Australian Government

Department of Education, Employment and Workplace Relations

MEM18047B Diagnose and maintain electronic controlling systems on mobile plant

Release: 1

MEM18047B Diagnose and maintain electronic controlling systems on mobile plant

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers testing, diagnosing and maintaining electronic control systems. Path 1

Application of the Unit

Application of the unit	This unit applies to testing, diagnosing, fault finding and removing/replacing electronic control systems associated with mobile plant and equipment, including discrete logic, analogue and microprocessor monitoring and control systems. This unit applies to automotive, agricultural and mining environments. Maintenance would typically cover wiring harness faults; testing and identifying faulty sensors, actuators and control components; replacing and making adjustments to input and output components; and accessing data from electronic control unit and applicable manufacturer software/hardware to change operating parameters. Information is sourced from manufacture/technical manuals. All work is undertaken to manufacturers' specifications and standard operating procedures. This competency does not cover the skills needed to repair electronic circuitry associated with these systems. If this skill is required, Units MEM18056B (Diagnose and repair analog equipment and components) and MEM18057B (Maintain/service analog/digital electronic equipment) should be selected as appropriate. **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
	MEM18030B	Diagnose and repair low voltage electrical systems
	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. Access and interpret fault codes	1.1. Applicable control unit is located and identified. 1.2. Fault codes are accessed using vehicle indicators, meters and diagnostic tooling. 1.3. Fault codes are interpreted. 1.4. Fault codes are cleared from memory according to procedures. 1.5. Diagnostic and maintenance procedures are performed using applicable techniques and precautions to safeguard electronic components and systems.
2. Locate and rectify faults using fault codes and manufactures fault finding and rectification procedures	2.1. Fault is traced from fault codes using applicable troubleshooting procedures. 2.2. Faults are rectified to required specification.
3. Locate and test input components	3.1. Input components are located and identified. 3.2. Input components are electrically tested.
4. Locate and test output components	4.1. Output components are located and identified. 4.2. Output components electrically tested.
5. Remove/replace and adjust sensors and actuators	5.1. Component part is removed correctly. 5.2. Correct replacement part is identified. 5.3. Component part replaced correctly. 5.4. Adjustments are made in relation to mechanical clearances and measured electrical and resistance values.
6. Change operating parameters	6.1. Appropriate specifications are sourced from plant/equipment identification and applicable manuals and specifications. 6.2. Appropriate tooling (software/hardware) is selected. 6.3. Plant/equipment identification is used to obtain security codes. 6.4. Data is downloaded. 6.5. Data is entered for new specifications. 6.6. Successful data entry is verified.

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:

- identifying the control unit
- using fault codes correctly to access fault codes with indicators, meters or diagnostic tooling
- interpreting fault codes and specifications correctly from applicable manuals
- clearing fault codes from memory and verifying using applicable procedures and manuals
- identifying and applying procedures to safeguard electronic components and systems when diagnosing and maintaining typical mobile plant electronic circuits
- locating and identifying various types of input and output components
- following manufactures' procedures to test output components
- identifying, removing, replacing component parts
- making adjustments in relation to mechanical clearances and measured electrical and resistance values
- selecting tooling (software/hardware) according to manufactures' manual
- obtaining security codes using correct protocol from manufacturer, plant/equipment identification and appropriate identification
- using computer and relevant computer applications including downloading and entering data for new specifications as per manufacturers' procedures

Required knowledge

Look for evidence that confirms knowledge of:

- applicable fault codes and their meanings
- procedures to clear fault codes and verify clearance
- sources of potential damage to typical mobile plant electronic systems when performing maintenance and diagnostic work
- techniques and procedures to safeguard against damage
- correct troubleshooting procedures
- techniques/procedures used to remove and replace faulty components
- various types of input components
- operation and principles of transducers used in control systems
- relevant testing procedures
- component types, functions and locations
- operation and principles of actuators used in control system
- concepts of EPROMs and microprocessors
- procedures to obtain security code
- procedure to download, enter and verify data

REQUIRED SKILLS AND KNOWLEDGE
• safe work practices and procedures

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 test, diagnose and maintain electronic controlling systems on mobile plant 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 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. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with testing, diagnosing and maintaining electronic controlling systems on mobile plant, 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,

EVIDENCE GUIDE	
	standards, manuals and reference materials.
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.	
Faults are rectified	Adjustments and replacements which do not include the repair of components
Input components	Sensors, actuators, resistors, capacitors, diodes, transistors, ICs, EPROMs, microprocessors
Output components	Hardware, software, hard copy devices, soft storage devices
Specifications	• Manufacturer and/or vendor specifications • Standard operating procedures

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Co-requisite units		

Competency field

Competency field	Maintenance and diagnostics