



Australian Government

MEA212 Inspect, test and troubleshoot basic aircraft instrument systems and components

Release: 3

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Modification History

Release 3. Equivalent to MEA212 Inspect, test and troubleshoot basic 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 test equipment to inspect, test and troubleshoot basic aircraft 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

MEA204	Remove and install basic aircraft instrument system components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts

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 aircraft basic instrument systems	1.1 Relevant maintenance documentation and modification status, including system defect reports where relevant,

	and components		are used to identify specific inspection requirements
		1.2	Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual
		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
		1.4	Defects are correctly identified and reported
2.	Test/adjust aircraft basic instrument systems and components	2.1	Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation
		2.2	Instrument system is 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, as appropriate
3.	Troubleshoot aircraft basic instrument systems and components	3.1	Available information from maintenance documentation, 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 to line replacement level
		3.3	Specialist advice is obtained, where required, to assist with the troubleshooting process
		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
		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.

Instrument systems and components include:

- Pitot/static systems and components, airspeed indicators (ASIs), vertical speed indicators (VSIs), outside air temperature gauges (OAT) and counter-pointer altimeters
- Directional gyros (DGs) and artificial horizons (AHs) (air and electrically driven)
- Turn and bank and slip/turn coordinators
- Direct reading compasses
- Remote reading gyro compass systems (where applicable to the enterprise)
- Piston engine indication system components (direct reading measuring instruments and temperature indication)
- Gas turbine engine indication system components (where applicable to the enterprise)
- Electrical systems indication (voltage, current, power and frequency)
- Basic fuel quantity indication systems and components
- Pneumatic/vacuum indication components
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Procedures and requirements include:

Unit Mapping Information

Release 3. Equivalent to MEA212 Inspect, test and troubleshoot basic 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 MEA212 Inspect, test and troubleshoot basic 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
 - direct reading compasses
 - remote reading gyro compass systems (may be omitted if not relevant to the enterprise)
 - piston engine indication systems
 - gas turbine engine indication systems (may be omitted if not relevant to the enterprise)
 - electrical systems indication
 - basic fuel quantity indication systems
 - pneumatic/vacuum indication systems
- applying logic processes, taking and interpreting system measurements, using test equipment and appropriate wiring diagrams and manuals to isolate instrument system malfunctions in the above systems
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability
- applying WHS requirements relevant to instrument system maintenance.

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 basic 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:

- the basic layout (block diagram level), function and operation of:
 - flight systems, including:
 - altitude (direct reading altimeters)
 - attitude including DGs and AHs (both air and electrically driven), turn and slip and turn coordinator
 - airspeed
 - OAT
 - remote reading gyro compass systems
 - piston engine indication systems, including:
 - direct reading temperature
 - direct reading pressure (e.g. oil pressure)
 - speed, including mechanical and electric tachometers
 - manifold pressure/boost, including aneroid, sylphon bellows and dual compartment types
 - gas turbine engine indication systems, including:
 - temperature and pressure
 - speed, including mechanical and electric tachometers
 - torque
 - fuel flow
 - vibration
 - auxiliary direct reading systems, including:
 - electrical
 - hydraulic pressure
 - pneumatic pressure and vacuum
 - basic fuel quantity indication
- basic instrument system maintenance and testing requirements, and troubleshooting procedures
- WHS requirements relevant to instrument system maintenance
- the operating principles of the above 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 systems
 - electrical fundamentals
- direct reading compass installations and calibration
- calibration of remote reading gyro compass systems
- 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 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 one (1) major system component/line replaceable unit (LRU) from each of:
 - pitot/static systems and components, ASIs, VSIs, OAT, and counter-pointer altimeters
 - DGs and AHs (air and electrically driven)
 - turn and bank and slip/turn coordinators
 - direct reading compasses
 - remote reading gyro compass system components (may be omitted if not relevant to the organisation)
 - piston engine indication system components (direct reading measuring instruments and temperature indication)
 - gas turbine engine indication system components (may be omitted if not relevant to the organisation)
 - electrical systems indication (voltage, current, power and frequency)
 - basic fuel quantity indication systems and components
 - pneumatic/vacuum indication components.
- 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 MEA275 Maintain basic light aircraft instrument systems and components will have satisfied the requirements of this unit with regard to common range of conditions variables. The Log of Industrial Experience and Achievement records relating to MEA275 Maintain basic light aircraft instrument systems and components may be accepted as also meeting the evidence requirements for this unit in the applicable common areas.

Links

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