



Australian Government

MEM18017 Modify mechanical systems and equipment

Release: 2

MEM18017 Modify mechanical systems and equipment

Modification History

Release 2. Quantum of hours of workplace practice removed. Supersedes and is equivalent to MEM18017 Modify mechanical systems and equipment (Release 1).

Release 1. Supersedes and is equivalent to MEM18017C Modify mechanical systems and equipment.

Application

This unit of competency defines the skills and knowledge required to determine the requirements of the modification, undertake the modification and evaluate the modified mechanical system/equipment.

It applies to significant modifications to plant and equipment that lead to desired changes in performance of existing equipment or the installation of new or replacement equipment.

Maintenance schedules are required for mechanical machines and systems, including stationary, stand-alone machines, and manual, semi-automatic and automatic process systems.

Where drafting skills to Australian Standard 1100 Technical drawing is required unit MEM09003 Prepare basic engineering drawing should also be selected.

Where the selection and use of precision mechanical measurements is required unit MEM12003 Perform precision mechanical measurement should also be selected.

Where interpretation of technical specifications is required unit MEM16012 Interpret technical specifications and manuals should also be selected.

Where minor modifications are required to be performed unit MEM18055 Dismantle, replace and assemble engineering components and MEM18006 Perform precision fitting of engineering components, should also be selected as appropriate.

Where balancing equipment is required unit MEM18008 Balance equipment should also be selected.

Where equipment condition monitoring and recording is required unit MEM18010 Perform equipment condition monitoring and recording should also be selected.

Where analysing of plant and equipment condition monitoring results is required unit MEM18016 Analyse plant and equipment condition monitoring results should also be selected.

Where graphical techniques and simple statistical computations are required, unit MEM12025 Use graphical techniques and perform simple statistical computations should also be selected.

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

Band: B

Unit Weight: 8

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.
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|---|----------------------|-----|---|
| 1 | Determine job | 1.1 | Follow standard operating procedures (SOPs) |
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Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
	requirements	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 modification requirements	2.1	Analyse maintenance reports and system output information
		2.2	Identify defective components, sub-assemblies and design faults
		2.3	Develop corrective action plan
3	Undertake standard modifications to mechanical systems and equipment	3.1	Identify modification options for overcoming parts failures and design faults
		3.2	Select replacements for failed components and sub-assemblies from manufacturers' catalogue
		3.3	Develop modification design in conjunction with and approved by appropriate authority
		3.4	Record modification according to SOPs
4	Evaluate modified mechanical system/equipment	4.1	Evaluate alterations for effectiveness and efficiency
		4.2	Report and record effectiveness/efficiency
		4.3	Check results against specifications
		4.4	Recommend additional modification/changes, where required

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.

Analysis includes:

- interpretation and integration of data from consultations, process control instrumentation, and specifications and manuals

Unit Mapping Information

Release 2. Supersedes and is equivalent to MEM18017 Modify mechanical systems and equipment (Release 1).

Release 1. Supersedes and is equivalent to MEM18017C Modify mechanical systems and 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 MEM18017 Modify mechanical systems and 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
- determining modification requirements by obtaining and analysing relevant maintenance reports, production data, specifications, drawings, circuits and conditioning monitoring data and developing corrective action plan in accordance with SOPs
- inspecting plant/equipment for correct location, alignment, operation, performance and conformance to specifications and identifying modification options to overcome parts failure and design faults
- developing modification/s to plant and equipment which lead to desired changes in performance in conjunction with, and approved by, appropriate authority
- recording approved modifications in accordance with procedures and preparing and authorising drawings of the modified components and/or sub-assemblies
- operating and monitoring performance of modified plant/equipment to ensure compliance with the required performance specifications
- recording/reporting efficiency/effectiveness of the modifications undertaken and recommending further modifications, where required.

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)
- desired changes in performance of the plant/equipment
- specifications of the plant/equipment and its performance requirements
- procedures for:
 - inspecting the plant/equipment against specifications
 - documenting the proposed modifications to the plant/equipment

- modifying and authorising changes to drawings of components and/or sub-assemblies, and plant/equipment
- recording modifications undertaken
- checking the operation of the modified plant/equipment against required performance specifications
- reporting/recording the effectiveness/efficiency of the modifications
- effect of defective components, sub-assemblies and design faults on the performance of plant/equipment
- reasons and action to be taken to achieve the desired changes in performance
- authority from whom approval to undertake the proposed modifications is to be obtained
- typical part failure modes and the causes and action to be taken to correct part failures and design faults
- options for modifying the plant/equipment for given part failures and/or design faults
- replacement parts from manufacturers'/suppliers' catalogues for given components and/or sub-assemblies
- tests to be undertaken to check the performance of the modified plant/equipment
- engineering design and drawing skills associated with modifying mechanical systems and equipment
- numerical operations, geometry and calculations/formulae.

Assessment Conditions

- Assessors must:
 - have vocational competency in modifying mechanical systems and 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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