



Australian Government

MEAMEC0042 Maintain basic light aircraft engines and propellers

Release: 1

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Modification History

Release 1. Application changed. Performance Criteria changed. Foundation Skills made explicit. Range of Conditions removed, and relevant information moved to Assessment Requirements. Assessment Requirements clarified. Supersedes and is equivalent to MEA353 Maintain basic light aircraft engines and propellers.

Application

This unit describes the skills and knowledge required to apply hand skills and use maintenance publications and knowledge of piston engine and system theory to inspect, test and troubleshoot, remove and install normally aspirated piston engines and engine system components during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

This unit applies to normally aspirated piston engines of basic light fixed wing aircraft and basic rotary wing aircraft, and fixed pitch propellers.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Civil Aviation Safety Authority (CASA) and the Defence Aviation Safety Authority (DASA).

Any other relevant legislation, industry standards and codes of practice within Australia must be applied.

Pre-requisite Unit

MEA107 Interpret and use aviation maintenance industry manuals and specifications

MEA154 Apply work health and safety practices in aviation maintenance

MEA155 Plan and organise aviation maintenance work activities

MEA156 Apply quality standards during aviation maintenance activities

MEA157 Complete aviation maintenance industry documentation

MEA158 Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Elements and Performance Criteria

Elements	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 piston engine system and components	1.1 Check isolation tags already attached to the system or related systems and configure aircraft or engine for safe system inspection and operation in accordance with applicable maintenance manual 1.2 Visually or physically check piston engine and components or systems for external and internal 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 (MSDSs) and items of personal protective equipment (PPE)
2. Test piston engine	2.1 Prepare aircraft and engine in accordance with applicable maintenance manual 2.2 Provide assistance with engine and/or system operation during prescribed test procedures to establish serviceability and correct function in accordance with applicable maintenance manual
3. Troubleshoot piston engine	3.1 Use available information from maintenance documentation and inspection and test results, when required, to assist in fault determination 3.2 Use maintenance manual fault diagnosis guide and logical processes to ensure efficient and accurate troubleshooting to line replacement level 3.3 Obtain specialist advice, when required, to assist with the troubleshooting process 3.4 Locate piston engine faults and identify and record the causes of the faults in maintenance documentation, when required 3.5 Determine fault rectification requirements to assist in planning the repair
4. Remove piston engine and engine system components	4.1 Prepare and support aircraft and render safe in accordance with the applicable maintenance manual including fitting isolation tags, when required, to ensure the safety of personnel and freedom from damage during engine removal 4.2 Carry out removal in accordance with the applicable maintenance manual while observing all relevant WHS requirements, including the use of MSDSs and items of PPE 4.3 Tag and prepare engine for transport or storage in accordance with the specified procedures 4.4 Complete required removal maintenance documentation and process in accordance with standard enterprise procedures
5. Install piston engine	5.1 Check engine to be installed to confirm correct part or model

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and engine system components	numbers, modification status and serviceability 5.2 Carry out installation in accordance with the applicable maintenance manual 5.3 Remove support or safety equipment at the appropriate time to ensure personnel safety and freedom from structural damage 5.4 Complete required installation maintenance documentation and process in accordance with standard enterprise procedures
6. Inspect and maintain fixed pitch propeller	6.1 Render engine safe for propeller inspection in accordance with maintenance manual or enterprise procedures 6.2 Inspect fixed pitch propeller for security, damage and deterioration in accordance with the applicable maintenance manual while observing all relevant WHS requirements, including the use of MSDSs and items of PPE 6.3 Blend out metal propeller nicks and dents within damage limits in accordance with maintenance manual procedures
7. Remove fixed pitch propeller	7.1 Render engine safe and the aircraft is prepared for propeller removal in accordance with maintenance manual or enterprise procedures 7.2 Remove propeller in accordance with maintenance manual procedures while observing all relevant WHS requirements, including the use of MSDSs and items of PPE 7.3 Tag and prepare removed propeller for transport or storage in accordance with specified procedures 7.4 Complete required removal maintenance documentation and process in accordance with standard enterprise procedures
8. Install fixed pitch propeller	8.1 Render engine safe and prepare the aircraft for propeller installation in accordance with maintenance manual or enterprise procedures 8.2 Check propeller to be installed to confirm correct part or number, modification status and serviceability 8.3 Carry out installation in accordance with the applicable maintenance manual 8.4 Complete required installation maintenance documentation and process in accordance with standard enterprise procedures

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance but not explicit in the performance criteria.

