



Australian Government

**MEM18051 Fault find and repair/rectify
complex electrical circuits**

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Modification History

Release	Comments
2	Dual banding removed.
1	This unit of competency was first released in MEM Manufacturing and Engineering Release 2.0.

Application

This unit of competency defines the skills and knowledge required to locate and repair/rectify faults in interconnected electrical circuits.

It applies to work on interconnected electrical circuits where electrical equipment and/or components are connected electrically, that is, there are multiple electrical power supplies or sources, voltages or circuits which are found in the control or switching of the circuit.

Band: A

Unit Weight: 6

Licensing/Regulatory Information

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

Pre-requisite unit(s)

MEM09002	Interpret technical drawing
MEM11011	Undertake manual handling
MEM10002	Terminate and connect electrical wiring
MEM10003	Install and test electrical wiring and circuits up to 1000 volts a.c. and 1500 volts d.c.
MEM12002	Perform electrical/electronic measurement
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
MEM18048	Fault find and repair/rectify basic electrical circuits
MEM18049	Disconnect/reconnect fixed wired equipment up to 1000 volts a.c./1500 volts d.c.

Competency field(s)

Maintenance and diagnostics

Unit sector(s)

N/A

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. Locate fault	2.1 Determine circuit/system function and characteristics by reference to circuit diagrams, specifications, schematics and/or consultation with technical adviser 2.2 Examine and interpret built-in fault indicators and error codes and record results to procedures, where appropriate 2.3 Isolate circuit power supply 2.4 Verify and localise faults using appropriate, tools and test equipment, procedures and techniques

	2.5 Record faults in accordance with SOPs
3. Repair/rectify fault	3.1 Repair/replace or adjust circuit/s to specifications or manufacturers' requirements 3.2 Check and test circuit/s for compliance with site or manufacturers' specifications 3.3 Record repair/rectification report in accordance with SOPs

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.	
Specifications/regulations and drawings include one (1) or more of the following:	• legislative acts • wiring rules • other standards • specifications • electrical and architectural drawings
Appropriate fault-finding techniques include testing for the following:	• voltage • current • frequency • polarity • phase • circuit continuity • insulation resistance • earth continuity

Test equipment includes one (1) or more of the following:	• continuity testers • ammeters • voltmeters • multimeters • tong testers • wattmeters • cathode ray oscilloscopes

Unit Mapping Information

Current Code and Title	Previous Code and Title	Comments	Equivalence
MEM18051 Fault find and repair/rectify complex electrical circuits	MEM18051B Fault find and repair/rectify complex electrical circuits	Supersedes and is equivalent to MEM18051B Fault find and repair/rectify complex electrical circuits	Equivalent

Assessment Requirements for MEM18051 Fault find and repair/rectify complex electrical circuits

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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, circuit drawings, schematics, regulatory and legislative requirements to fault find and repair/rectify complex electrical circuits
- checking that the electrical circuit/system is isolated and tagged where necessary in strict accordance with work health and safety (WHS) requirements and procedures
- locating and reading/recording built-in indicators and error codes
- using diagnostic skills to locate faulty operation using appropriate fault finding techniques and test equipment to verify faults
- repairing/replacing or adjusting electrical circuits/systems to specifications and verifying using appropriate test equipment that the electrical circuit/system is operating to specifications
- recording rectification activities in accordance with SOPs.

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)
- circuit characteristics
- relevant regulatory requirements

- errors indicated by built-in devices
- circuit isolation procedures
- common electrical test instruments and their application
- common techniques for testing electrical circuits
- recording/reporting requirements for electrical circuit faults
- appropriate techniques/procedures for returning the circuit/s to specification
- site/manufacturers' circuit specifications
- requirements for recording circuit rectifications
- any applicable industry standards, national/Australian Standards, NOHSC guides, and state/territory regulatory codes of practice/standards.

Assessment Conditions

- Assessors must:
 - have vocational competency in diagnosing, repairing/rectifying complex electrical circuits/systems 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
- Where possible assessment must occur in operational workplace situations. Where this is not possible or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions. This must cover all aspects of workplace performance, including environment, 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.

Link

Companion volumes, including implementation guides, are found on the national training register - <https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=45a7f1d5-61a5-447a-9688-7abbd7e1a5c7>.