Australian Government

Department of Education, Employment and Workplace Relations

MEA352A Maintain basic rotary wing aircraft systems

Revision Number: 2

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Modification History

Minor formatting and editorial changes made. Prerequisite unit version code updated.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to maintain basic rotary wing aircraft rotors, rotor control systems, airframe systems and components.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the applicable Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

Application of the Unit

This unit requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot, and replace components of rotor, rotor control systems and airframe systems of basic rotary wing aircraft.

Applications include rotary wing aircraft that have mechanical control systems, either skids or floats and a normally aspirated engine.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA101B	Interpret occupational health and safety practices in aviation maintenance
MEA103B	Plan and organise aviation maintenance work activities
MEA105C	Apply quality standards applicable to aviation maintenance processes
MEA107B	Interpret and use aviation maintenance industry manuals and specifications
MEA108B	Complete aviation maintenance industry documentation
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

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 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
	1.3. Defects are identified and recorded in accordance with standard enterprise procedures
2. Inspect basic rotary wing airframe systems	2.1. Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements
	2.2. Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual
	2.3. ***Airframe system*** components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual
	2.4. Defects are correctly identified and reported
3. Ground test rotor and rotor control systems	3.1. 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***
	3.2. 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
	3.3. System calibration or adjustments are performed in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices
4. Test/adjust basic rotary wing airframe systems and components	4.1. Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation
	4.2. Airframe system is functionally tested, in accordance with maintenance manual, for evidence of serviceability or malfunction
	4.3. System adjustment is performed in accordance with maintenance manual
5. Troubleshoot rotor and rotor control	5.1. Available information from aircraft maintenance documentation, inspection and test results is used to assist in

systems	fault determination
	5.2. Relevant aircraft publication fault diagnosis guide and logical processes are used to ensure efficient and accurate ***troubleshooting***
	5.3. Specialist advice is obtained to assist with the troubleshooting process
	5.4. 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
	5.5. Fault rectification requirements are determined
6. Troubleshoot basic rotary wing airframe systems	6.1. Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination
	6.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting
	6.3. Specialist advice is obtained, where required, to assist with the troubleshooting process
	6.4. Airframe system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures
	6.5. Rectification requirements are determined
7. Remove and install rotary wing rotor and rotor system components	7.1. System is rendered safe and prepared in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices, and isolation and warning signs are installed/fitted to ensure personnel safety
	7.2. Rotor and rotor system component removal is carried out in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices
	7.3. Required aircraft maintenance documentation is completed and processed in accordance with standard enterprise procedures
	7.4. Removed components are labelled, sealed and packaged in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices
	7.5. Rotor or rotor system component to be installed is checked to confirm correct part or model numbers, modification status and serviceability
	7.6. Mass balance of rotor blades/head is checked in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices
	7.7. Installation is carried out in accordance with relevant aircraft

	publications/maintenance regulations/orders and standards and practices
	7.8. Support/safety equipment is removed at the appropriate time to ensure personnel safety and freedom from structural damage
8. Remove and install rotor control system components	8.1. System is rendered safe and prepared in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices, and isolation and warning signs are installed/fitted to ensure personnel safety
	8.2. Rotary wing flight control system component removal is carried out in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices
	8.3. Required aircraft maintenance documentation is completed and processed in accordance with standard enterprise procedures
	8.4. Removed components are labelled, sealed and packaged in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices
	8.5. Rotary wing flight control system components to be installed are checked to confirm correct part or model numbers, modification status and serviceability
	8.6. Installation is carried out in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices
	8.7. Support/safety equipment is removed at the appropriate time to ensure personnel safety and freedom from structural damage
	8.8. Required aircraft maintenance documentation is completed and processed in accordance with standard enterprise procedures
9. Remove and install basic rotary wing airframe system components	9.1. System is rendered safe in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety
	9.2. ***Airframe system component*** removal is carried out in accordance with the applicable maintenance manual.
	9.3. Required maintenance documentation is accurately completed and correctly processed
	9.4. Removed components are tagged, sealed and packaged in accordance with specified procedures
	9.5. Components to be installed are checked to confirm correct part numbers, serviceability and modification status
	9.6. Mass balance of control surfaces to be installed is checked in accordance with the applicable maintenance manual, if

required

9.7. Installation is carried out in accordance with the applicable maintenance manual

9.8. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- using hand skills, tools and test equipment in the testing, adjustment and troubleshooting of:
  - rotary wing mechanical control systems
  - helicopter airframe systems and components, including rotors and rotor system
- recognising system and component defects/external damage, correct installation and security for the range of airframe systems listed in the Range Statement
- removing, installing and rigging of rotor systems and rotor/flight controls
- removing and installing the range of airframe components listed in the Range Statement
- checking rotor mass balance
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability
- effectively using maintenance documentation and relevant fault diagnosis guides in the troubleshooting process and for component removal and installation
- applying standard procedures
- observing all relevant OHS procedures, including the use of MSDS and PPE

Required knowledge

Look for evidence that confirms knowledge of:

- OHS precautions relevant to airframe system maintenance, including the lifting and handling of heavy components and how to obtain MSDS and PPE
- standard trade practices relating to tool and test/rigging equipment usage and installation/securing of system components
- 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
- helicopter structure and airframe systems:
  - structure and layout
  - engine and transmission
  - flight control system layout and operation
  - cabin heater system layout and operation
  - fuel system layout and operation
- helicopter maintenance procedures and troubleshooting
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures, including requirements for engine and rotor system operation

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot basic rotary wing aircraft rotor, rotor control and airframe systems and remove and install rotors, and a range of rotor control and airframe system components that is representative of the scope of the listed variables in accordance with relevant maintenance manual instructions while applying all relevant OHS procedures and standard processes.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	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, rotors, rotor control systems, airframe systems and components of basic rotary wing aircraft. It is essential that relevant procedures, cleanliness requirements and safety precautions are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. Evidence of transferability of skills and knowledge related to inspection, testing, troubleshooting and component removal and installation is essential. This may be demonstrated through application across a range of rotors, rotor control systems, airframe systems and components as listed in the Range Statement. 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. A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of this unit of competency are being achieved under routine supervision on groups listed in the Range Statement, as follows: • at least one component from each of Groups 1 to 7 • a representative range of components from Groups 8

	and 9. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
Context of and specific resources for assessment	Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Rotor and rotor control system	Rotor and rotor control system components may include: 1. Main rotor blades and tail rotor blades 2. Rotor heads, swash plates and tail rotor pitch control assemblies 3. Mechanical flight control components (collective and cyclic pitch levers, rudder pedals, cables, pulleys, guides, fairleads, bellcranks, rods, torque tubes, chains and sprockets) 4. Main rotor, intermediate or tail rotor gearboxes 5. Drive shafts and couplings
Engine and rotor system operation	The operation of engine and rotor system: • must be performed by a qualified pilot
Airframe systems and components	Airframe systems may include: 6. Fuel systems 7. Cabin heating systems Airframe system components may include: 8. Rigid or flexible fuel tanks, selector/shutoff valves and rigid or flexible plumbing 9. Cabin heater ducting and control valves
Troubleshooting	Troubleshooting involves the use of test sets, downloaded maintenance data and fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities
Procedures and requirements	Refer to industry standard procedures specified by

	manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Aviation maintenance

Competency field

Co-requisite units

Not applicable