



Australian Government

MEA321C Test and troubleshoot aircraft fixed wing flight control systems and components

Release 2

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Modification History

Release 2 – Additional information in Range Statement and change to Assessment Requirements - equivalent.

Release 1 - Knowledge statements expanded - 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 fixed wing aircraft flight control 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 requirement 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 and the use of maintenance publications and knowledge of system theory to test and troubleshoot aircraft flight control systems and components.

Applications include 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

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| <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, including system defect reports, where relevant, are interpreted to identify an unserviceability |
| 2 Test fixed wing flight control systems | 2.1 Powered controls of the aircraft and system are prepared, in accordance with maintenance manual, for the application of electrical and hydraulic power 2.2 Power is applied, if necessary, and system is functionally tested, in accordance with applicable maintenance manual, for malfunction or evidence of incorrect rigging 2.3 System rigging is performed in accordance with applicable maintenance manual |
| 3 Troubleshoot fixed wing flight control 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 <i>troubleshooting</i> 3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process 3.4 <i>Fixed wing flight control system</i> 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 |

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- OHS precautions relevant to flight control system maintenance
- standard trade practices relating to tool and test/rigging equipment usage and installation/securing of system components
- flight control system layout and operation
- theory of flight:
 - airflow
 - conditions of flight
 - lift and forces
 - drag
 - wings, tailplane and vertical stabiliser
 - lift augmentation (flaps, slats and slots)
 - aircraft control surfaces and their function (elevator, ailerons, rudder, elevons and trim tabs)
 - spoilers and speed brakes
 - flight control balancing and flutter
 - stability and control and flight control rigging
- mechanical system layout and operation:
 - cockpit controls
 - cables and cable tensioning
 - pulleys and fairleads
 - bellcranks
 - levers
 - control surface horns
 - screwjacks
 - push/pull rods
- powered flight controls:
 - system layout and operation
 - component construction and operation
 - electrical and instrument interfaces:
 - flaps
 - trim
 - position indication
- flight control system maintenance procedures and troubleshooting methods
- flight control system rigging equipment and procedures
- flight control system interfaces with automatic pilot systems and automatic flight control systems
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

Look for evidence that confirms skills in:

- applying all relevant OHS procedures
- using relevant maintenance documentation and aircraft manuals to:
 - recognise defects during visual inspection of fixed wing flight control systems and system components
 - rig fixed wing flight control systems
 - functionally test the operation of fixed wing flight control systems and recognise system/component malfunction or evidence of incorrect rigging
 - to the extent permitted by applicable fault diagnosis guides, troubleshoot unserviceabilities in fixed wing flight control systems and clearly record the causes of the unserviceabilities

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.

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| <p>Overview of assessment</p> | <p>A person who demonstrates competency in this unit must be able to apply hand skills and use maintenance publications and system theory knowledge to test and troubleshoot fixed wing aircraft flight control systems and components while applying all relevant safety precautions.</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 the aircraft fixed wing flight systems. It is essential that testing procedures take into account all safety precautions associated with flight control system operation, in particular where system operation/switching interrelates with other systems being maintained, and that knowledge be demonstrated of dual inspection requirements associated with work on flight controls and systems.</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 types. The application of ground 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 the unit of competency are being achieved under routine supervision on at least one item from each of Groups 1 to 5 in the Range Statement. 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</p> | <p>Competency should be assessed in the work environment or simulated work environment using tools and</p> |

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| for assessment | equipment specified in aircraft maintenance manuals. 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 | Individuals being assessed who have already attained MEA312C Inspect, test and troubleshoot aircraft fixed wing flight control systems and components, will have met the requirements for the Performance Criteria for Element 1. The requirements for Elements 2 and 3 will also be met if recorded experience for MEA312C Inspect, test and troubleshoot aircraft fixed wing flight control systems and components, involved aircraft with powered flight controls. If experience was gained on aircraft types with only mechanical flight controls the recorded experience will partially meet the requirements for this unit. Log of Industrial Experience and Achievement records relating to MEA312C Inspect, test and troubleshoot aircraft fixed wing flight control systems and components, may be accepted as also meeting the evidence requirements for this unit in the applicable areas. |

Range Statement

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| <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>Fixed wing flight control system and components</p> | <p>Flight control systems and system components may include:</p> <ol style="list-style-type: none"> 1. Elevator, aileron and rudder primary flight control systems and associated trim systems 2. Speed brake, spoiler, flap and high lift systems 3. Ailerons, elevators, rudders, trim tabs, speed brakes, spoilers, flaps, slats 4. Actuators – mechanical, hydraulic, pneumatic or electric 5. Mechanical flight control components including cables, pulleys, guides, fairleads, tension regulators, control rods, bellcranks, torque tubes, chains, sprockets, control sticks (or wheels or columns), trim wheels or handles, and rudder pedals. |
| <p>Troubleshooting</p> | <p>Troubleshooting involves the use of fault-finding charts or similar, to line replacement level</p> |
| <p>Application</p> | <p>Application of this unit may relate to:</p> <ul style="list-style-type: none"> • scheduled or unscheduled maintenance activities • individual or team-related activities |
| <p>Procedures and requirements</p> | <p>Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise</p> |

Unit Sector(s)

Aviation maintenance

Custom Content Section

Not applicable.