Australian Government

Department of Education, Employment and Workplace Relations

MEM18004B Maintain and overhaul mechanical equipment

Release: 1

MEM18004B Maintain and overhaul mechanical equipment

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers diagnosing, locating faults, repairing, overhauling, fitting and adjusting mechanical systems and equipment. This unit integrates the application of prerequisite diagnostic, maintenance and overhaul competencies.

Application of the Unit

Application of the unit	This unit applies to situations where an integrated level of skills in maintenance and overhaul of mechanical systems and equipment is required. This unit builds on skills covered by the prerequisites. Where additional specialist skills are required, appropriate units should also be selected. Where extensive system knowledge for safe shut-down/isolation of machinery/equipment is required, Unit MEM18011C (Shut down and isolate machines/equipment) should also be selected. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
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
	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
	MEM18055B	Dismantle, replace and assemble engineering components

Employability Skills Information

Employability skills	This unit contains employability skills.

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.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Perform preventative maintenance tasks and adjustments	1.1. Preventative maintenance schedule is read and task requirements are determined. 1.2. Appropriate maintenance principles and techniques are used and routine maintenance tasks are performed on mechanical equipment, components or sub-assemblies using correct tools, equipment and procedures. 1.3. Mechanical equipment, components, sub-assemblies are checked visually and with test equipment, using prescribed procedures and safety requirements to ensure correct function or determine malfunction. 1.4. Adjustments are made to equipment or components to ensure specifications are met using acceptable fitting techniques and procedures, observing all safety requirements.
2. Diagnose and locate faults	2.1. Equipment component function is determined by reference to engineering drawings, technical manuals and or consultation with appropriate personnel. 2.2. Maintenance reports are checked, reviewed and faults are diagnosed. 2.3. Consultation with operators and other relevant plant personnel is carried out to assist in locating faults. 2.4. Where appropriate, test equipment is selected and applied in accordance with defined requirements and procedures to assist fault location. 2.5. Fault condition is diagnosed and localised at component level using appropriate test equipment and procedures. 2.6. Faulty condition is evaluated and appropriate corrective action is taken. 2.7. Faults are documented to standard operating procedures.
3. Repair or overhaul mechanical system	3.1. Machine or equipment is isolated safely or checked for isolation. 3.2. Faulty equipment, component or sub-assembly is removed from system using appropriate engineering principles, tools, equipment and procedures. 3.3. Replaceable items are selected from manufacturers' catalogues and obtained by appropriate means. 3.4. Correct repair procedure, tools and equipment are selected and prepared for use on serviceable items.

ELEMENT	PERFORMANCE CRITERIA
	3.5. Using appropriate engineering principles, designated procedures, correct tools/equipment and safe workshop practices, serviceable items are repaired or overhauled to manufacturers' or site specifications. 3.6. Components are checked with precision instruments to ensure conformance to specifications where applicable.
4. Fit and adjust mechanical equipment	4.1. All electrical, safety and site requirements are adhered to throughout the maintenance cycle. 4.2. Maintenance report is completed to standard operating procedures and conveyed to designated personnel. 4.3. Fitting requirements are determined and sequential assembly planning is carried out where applicable. 4.4. Sound fitting principles and techniques are applied in the preparation and assembly of component parts using fastening equipment and methods which ensure conformance to specifications, operational performance, quality and safety. 4.5. Using acceptable maintenance practices, correct gland packing, jointing and gasket materials are selected and applied correctly in conformance to specifications and operational requirements. 4.6. Correct lubrication requirements are determined by appropriate means and attended to where applicable using mechanical or manual applications. 4.7. Appropriate wedges and levelling devices are used to level mechanical equipment as appropriate. 4.8. Correct alignment and balancing functions are performed where appropriate. 4.9. Final adjustments are performed on mechanical equipment to align to operational specifications using acceptable engineering principles, fitting techniques and procedures 4.10. Mechanical equipment is tested for accuracy and correct operation where applicable, and returned to service to specifications using acceptable procedures. 4.11. Appropriate work and safety clearances are obtained throughout maintenance cycle.

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:

- planning and sequencing of multiple tasks
- sourcing resources
- using diagnostic skills to check and test mechanical systems/equipment
- using communication skills to consult with operators and other relevant plant personnel to assist in locating faults
- making systematic operational adjustments
- checking system
- using language and literacy skills to enable all reporting requirements to be met including checking maintenance reports; documenting faults etc.
- reading and interpreting engineering drawings, technical manuals equipment component function

Required knowledge

Look for evidence that confirms knowledge of:

- 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
- use and application of personal protective equipment
- safe work practices and procedures
- hazards and control measures associated with maintaining and overhauling mechanical equipment

Evidence Guide

EVIDENCE GUIDE	
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.	
Overview of assessment	A person who demonstrates competency in this unit must be able to, in an integrated manner, diagnose, locate faults, repair, overhaul, fit and adjust mechanical systems and equipment. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	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.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, i.e. the candidate is not in productive work, 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. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with maintaining and overhauling mechanical equipment 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.

EVIDENCE GUIDE	
Guidance information for assessment	

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.	
Routine maintenance tasks	Checks for correct operation, lubrication, adjustments; repair to leaking glands
Test equipment	Engineers level, laser alignments etc., and appropriate equipment for measurement of alignment, flatness, squareness, straightness, temperature, vibration, load deflection, noise level, RPM
Fitting techniques and procedures	Appropriate fitting principles and techniques are utilised in the assembly/disassembly of component parts using fastening equipment and methods, e.g. dowelling, pinning and pegging, keying, thread production and repair, etc. which ensures conformance to specifications, operational performance, quality and safety. It also includes the straightforward removal and replacement of pre-manufactured bearings and seals and using acceptable maintenance procedures, appropriate lubrication, gland packing, jointing/gaskets, and seals. Materials are selected and applied in conformance to application requirements and specifications as applicable. Using acceptable workshop practices new components are manufactured including by marking out, drilling, scraping, filing, reaming, tapping or threading to specifications

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Maintenance and diagnostics