Australian Government

Department of Education, Employment and Workplace Relations

MEM18034B Perform engine top-end overhaul

Release: 1

MEM18034B Perform engine top-end overhaul

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers dismantling, cleaning and assessing parts, recording and interpreting measurements, and reconditioning the cylinder head.

Application of the Unit

Application of the unit	This unit covers top-end overhaul of 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 etc. It includes both the reconditioning of original parts, crack repairs using non-welding techniques and sizing and fitting of replacement parts. Where diagnostic skills are not required and where straightforward removal and replacement of pre-manufactured bearings is undertaken, Unit MEM18055B (Dismantle, replace and assemble engineering components) should be regarded as sufficient. **Band**: **A** **Unit Weight**: **8**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations
	MEM18003C	Use tools for precision work
	MEM18006C	Repair and fit engineering components
	MEM18055B	Dismantle, replace and assemble engineering components

Employability Skills Information

Employability skills	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.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Dismantle clean and assess parts	1.1. Characteristics of surface finishes and wear patterns associated with valve operating mechanisms and cylinder head are understood. 1.2. Cylinder head and ancillary components are disassembled according to manufacturers' recommendations. 1.3. Parts are assessed for abnormal wear or defects. 1.4. Appropriate cleaning solution/procedure is selected. 1.5. Parts are correctly cleaned and stored ready for reassembly. 1.6. Parts are racked or set out according to their original location in the engine.
2. Record and interpret measurements	2.1. Measurements are accurately obtained and recorded using appropriate measuring equipment. 2.2. Parts are replaced or reused, and appropriate under/over size of replacement parts is determined.
3. Recondition cylinder head	3.1. Cylinder head is correctly pressure tested for serviceability. 3.2. Spring tensions, valve and guide dimensions and surface flatness are measured and recorded. 3.3. Cylinder head is removed according to manufacturers' specification. 3.4. Grinding and cleaning equipment is correctly used. 3.5. Operational parameters of cylinder head components are understood and applied in determining whether components are reconditioned or replaced. 3.6. Injectors sleeves, sealing washers, plugs, capping etc. are replaced correctly.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in:

REQUIRED SKILLS AND KNOWLEDGE

- reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents
- planning and sequencing operations
- checking task-related information
- checking for conformance to specification
- removing the cylinder head from the engine
- dismantling the cylinder head and ancillary components
- identifying the cylinder head as serviceable or requiring repair/replacement
- pressure testing the cylinder head
- measuring and recording spring tension, valve and guide dimensions and surface flatness
- grounding valves and valve
- cleaning cylinder head and ancillary equipment using appropriate solutions
- identifying cylinder head components for repair or replacement
- replacing cylinder head components
- checking parts for abnormal wear or defects
- identifying components for reuse or replacement
- cleaning parts using appropriate solutions and procedures
- racking and setting out engine parts according to their original position in readiness for reassembly
- obtaining and recording measurements
- undertaking calculations and numerical operations within the scope of this unit

Required knowledge

Look for evidence that confirms knowledge of:

- the characteristics of surface finishes and wear patterns as applied to valve operating mechanisms and cylinder heads
- the specifications of valve operating mechanisms and cylinder heads
- the procedures, tools, techniques and equipment for dismantling cylinder heads and ancillary equipment
  the hazards and control measures associated with the removal of cylinder heads and ancillary equipment, including housekeeping
- the procedures for storing parts in readiness for reassembly
- the procedures, tools, techniques and equipment for pressure testing cylinder heads
- the cylinder head specifications
- the procedures, tools, techniques and equipment for measuring spring tension, valve and guide dimensions and surface flatness
- the procedures for recording cylinder head and valve mechanism measurements
- the procedures, tools, techniques and equipment for removing the cylinder head from the engine

REQUIRED SKILLS AND KNOWLEDGE
• the procedures, tools, techniques and equipment for grinding valves and valve seats • the procedures and solutions for cleaning cylinder heads and ancillary equipment • the operational parameters of cylinder head components • the procedures, tools, techniques and equipment for reassembling cylinder heads and their components • the precautions to be taken when reassembling cylinder heads • safe work practices and procedures

Evidence Guide

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 perform engine top-end overhaul. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing engine top-end overhaul, or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

EVIDENCE GUIDE	
Guidance information for assessment	

Range Statement

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.	

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Maintenance and diagnostics