



Australian Government

Department of Education, Employment and Workplace Relations

MEM18033B Perform engine bottom-end overhaul

Release: 1

MEM18033B Perform engine bottom-end overhaul

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers dismantling, cleaning and assessing parts, recording and interpreting measurements, and reconditioning components.
------------------------	---

Application of the Unit

Application of the unit	This unit refers to work typically undertaken in a bottom-end engine overhaul. It includes cylinder honing using hand held power tools, and replacement of bearings, piston rings and similar activities but not major machining such as crankshaft grinding, cylinder boring and tunnel boring. Band: A Unit Weight: 4
--------------------------------	---

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools

Prerequisite units		
	MEM18002B	Use power tools/hand held operations
	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 crankshaft and piston assemblies are understood and parts are correctly assessed for reuse or replacement. 1.2.Engine is removed from plant, top-end components are removed and block assembly is dismantled according to manufacturers' recommendations. 1.3.Parts are assessed for abnormal wear or defects. 1.4.Appropriate cleaning solution and procedure is selected. 1.5.Parts are racked or set out according to their original location in the engine. 1.6.Characteristics of surface finishes and wear patterns associated with crankshaft and piston assemblies are understood and parts are correctly assessed for reuse or replacement.
2. Record and interpret measurements	2.1.Measurements are accurately obtained and recorded. 2.2.Readings are correctly interpreted regarding replacement or reuse and appropriate under/oversize of replacement parts is determined.
3. Recondition components	3.1.Ridges, gaps, tapers, ovality and protrusions are identified and necessary corrective action is taken. 3.2.Tools and equipment are correctly used. 3.3.Components are assembled according to manufacturers' specifications. 3.4.Bearing clearances are correctly determined by calculation or direct measurement.

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:

- reading, interpreting and following information on written job instructions,

REQUIRED SKILLS AND KNOWLEDGE

- 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 engine and top-end components
- removing ridges, gaps, tapers, protrusions and ovality
- dismantling block assembly
- calculating bearing clearances
- 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
- identifying replacement parts required as being under or over size
- using tools and equipment
- assembling engine bottom-end components
- 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 crankshaft and piston assemblies
- the specifications of crankshaft and piston assemblies
- the reasons for identifying the components for reuse or replacement
- the procedures for dismantling the block assembly and removing the engine from the plant
- the procedures for removing the top end from the engine
- the tools, techniques and equipment to be used
- the reasons for selecting the chosen tools, techniques and equipment
- the hazards and control measures associated with the removal of engines/engine components, including housekeeping
- the action to be taken when abnormal wear or defects are observed in the engine components
- the procedures and solution for cleaning engine parts
- the procedures for racking and/or setting out of parts in readiness for reassembly
- the measuring instruments to be used to measure engine components
- the procedures for recording engine measurements
- the concept of under/over size of replacement parts and the reasons for identifying replacement parts as under or over size

REQUIRED SKILLS AND KNOWLEDGE

- the procedures for removing ridges, gaps, tapers, ovality and protrusions
- the tools, techniques and equipment required to correct the above faults
- the procedures for assembling engine bottom ends
- the precautions to be taken when assembling engine bottom ends
- the methods and procedures for determining bearing clearances
- 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 bottom-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 bottom-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
-------------------------	-----------------------------