



Australian Government

MEA213 Inspect, test and troubleshoot advanced aircraft instrument systems and components

Release: 2

MEA213 Inspect, test and troubleshoot advanced aircraft instrument systems and components

Modification History

Release 2. Equivalent to MEA213 Inspect, test and troubleshoot advanced aircraft instrument systems and components with amended prerequisite codes.

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot aircraft advanced instrument systems and components of fixed and rotary wing aircraft during 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) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a 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
MEA292	Remove and install advanced aircraft instrument 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.
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| 1. Inspect aircraft advanced instrument systems and components | <p>1.1 Relevant maintenance documentation and modification status, including system defect 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 and operation in accordance with the applicable maintenance manual</p> <p>1.3 Instrument system components are 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</p> <p>1.4 Defects are correctly identified and reported</p> |
| 2. Test/adjust aircraft advanced instrument systems and components | <p>2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation</p> <p>2.2 Instrument system is functionally tested, in accordance with maintenance manual, for evidence of serviceability or malfunction</p> <p>2.3 System calibration or adjustments are performed in accordance with maintenance manual, as appropriate</p> |
| 3. Troubleshoot aircraft advanced instrument systems | <p>3.1 Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination</p> <p>3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting to line replacement level</p> <p>3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process</p> <p>3.4 Instrument 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</p> <p>3.5 Rectification requirements are determined</p> |

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.

Instrument systems and components include:

- Pitot/static system components; airspeed indicators (ASIs); vertical speed indicators (VSIs); air data systems and components; machmeters; altimeters, including servo and encoding altimeters; angle of attack and stall warning/avoidance systems
- Turn and slip indicators, directional gyros (DGs), artificial horizons (AHs), attitude and heading reference systems (AHRS) and components, remote reading gyro compass systems and components and direct reading compasses
- Turbine engine indication systems and components (tachometers, pressure, temperature, engine performance and engine vibration)
- Transmitter/indicator measuring instrument systems (pressure, temperature and position)
- Fuel quantity indication and flow systems and components
- Ground proximity warning system (GPWS) (where applicable to the enterprise)
- Flight data recorders (FDRs) (where applicable to the enterprise)
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Procedures and requirements include:

Unit Mapping Information

Release 2. Equivalent to MEA213 Inspect, test and troubleshoot advanced aircraft instrument systems and components

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 MEA213 Inspect, test and troubleshoot advanced aircraft instrument systems and components

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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:

- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) and security in:
 - flight instruments
 - pitot/static systems
 - navigation systems – compasses and AHRS
 - GPWS (where applicable to the enterprise)
 - FDRs (where applicable to the enterprise)
 - position indicators, engine/auxiliary system indication systems and system components
- applying logic processes, taking and interpreting system measurements, and using test equipment and appropriate wiring diagrams and manuals to isolate instrument and display system malfunctions in the listed systems
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability
- applying relevant WHS practices
- using approved maintenance documentation and aircraft publications relating to the instrument and display systems being maintained.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the instrument 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 is essential. This is to be demonstrated through application across a range of advanced aircraft instrument systems and components listed in the Assessment 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
- instrument system maintenance requirements and testing and troubleshooting procedures
- the basic layout (block diagram level), function and operation of:
 - flight instruments, including:
 - ASIs
 - VSIs
 - air data systems and components
 - machmeters
 - altimeters including servo and encoding altimeters
 - turn and slip indicators
 - AHs
 - DGs
 - angle of attack and stall warning/avoidance systems
 - pitot/static systems
 - navigation systems:
 - direct reading compasses
 - gyro compasses
 - AHRS
 - GPWS
 - turbine engine instruments, including:
 - temperature and pressure, including thermocouples, sensors and transmitters
 - speed, including mechanical and electric tachometers
 - thrust, including fan, propeller and jet
 - torque
 - fuel flow
 - vibration
 - auxiliary transmitter/indicator measuring systems, including:
 - hydraulic pressure and temperature
 - pneumatic pressure
 - transmission oil pressure and temperature
 - fuel remaining/used
 - fuel quantity indication
 - component position (e.g. doors, flaps, speed brakes and landing gear)
 - FDR systems
- explaining the operating principles of the above-listed systems and associated with:

- atmospheric conditions; properties and effects 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
- explaining the various methods of navigation, and describing how they are used by both aircraft conventional and electronic navigational instruments and systems
- relevant WHS practices
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that applicable general and special purpose tools, and test and ground support equipment 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 a system and at least (1) one major system component/line replacement unit (LRU) from each of:
 - pitot/static system components; ASIs; VSIs; air data systems and components; machmeters; altimeters, including servo and encoding altimeters; angle of attack and stall warning/avoidance systems
 - turn and slip indicators, DGs, AHs, AHRS and components, remote reading gyro compass systems and components, and direct reading compasses
 - turbine engine indication systems and components (tachometers, pressure, temperature, engine performance and engine vibration)
 - transmitter/indicator measuring instrument systems (pressure, temperature and position)
 - fuel quantity indication and flow systems and components
 - GPWS (may be omitted if not applicable to the enterprise)
 - FDRs (may be omitted if not applicable to the enterprise).
- 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.

- Individuals being assessed who have already attained MEA212 Inspect, test and troubleshoot basic aircraft instrument systems and components will have covered inspection, testing and troubleshooting of a range of flight instruments and direct reading compass and measuring systems. The Log of Industrial Experience and Achievement records relating to MEA212 Inspect, test and troubleshoot basic aircraft instrument systems and components may be accepted as also meeting the evidence requirements for this unit in the applicable areas.
- Advice provided in MEA212 Inspect, test and troubleshoot basic aircraft instrument systems and components regarding MEA275 Maintain basic light aircraft systems and components should also be considered where applicable.

Links

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