Australian Government

# MEA394A Repair and/or overhaul aircraft piston engine crankcase assembly components

**Release: 1**

INDUSTRY SKILLS COUNCILS
Creating Australia's Future

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## Modification History

Release 1 - New unit of competency. Covers components of MEA388A - Not equivalent

## Unit Descriptor

This unit of competency is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. It covers the competencies required to overhaul and repair aircraft piston engine crankcase assembly components. 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).

## Application of the Unit

This unit requires application of hand skills, theory knowledge and maintenance publication procedures to repair and overhaul aircraft piston engine crankcase assembly components. Applications include components from fixed and rotary wing aircraft piston engines.

## Licensing/Regulatory Information

Not applicable.

## Pre-Requisites

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| MEA101B | Interpret occupational health and safety practices in aviation maintenance |
| MEA103B | Plan and organise aviation maintenance work activity |
| MEA105C | Apply quality standards applicable to aviation maintenance processes |
| MEA107B | Interpret and use aviation maintenance industry manuals and specifications |
| MEA108B | Complete aviation maintenance industry documentation |
| MEA109B | Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance |

# Employability Skills Information

This unit contains employability skills

# Elements and Performance Criteria Pre-Content

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| Elements describe the essential outcomes of a unit of competency. | Performance criteria describe the performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide. |

# Elements and Performance Criteria

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| 1 | Determine requirements | 1.1 | Component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers |
| | | 1.2 | Crankcase assembly components are inspected and/or operated through prescribed test procedures to establish serviceability and confirm defects, if necessary |
| | | 1.3 | Modification status is clearly established to assist in determining the overhaul requirements for the components |
| | | 1.4 | Extent of overhaul or repair is identified and documented in accordance with standard enterprise procedures |
| 2 | Dismantle and inspect piston engine crankcase assembly components/parts | 2.1 | Crankcase assembly component parts are dismantled in accordance with maintenance manual and/or enterprise procedures |
| | | 2.2 | Component parts are assessed for serviceability in accordance with the relevant maintenance documentation |
| | | 2.3 | Parts requiring specialist repair are tagged and repair instructions are specified in accordance with standard enterprise procedures |
| | | 2.4 | Parts requiring non-destructive testing are prepared for testing in accordance with the relevant maintenance documentation |

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| | | 2.5 | Parts lists are compiled and processed in accordance with standard enterprise procedures |
| 3 | Repair and/or modify piston engine crankcase assembly components or parts | 3.1 | Component parts are repaired or replaced in accordance with the relevant maintenance documentation |
| | | 3.2 | Modification of components is undertaken where required by reference to relevant manufacturer's bulletins or procedures, regulatory requirements and/or customer requirements |
| 4 | Assemble, test and adjust piston engine crankcase assembly components | 4.1 | Crankcase assembly component parts are assembled within specified tolerances and in accordance with the appropriate maintenance documents |
| | | 4.2 | Components are tested, adjusted or calibrated to operate within prescribed specifications |
| | | 4.3 | Crankcase assembly is prepared for engine reassembly |
| | | 4.4 | Where components are not to be assembled into an engine the finished components are tagged, sealed and packaged in accordance with standard enterprise procedures |
| | | 4.5 | Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures |

# Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

### Required skills

Required skills include:

- applying relevant work health and safety (WHS) procedures, including the use of material safety data sheets (MSDS) and personal protective equipment (PPE)
- using relevant maintenance documentation, specifications and aircraft/component manuals to:
  - recognise state of serviceability and overhaul or repair requirements for piston engine crankcase assembly components as listed in the Range of Variables
  - dismantle and inspect crankcase assembly component parts for serviceability and identify repair requirements as applicable
  - repair/replace/modify crankcase component parts
  - assemble, test for correct operation and adjust crankcase assembly components
- correctly tagging, sealing and packaging completed components

### Required knowledge

Required knowledge includes:

- how to obtain relevant MSDS
- the use of applicable items of PPE
- WHS procedures
- component inspection and wear measurement procedures
- non-destructive testing methods and application
- component repair and overhaul procedures and processes

# Evidence Guide

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| 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 and component theory knowledge and use maintenance publications to repair and overhaul aircraft piston engine crankcase assembly components while applying all relevant safety precautions. |
| **Critical aspects for assessment and evidence required to demonstrate competency in this unit** | Evidence of transferability of skills and knowledge related to repair is essential. This may be demonstrated through application across a number of different piston engine crankcase assembly components. Ability to assess component serviceability and interpret parts requirements will be necessary to supplement the required evidence. Capability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. The application of testing procedures should also clearly indicate knowledge of system operation. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults before undertaking any action.<br><br>The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.<br><br>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 in the Range Statement (Groups 7 and 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 |

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| | used where appropriate. |
| **Method of assessment** | |
| **Guidance information for assessment** | |

# Range Statement

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| The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. 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 |
| **Piston engine crankcase assembly components** | Crankcase assembly components may include:<br>1. Crankshaft, gears, con rods and counterweights<br>2. Camshaft, hydraulic tappets/cam followers and gears<br>3. Propeller shaft, reduction drive gear and quill shaft<br>4. Component gear drives/trains<br>5. Crankcase castings, bearings, component mounting pads and studs<br>6. Oil system components<br>7. Supercharger and turbocharger components (where applicable to enterprise)<br>8. Propeller governor (where applicable to enterprise) |
| **Application** | Application of this unit may relate to:<br>• scheduled or unscheduled maintenance<br>• individual or team-related activities<br>• complex testing and adjusting of components, and where this is undertaken, it may be carried out under supervision at the appropriate level |
| **Procedures and requirements** | Procedures and requirements refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise |

# Unit Sector(s)

Aviation maintenance

# Custom Content Section

Not applicable.