



Australian Government

Department of Education, Employment and Workplace Relations

MEM18017C Modify mechanical systems and equipment

Release: 1

MEM18017C Modify mechanical systems and equipment

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers determining the requirements of the modification, undertaking the modification and evaluating the modified mechanical system/equipment.
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Application of the Unit

Application of the unit	<p>This unit applies to significant modifications to plant and equipment that lead to desired changes in performance. Maintenance schedules are required for mechanical machines and systems, including stationary, stand-alone machines, and manual, semi-automatic and automatic process systems. This unit applies to existing equipment or the installation of new or replacement equipment.</p> <p>Where drafting skills to Australian Standard 1100 are required, see Unit MEM09003B (Prepare basic engineering drawing).</p> <p>Where minor modifications are required, see Units MEM18055B (Dismantle, replace and assemble engineering components) or MEM18006C (Repair and fit engineering components)</p> <p>Where balancing equipment is required, Unit MEM18008B (Balance equipment) should also be selected.</p> <p>Band: B</p> <p>Unit Weight: 8</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM09002B	Interpret technical drawing
	MEM12003B	Perform precision mechanical measurement
	MEM12023A	Perform engineering measurements
	MEM12024A	Perform computations
	MEM12025A	Use graphical techniques and perform simple statistical computations
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations
	MEM18003C	Use tools for precision work
	MEM18005B	Perform fault diagnosis, installation and removal of bearings
	MEM18006C	Repair and fit engineering components
	MEM18007B	Maintain and repair mechanical drives and mechanical transmission assemblies
	MEM18009B	Perform levelling and alignment of machines and engineering components
	MEM18010C	Perform equipment condition monitoring and recording
	MEM18011C	Shut down and isolate machines/equipment
	MEM18016B	Analyse plant and equipment condition monitoring results
	MEM18055B	Dismantle, replace and assemble engineering components

Employability Skills Information

Employability skills	This unit contains employability skills.
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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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Determine modification requirements	1.1. Maintenance reports and system output information are analysed. 1.2. Defective components, sub-assemblies and design faults are identified. 1.3. Corrective action plan is developed.
2. Undertake standard modifications to mechanical systems and equipment	2.1. Modification options for overcoming parts failures and design faults are identified. 2.2. Failed components and sub-assembly replacements are selected from manufacturers' catalogue. 2.3. Modification designs are developed in conjunction with and approved by appropriate authority. 2.4. Modification is recorded according to standard operating procedures
3. Evaluate modified mechanical system/equipment	3.1. Alterations are evaluated for effectiveness and efficiency. 3.2. Effectiveness/efficiency is reported and recorded. 3.3. Results are checked against specifications. 3.4. Additional modification/changes, if required, are recommended.

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:

- obtaining, reading, interpreting and following information on relevant maintenance reports, production data, drawings, circuits, condition monitoring data, specifications, instructions, etc.
- analysing reports and other relevant information
- developing and planning corrective action plans
- inspecting plant/equipment for correct location, alignment, operation, performance and conformance to specifications
- documenting and approving planned modifications
- preparing and authorising drawings of the modified components and/or

REQUIRED SKILLS AND KNOWLEDGE

sub-assemblies

- recording approved modifications undertaken
- operating and monitoring performance of modified plant/equipment to ensure conformance with the required performance specifications
- reporting/recording efficiency/effectiveness of the modifications undertaken
- recommending further modifications to the plant/equipment

Required knowledge

Look for evidence that confirms knowledge of:

- the desired changes in performance of the plant/equipment
- the specifications of the plant/equipment and its performance requirements
- the procedures for inspecting the plant/equipment against specifications
- where appropriate, defective components, sub-assemblies and design faults
- the effect of defective components, sub-assemblies and design faults on the performance of plant/equipment
- the action to be taken to achieve the desired changes in performance
- the reasons for taking the action identified
- the procedures for documenting the proposed modifications to the plant/equipment
- the authority from whom approval to undertake the proposed modifications is to be obtained
- typical part failure modes and the causes
- the action to be taken to correct part failures and design faults
- for given part failures and/or design faults, the options for modifying the plant/equipment
- for given components and/or sub-assemblies, appropriate standard replacements from manufacturers'/suppliers' catalogues
- the procedures for modifying drawings of components and/or sub-assemblies
- the procedures for authorising changes made to drawings of plant/equipment
- the procedures for recording modifications undertaken
- the procedures for checking the operation of the modified plant/equipment against required performance specifications
- procedures to report/record the effectiveness/efficiency of the modifications
- the 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 within the scope of this unit
- hazards and control measures associated with modifying mechanical systems and equipment
- use and application of personal protective equipment

REQUIRED SKILLS AND KNOWLEDGE

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| <ul style="list-style-type: none">• safe work practices and procedures |
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Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
<p>Overview of assessment</p>	<p>A person who demonstrates competency in this unit must be able to modify mechanical systems and equipment. Competency in this unit cannot be claimed until all prerequisites have been satisfied.</p>
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>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.</p>
<p>Context of and specific resources for assessment</p>	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with modifying mechanical systems and equipment or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
<p>Method of assessment</p>	<p>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.</p>

EVIDENCE GUIDE

Guidance information for assessment	
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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.

Analysed

Interpretation and integration of data from consultations, process control instrumentation and condition monitoring systems, etc.

Modifications

Changes to plant and equipment which lead to desired changes in performance

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Maintenance and diagnostics
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