



Australian Government

MEM27030 Perform engine bottom-end overhaul

Release: 1

MEM27030 Perform engine bottom-end overhaul

Modification History

Release 1. Supersedes and is equivalent to MEM18033B Perform engine bottom-end overhaul

Application

This unit of competency defines the skills and knowledge required to dismantle, clean and assess parts, record and interpret measurements, and recondition components.

It includes cylinder honing using hand held power tools, and replacement of bearings, piston rings and similar activities but not major machining, including crankshaft grinding, cylinder boring and tunnel boring.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Band: A

Unit Weight: 4

Pre-requisite Unit

MEM09002	Interpret technical drawing
MEM11011	Undertake manual handling
MEM12003	Perform precision mechanical measurement
MEM12023	Perform engineering measurements
MEM12024	Perform computations
MEM13015	Work safely and effectively in manufacturing and engineering
MEM14006	Plan work activities
MEM16006	Organise and communicate information
MEM18001	Use hand tools
MEM18002	Use power tools/hand held operations
MEM18055	Dismantle, replace and assemble engineering components

Competency Field

Maintenance and diagnostics

Elements and Performance Criteria

Elements describe the essential outcomes.

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

- | | | | |
|---|--|-----|---|
| 1 | Determine job requirements | 1.1 | Follow standard operating procedures (SOPs) |
| | | 1.2 | Comply with work health and safety (WHS) requirements at all times |
| | | 1.3 | Use appropriate personal protective equipment (PPE) in accordance with SOPs |
| | | 1.4 | Identify job requirements from specifications, drawings, job sheets or work instructions |
| 2 | Dismantle, clean and assess parts | 2.1 | Determine the reuse or replacement of crankshaft and piston assemblies based on the characteristics of surface finish and wear patterns |
| | | 2.2 | Remove engine from plant, remove top-end components and dismantle block assembly according to manufacturer recommendations |
| | | 2.3 | Check parts for abnormal wear or defects and identify components for reuse or replacement |
| | | 2.4 | Select appropriate cleaning solution and procedure, clean and store ready for reassembly |
| | | 2.5 | Rack or set out parts according to their original location in the engine |
| | | 2.6 | Obtain and record measurements using appropriate measuring equipment |
| | | 2.7 | Interpret readings regarding replacement or reuse and determine appropriate under/oversize of replacement parts |
| 3 | Recondition components | 3.1 | Identify ridges, gaps, tapers, ovality and protrusions and take necessary corrective action |
| | | 3.2 | Assemble components according to manufacturer specifications using appropriate tools and equipment |

Elements describe the essential outcomes.

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

- 3.3 Determine bearing clearances by calculation or direct measurement

Foundation Skills

This section describes those required skills (reading, writing, oral communication and numeracy) that are essential to workplace performance in this unit of competency.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

No range of conditions provided for this unit.

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM18033B Perform engine bottom-end overhaul

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>

Assessment Requirements for MEM27030 Perform engine bottom-end overhaul

Modification History

Release 1. Supersedes and is equivalent to MEM18033B Perform engine bottom-end overhaul

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria on at least two (2) occasions and include:

- following work instructions, standard operating procedures (SOPs) and safe work practices
- identifying and interpreting specifications, charts, lists, drawings and other applicable reference documents to perform engine bottom-end overhaul
- checking engine for conformance and removing the engine and top-end components and dismantling block assembly
- undertaking calculation and numerical operations to calculate bearing clearances
- checking parts for abnormal wear or defects and identifying components for reuse or replacement
- cleaning parts using appropriate solutions and safety precautions, racking and setting out engine parts according to their original position in readiness for reassembly
- obtaining and recording measurements and interpreting readings for replacement or reuse as being under or over size
- reassembling engine bottom-end components using appropriate tools, equipment and techniques.

Knowledge Evidence

Evidence required to demonstrate the required knowledge for this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include knowledge of:

- safe work practices and procedures and use of personal protective equipment (PPE)
- characteristics of surface finishes and wear patterns as applied to crankshaft and piston assemblies
- specifications of crankshaft and piston assemblies
- reasons for identifying the components for reuse or replacement
- procedures for:
 - dismantling the block assembly and removing the engine from the plant
 - removing the top-end from the engine
 - cleaning engine parts and solution to be applied
 - racking and/or setting out of parts in readiness for reassembly
 - recording engine measurements

- removing ridges, gaps, tapers, ovality and protrusions
- assembling engine bottom ends and precautions to be taken
- determining bearing clearances and methods to be applied
- tools, techniques and equipment to be used and reasons for selection
- action to be taken when abnormal wear or defects are observed in the engine components
- measuring instruments to be used to measure engine components
- concept of under/over size of replacement parts and the reasons for identifying replacement parts as under or over size
- tools, techniques and equipment required to correct the above faults.

Assessment Conditions

- Assessors must:
 - have vocational competency in performing engine bottom-end overhaul at least to the level being assessed with relevant industry knowledge and experience
 - satisfy the assessor requirements in the *Standards for Registered Training Organisations 2015* or its replacement and comply with the *National Vocational Education and Training Regulator Act 2011*, its replacement or equivalent legislation covering VET regulation in a non-referring state/territory as the case requires
- Where possible assessment must occur in operational workplace situations. Where this is not possible or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions. This must cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills
- Conditions for assessment must include access to all tools, equipment, materials and documentation required, including relevant workplace procedures, product and manufacturing specifications
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>