



Australian Government

MEM18006 Perform precision fitting of engineering components

Release: 2

MEM18006 Perform precision fitting of engineering components

Modification History

Release 2. Quantum of hours of workplace practice removed. Supersedes and is equivalent to MEM18006 Perform precision fitting of engineering components (Release 1).

Release 1. Supersedes and is equivalent to MEM18006C Repair and fit engineering components.

Application

This unit of competency has been developed for Engineering Tradesperson - Mechanical apprenticeship training and the recognition of trade-level skills in precision fitting and mechanical repair.

It defines the trade-level fitting skills and knowledge associated with manufacturing of new parts/components and fitting mechanical engineering components into assemblies or sub-assemblies to specifications and specified tolerances.

The skills and knowledge described by this unit are applied in occupational and work situations associated with fitting, mechanical trade and maintenance work.

Where the knowledge and skills associated with machining or welding are required, the appropriate units should also be selected.

Where additional or higher marking out skills are required unit MEM12006 Mark off/out (general engineering) should also be selected.

Where the knowledge and skills associated with the installation, removal, repair or replacement of mechanical seals is required unit MEM18012 Perform installation and removal of mechanical seals should also be selected.

Where the knowledge and skills associated with high pressure fluid power seals is required unit MEM18020 Maintain hydraulic system components should also be selected.

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

Band: A

Unit Weight: 6

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
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	Plan and prepare to undertake work	2.1	Assess operation and condition of components against specifications
		2.2	Identify and isolate any faulty or worn components
		2.3	Mark component parts for identification, where required
		2.4	Determine the cause/s of faults using appropriate engineering principles, techniques, procedures, tools and

Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
		equipment	
		2.5	Determine repair/replacement strategy
3	Manufacture and/or repair and/or replace faulty components	3.1	Obtain parts, component and or materials from appropriate sources
		3.2	Source, repair or produce components to meet specifications
		3.3	Inspect components for compliance with specifications
4	Fit engineering components into assemblies or sub-assemblies	4.1	Determine the correct fitting requirements and sequence of assembly
		4.2	Prepare and assemble component parts using fastening equipment and methods which ensures conformance to specifications, operational performance, quality and safety
		4.3	Determine lubrication requirements by appropriate means and lubricate, where applicable
		4.4	Perform final adjustments on component assembly to meet operational specifications
5	Check operation of repaired components/unit	5.1	Check all components/unit under operational conditions for compliance to specifications
		5.2	Approve any out-of-specification modification/alterations through an appropriate authority and record
		5.3	Perform final modifications/alterations on assembly to meet operational specifications
		5.4	Commission the final assembly and return to service

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

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Engineering principles and fitting techniques include one (1) or more of the following:

- limits of tolerance
- allowances and clearances
- effects of wear, stress and 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
- datum and centrelines
- broaching
- drilling
- scraping
- filing
- reaming
- tapping
- threading
- simple gland top-ups in non-critical applications
- routine gland maintenance
- jointing
- gaskets

Unit Mapping Information

Release 2. Supersedes and is equivalent to MEM18006 Perform precision fitting of engineering components (Release 1).

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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 MEM18006 Perform precision fitting of engineering components

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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
- assessing engineering components visually and dimensionally with appropriate testing and measuring equipment techniques for compliance to specifications
- repairing or replacing faulty components using appropriate tools, equipment and techniques
- assembling components using appropriate fitting techniques and principles
- recording approved modifications/alterations
- inspecting final assembly to check compliance to specifications
- returning the final assembly to service in accordance with SOPs.

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)
- tools and equipment used to dismantle, repair, assemble and fit engineering components
- consequences of having non-compliant components
- types of modifications/adjustments to components being repaired/fitted
- repair methods
- sources of replacement parts
- techniques for the production of engineering components
- assembly and fitting techniques
- machine backlash/recoil
- measuring equipment
- engineering components - shafts, single and multi-throw crankshafts, cams and journals, bearings and bearing surfaces, and keys

- squareness, roundness, concentricity, flatness, straightness, surface finish and angular correctness
- purpose, selection criteria and use of gland packing, jointing or gasket materials
- types and application of lubricants
- approval processes for documenting out-of-specification modifications
- commissioning and return to service procedures.

Assessment Conditions

- Assessors must:
 - have vocational competency in performing precision fitting of engineering components 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.

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