- Reading skills to interpret maintenance documentation, specifications (allowable limits) and procedures.
- Writing skills to complete maintenance documentation.
- Numeracy skills to interpret and communicate technical information.

Other foundation skills essential to performance are explicit in the performance criteria of this unit.

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEA353 Maintain basic light aircraft engines and propellers.

Links

Companion Volume implementation guides are found in VETNet – -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEAMEC0042 Maintain basic light aircraft engines and propellers

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Performance Evidence

There must be evidence the candidate has completed all the tasks outlined in the elements and performance criteria of this unit, and demonstrated the ability to:

- maintain, under routine supervision, at least one item from each of the following groups:
 - normally aspirated engine (all types), main components and accessories drives
 - control system
 - starter system
 - fuel and air systems
 - exhaust system
 - oil system (if dry sump) (may be omitted where not applicable to the enterprise)
 - fixed pitch propeller (may include a spinner and the propeller will be made from one of metal, composite or wood)
- while undertaking the above work:
 - take into account all safety precautions associated with piston engine system operation, and awareness of dual inspection requirements associated with work on engine controls
 - apply testing procedures and functional rigging checks
 - operate systems, monitor indications, record parameters and recognise correct function
 - compile engine condition monitoring records
 - rig and adjust engine controls and systems.

Knowledge Evidence

There must be evidence the candidate has knowledge of:

- work health and safety (WHS) procedures for engine and propeller maintenance, including lifting and handling of heavy objects
- how to obtain material safety data sheets (MSDSs)
- use of personal protective equipment (PPE)
- engine and propeller maintenance manuals
- engine and propeller maintenance regulatory requirements and standard procedures
- fault diagnosis techniques

- piston engine and engine system layout and operation:
 - four stroke engine theory of operation and performance
 - cylinder configurations
 - construction (components and materials)
 - carburettors and air induction systems
 - fuel injection systems
 - fuels and their characteristics
 - ignition systems
 - lubricating systems and lubricants
 - cooling systems
 - exhaust systems
 - accessory drives and mounts
 - normally aspirated piston engine maintenance requirements and troubleshooting procedures
- system component operation, including the following electrical and instrument system interfaces:
 - magnetos and ignition harnesses
 - spark plugs
 - fuel pumps
 - fuel filters
 - oil pumps
 - oil filters
 - oil tanks
 - vacuum pumps
 - generators
 - starter motors
 - oil pressure gauges (direct reading)
 - temperature gauges (direct reading)
 - tachometers
 - manifold pressure gauges
 - maintenance requirements and troubleshooting procedures
- removal and installation procedures for piston engines and engine components:
 - removal procedures and handling
 - control linkages
 - electrical wiring
 - engine instrument connections
 - installation and rigging
 - ground running
 - system component removal, installation and system testing
- propellers, materials and damage and deterioration criteria:

- fixed pitch propeller types, terminology and theory:
 - tractor or pusher
 - matching to engine and aircraft
 - leading edge or trailing edge
 - blade stations
 - forces acting on a propeller
 - propeller balance
- materials and construction methods:
 - metal propeller metals, construction and surface protection
 - wooden propeller materials, construction and surface protection
 - composite propeller materials, construction and surface protection
 - damage and deterioration
- methods of blending out of minor damage to metal propellers
- propeller removal and installation procedures.

Assessment Conditions

The following conditions of assessment represent the requirements of the regulators Defence Aviation Safety Authority (DASA) and Civil Aviation Safety Authority (CASA) and maintenance stakeholders and must be rigorously observed.

Skills must have been demonstrated in the workplace or in a simulated environment that reflects workplace conditions and contingencies encountered in maintaining basic light aircraft engines and propellers. The following conditions must be met for this unit:

- use of suitable facilities, equipment and resources, including:
 - workplace procedures, manufacturing specifications, codes, standards, manuals, and reference materials relevant to maintaining basic light aircraft engines and propellers
 - tools and equipment specified in maintenance documentation.
 - general-purpose tools and test equipment found in most routine situations.

Evidence of tasks demonstrating competency must be recorded in a log of industrial experience and achievement.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

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