groups 1, 2, 6, 7, 8)

	- on at least one component of each group listed in the Range Statement against hydro-mechanical system components 3 to 5 - landing gear system components 9 to 11 Where the aircraft is rotary wing and is fitted with skids or floats coverage of Groups 6, 7, 8, 10 and 11 is not required and where a rotary wing aircraft is fitted with a fixed undercarriage with wheels coverage of Groups 6 and 7 is not required. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	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 general purpose tools, test and ground support equipment found in most routine situations would be used where appropriate. The level of troubleshooting is limited in its application to the use of fault diagnosis guides or other similar information.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Systems and system components	Hydro-mechanical systems include: 1. Hydraulic systems 2. Fuel systems Components of hydro-mechanical systems include: 3. Hydraulic accumulators, filters, reservoirs, valves, pumps, motors, actuators, regulators and direct reading gauges 4. Fuel system filters, valves, pumps, rigid and flexible storage cells/tanks 5. Rigid and flexible pipelines, hoses and fittings Landing gear systems include: 6. Retraction systems 7. Steering systems 8. Brake systems, including anti-skid, where applicable Landing gear components include: 9. Wheel assemblies, skids and floats 10. Brake units 11. Struts/oleos (Additional components of landing gear systems are included in hydro-mechanical system components)
Troubleshooting	Troubleshooting involves the use of fault finding charts or similar, to line replacement level
Application	Application of this unit of competency may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise
Electrical interface	The work can include associated electrical loom terminations and/or plugs

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable