



Australian Government

MEM18004 Maintain and overhaul mechanical equipment

Release: 2

MEM18004 Maintain and overhaul mechanical equipment

Modification History

Release 2. Quantum of hours of workplace practice removed. Supersedes and is equivalent to MEM18004 Maintain and overhaul mechanical equipment (Release 1).

Release 1. Supersedes and is equivalent to MEM18004B Maintain and overhaul mechanical equipment.

Application

This unit of competency defines the skills and knowledge required to diagnose, locate faults, repair, overhaul, fit and adjust mechanical systems and equipment.

It integrates the application of prerequisite diagnostic, maintenance and overhaul competencies and applies to situations where an integrated level of skills in maintenance and overhaul of mechanical systems and equipment is required.

Where gland packing is required, unit MEM18013 Perform gland packing should also be selected.

Where additional specialist skills are required select appropriate units.

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

Band: A

Unit Weight: 4

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
MEM18005	Perform fault diagnosis, installation and removal of bearings
MEM18006	Perform precision fitting of engineering components
MEM18007	Maintain and repair mechanical drives and mechanical transmission assemblies
MEM18009	Perform precision levelling and alignment of machines and engineering components
MEM18011	Shut down and isolate machines/equipment
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 Perform maintenance tasks and adjustments

- 2.1 Perform maintenance tasks on mechanical equipment, components or sub-assemblies to meet specifications
- 2.2 Check mechanical equipment, components and sub-assemblies visually and with test equipment to ensure correct function or determine malfunction
- 2.3 Make adjustments to equipment or components to ensure

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specifications are met

3 Diagnose and locate faults

- 3.1 Determine equipment component function by reference to engineering drawings, technical manuals and/or consultation with appropriate personnel
- 3.2 Check maintenance reports, review and diagnose faults
- 3.3 Carry out consultation with operators and other relevant plant personnel to assist in locating faults, as required
- 3.4 Diagnose fault condition and localise at component level using appropriate test equipment and procedures
- 3.5 Evaluate faulty condition and take appropriate corrective action
- 3.6 Document faults according to SOPs

4 Repair or overhaul mechanical system

- 4.1 Isolate machine or equipment safely or check for isolation
- 4.2 Remove faulty equipment, component or sub-assembly from system
- 4.3 Select replaceable items from manufacturers' catalogues and obtain by appropriate means
- 4.4 Select correct repair procedure, tools and equipment and prepare for use on serviceable items
- 4.5 Service, repair or overhaul items to manufacturers' or site specifications
- 4.6 Check components for compliance to specifications, where applicable

Elements describe the essential outcomes.

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

5 Fit and adjust mechanical equipment

- 5.1 Adhere to all electrical, safety and site requirements throughout the maintenance cycle
- 5.2 Complete maintenance report to procedures and convey to designated personnel
- 5.3 Determine fitting requirements and carry out sequential assembly planning, where applicable
- 5.4 Prepare and assemble component parts using fastening equipment and methods which ensure conformance to specifications, operational performance, quality and safety
- 5.5 Select correct jointing and gasket materials and apply in conformance to specifications and operational requirements
- 5.6 Determine correct lubrication requirements by appropriate means and attend to, where applicable, using mechanical or manual applications
- 5.7 Level mechanical equipment as appropriate using appropriate wedges and levelling devices
- 5.8 Perform correct alignment and balancing functions, where appropriate
- 5.9 Perform final adjustments on mechanical equipment to align to operational specifications
- 5.10 Test mechanical equipment for accuracy and correct operation where applicable, and return to service to specifications
- 5.11 Obtain appropriate work and safety clearances throughout maintenance cycle

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.

Routine maintenance tasks include one (1) or more of the following:

- correct operation
- lubrication
- adjustments

Test equipment includes one (1) or more of the following:

- engineers' level
- laser alignments
- appropriate equipment for measurement of:
 - alignment
 - flatness
 - squareness
 - straightness
 - temperature
 - vibration
 - load deflection
 - noise level
 - RPM

Fitting techniques utilised in the assembly/disassembly of component parts using fastening equipment and methods and procedures to specifications include one or more of the following:

- dowelling
- pinning and pegging
- keying
- thread production and repair which ensures conformance to specifications, operational performance, quality and safety
- the straightforward removal and replacement of pre-manufactured bearings and seals
- using acceptable maintenance procedures
- appropriate lubrication
- jointing/gaskets
- seals
- selection and application of materials in conformance to application requirements and specifications, as applicable
- manufacture of new or replacement components, including:
 - marking out
 - drilling
 - scraping

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- filing
- reaming
- tapping
- threading

Unit Mapping Information

Release 2. Supersedes and is equivalent to MEM18004 Maintain and overhaul mechanical equipment (Release 1).

Release 1. Supersedes and is equivalent to MEM18004B Maintain and overhaul mechanical equipment.

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 MEM18004 Maintain and overhaul mechanical equipment

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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
- identifying and interpreting specifications, charts, lists and drawings to maintain and overhaul mechanical equipment
- performing maintenance tasks on mechanical equipment, components or sub-assemblies in accordance with procedures
- assessing mechanical equipment, components and sub-assemblies visually and with appropriate test equipment to ensure correct function or determine malfunction and make adjustments according to procedures
- diagnosing and locating faults using appropriate diagnostic techniques, including visual inspection and use of test equipment, and localising fault condition to component level
- repairing or overhauling faulty equipment using appropriate fitting techniques and principles, tools, equipment and procedures and to manufacturers' or site specifications
- fitting and adjusting mechanical systems and equipment by applying sound fitting principles and techniques to specifications
- performing final adjustments and testing mechanical equipment for accuracy and correct function to align with operational specifications and return to service in accordance with work site procedures.

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)
- preventative maintenance procedures
- functions of system/equipment and their operational requirements
- causes and symptoms of faults and failures
- system and equipment hazard identification and isolation procedures
- options for sourcing replacement parts

- consequences of incorrect adjustments
- procedures for testing the mechanical systems and equipment
- procedures for returning mechanical systems and equipment to service.

Assessment Conditions

- Assessors must:
 - have vocational competency in maintaining and overhauling mechanical equipment 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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