



Australian Government

MEAAVI0051 Maintain light aircraft AC-powered 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 MEA281 Maintain light aircraft AC powered 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 alternating current (AC) powered aircraft instrument systems, including the power supply, and to remove and install components during scheduled or unscheduled maintenance.

Applications include light fixed wing and rotary wing aircraft with piston or turbine engines. Work may be performed individually or as part of a team.

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 light aircraft AC instrument systems, power supplies and components	1.1 Identify specific inspection requirements using maintenance documentation and modification status, including relevant system defect reports to identify specific inspection requirements 1.2 Check isolation tags and configure aircraft for safe system inspection and operation in accordance with maintenance manual 1.3 Visually or physically check AC instrument system and AC power

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	supply components for external signs of defects in accordance with maintenance manual while observing all relevant work health and safety (WHS) requirements 1.4 Identify and report defects in accordance with standard enterprise procedures
2. Test and adjust light aircraft AC instrument systems, power supplies and components	2.1 Prepare aircraft and system for the application of power or system operation in accordance with maintenance manual 2.2 Perform functional testing on instrument system and AC power supply for evidence of serviceability or malfunction in accordance with maintenance manual 2.3 Perform required calibration or adjustments to systems in accordance with maintenance manual
3. Troubleshoot light aircraft AC instrument systems, power supplies and components	3.1 Use available information from maintenance documentation, inspection and test results to assist in fault determination 3.2 Troubleshoot to line replacement level using maintenance manual fault diagnosis guides and logic processes, test sets, downloaded maintenance data and fault-finding charts or similar 3.3 Obtain required specialist or supervisory advice to assist with the troubleshooting process 3.4 Locate instrument system or power supply 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 light aircraft AC instrument system, and power supply components	4.1 Render system safe and prepare it in accordance with the applicable maintenance manual, fitting required isolation tags to ensure personnel safety 4.2 Remove instrument or power supply component in accordance with the applicable maintenance manual while observing all relevant 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 or power supply components to be installed

Elements	Performance Criteria
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
	against maintenance manual 4.6 Perform physical installation of instrument or power supply components in accordance with maintenance manual and regulatory requirements, ensuring required appropriate adjustment or alignment is carried out 4.7 Reinstall system to correct operational condition in preparation for required testing 4.8 Complete and process required maintenance documentation in relation to installation 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.

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 MEA281 Maintain light aircraft AC powered 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 MEAAVI0051 Maintain light aircraft AC-powered 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 light aircraft alternating current (AC) powered instrument systems and components during scheduled or unscheduled maintenance on a system and at least one major system component or line replaceable unit (LRU) from each of the following groups:
 - directional gyro (DG), artificial horizon (AH), altitude heading and reference system (AHRS) and components, servo and encoding altimeters, remote reading gyro compasses and components
 - piston engine and gas turbine engine indication system components
 - fuel quantity indication and flow indication systems and components
 - transmitter/indicator measuring instrument systems (pressure, temperature, vacuum) and components
 - inverters and transformer/rectifier units.
- locate and identify AC-powered instrument system components for the systems being maintained including:
 - AH, DG, AHRS, servo and encoding altimeters
 - engine system temperature, speed, oil pressure, torque and manifold pressure
 - auxiliary systems, including vacuum, fuel storage quantities and fuel flow
 - remote reading gyro compasses
- locate and identify AC instrument power supply system components for the systems being maintained, including:
 - inverters
 - transformer/rectifier units
 - voltage and frequency indication
- correctly handle and observe maintenance precautions for gyroscopes and gimbals
- recognise system and component defects, external damage, correct/incorrect installation, connection of plugs, terminations, attachment hardware (including cabling/harnesses) and security in AC-powered instruments and related power supply, including:
 - flight instruments
 - remote reading gyro compasses

- piston engine and gas turbine engine indication systems (indicators and transmitters or sensors)
- fuel quantity and flow indication systems (indicators, probes and transmitters)
- transmitter/indicator measuring instrument systems (pressure, temperature and vacuum)
- AC power supply, including inverters and transformer or rectifier units
- perform functional testing by applying logic processes, taking and interpreting system measurements, 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, including correct handling and observing maintenance precautions for gyroscopes and gimbals.

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 light aircraft AC powered instrument systems and components
- AC theory, including:
 - calculations and measurement in AC circuits
 - inductors and inductive reactance
 - transformer operation
 - capacitors and capacitive reactance
 - LCR circuits and resonance
 - passive filters
 - power relationship in reactive circuits
- the basic layout (block diagram level), function and operation of AC-powered:
 - flight instruments
 - remote reading gyro compasses
 - piston engine and gas turbine engine indication systems (indicators and transmitters or sensors)
 - fuel quantity and flow indication systems (indicators, probes and transmitters)
 - transmitter/indicator measuring instrument systems (pressure, temperature and vacuum)
 - AC power supply including AC generators, inverters and transformer/rectifier units
- 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 instrument systems
 - gyroscopes and their use in aircraft instrument systems

- electrical fundamentals
- relevant maintenance documentation and maintenance publications
- maintenance requirements and troubleshooting procedures.

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 light aircraft AC-powered 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 light aircraft AC-powered instrument systems and components.
 - tools and equipment specified in maintenance documentation
 - general-purpose tools and test equipment found in most routine situations.

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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