



Australian Government

Department of Education, Employment and Workplace Relations

MEA312C Inspect, test and troubleshoot aircraft fixed wing flight control systems and components

Release: 1

MEA312C Inspect, test and troubleshoot aircraft fixed wing flight control systems and components

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit is part of the Mechanical Certificate IV AME training pathway. It covers the competencies required to inspect, test and troubleshoot fixed wing aircraft flight control systems and components. 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.
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Application of the Unit

Application of the unit	This unit requires application of hand skills and the use of maintenance publications and knowledge of system theory to inspect, test and troubleshoot aircraft flight control system components. Applications include fixed wing aircraft.
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		
	MEA305C	Remove and install aircraft fixed wing flight control system components

Employability Skills Information

Employability skills	This unit contains employability skills.
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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

ELEMENT	PERFORMANCE CRITERIA
1. Inspect fixed wing flight control systems and components.	<p>1.1. Isolation tags already attached to the system or related systems are checked and aircraft configured for safe system inspection and operation in accordance with applicable maintenance manual.</p> <p>1.2. Fixed wing <i>flight control systems and components</i> are visually or physically checked for signs of defects in accordance with applicable maintenance manual</p>
2. Test fixed wing flight control systems.	<p>2.1. Powered controls of the aircraft and system are prepared, in accordance with maintenance manual, for the application of electrical and hydraulic power.</p> <p>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..</p> <p>2.3. System rigging is performed in accordance with applicable maintenance manual</p>
3. Prepare for troubleshooting	<p>3.1. Relevant maintenance documentation and modification status, including system defect reports where relevant, are interpreted to identify an unserviceability.</p>
4. Troubleshoot fixed wing flight control systems.	<p>4.1. Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination.</p> <p>4.2. Maintenance manual fault diagnosis guide and logical processes are used to ensure efficient and accurate <i>troubleshooting</i>.</p> <p>4.3. Specialist advice is obtained, where required, to assist with the troubleshooting process.</p> <p>4.4. Fixed wing flight control system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required.</p> <p>4.5. Fault rectification requirements are determined to assist in planning the repair.</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- Application of relevant occupational health and safety (OHS) procedures
- The use of 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, troubleshooting unserviceabilities in fixed wing flight control systems and clearly recording the causes of the unserviceabilities

Required 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, slots)
 - Aircraft control surfaces and their function (elevator, ailerons, rudder, elevons, 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

REQUIRED SKILLS AND KNOWLEDGE

- 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 interfaces with automatic pilot systems
- Relevant maintenance manuals
- Relevant regulatory requirements and standard procedures

Evidence Guide

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 apply hand skills and use maintenance publications to inspect, test and troubleshoot fixed wing aircraft flight control systems and components while applying all relevant safety precautions.

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 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 inter-relates to other systems being maintained, and that an awareness be demonstrated of dual inspection requirements associated with work on flight controls and systems.

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 types. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. In addition, knowledge of dual inspection requirements must be demonstrated. 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.

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

EVIDENCE GUIDE	
	the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry .
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment, using tools and 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	

Range Statement

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>	
Note	<p>Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide.</p>
Flight control systems and system components	<p><i>Flight control systems and system components may include:</i></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 (cables, pulleys, guides, fairleads, tension regulators, control rods, bellcranks, torque tubes, chains, sprockets, control sticks, wheels or columns, trim wheels or handles, rudder pedals).
Troubleshooting	<p><i>Troubleshooting</i> involves the use of fault finding charts or similar, to line replacement level.</p>
Application	<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
Procedures and requirements	<p>Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise</p>

Unit Sector(s)

Unit sector	
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Competency field

Competency field	Aviation maintenance
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Co-requisite units

Co-requisite units		