



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **MEA279A Inspect, test and troubleshoot full authority digital engine control systems**

**Release: 2**

## **MEA279A Inspect, test and troubleshoot full authority digital engine control systems**

### **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 full authority digital engine control (FADEC) systems and components. Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the applicable 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 maintenance documentation/publications and test sets in the inspection, testing and troubleshooting of FADEC systems.

Applications include fixed and rotary wing aircraft with engines that are controlled by FADEC systems.

### **Licensing/Regulatory Information**

Not applicable.

### **Pre-Requisites**

MEA246C            Fabricate and/or repair aircraft electrical hardware or parts

### **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>
--	---

## Elements and Performance Criteria

- |  |   |
|--|---|
| <p>1. Inspect FADEC systems and components</p> | <p>1.1. Relevant maintenance documentation and modification status, including system reports, where relevant, are used to identify specific inspection requirements</p> <p>1.2. Isolation tags are checked and aircraft configured for safe system inspection in accordance with the applicable maintenance manual</p> <p>1.3. <b><i>FADEC system</i></b> is visually or physically checked for external signs of defects in accordance with applicable maintenance manual</p> <p>1.4. Defects are correctly identified and reported</p>  |
| <p>2. Test FADEC systems</p>                   | <p>2.1. Aircraft and system are prepared in accordance with applicable maintenance manual for application of power/system operation</p> <p>2.2. FADEC system is functionally tested in accordance with maintenance manual for serviceability or malfunction</p>   |
| <p>3. Troubleshoot FADEC systems</p>           | <p>3.1. Available information from maintenance documentation and inspection and test reports are used, where necessary, to assist in fault determination</p> <p>3.2. Maintenance manual fault diagnosis guides and logic processes are used to identify faults and accurate <b><i>troubleshooting</i></b></p> <p>3.3. Specialist advice is obtained, where required, to assist with the troubleshooting</p> <p>3.4. System faults are located and the causes of the faults are clearly identified and recorded in maintenance documentation, where required and in accordance with applicable enterprise procedures</p> <p>3.5. Rectification requirements are determined</p> |

## Required Skills and Knowledge

### Required skills

Look for evidence that confirms skills in:

- applying relevant OHS 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

### Required knowledge

Look for evidence that confirms 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

## 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><b>Overview of assessment</b></p>	<p>A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot FADEC systems while observing all relevant safety precautions.</p>
<p><b>Critical aspects for assessment and evidence required to demonstrate competency in this unit</b></p>	<p>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 FADEC 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, as well as work practices associated with electrostatic sensitive devices. 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 and component removal and installation is essential. This is to be demonstrated through application on FADEC systems and components as defined in the Range Statement. 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 FADEC systems and system components as defined 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><b>Context of and specific resources for assessment</b></p>	<p>Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is</p>

	also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
<b>Method of assessment</b>	
<b>Guidance information for assessment</b>	

## 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.

<b>FADEC systems</b>	<p>FADEC systems may include:</p> <ul style="list-style-type: none"> <li>computers, sensors, interfaces, cockpit controls, data cables and wiring looms that comprise the electronic control system</li> </ul> <p>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. MEA313C Inspect, test and troubleshoot piston engine systems and components, MEA314C Inspect, test and troubleshoot gas turbine engine systems and components or MEA353A Maintain basic light aircraft engines and propellers)</p>
<b>Troubleshooting</b>	Troubleshooting involves the use of test sets, downloaded maintenance data and fault-finding charts or similar, to line replacement level
<b>Application</b>	<p>Application of this unit may relate to:</p> <ul style="list-style-type: none"> <li>scheduled or unscheduled maintenance</li> <li>individual or team-related activities</li> </ul>
<b>Procedures and requirements</b>	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

## **Unit Sector(s)**

Aviation maintenance

## **Competency field**

## **Co-requisite units**

MEA207C          Remove and install aircraft electronic system components