



Australian Government

**Assessment Requirements for MEA227 Test
and troubleshoot aircraft electrical systems
and components**

Release: 2

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Modification History

Release 2. Equivalent to MEA227 Test and troubleshoot aircraft electrical systems and components with amended prerequisite codes.

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:

- applying relevant WHS practices
- using approved maintenance documentation and aircraft publications relating to the electrical system being maintained
- recognition of system and electrical component defects/external damage, correct installation, connection of plugs, terminations, and attaching hardware (including cabling/harnesses) and security in:
 - AC and DC power generation systems, including regulation, distribution, control and cooling
 - battery installations
 - flight control and/or electro-hydraulic systems
 - engine ignition, starting, fuel distribution and control systems
 - internal/external lighting systems, including controls
 - landing gear systems
 - anti-skid braking systems
 - auxiliary systems, including ice/rain protection, fire detection, environmental control and pressurisation, water and waste, doors, propeller control, equipment and furnishings
 - equipment cooling and ventilation systems
 - master caution and warning systems
- applying logic processes, taking and interpreting electrical measurements, and using test equipment and appropriate wiring diagrams and manuals to isolate electrical system malfunctions of the above components and systems
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the electrical 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 testing and troubleshooting is essential. This is to be demonstrated through application across a range of aircraft electrical 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
- explaining the basic layout (block diagram level), function and operation of:
 - AC and DC power generation systems, including regulation, distribution, control and cooling
 - battery installations
 - flight control and/or electro-hydraulic systems
 - engine ignition, starting, fuel distribution and control systems
 - internal/external lighting systems, including controls
 - landing gear systems
 - anti-skid braking systems
 - auxiliary systems, including ice/rain protection, fire detection, environmental control and pressurisation, water and waste, doors, propeller control, equipment and furnishings
 - equipment cooling and ventilation systems
 - master caution and warning systems
- explaining basic principles/functions, relating to systems listed above and associated with:
 - basic AC and DC circuit theory
 - digital fundamentals
 - analogue fundamentals
 - AC and DC generator characteristics
 - single and polyphase AC motors and DC motors
 - rotary and static inverters
 - air cycle air conditioning
 - electrical sensing and transmitting devices
- WHS requirements applicable to the maintenance of aircraft electrical systems, including gas turbine engine high-energy ignition units
- electrical system maintenance requirements and troubleshooting procedures
- 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 one (1) item from each of the following groups, including all related electrical hardware, looms and cables:
 - AC and/or DC power generation, regulation and distribution systems
 - rotary and static inverters and TR units
 - air cycle air conditioning and pressurisation systems
 - flight and engine control systems
 - ignition and starting systems
 - fire/smoke detection and extinguishing
 - lighting (internal and external)
 - master and caution warning systems
 - equipment cooling and ventilation
 - equipment and furnishing
 - position indicating systems
 - fuel storage and distribution
 - landing gear indication and anti-skid
 - main batteries and battery bus ties/interlocks (including a battery check)
 - propeller control systems (may be omitted if not applicable to the enterprise)
 - ice and rain protection (may be omitted if not applicable to the enterprise)
 - wastewater (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 MEA294 Inspect, test and troubleshoot advanced aircraft electrical systems and components, will have covered a significant proportion of the Performance Criteria for Elements 1, 2 and 3 and will have covered many of the Range of Conditions variables. The Log of Industrial Experience and Achievement records relating to MEA294 Inspect, test and troubleshoot advanced aircraft electrical systems and components, may be accepted as also meeting the evidence requirements for this unit in the applicable areas.
- The relationship between MEA294 Inspect, test and troubleshoot advanced aircraft electrical systems and components, and MEA210 Inspect, test and troubleshoot basic aircraft electrical systems and components, may also be taken into account where MEA210 Inspect, test and troubleshoot basic aircraft electrical systems and components, has been attained, but not MEA294 Inspect, test and troubleshoot advanced aircraft electrical systems and components. Advice in MEA210 Inspect, test and troubleshoot basic aircraft electrical systems and components, regarding the coverage of MEA274 Maintain basic light aircraft electrical systems and components, may also be taken into consideration where applicable.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>