



Australian Government

MEA315 Inspect, test and troubleshoot propeller systems and components

Release: 1

MEA315 Inspect, test and troubleshoot propeller 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 propeller and propeller system theory to inspect, test and troubleshoot fixed wing aircraft propellers and propeller system components 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

MEA307 Remove and install propeller systems and components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

1. Inspect propeller systems and components

Performance criteria describe the performance needed to demonstrate achievement of the element.

- 1.1 Isolation tags already attached to the system or related systems are checked and aircraft configured for safe system inspection and operation in accordance with

			applicable maintenance manual
		1.2	Propeller system is visually or physically checked for rigging and external signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE)
2.	Test propeller systems	2.1	Aircraft and system are correctly prepared, in accordance with maintenance manual, for the operation of engine and propeller system
		2.2	Propeller and system are functionally tested in accordance with applicable maintenance manual for evidence of malfunction or defects
		2.3	System calibration or adjustments are performed in accordance with applicable maintenance manual
3.	Prepare for troubleshooting	3.1	Relevant maintenance documentation and modification status, including system defect reports, where relevant, are interpreted to identify an unserviceability
4.	Troubleshoot propeller systems	4.1	Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination
		4.2	Maintenance manual fault diagnosis guide and logical processes are used to ensure efficient and accurate troubleshooting to line replacement level
		4.3	Specialist advice is obtained, where required, to assist with the troubleshooting process
		4.4	Propeller system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required
		4.5	Fault rectification requirements are determined to assist in planning the repair

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.

Propeller and propeller systems include:

- Propellers, including spinners, where fitted
- Constant speed, feathering and reversing propeller drives
- Beta control systems and governors
- Controls and linkages
- De-ice/anti-ice equipment (where applicable to the enterprise)

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA315C Inspect, test and troubleshoot propeller 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 MEA315 Inspect, test and troubleshoot propeller systems and components

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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, including the lifting and handling of heavy components
- using relevant maintenance documentation and aircraft manuals to:
 - recognise, through visual/physical inspection, external signs of defects or rigging abnormalities in propellers and propeller system components
 - functionally test propellers and propeller systems and recognise any indication of malfunction or incorrect rigging or adjustment
 - rig and adjust propeller controls and systems
- using fault diagnosis guides and equivalent data to accurately and efficiently troubleshoot the causes of unserviceabilities in propellers and propeller 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 propeller systems. It is essential that system test procedures take into account all safety precautions associated with propeller system operation, and that awareness be demonstrated of dual inspection requirements associated with work on propeller control systems.

This shall be demonstrated through application across a number of propeller systems or propeller types. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical.

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
- propeller system layout and operation:
 - propeller types
 - propeller terminology
 - forces acting on a propeller
 - propeller construction
 - propeller operation

- pitch changing mechanisms
- governors and beta control
- controls and rigging of propeller controls
- maintenance requirements and troubleshooting procedures
- ancillary systems and system component operation, including electrical and instrument system interfaces:
 - de-icing and anti-icing
 - multi-engine synchronising and synchrophasing
 - feathering and unfeathering, including auto feathering
 - pitch reversal
 - negative torque sensing and protection
 - de-coupling
 - braking
 - thrust and torque measuring and indication
 - maintenance requirements and troubleshooting procedures
- relevant WHS practices, including the requirements for the lifting and handling of heavy components
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

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 situations would be used where appropriate.
- The application of 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.
- 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:
 - propellers, including spinners, where fitted
 - constant speed, feathering and reversing propeller drives
 - beta control systems and governors
 - controls and linkages
 - de-ice/anti-ice equipment (may be omitted where it is 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.

Links

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