



Australian Government

MEAAVI0045 Maintain basic light aircraft instrument systems and components

Release: 1

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Modification History

Release 1. Application changed. Elements and Performance Criteria changed. Foundation Skills made explicit. Range of Conditions removed, and relevant information moved to Assessment Requirements. Assessment Requirements clarified. Supersedes and is equivalent to MEA275 Maintain basic light aircraft instrument systems and components.

Application

This unit describes the skills and knowledge required to apply hand skills and use system and component knowledge and applicable test equipment to inspect, test and troubleshoot basic aircraft instrument systems and to remove and install components during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

Applications include light fixed wing aircraft with fixed undercarriage and basic rotary wing aircraft with skids or floats and no powered flight controls powered by either a normally aspirated piston engine or small gas turbine.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Civil Aviation Safety Authority (CASA) and the Defence Aviation Safety Authority (DASA).

Any other relevant legislation, industry standards and codes of practice within Australia must be applied.

Pre-requisite Unit

MEA246 Fabricate and/or repair aircraft electrical hardware or parts

Competency Field

Aviation maintenance

Elements and Performance Criteria

Elements	Performance Criteria
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1. Inspect basic aircraft instrument systems and components	1.1 Identify specific inspection requirements from relevant maintenance documentation and modification status, including system defect reports 1.2 Check isolation tags and configure aircraft for safe system inspection and operation in accordance with maintenance manual while observing work health and safety (WHS) requirements

Elements	Performance Criteria
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
	1.3 Visually or physically check instrument system components for external signs of defects in accordance with maintenance manual 1.4 Identify and report defects in accordance with standard enterprise procedures
2. Test or adjust basic aircraft instrument systems and components	2.1 Prepare aircraft and system for application of power or system operation in accordance with maintenance manual 2.2 Perform functional testing on instrument system for evidence of serviceability or malfunction in accordance with maintenance manual 2.3 Perform required calibration or adjustments to system in accordance with maintenance manual
3. Troubleshoot basic aircraft instrument systems and components	3.1 Use available information from maintenance documentation and inspection and test results to assist in fault determination 3.2 Troubleshoot issues to line replacement level using maintenance manual fault diagnosis guides and logic processes 3.3 Obtain required specialist or supervisory advice to assist with the troubleshooting process 3.4 Locate instrument system faults and identify and record causes of faults in required maintenance documentation in accordance with standard enterprise procedures 3.5 Determine requirements for rectification of faults
4. Remove and install basic aircraft instrument system components	4.1 Render system safe and prepare it in accordance with maintenance manual, fitting required isolation tags to ensure personnel safety 4.2 Remove instrument components in accordance with maintenance manual while observing all WHS requirements 4.3 Complete and process required maintenance documentation relating to removal in accordance with standard enterprise procedures 4.4 Tag and pack removed components in accordance with specified procedures 4.5 Confirm correct part numbers, modification status, serviceability and shelf life of instrument components to be installed 4.6 Perform physical installation of instrument components in accordance with maintenance manual and regulatory requirements, and ensure appropriate adjustment or alignment is carried out 4.7 Reinstate system to correct operational condition in preparation for

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	testing, as necessary and in accordance with maintenance manual 4.8 Complete and process required maintenance documentation in accordance with standard enterprise procedures

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance but not explicit in the performance criteria.

- Reading skills to interpret maintenance manuals, inspection procedures and specifications (allowable limits).
- Writing skills to record and report on defects and faults and their causes.
- Numeracy skills to interpret and communicate technical information and take and interpret system measurements and instrument displays.

Other foundation skills essential to performance are explicit in the performance criteria of this unit.

