



Australian Government

MEA360 Maintain aircraft diesel engines

Release: 1

MEA360 Maintain aircraft diesel engines

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 diesel engine and system theory to inspect, test and troubleshoot, remove and install aircraft diesel engines and engine system components during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

Applications include diesel engines fitted to light aircraft and driving fixed pitch propellers. Where the engine is driving a constant speed propeller, MEA307 Remove and install propeller systems and components and MEA315 Inspect, test and troubleshoot propeller systems and components, will also be required.

The unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway.

Where a Civil Aviation Safety Authority (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

MEA353 Maintain basic light aircraft engines and propellers

Competency Field

Aviation maintenance

Unit Sector

Elements and 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 diesel engine and components/systems | 1.1 Isolation tags already attached to the system or related systems are checked and aircraft/engine configured for safe system inspection and operation |
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- in accordance with applicable maintenance manual
- 1.2 Diesel engine and components/systems are visually or physically checked 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 (MSDS) and items of personal protective equipment (PPE)
 2. Test diesel engine
 - 2.1 Aircraft and engine are correctly prepared in accordance with applicable maintenance manual
 - 2.2 Built-in system test functions and status displays are activated, where applicable, outputs recorded and interpreted
 - 2.3 Assistance is provided with engine and/or system operation during prescribed test procedures to establish serviceability and correct function in accordance with applicable maintenance manual
 3. Troubleshoot diesel engine
 - 3.1 Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination
 - 3.2 Maintenance manual fault diagnosis guide, downloaded maintenance data (where applicable) and logical processes are used to ensure efficient and accurate troubleshooting to line replacement level
 - 3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process
 - 3.4 Diesel engine faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required
 - 3.5 Fault rectification requirements are determined to assist in planning the repair
 4. Remove diesel engine and engine system components
 - 4.1 Aircraft is prepared and supported and rendered safe in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure the safety of personnel and freedom from damage during engine removal

	4.2	Removal is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements, including the use of MSDS and items of PPE
	4.3	Engine is tagged and prepared for transport or storage in accordance with the specified procedures
	4.4	Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
5. Install diesel engine and engine system components	5.1	Engine to be installed is checked to confirm correct part or model numbers, modification status and serviceability
	5.2	Installation is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements, including the use of MSDS and items of PPE
	5.3	Support/safety equipment is removed at the appropriate time to ensure personnel safety and freedom from structural damage
	5.4	Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

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.

Diesel engines and components/systems include:

- Two and four stroke diesel aircraft engines, main components and accessories/drives
- Super/turbo charging systems

Control system, including full authority digital engine

	control (FADEC)
	• Starter system • Fuel and air systems • Cooling system (liquid or air as applicable to enterprise) • Exhaust system • Oil system (if dry sump) (where applicable to the enterprise)
Engine testing includes:	• Testing of engines fitted to helicopters (where auxiliary drive is not available) shall be carried out through the individual directing a pilot qualified on type
Procedures and requirements include:	• Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA360A Maintain aircraft diesel engines

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 MEA360 Maintain aircraft diesel engines

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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 procedures, including the use of PPE and MSDS
- using relevant maintenance documentation and aircraft manuals
- recognising external and internal signs of defects in aircraft diesel engines, components and system components through visual/physical inspection
- assisting with testing of diesel 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 systems
- using fault diagnosis guides and equivalent data to accurately and efficiently troubleshoot the causes of unserviceabilities in diesel engines and engine systems, clearly record details and identify the required rectification actions
- correctly removing and installing diesel engines and engine components.

The underlying skills inherent in this unit should be transferable across a range of inspection, testing, troubleshooting and removal and installation tasks (including the timely involvement of supervisor or other trades) associated with diesel aircraft engines and engine systems. It is essential that system testing procedures take into account all safety precautions associated with diesel engine system operation (including interfaces with FADEC systems) 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 shall be demonstrated through application across a number of engine systems or types.

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 engine and propeller maintenance, including lifting and handling of heavy objects and how to obtain PPE and MSDS
- fault diagnosis techniques
- two and four stroke diesel aircraft engines and engine system layout and operation:
 - principles of operation of two and four stroke diesel engines

- component function, construction and materials
- engine operation
- engine power, efficiency and performance
- diesel aircraft engine super/turbo charging systems
- diesel aircraft engine fuels and lubricating oils
- diesel fuel injection systems
- FADEC operation
- diesel aircraft engine induction systems
- diesel aircraft engine cooling systems (liquid and air)
- diesel aircraft engine exhaust systems
- system component operation, including electrical and instrument system interfaces
- dry sump lubrication systems
- removal and installation procedures for diesel aircraft engines and engine components
- diesel aircraft engine maintenance requirements and troubleshooting
- 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 documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The application of testing procedures and functional checks should indicate knowledge of system operation. 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 engine control system 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.
- 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:
 - two and four stroke diesel aircraft engines, main components and accessories/drives
 - super/turbo charging systems
 - control system, including FADEC (where applicable to enterprise)
 - starter system
 - fuel and air systems
 - cooling system (liquid or air as applicable to enterprise)
 - exhaust system
 - oil system (if dry sump) (may be omitted where 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.

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