



Australian Government

Department of Education, Employment and Workplace Relations

MEA291A Inspect, test and troubleshoot fixed wing single axis autopilot 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 Avionic Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to inspect, test and troubleshoot single axis autopilot systems and components of fixed wing aircraft. 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 and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot fixed wing single axis autopilot systems and components. Applications include fixed wing aircraft that have single axis autopilot systems, including those with radio navigation system interfaces.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA207C	Remove and install aircraft electronic system components
MEA246C	Fabricate and/or repair aircraft electrical components or parts

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 fixed wing single axis autopilot systems and components | 1.1. Relevant maintenance documentation and modification status, including system reports, where relevant, are used to identify specific inspection requirements
1.2. Isolation tags are checked and aircraft configured for safe system inspection in accordance with the applicable maintenance manual
1.3. Single axis autopilot system and components are visually or physically checked for signs of defects in accordance with applicable maintenance manual
1.4. Defects are correctly identified and reported |
| 2. Test/adjust fixed wing single axis autopilot systems and components | 2.1. Aircraft and system are prepared in accordance with applicable maintenance manual for application of power/system operation
2.2. Autopilot systems are functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction
2.3. System calibration or adjustments are performed in accordance with maintenance manual where appropriate |
| 3. Troubleshoot fixed wing single axis autopilot systems | 3.1. Available information from maintenance documentation, inspection and test results are used, where necessary, to assist in fault determination
3.2. Maintenance manual fault diagnosis guides and logic processes are used to identify faults and accurate <i>troubleshooting</i>
3.3. Specialist advice is obtained, where required, to assist with the troubleshooting
3.4. Autopilot system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures
3.5. Rectification requirements are determined |

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices
- using approved maintenance documentation and aircraft publications relating to the single axis autopilot system being maintained
- recognising system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) and security in:
 - autopilot system components
 - radio navigation system interfaces
- applying logic processes, taking and interpreting system measurements, and using test equipment and appropriate wiring diagrams and manuals, to accurately and effectively isolate system malfunctions
- testing the system to isolate system malfunctions and assess post-maintenance serviceability

Required knowledge

Look for evidence that confirms knowledge of:

- component attachment methods
- the basic layout (block diagram level), function and operation of:
 - autopilot system components
 - interface with radio navigation systems
- autopilot system maintenance requirements and troubleshooting procedures
- relevant OHS practices
- basic principles/functions, relating to the listed systems and associated with:
 - basic AC and DC circuit theory
 - digital fundamentals
 - analogue fundamentals
 - fixed wing flight theory
 - inner and outer loop control
- 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 fixed wing single axis autopilot systems and components while observing 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 fixed wing aircraft single axis autopilot systems and components. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. 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 is to be demonstrated through application across an autopilot system and its components. 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.

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 an autopilot system and its components. 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 workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that general and special purpose tools, test and ground

	support equipment, would be used where appropriate.
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.

Troubleshooting	Troubleshooting involves the use of fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • 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

Competency field

Co-requisite units

Not applicable