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEA275 Maintain basic light 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 MEAAVI0045 Maintain basic light aircraft instrument systems and components

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Performance Evidence

There must be evidence the candidate has completed all the tasks outlined in the elements and performance criteria of this unit, and demonstrated the ability to:

- maintain basic light aircraft instrument systems and components on a system and at least one major system component/line replaceable unit (LRU) from each of the following groups:
 - pitot/static systems and components, air speed indicator (ASI), vertical speed indicator (VSI) 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
 - piston engine and gas turbine engine indication system components (direct reading measuring instruments and temperature indication)
 - electronic flight and engine instrument system components (may be omitted if not relevant to the enterprise)
 - electrical systems indication (voltage and current)
 - basic fuel quantity indication systems and components
 - vacuum indication components
- locate and identify flight instrument system components during maintenance and comprising:
 - engine system temperature and speed, including mechanical and electrical tachometers
 - auxiliary direct reading systems, including vacuum, fuel storage quantities
 - flight systems, including attitude, altitude, air speed and outside air temperature (OAT)
- locate and identified direct reading compasses during above maintenance
- correctly handle and use observed maintenance precautions relating to gyroscopes, gimbals and pitot or static systems (connections, heating and protrusions) during the above maintenance
- recognise system and component defects or external damage, correct installation, connection of plugs, terminations, attaching hardware, including cabling/harnesses, and security in each of the following:
 - flight instruments
 - pitot/static systems

- direct reading compasses
- piston engine and gas turbine engine indication systems
- electrical systems indication
- basic fuel quantity indication systems
- vacuum indication systems
- perform functional testing by applying logic processes, taking and interpreting system measurements and using test equipment and appropriate wiring diagrams and manuals to isolate malfunctions in the above systems and assess post-maintenance serviceability
- apply testing procedures, cleanliness requirements and safety precautions at all times, and as relevant to the system/s being maintained
- locate and identify at least one of the following:
 - electronic flight instrument system (EFIS)
 - engine indicating and crew alerting system (EICAS)
 - electronic central aircraft monitoring (ECAM)
 - data linkage and transmission systems

Knowledge Evidence

There must be evidence the candidate has knowledge of:

- component attachment methods
- connection of hardware and plugs
- handling precautions for electrostatic sensitive devices
- work health and safety (WHS) practices for basic light aircraft instrument systems and components
- the basic layout (block diagram level), function and operation of:
 - pitot/static systems
 - piston engine and gas turbine engine direct reading indication systems
 - basic fuel quantity measurement systems
- 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
- instrument construction and operation, including:
 - instrument groupings, panel layout and construction
 - pitot static instruments (ASI, VSI and counter-pointer altimeters), their operation, calibration, safe handling and related terminology
 - pitot pressure
 - static pressure
 - altimeter Q code settings:
 - QNH

- QNE
- QFE
- indicated airspeed (IAS)
- true airspeed (TAS)
- vacuum system indication component construction and operation
- air and electrically powered artificial horizon construction and operation
- DG construction and operation
- construction and operation of direct reading engine instruments
- turn and bank and slip/turn coordinator construction and operation
- direct reading compass construction and compass calibration
- piston and gas turbine engine direct reading measuring instruments and temperature indication instruments construction and operation
- voltage and current measuring instrument construction and operation
- volumetric fluid quantity system components, construction and operation
- instrument system maintenance requirements and troubleshooting procedures, including pitot or static system leak testing
- maintenance documentation and maintenance publications for basic light aircraft instrument systems and components
- relevant regulatory requirements and standard procedures
- for electronic flight and engine instrument systems, including:
 - the layout and operation (to block diagram level) of EFIS, EICAS and ECAM systems and related data linkage and transmission systems
 - interpretation of display data
 - component removal and installation procedures
 - testing of system operation using on-board testing procedures and/or simple external test equipment with a go or no-go outcome
 - software management control requirements.
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Assessment Conditions

The following conditions of assessment represent the requirements of the regulators (DASA and CASA) and maintenance stakeholders and must be rigorously observed.

Skills must have been demonstrated under routine supervision in the workplace or in a simulated environment that reflects workplace conditions and contingencies encountered in maintaining basic light aircraft instrument systems and components. The following conditions must be met for this unit:

- use of suitable facilities, equipment and resources, including:
 - workplace procedures, manufacturing specifications, codes, standards, manuals, and reference materials relevant to maintaining basic light aircraft instrument systems and components
 - tools and equipment specified in maintenance documentation

- general-purpose tools and test equipment found in most routine situations and required for maintaining basic light aircraft instrument systems and components.

Evidence of tasks demonstrating competency must be recorded in a log of industrial experience and achievement.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

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