



Australian Government

MEA279 Inspect, test and troubleshoot full authority digital engine control systems

Release: 2

MEA279 Inspect, test and troubleshoot full authority digital engine control systems

Modification History

Release 2. Equivalent to MEA279 Inspect, test and troubleshoot full authority digital engine control systems with amended prerequisite codes.

Application

This unit of competency requires application of hand skills and the use of maintenance documentation/publications and test sets in the inspection, testing and troubleshooting of full authority digital engine control (FADEC) systems of fixed and rotary wing aircraft scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) and small aircraft maintenance Certificate IV (Mechatronic) training pathways.

Where a Civil Aviation Safety Authority (CASA) licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA246	Fabricate and/or repair aircraft electrical hardware or parts
MEA293	Remove and install aircraft electronic system components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1. Inspect FADEC systems and components	1.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements

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| | 1.2 | Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual |
| | 1.3 | FADEC system is visually or physically checked for external signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements |
| | 1.4 | Defects are correctly identified and reported |
| 2. Test FADEC systems | 2.1 | Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation |
| | 2.2 | FADEC system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction |
| 3. Troubleshoot FADEC 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 guides and logic processes are used to ensure efficient and accurate troubleshooting using test sets, downloaded maintenance data and fault-finding charts or similar, to line replacement level |
| | 3.3 | Specialist advice is obtained, where required, to assist with the troubleshooting process |
| | 3.4 | System faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, and in accordance with standard enterprise procedures |
| | 3.5 | Rectification requirements are determined |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

FADEC systems include:

- Computers, sensors, interfaces, cockpit controls, data cables and wiring looms that comprise the electronic control system
- Other engine-mounted related components, such as spark plugs, ignition units, injectors and fuel control units are covered by the applicable engine maintenance units (e.g. MEA313 Inspect, test and troubleshoot piston engine systems and components, MEA314 Inspect, test and troubleshoot gas turbine engine systems and components or MEA353 Maintain basic light aircraft engines and propellers)

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

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Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA279 Inspect, test and troubleshoot full authority digital engine control systems

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Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices, including those relating to engine ground running
- using approved maintenance documentation and aircraft publications relating to the applicable FADEC system
- using test sets to download maintenance data from the FADEC system and interpreting the data
- identifying/locating airframe and engine, including propeller/rotor-mounted FADEC system components
- recognising system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) and security in airframe and engine-mounted FADEC system components
- correctly handling electrostatic sensitive devices
- applying logic processes, using test equipment and appropriate wiring diagrams and manuals to isolate FADEC system malfunctions
- using built-in test features to confirm post-maintenance serviceability.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the FADEC system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting and component removal and installation is essential. This is to be demonstrated through application on FADEC systems and components as defined in the Range of Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- connection of hardware and plugs
- digital electronic theory

- open and closed loop control
- the basic layout (block diagram level), function and operation of FADEC systems
- architecture of FADEC system computers, software and software management
- operation of sensors that input data to FADEC system computers
- built-in test system operation and downloading and interpretation of system data
- relevant regulatory requirements and standard procedures, including software management control
- maintenance requirements and troubleshooting procedures
- relevant maintenance manuals.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- 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.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on FADEC systems and system components as follows:
 - computers, sensors, interfaces, cockpit controls, data cables and wiring looms that comprise the electronic control system
- Other engine-mounted related components, such as spark plugs, ignition units, injectors and fuel control units are covered by the applicable engine maintenance units (e.g. MEA313 Inspect, test and troubleshoot piston engine systems and components, MEA314 Inspect, test and troubleshoot gas turbine engine systems and components or MEA353 Maintain basic light aircraft engines and propellers) and should not be assessed as part of this unit.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
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