



Australian Government

Department of Education, Employment and Workplace Relations

MEA315C Inspect, test and troubleshoot propeller systems and components

Revision Number: 2

MEA315C Inspect, test and troubleshoot propeller systems and components

Modification History

Minor formatting and editorial changes made.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to inspect, test and troubleshoot propeller systems and components. This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen 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, the use of maintenance publications and knowledge of propeller and propeller system theory to inspect, test and troubleshoot propellers and propeller system components.

Applications include propeller driven fixed wing aircraft.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA307C Remove and install propeller systems and components

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

<p>Elements describe the essential outcomes of a unit of competency.</p>	<p>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.</p>
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Elements and Performance Criteria

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| <p>1. Inspect propeller systems and components</p> | <p>1.1. Isolation tags already attached to the system or related systems are checked and configured for safe system inspection and operation in accordance with applicable maintenance manual</p> <p>1.2. Propeller system is visually or physically checked for rigging and external damage in accordance with applicable maintenance manual</p> |
| <p>2. Test propeller systems</p> | <p>2.1. Aircraft and system are correctly prepared in accordance with maintenance manual for operation of engine and propeller system</p> <p>2.2. <i>Propeller and system</i> are functionally tested in accordance with applicable maintenance manual for evidence of malfunction or defects</p> <p>2.3. System calibration or adjustments are performed in accordance with applicable maintenance manual</p> |
| <p>3. Prepare for troubleshooting</p> | <p>3.1. Relevant maintenance documentation and modification status, including system reports, where relevant, are interpreted to identify an unserviceability</p> |
| <p>4. Troubleshoot propeller systems</p> | <p>4.1. Available information from maintenance documentation and inspection and test results are used, where necessary, to assist in fault determination</p> <p>4.2. Maintenance manual fault diagnosis guide and logical processes are used to identify and accurate <i>troubleshooting</i></p> <p>4.3. Specialist advice is obtained, where required, to assist with the troubleshooting</p> <p>4.4. Propeller system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required</p> <p>4.5. Fault rectification requirements are determined to assist in planning the repair</p> |

Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS practices, including the lifting and handling of heavy components
- using relevant maintenance documentation and aircraft manuals to:
 - through visual/physical inspection, recognise 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

Required knowledge

Look for evidence that confirms 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 OHS practices, including the requirements for the lifting and handling of heavy

components

- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

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.

<p>Overview of assessment</p>	<p>A person who demonstrates competency in this unit must be able to apply hand skills, use maintenance publications and propeller and propeller system theory knowledge to inspect, test and troubleshoot propellers and their systems on propeller driven fixed wing aircraft while applying all relevant safety precautions.</p>
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>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.</p> <p>Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This may be demonstrated through application across a number of aircraft systems or aircraft types.</p> <p>Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. The application of testing procedures should also 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.</p> <p>A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one item from each of Groups 1 to 4 listed in the Range Statement (Group 5 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</p>

	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 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 level of troubleshooting is limited in its application to the use of fault diagnosis guides or other similar information.
Method of assessment	
Guidance information for assessment	

Range Statement

<p>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.</p>	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Propeller and propeller systems	<p>Propeller and systems may include:</p> <ol style="list-style-type: none"> 1. Propellers, including spinners, where fitted 2. Constant speed, feathering and reversing propeller drives 3. Beta control systems and governors 4. Controls and linkages 5. De-ice/anti-ice equipment
Troubleshooting	Troubleshooting involves the use of fault-finding charts or similar, to line replacement level
Application	<p>Application of this unit may relate to:</p> <ul style="list-style-type: none"> • scheduled or unscheduled maintenance activities • 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