



Australian Government

MEA316 Inspect, test and troubleshoot rotary wing rotor and control systems and components

Release: 1

MEA316 Inspect, test and troubleshoot rotary wing rotor and control systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, the use of maintenance publications, and knowledge of rotors and rotor control system theory to inspect, test and troubleshoot rotary wing aircraft rotors and rotor control systems during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

The unit is part of the Mechanical 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

MEA308 Remove and install rotary wing rotor and flight control system 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. Inspect rotor and rotor control systems and components | 1.1 Isolation and warning signs are fitted/installed to the system or related systems and the aircraft configured for safe system inspection and operation in accordance with relevant aircraft publications/maintenance regulations |
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- orders and standards and practices
- 1.2 Rotor and rotor control system is visually or physically checked/inspected for external signs of defects in accordance with relevant aircraft publications maintenance regulations/orders and standards and practices while observing all relevant work health and safety (WHS) requirements
 - 1.3 Defects are identified and recorded in accordance with standard enterprise procedures
 2. Ground test rotor and rotor control systems
 - 2.1 Aircraft and system prepared in accordance with relevant aircraft publications/maintenance regulations orders and standards and practices for the operation of engine and rotor system
 - 2.2 Rotor and rotor control system are functionally tested in accordance with relevant aircraft publications maintenance regulations/orders and standards and practices for evidence of malfunction
 - 2.3 System calibration or adjustments are performed in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices
 3. Prepare for troubleshooting
 - 3.1 Relevant aircraft publications and modification status, including system defect reports, are interpreted to identify an unserviceability
 4. Troubleshoot rotor and rotor control systems
 - 4.1 Available information from aircraft maintenance documentation, inspection and test results is used to assist in fault determination
 - 4.2 Relevant aircraft publication fault diagnosis guide and logical processes are used to ensure efficient and accurate troubleshooting to line replacement level
 - 4.3 Specialist advice is obtained to assist with the troubleshooting process
 - 4.4 Rotor and rotor control system faults are located and the causes of the faults are clearly identified and recorded in aircraft maintenance documentation in accordance with standard enterprise procedures
 - 4.5 Fault 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.

Rotor and rotor control systems include:

- Main rotor blades and tail rotor blades
- Rotor heads, swash plates and tail rotor pitch control assemblies
- Mechanical, powered flight control components
- Main rotor, intermediate or tail rotor gearboxes
- Drive shafts and couplings
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Procedures and requirements include:

Unit Mapping Information

Release 1 – equivalent to MEA316C Inspect, test and troubleshoot rotary wing rotor and control 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 MEA316 Inspect, test and troubleshoot rotary wing rotor and control systems and 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 must include:

- applying relevant WHS procedures
- using relevant maintenance documentation and aircraft manuals to:
 - recognise through visual/physical inspection external signs of defects in the rotor, rotor head, tail rotor and flight control mechanical system components
 - ground test the rotor and control system and recognise correct function
 - rig and adjust rotor controls and systems
- using fault diagnosis guides and equivalent data to accurately and efficiently troubleshoot the causes of unserviceabilities in rotor control systems, clearly record details and identify the required rectification actions.

The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with the rotor control systems. It is essential that testing procedures take into account all safety precautions associated with ground testing of rotor and rotor control systems, and that awareness be demonstrated of dual inspection requirements associated with work on control systems.

Ability to interpret system performance specifications (allowable limits) and apply them in practice is critical and shall be demonstrated through application across the range of systems 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:

- fault diagnosis techniques
- standard trade practices relating to tool and test/rigging equipment usage
- theory of flight:
 - airflow
 - conditions of flight
 - lift and forces
 - drag

- rotary flight principles:
 - terminology relating to:
 - aerofoils
 - main rotor blades
 - rotor discs
 - rotors – main and tail
 - aerodynamic characteristics:
 - aerofoil design
 - forces
 - rotor thrust and power requirements
 - vortex ring
 - autorotation
 - helicopter stability
- helicopter dynamic components:
 - main rotors:
 - blades
 - heads
 - linkages
 - tail rotors
 - swash plates
 - transmissions and drive shafts
 - clutches and freewheeling units
- system and component operation, including electrical and instrument system interfaces:
 - cyclic pitch control
 - collective pitch control
 - tail rotor control
 - mechanical and powered control systems
 - engine control interface
 - torque reaction and anti-torque devices
 - engine indication
 - vibration monitoring
- helicopter maintenance procedures and troubleshooting
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures including requirements for engine and rotor system operation
- relevant WHS practices.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified in aircraft maintenance manuals. It is also expected that applicable general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
- The application of ground testing procedures should clearly indicate knowledge of system operation. System operation knowledge, the relationship of individual components and the links with other systems will be necessary to supplement evidence of ability to troubleshoot the system 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.
- Functional testing of rotors and rotor control systems with engine/s running may be carried out with the applicant directing a pilot qualified on type.
- 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) item from each of the following groups:
 - main rotor blades and tail rotor blades
 - rotor heads, swash plates and tail rotor pitch control assemblies
 - mechanical, powered flight control components
 - main rotor, intermediate or tail rotor gearboxes
 - drive shafts and couplings.
- 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 MEA352 Maintain basic rotary wing aircraft systems 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 MEA352 Maintain basic rotary wing aircraft systems may be accepted as also meeting the evidence requirements for this unit in the applicable common areas.

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