



Australian Government

Department of Education, Employment and Workplace Relations

MEM18006B Repair and fit engineering components

Release: 1

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Modification History

There are no notes for this unit.

Unit Descriptor

This unit covers fault finding, repairing faulty components, manufacturing new parts/components, and fitting mechanical engineering components into assemblies or sub-assemblies.

Tasks undertaken use mechanical engineering and maintenance principles, designated procedures, correct and appropriate tools/equipment, and safe working practices.

Application of the Unit

Work is undertaken autonomously or in a team environment using predetermined standards of quality, safety and workshop procedures. This unit includes the repair, replacement, assembling and final fitting of items, sub-assemblies and assemblies. All specifications are interpreted from engineering drawings, detailed/technical sketches and associated data sheets; this includes the use of acceptable workshop practices. New components are manufactured as required to specifications.

Licensing/Regulatory Information

Pre-Requisites

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

MEM18055B Dismantle, replace and assemble engineering components

Employability Skills Information

Elements and Performance Criteria Pre-Content

Elements are the essential outcomes of the unit of competency.

Together, performance criteria specify the requirements for competent performance. Text in italics is explained in the range statement following.

Elements and Performance Criteria

Elements and Performance Criteria

Element	Performance Criteria
1 Identify scope of repair and/or fit required	<p>1.1 Operational specifications for components are obtained from appropriate source and are interpreted and understood.</p> <p>1.2 Operation and condition of components are assessed against specifications.</p> <p>1.3 Faulty/worn components are identified.</p> <p>1.4 Causes of faults are determined using appropriate engineering principles, techniques, procedures, tools and equipment.</p> <p>1.5 Repair, replacement, adjustment or manufacture requirements are determined.</p>
2 Repair/replace faulty components	<p>2.1 Where applicable, appropriate method of repair is determined.</p> <p>2.2 Where applicable, faulty components are repaired or adjusted to conform to specifications.</p> <p>2.3 Where applicable, replacement parts are selected from manufacturers' catalogues and assessed against specifications.</p>
3 Manufacture parts/components	<p>3.1 Parts/component specifications are determined from appropriate source.</p> <p>3.2 Materials are selected to meet specification requirements.</p> <p>3.3 New components are produced in conformance to specifications using appropriate workshop</p>

practices.

- 3.4 Completed components are inspected for compliance with dimensions.
- 3.5 Where appropriate, component parts are marked for identification prior to assembly.
- 4 Fit engineering components into assemblies or subassemblies
 - 4.1 Fitting requirements and sequence of assembly are determined.
 - 4.2 Appropriate **fitting principles and techniques** are applied in the preparation and assembly of component parts using fastening equipment and methods which ensures conformance to specifications, operational performance, quality and safety.
 - 4.3 Using acceptable engineering practices, correct gland packing, jointing/gasket materials are selected and applied correctly in conformance to specifications and operational requirements.
 - 4.4 Correct lubrication requirements are determined by appropriate means and attended to where applicable.
 - 4.5 Final adjustments are performed on component assembly to meet operational specifications using acceptable engineering principles, fitting techniques and procedures.
- 5 Check operation of repaired components/unit
 - 5.1 Components/unit are checked under operational conditions for compliance to operational specifications using acceptable engineering principles to standard operating procedures.
 - 5.2 Out of specification modification/alterations are approved by appropriate authority and are recorded and documented to standard operating procedures.
 - 5.3 Final component assembly is commissioned and returned to service according to standard operating procedures.

Required Skills and Knowledge

Evidence Guide

The evidence guide specifies the evidence required to demonstrate achievement in the unit of competency as a whole. It must be read in conjunction with the unit descriptor, performance criteria, range statement and the assessment guidelines for the Metal and Engineering Training Package

Overview of assessment requirements

A person who demonstrates competency in this unit must be able to repair and fit engineering components. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Context of 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.

Interdependent assessment

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with repairing and fitting engineering components 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.

Consistency of performance

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.

Required skills

Look for evidence that confirms skills in:

obtaining operational specifications for the component/s

assessing operation against specification and identifying faults

checking component/s visually and dimensionally against the operational specifications using work site procedures

checking repaired components visually and dimensionally for conformance to specifications

adjusting components to achieve conformance to specifications where appropriate

selecting replacement parts which conform to specifications

preparing and assembling components using appropriate fitting techniques and principles

where appropriate, applying gland packing, jointing or gasket materials, using acceptable engineering practices

applying appropriate lubricants to the assembly using acceptable engineering practices, where required

checking components for conformance to specification

where appropriate, adjusting components to

achieve conformance to specifications

where appropriate, recording any approved modifications/alterations to work site procedures

inspecting the final assembly and checking conformance to operational specifications

where appropriate returning the final assembly to service in accordance with work site procedures

reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents

undertaking numerical operations, geometry and calculations/formulae within the scope of this unit

Required knowledge

Look for evidence that confirms knowledge of:

tools and equipment to be used to dismantle the components

consequences of having components that do not comply with operational specifications

the types of adjustment applicable to the components being repaired/fitted

appropriate methods of repair

the features and/or dimensions upon which replacement parts are to be selected

the process of identifying replacement parts from third party suppliers' catalogues

the material properties required

the manufacturing operations to be used in the production of new components

the sequence of operations to be used in the production of new components

the fitting requirements for assembling components

the appropriate sequence of assembly tasks

the purpose of using gland packing, jointing or gasket materials

the reasons for selecting particular jointing or packing materials

the applications of different types of lubricants

the consequences of using inappropriate or no lubricant

the need to have approval for out of specification modifications

the reasons for documenting out of specification modifications

return to service procedures

the consequences of not following work site return to service procedures

hazard and control measures associated with repairing and fitting engineering components, including housekeeping

safe work practices and procedures

Range Statement

The range statement provides information about the context in which the unit of competency is carried out. The variables and scope cater for different work requirements, work practices and knowledge between States, Territories and the Commonwealth, and between organisations and workplaces. The range statement relates to the unit as a whole and provides a focus for assessment. Text in italics in the performance criteria is explained here.

The following variables may be present and may include, but are not limited to, the examples listed under the scope. All work is undertaken to relevant legislative requirements, where applicable

Variable	Scope
Manufacturers' catalogue	Any appropriate manufacturers' catalogues that contain replacement parts that conform with specifications and operational requirements
Appropriate workshop practices	Include drilling, scraping, filing, reaming, tapping, threading etc.
Fitting principles and techniques	Limits of tolerance Allowances and clearances Effects of wear, stress, temperature Types of fits - clearance transition interference Press fitting methods Force fits Shrink and freeze (expansion) fits Keyed fits Taper fits Lateral and radial forces Backlash Configuration and mating of parts Applied use of precision tools and measuring equipment Engineering components - shafts, single and multi throw crankshafts, cams and journals, bearings and bearing surfaces, keys Squareness, roundness, concentricity, flatness, straightness, surface finish, angular

correctness

Datum and centrelines

Tapping, reaming, broaching

Unit Sector(s)

Related units

This unit does not address machining competencies and welding; if these are required, the appropriate units should also be accessed. Where additional or higher marking out skills are required, refer Unit MEM12006B (Mark off/out (general engineering)). The knowledge and skills associated with the installation, removal, repair or replacement of mechanical seals is covered by Unit MEM18012B (Perform installation and removal of mechanical seals). For high pressure fluid power seals, see Unit MEM18020B (Maintain hydraulic system components).

Competency field

Maintenance&diagnostics

Band

A

Unit Weight

6