



Australian Government

Department of Education, Employment and Workplace Relations

MEA320C Test and troubleshoot aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components

Release: 1

MEA320C Test and troubleshoot aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components

Modification History

References to flight controls removed from Range Statement - equivalent to previous version.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathways and must be taken with MEA318C Inspect aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components. It covers the competencies required to test and troubleshoot 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 ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirements for the granting of the chosen B1 maintenance certification 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 testing and troubleshooting of aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components.

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

Licensing/Regulatory Information

Refer to unit descriptor

Pre-Requisites

MEA318C Inspect aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

<p>Elements describe the essential outcomes of a unit of competency.</p>	<p>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.</p>
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Elements and Performance Criteria

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| 1 | Prepare for troubleshooting | 1.1 | Relevant maintenance documentation and modification status defect/service difficulty reports where relevant, are interpreted for 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 application of power |
| | | 2.2 | Power is applied and system and components functionally tested in accordance with specified procedures, for evidence of malfunction or leakage |
| | | 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 previous test results is used, where necessary, to assist in fault determination |
| | | 3.2 | Maintenance manual fault diagnosis guide and logical process are used to ensure efficient and accurate <i>troubleshooting</i> |
| | | 3.3 | Specialist advice is obtained, where required, to assist with the troubleshooting process |
| | | 3.4 | <i>Hydro-mechanical, mechanical, gaseous and landing gear system component</i> faults are located and the causes of the faults are identified and correctly recorded in maintenance documentation, where applicable |
| | | 3.5 | Fault rectification requirements are determined to assist in planned maintenance adjustment |

Required Skills and Knowledge

- hydraulic, fuel, gaseous, mechanical and landing gear system layout, operation and characteristics and system 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 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
 - nose wheel steering systems
- fuel system and component layout, operation and characteristics (including electrical system interfaces) and system 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 and landing gear systems and components
- maintenance requirements and troubleshooting procedures
- relevant OHS practices relating to hydraulic, fuel, gaseous, mechanical and landing gear systems and 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

Look for evidence that confirms skills in:

- applying all relevant OHS procedures, including selection and use of PPE and MSDS
- using maintenance manuals to prepare the aircraft for testing and troubleshooting of hydraulic, fuel, gaseous, mechanical and landing gear systems and components
- use of hand skills, tools and systems knowledge in the testing, adjustment and troubleshooting of hydraulic, fuel, gaseous, mechanical and landing gear systems
- use of hand skills, tools and component knowledge in the adjustment and troubleshooting of hydraulic, fuel, gaseous, mechanical system components
- jacking of the aircraft, as required, for landing gear system testing, rigging and troubleshooting
- use of hand skills, tools and system/component knowledge in the adjustment and troubleshooting of landing gear systems and components
- the effective use of maintenance documentation and relevant fault diagnosis guides in the troubleshooting of landing gear systems and components

- the recognition of external defects in hydro-mechanical, gaseous, mechanical and landing gear systems and

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.

<p>Overview of assessment</p>	<p>A person who demonstrates competency in this unit must be able to test and troubleshoot a range of hydraulic, fuel, gaseous and mechanical system and landing gear components in accordance with relevant maintenance manual instructions while applying all relevant OHS procedures and standard processes.</p>
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>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 inspection procedures and specifications (allowable limits) and apply them in practice is critical.</p> <p>Evidence of transferability of skills and knowledge related to 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 and quality requirements in accordance with the industry and regulatory standards.</p> <p>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 and on at least one component of each group listed in the Range Statement, as follows:</p> <ul style="list-style-type: none"> • Hydraulic systems – a system and at least one component from each of hydro-mechanical system components 3 and 5 • Fuel systems – a system and at least one component from each of 4 and 5

	<ul style="list-style-type: none"> • Landing gear systems – each listed system 6 to 8 • Landing gear components – one each of 9 to 11 • Gaseous systems – each listed system 12 to 15 and at least one component from each of gaseous system components 16 to 19 • Mechanical systems – a system applicable to 20 and at least one component from each of mechanical system components 21 and 22. <p>This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.</p>
<p>Context of and specific resources for assessment</p>	<p>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.</p>
<p>Method of assessment</p>	
<p>Guidance information for assessment</p>	<p>Individuals being assessed who have already attained the following related units will have met the Performance Criteria and Range Statement variables for Elements listed:</p> <ul style="list-style-type: none"> • Element 1 – any one of MEA309C Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear system and components, or MEA310C Inspect, test and troubleshoot aircraft pneumatic systems and components • Elements 2 and 3 – MEA309C Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear system and components, for hydro-mechanical system variables, and MEA310C Inspect, test and troubleshoot aircraft pneumatic systems and components, for gaseous system variables <p>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 Statement variables.</p> <p>Advice in MEA310C Inspect, test and troubleshoot aircraft pneumatic systems and components, regarding MEA355A Maintain light aircraft air cycle air</p>

	conditioning systems, and MEA356A Maintain light piston engine aircraft pressurisation systems, may also be taken into consideration where applicable.
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Range Statement

<p>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.</p>	
<p>Note</p>	<p>Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide</p>
<p>Hydro-mechanical systems and components</p>	<p>Hydro-mechanical systems include:</p> <ol style="list-style-type: none"> 1. Hydraulic systems 2. Fuel systems <p>Components of hydro-mechanical systems include:</p> <ol style="list-style-type: none"> 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
<p>Landing gear systems and components (components of landing gear retraction, steering and braking systems are covered by hydro-mechanical and mechanical system components)</p>	<p>Landing gear systems include:</p> <ol style="list-style-type: none"> 6. Retraction systems 7. Steering systems 8. Brake systems, including anti-skid, where applicable <p>Landing gear components include:</p> <ol style="list-style-type: none"> 9. Wheel assemblies 10. Brake units 11. Struts/oleos
<p>Gaseous systems and components</p>	<p>Gaseous systems include:</p> <ol style="list-style-type: none"> 12. Pneumatic 13. Air cycle air conditioning 14. Pressurisation 15. Fire-extinguishing <p>Gaseous system components include:</p> <ol style="list-style-type: none"> 16. Gauges (direct reading), temperature sensors, pressurisation controllers and temperature controllers 17. Heat exchangers, pressure vessels, condensers, compressors, expansion turbines, humidifiers, valves and actuators 18. Rigid and flexible pipelines and fittings 19. Ducting
<p>Mechanical systems and</p>	<p>Mechanical systems include:</p> <ol style="list-style-type: none"> 20. Mechanical operating and locking systems

components	Mechanical system components include: 21. Cables, pulleys, guides, fairleads, tension regulators, chains and sprockets 22. Push/pull rods, torque tubes, bellcranks, screwjacks, clutches, springs, bearings and gears
Troubleshooting	Troubleshooting involves the use of fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: <ul style="list-style-type: none">• scheduled or unscheduled maintenance activities• individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.