Australian Government

Department of Education, Employment and Workplace Relations

MEA360A Maintain aircraft diesel engines

Revision Number: 2

MEA360A Maintain aircraft diesel engines

Modification History

Minor formatting and editorial changes made. Unit version codes updated in unit application.

Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to maintain installed aircraft diesel engines.

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 diesel engine and system theory to inspect, test and troubleshoot, remove and install aircraft diesel engines and engine system components.

Applications include diesel engines fitted to light aircraft and driving fixed pitch propellers. Where the engine is driving a constant speed propeller, MEA307C Remove and install propeller systems and components and MEA315C Inspect, test and troubleshoot propeller systems and components, will also be required. FADEC systems are covered by MEA279A Inspect, test and troubleshoot full authority digital engine control systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

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Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	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.

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Elements and Performance Criteria

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 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
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 and logical processes are used to ensure efficient and accurate ***troubleshooting***
	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
	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

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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 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

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Required Skills and Knowledge

Required skills

Look for evidence that confirms skills in:

- applying relevant OHS procedures, including the use of MSDS and PPE
- 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 other than 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

Required knowledge

Look for evidence that confirms knowledge of:

- OHS procedures associated with engine and propeller maintenance, including lifting and handling of heavy objects and how to obtain MSDS and PPE
- 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
- interfaces between engine systems and FADEC
- 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

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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.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply hand skills, use maintenance publications and engine and system theory knowledge to inspect, test, troubleshoot, remove and install aircraft diesel engines and engine system components on fixed or rotary wing aircraft while applying all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	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. 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 engine systems or types. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. The application of testing procedures and functional checks should also 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. 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 8 listed in

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	the Range Statement (Group 8 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.
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 documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
Method of assessment	
Guidance information for assessment	

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Range Statement

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.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Diesel engines and components/systems	Diesel engines and components/systems may include: 1. Two and four stroke diesel aircraft engines, main components and accessories/drives 2. Super/turbo charging systems 3. Control system/FADEC interface 4. Starter system 5. Fuel and air systems 6. Cooling system (liquid or air as applicable to enterprise) 7. Exhaust system 8. Oil system (if dry sump)
Engine testing	Testing of engines fitted to helicopters (where auxiliary drive is not available) may be carried out through the individual directing a pilot qualified on type
Troubleshooting	Troubleshooting involves the use of test sets, downloaded maintenance data and fault-finding charts or similar, to line replacement level
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • 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

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Competency field

Co-requisite units

MEA353A Maintain basic light aircraft engines and propellers

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