



Australian Government

MEM27031 Perform engine top-end overhaul

Release: 2

MEM27031 Perform engine top-end overhaul

Modification History

Release 2. Quantum of hours of workplace practice removed. Supersedes and is equivalent to MEM27031 Perform engine top-end overhaul (Release 1).

Release 1. Supersedes and is equivalent to MEM18034B Perform engine top-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 the cylinder head.

It includes all types of engines and work associated with the reconditioning of cylinder heads, including determining the causes of failures, replacement of inserts, guides and injector sleeves, grinding of valves and seats, and crack/twist/bend testing. The reconditioning of original parts, crack repairs using non-welding techniques and sizing and fitting of replacement parts are also included.

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

Band: A

Unit Weight: 8

Pre-requisite Unit

MEM09002	Interpret technical drawing
MEM11011	Undertake manual handling
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
MEM18003	Use tools for precision work
MEM18006	Perform precision fitting of engineering components

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 | Interpret characteristics of surface finishes and wear patterns associated with valve operating mechanisms and cylinder head |
| | | 2.2 | Disassemble cylinder head and ancillary components 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/procedure, clean parts 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 |

Elements describe the essential outcomes.

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

- | | | | |
|---|----------------------------------|-----|--|
| 3 | Recondition cylinder head | 3.1 | Pressure test cylinder head for serviceability |
| | | 3.2 | Measure and record spring tensions, valve and guide dimensions and surface flatness |
| | | 3.3 | Remove cylinder head according to manufacturer specifications |
| | | 3.4 | Use grinding and cleaning equipment in reconditioning the cylinder head |
| | | 3.5 | Apply operational parameters of cylinder head components in determining whether components are to be reconditioned or replaced |
| | | 3.6 | Replace injector sleeves, sealing washers, plugs and capping |

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 2. Supersedes and is equivalent to MEM27031 Perform engine top-end overhaul (Release 1).

Release 1. Supersedes and is equivalent to MEM18034B Perform engine top-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 MEM27031 Perform engine top-end overhaul

Modification History

Release 2. Quantum of hours of workplace practice removed. Supersedes and is equivalent to MEM27031 Perform engine top-end overhaul (Release 1).

Release 1. Supersedes and is equivalent to MEM18034B Perform engine top-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 top-end overhaul
- checking for conformance against specifications and removing the cylinder head from the engine, dismantling cylinder head and ancillary components in accordance with procedures
- undertaking calculation and numerical operations in performing engine top-end overhaul
- checking parts for abnormal wear or defects and identifying components for reuse or replacement
- cleaning cylinder head, ancillary equipment and parts using appropriate solutions and safety precautions, racking and setting out 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
- identifying the cylinder head as serviceable or requiring repair/replacement and pressure testing the cylinder head to specifications
- measuring and recording spring tension, valve and guide dimensions and surface flatness
- grinding valves and valve seats using appropriate tools, equipment and techniques
- determining whether components are to be reconditioned or replaced
- replacing all applicable 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 valve operating mechanisms and cylinder heads

- specifications of valve operating mechanisms and cylinder heads
- procedures for:
 - dismantling cylinder heads and ancillary equipment and tools, techniques and equipment
 - storing parts in readiness for reassembly
 - pressure testing cylinder heads using appropriate tools, techniques and equipment
 - for measuring spring tension, valve and guide dimensions and surface flatness using appropriate tools, techniques and equipment
 - recording cylinder head and valve mechanism measurements
 - removing the cylinder head from the engine using appropriate tools, techniques and equipment
 - grinding valves and valve seats using appropriate tools, techniques and equipment
 - cleaning cylinder heads and ancillary equipment and solutions to be applied
 - reassembling cylinder heads and their components using appropriate tools, techniques and equipment
- cylinder head specifications
- operational parameters of cylinder head components
- precautions to be taken when reassembling cylinder heads.

Assessment Conditions

- Assessors must:
 - have vocational competency in performing engine top-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.
- Assessment must occur in a functioning workplace. Where assessment in the workplace would be unsafe, impractical or threatens the environment, assessment must occur in a sufficiently rigorous simulated environment that reflects the circumstances that would be experienced in a functioning workplace. Assessment must cover all aspects of workplace performance, including 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>

