



**Australian Government**

**Assessment Requirements for MEA313  
Inspect, test and troubleshoot piston engine  
systems and components**

**Release: 1**

# Assessment Requirements for MEA313 Inspect, test and troubleshoot piston engine 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, including the use of MSDS and PPE
- using relevant maintenance documentation and aircraft manuals
- through visual/physical inspection, recognising external and internal signs of defects in piston engines, components and system components
- assisting with testing of piston engine and engine system operation, be able to operate systems, monitor indications, record parameters and recognise correct function
- compiling engine condition monitoring records
- rigging and adjusting engine controls and systems, including FADEC (where FADEC is applicable to the enterprise)
- using fault diagnosis guides and equivalent data to accurately and efficiently troubleshoot the causes of unserviceabilities in piston engines and engine 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 supervisor or other trades) associated with engine systems. It is essential that system testing procedures take into account all safety precautions associated with piston engine system operation, and that awareness be demonstrated of dual inspection requirements associated with work on engine controls. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical.

This may be demonstrated through application across a number of engine system groups as listed in the Assessment Conditions. The application of testing procedures and functional rigging checks should also indicate knowledge of system operation.

## 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:

- WHS procedures associated with piston engine maintenance, including lifting and handling of heavy objects
- how to obtain MSDS
- use of PPE

- 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
  - superchargers and turbochargers
  - accessory drives and mounts
  - controls and rigging of controls
  - FADEC systems
  - piston engine maintenance requirements and troubleshooting procedures including ground running of engines
- system component operation, including electrical and instrument system interfaces:
  - magnetos and ignition harnesses
  - spark plugs
  - fuel pumps
  - fuel filters
  - oil pumps
  - oil filters
  - oil tanks
  - vacuum pumps and air pumps
  - generators
  - starter motors
  - oil pressure gauges (direct reading)
  - temperature gauges (direct reading)
  - tachometers
  - manifold pressure gauges
  - system and component maintenance requirements and troubleshooting procedures
- 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 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.
- Engine system operation knowledge, the relationship of individual components and the links with other systems will be necessary to supplement evidence of ability to carry out rigging checks and 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.
- Testing of engines fitted to helicopters (where auxiliary drive is not available) may be carried out through 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:
  - engine (all types), main components and accessories/drives
  - control system, including FADEC (where FADEC is applicable to the enterprise)
  - ignition and starter systems
  - fuel, air systems and super/turbo chargers
  - oil system.
- 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 MEA353 Maintain basic light aircraft engines and propellers 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 MEA353 Maintain basic light aircraft engines and propellers may be accepted as also meeting the evidence requirements for this unit in the applicable common areas.

## Links

Companion Volume implementation guides are found in VETNet -

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