



Australian Government

Department of Education, Employment and Workplace Relations

MEA228D Test and troubleshoot aircraft instrument systems and components

Release: 1

MEA228D Test and troubleshoot aircraft instrument systems and components

Modification History

Knowledge statements expanded - equivalent to previous unit.

Unit Descriptor

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to test and troubleshoot aircraft instrument and display 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 B2 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, standard trade practices and systems knowledge in the testing and troubleshooting of aircraft instrument and display systems and components during both scheduled and unscheduled maintenance.

Applications include instrument and display systems and components fitted to both fixed and rotary wing aircraft.

Licensing/Regulatory Information

Refer to unit descriptor

Pre-Requisites

Not applicable.

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>
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Elements and Performance Criteria

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| 1 | Prepare for troubleshooting | 1.1 | Relevant maintenance documentation and modification status, defect/service difficulty reports where relevant, are interpreted unserviceability |
| 2 | Test/adjust instrument and display systems | 2.1 | The aircraft and systems are correctly prepared, in accordance procedures, for the application of power and system operation |
| | | 2.2 | <i>Instrument or display system</i> is functionally tested, in accordance procedures, for evidence of serviceability or malfunction |
| | | 2.3 | System calibration or adjustments are performed in accordance procedures |
| 3 | Troubleshoot instrument and display systems | 3.1 | Available information from maintenance documentation and i results is used, where necessary, to assist in fault determination |
| | | 3.2 | Maintenance manual fault diagnosis guides and logic processes ensure efficient and accurate <i>troubleshooting</i> |
| | | 3.3 | Specialist advice is obtained, where required, to assist with the process |
| | | 3.4 | Instrument or display system faults are located and the causes clearly identified and correctly recorded in maintenance documents required |
| | | 3.5 | Fault rectification requirements are determined to assist in plan adjustment |

Required Skills and Knowledge

Look for evidence that confirms knowledge of:

- standard trade practices relating to tool and test equipment usage and installation/securing of system components
- the basic layout (block diagram level) of the systems listed in the Range Statement
- the operating principles of the systems listed in the Range Statement and associated with:
 - the properties and effects of atmospheric conditions on aircraft instruments and systems
 - pressure and temperature sensing elements and their use in aircraft instruments
 - gyroscopes and their use in aircraft instrument and reference systems
 - electrical fundamentals and display screen generation
- the various methods of navigation and how they are used by both conventional and electronic navigation systems
- maintenance requirements and troubleshooting procedures
- OHS procedures relating to instrument and display systems and components
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures, including software management control

Look for evidence that confirms skills in:

- using hand skills, tools and test equipment in the testing, adjustment and troubleshooting of instrument and display systems
- recognition of system and component defects/external damage, correct installation, connection of plugs, terminals and attaching hardware (including cabling/harnesses) for the systems listed in Range Statement
- interpreting the information presented on instrument and display systems
- applying logic processes and using appropriate wiring diagrams and manuals to isolate instrument and display malfunctions
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability
- effectively using maintenance documentation and relevant fault diagnosis guides in the troubleshooting process
- applying standard procedures
- observing all relevant OHS 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 test and troubleshoot a range of instrument and display systems and components that is representative of the scope of the listed variables in accordance with relevant maintenance manual instructions while applying all relevant OHS procedures and standard processes. Coverage of display systems is required only where applicable to the enterprise.

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 aircraft instrument and display systems and their 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 may be demonstrated through application across a range of aircraft instrument and display systems (where display systems are applicable to the enterprise) listed 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 this unit of competency are being achieved under routine supervision on a system and on at least one major system component of each Group 1 to 6 (Groups 5 and 6 may be omitted if not applicable to the enterprise), as listed 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.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment, using procedures, tools and equipment specified in maintenance documentation. 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 to enable troubleshooting to line replaceable item level.
Method of assessment	
Guidance information for assessment	Individuals being assessed who have already attained MEA213C Inspect, test and troubleshoot advanced aircraft instrument systems, will have covered a significant proportion of the Performance Criteria for Elements 1, 2 and 3 and will have covered many of the Range Statement variables. Log of Industrial Experience and Achievement records relating to MEA213C Inspect, test and troubleshoot advanced aircraft instrument systems, may be accepted as also meeting the evidence requirements for this unit in the applicable areas. The relationship between MEA213C Inspect, test and troubleshoot advanced aircraft instrument systems and MEA212C Inspect, test and troubleshoot basic aircraft instrument systems and components, may also be taken into account where MEA212C Inspect, test and troubleshoot basic aircraft instrument systems and components has been attained, but not MEA213C Inspect, test and troubleshoot advanced aircraft instrument systems. Advice in MEA212C Inspect, test and troubleshoot basic aircraft instrument systems and components regarding the coverage of MEA275A Maintain basic light aircraft instrument systems and components, may also be taken into consideration where applicable.

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>	
<p>Note</p>	<p>Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide</p>
<p>Instrument or display systems</p>	<p>Instrument or display systems may include:</p> <ol style="list-style-type: none"> 1. Flight instruments – pitot/static systems, ASIs, machmeters, air data systems and instruments, VSIs, altimeters, altitude alerting and reporting, turn and bank, DGs, AHs, angle of attack, stall warning/avoidance, GPWS and FDRs 2. Engine Instruments – engine speed, pressure, temperature, performance, vibration and torque 3. Instrument navigation systems – INS, IRS, compasses and AHRS 4. Miscellaneous – pressure, fuel quantity, fuel flow, position, voltage, frequency, current and power 5. Display systems – EFIS, EICAS, FMCS, ECAM and HUD 6. Integrated modular avionics
<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

Co-requisites

MEA224C Inspect aircraft instrument systems and components

MEA226D Inspect aircraft electronic systems and components