



**Australian Government**

# **MEA306 Remove and install engines and engine system components**

**Release: 2**

# MEA306 Remove and install engines and engine system components

## Modification History

Release 2. Equivalent to MEA306 Remove and install engines and engine system components with amended prerequisite codes.

## Application

This unit of competency requires application of hand skills and the use of maintenance publications to remove and install gas turbine or piston engines and engine system components of fixed and rotary wing aircraft during scheduled and unscheduled maintenance.

Work may be performed individually or as part of a team.

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

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a 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

|        |                                                                                              |
|--------|----------------------------------------------------------------------------------------------|
| 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

## Unit Sector

### Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- |                                    |                                                                                                                                                                                                                                                                  |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Remove engine                   | 1.1 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                    |
|                                    | 1.2 Removal is carried out in accordance with the 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) |
|                                    | 1.3 Engine is tagged and prepared for transport or storage in accordance with the specified procedures                                                                                                                                                           |
|                                    | 1.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures                                                                                                                                              |
| 2. Remove engine system components | 2.1 Aircraft and/or engine system is prepared and rendered safe in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure the safety of personnel                                                           |
|                                    | 2.2 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                                                                                        |
|                                    | 2.3 Engine system component is tagged and prepared for transport or storage in accordance with the specified procedures                                                                                                                                          |
|                                    | 2.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures                                                                                                                                              |
| 3. Install engine                  | 3.1 Engine to be installed is checked to confirm correct part or model numbers, modification status and serviceability                                                                                                                                           |
|                                    | 3.2 Installation is carried out in accordance with the applicable maintenance manual                                                                                                                                                                             |

- |                                     |     |                                                                                                                                                                            |
|-------------------------------------|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                     | 3.3 | Support/safety equipment is removed at the appropriate time to ensure personnel safety and freedom from structural damage                                                  |
|                                     | 3.4 | Required maintenance documentation is completed and processed in accordance with standard enterprise procedures                                                            |
| 4. Install engine system components | 4.1 | Engine components to be installed are checked to confirm correct part or model numbers, modification status and serviceability                                             |
|                                     | 4.2 | 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 |
|                                     | 4.3 | Support/safety equipment is removed at the appropriate time to ensure personnel safety and freedom from structural damage                                                  |
|                                     | 4.4 | 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.

### **Engines and engine system components include:**

- Engine change unit or auxiliary power unit (turbo-prop, turbofan, turboshaft, turbojet and piston)
- Fuel, oil and air system (or induction and super/turbo charger systems in the case of piston engine) components
- Engine control system components
- Ignition or igniter system components
- Starting system components
- Fire protection system components.

**Procedures and requirements include:**

- Accessories and associated drives
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

## Unit Mapping Information

Release 2. Equivalent to MEA306 Remove and install engines and engine system components

## 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 MEA306 Remove and install engines and engine system components

## Modification History

Release 2. Equivalent to MEA306 Remove and install engines and engine system components with amended prerequisite codes.

## 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 WHS practices, including lifting and handling heavy components
- using MSDS and PPE
- using relevant maintenance documentation and aircraft manuals to:
  - correctly remove and install engines, engine change units and auxiliary power units (APUs)
  - prepare removed engines for transportation and/or storage
  - locate and correctly remove and install the range of engine system components listed in the Range of Conditions
- identifying the requirement for adjustment and rigging of systems and controls after the installation of engines or system components.

It is essential that safety precautions applicable to engines and engine systems being maintained are fully observed, understood and complied with, including allowance for the effect on aircraft centre of gravity when engines are removed. Awareness must be demonstrated of dual inspection requirements associated with work on engine control systems.

Evidence of transferability of skills and knowledge related to removal and installation is essential. This may be demonstrated through removal and installation of a representative range of engines and engine system components as listed in the Assessment Conditions.

## 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:

- removal and installation procedures for aircraft:
  - engines
  - engine change units
  - APUs
- engine inhibiting and de-inhibiting procedures
- layout, installation and connection of components of:
  - fuel systems

- lubrication systems
- air systems
- super and turbo charging systems
- exhaust systems
- ignition and igniter systems
- starting systems
- fire protection systems
- accessories and associated drives
- engine control system component removal and installation, including the requirement for rigging and for the independent inspection of work performed
- engine maintenance documentation and manuals
- relevant WHS practices, including those relating to the lifting and handling of heavy items
- how to obtain MSDS
- use of PPE
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

## Assessment Conditions

- Competency should be assessed in the work environment, or by the use of simulated activities, 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.
- An understanding of component attachment methods and the need for adjustment, rigging and system operation as it relates to the work must be demonstrated 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:
  - engine change unit or auxiliary power unit (turbo-prop, turbofan, turboshaft, turbojet, piston)
  - fuel, oil and air system (or induction and super/turbo charger systems in the case of piston engine) components
  - engine control system components
  - ignition or igniter system components
  - starting system components
  - fire protection system components.
  - accessories and associated drives.

- 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 Statement 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>