



Australian Government

MEA203 Remove and install advanced aircraft electrical system components

Release: 1

MEA203 Remove and install advanced aircraft electrical system components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of maintenance documentation/publications in the removal and installation of advanced aircraft electrical alternating current (AC) and direct current (DC) system components of fixed and rotary wing aircraft that have both AC and DC electrical systems 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, and of the Mechanical Aircraft Maintenance Engineer licensing 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

MEA201 Remove and install miscellaneous aircraft electrical hardware/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. Remove AC and DC aircraft electrical system components | 1.1 | System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel |
|--|-----|---|

		safety
	1.2	Electrical component removal is carried out in accordance with the applicable maintenance manual while observing all relevant work health and safety (WHS) requirements
	1.3	Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
	1.4	Removed components are tagged and packaged in accordance with specified procedures
2.	Install AC and DC aircraft electrical system components.	2.1 Electrical components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life
		2.2 Physical installation of electrical components is performed in accordance with the applicable maintenance manual, ensuring appropriate adjustment/alignment with mechanical interface is carried out
		2.3 System is reinstated to correct operational condition in preparation for testing, as necessary
		2.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

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.

Electrical system components include:

- DC and AC power generation and distribution system components, including generators and related multi-sourced DC power generation, starter generators alternators and regulation, and control and distribution

system components

- Transformer rectifier units and/or inverters
- Batteries and related bus tie or interlock system components and battery temperature monitoring systems
- Motors and actuators
- Components of gas turbine and/or piston engine ignition and starting systems (where applicable to the enterprise)
- External/internal lights
- Electrical components of specific electrical systems, such as air cycle air conditioning, combustion heaters, equipment cooling, anti-icing and de-icing, landing gear, anti-skid, flight control, master and central warning, fuel storage and distribution, fire warning and extinguishing, and engine/propeller control (where applicable to the enterprise)
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Procedures and requirements include:

Unit Mapping Information

Release 1 – equivalent to MEA203C Remove and install advanced aircraft electrical system 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 MEA203 Remove and install advanced aircraft electrical system components

Modification History

Release 1 - New unit of competency

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 include:

- identifying/locating:
 - DC power regulation, distribution and control systems and components, i.e. regulators and bus bars
 - AC power regulation, distribution and control systems and components, i.e. generator control units
 - various types of inverters and transformer rectifier units
 - gas turbine and piston engine ignition and starting systems and components (where applicable to the enterprise)
 - batteries (lead acid and nickel cadmium) and associated mounting equipment including related anti-vibration aids and battery temperature monitoring systems
 - flight control servo actuating devices, i.e. AC and DC electro-mechanical, electro-pneumatic, electro-hydraulic, duplex servomotors, power control units and trim control devices
 - electrical components of aircraft systems, such as air cycle air conditioning, anti-icing and de-icing, landing gear, anti-skid, flight control, master and central warning, fuel storage and distribution, external and internal lighting, fire warning and extinguishing, and engine/propeller control (where applicable to the enterprise)
- correctly connecting:
 - DC generators
 - star or delta alternators to star and delta loads
 - starter generators
 - AC motors
 - polyphase motors
- applying relevant WHS practices.

It is essential that cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with, as well as work practices associated with electrostatic sensitive devices.

Evidence of transferability of skills and knowledge related to removal and installation is essential. This is to be demonstrated by application across a range of aircraft major electrical system components encompassing electrical with mechanical interface and installations that require alignment and/or adjustment (mechanical or electrical).

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 and plugs
- relevant WHS practices
- the use of approved maintenance documentation and aircraft publications relating to AC and DC electrical systems
- properties of permanent magnets
- precautions for the care and storage of permanent magnets
- bonding of aircraft components and lightning protection
- general construction, operating characteristics and applications for aircraft:
 - generators
 - alternators
 - AC and DC motors
 - transformer rectifier units
 - rotary and static inverters
 - batteries
 - linear and rotary actuators
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures
- environmental protection requirements relating to Halon fire extinguishers (e.g. Bromochlorodifluoromethane (BCF)).

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified in maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine maintenance situations would be used where appropriate.
- An understanding of the attachment methods, connection of hardware, and the need for adjustment or rigging and system operation as they relate to the work must be demonstrated 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 at least one (1) component from:

- DC and AC power generation and distribution system components, including generators and related multi-sourced DC power generation, starter generators alternators and regulation, and control and distribution system components
- transformer rectifier units and/or inverters
- batteries and related bus tie or interlock system components and battery temperature monitoring systems
- motors and actuators
- components of gas turbine and/or piston engine ignition and starting systems (may be omitted where not applicable to the enterprise)
- external/internal lights
- and on three (3) components that are applicable to the enterprise from:
 - electrical components of specific electrical systems, such as air cycle air conditioning, combustion heaters, equipment cooling, anti-icing and de-icing, landing gear, anti-skid, flight control, master and central warning, fuel storage and distribution, fire warning and extinguishing and engine/propeller control.
- This shall be established via 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 MEA202 Remove and install basic aircraft electrical system components will have covered a significant amount of the skill and knowledge requirements for this unit plus part of the Performance Criteria for Elements 1 and 2 and associated range of conditions items. The Log of Industrial Experience and Achievement records relating to MEA202 Remove and install basic aircraft electrical system components may be accepted as also meeting the evidence requirements for this unit in the applicable areas.
- Guidance information in MEA202 Remove and install basic aircraft electrical system components regarding MEA274 Maintain basic light aircraft electrical systems and components should also be taken into consideration and the attainment of MEA277 Maintain twin engine aircraft electrical systems and components would significantly increase the extent of coverage of range of conditions variables. The Log of Experience and Achievement records relating to MEA274 Maintain basic light aircraft electrical systems and components and MEA277 Maintain twin engine aircraft electrical systems and components may also be accepted as meeting the evidence requirements for this unit in the applicable areas.

Links

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