



Australian Government

MEM18108 Troubleshoot analog and digital electronic equipment

Release: 2

MEM18108 Troubleshoot analog and digital electronic equipment

Modification History

Release 2. Prerequisite units updated

Release 1. New unit

Application

This unit has been developed for Engineering Tradesperson – industrial electrician apprenticeship training and the recognition of trade-level skills in troubleshooting analog/digital electronic equipment down to sub-assembly and/or card level where a series of checks and pre-determined tests is applied in accordance with workshop manuals and testing procedures.

It applies to a wide range of electronic systems and sub-assemblies used in an industrial environment.

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

Band: A

Unit Weight: 4

Pre-requisite Unit

Path 1	MEM12023	Perform engineering measurements
	MEM18001	Use hand tools
	MEM18104	Dismantle, replace and assemble electrical components and equipment

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. Troubleshoot electronic equipment	2.1 Determine the function of electronic equipment by reference to circuit diagrams, equipment manuals and/or consultation with equipment operator, where appropriate 2.2 Run equipment built-in test functions and record results, where appropriate 2.3 Note and record built-in faults/status display 2.4 Apply diagnostic techniques to locate faults in electronic equipment, including the use of specialist test equipment 2.5 Isolate and remove faulty card or sub-assembly from electronic system using appropriate tools and techniques 2.6 Source replacement item and replace in accordance with manufacturer specifications	
3. Return electronic equipment to service	3.1 Adjust/tune or calibrate electronic equipment for conformance to specifications, where appropriate 3.2 Test repaired equipment/sub-assemblies for compliance to specifications and/or manufacturer requirements 3.3 Complete all documentation requirements according to 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.

Electronic equipment includes one or more of the following:

- amplifiers
- analog/digital hardware
- telecommunication
- consumer audio/video
- electronic appliances
- process control
- computer systems
- security monitoring and alarm systems
- scanning systems
- fire systems
- power supplies
- test equipment

Fault-finding techniques include one or more of the following:

- signal injection
- substitution
- monitoring
- measurement
- visual

Test equipment includes one or more of the following:

- continuity testers
- ammeters
- voltmeters
- cathode ray oscilloscopes (CROs)
- frequency counters
- signal generators
- digital probes

Unit Mapping Information

No equivalent unit

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 MEM18108 Troubleshoot analog and digital electronic equipment

Modification History

Release 2. Prerequisite units updated

Release 1. New unit

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, SOPs and safe work practices
- identifying and interpreting circuit diagrams, specifications, schematics, maintenance records, drawings, supplier catalogues and obtaining relevant data with respect to troubleshooting analog/digital electronic equipment
- locating, reading/recording and diagnosing built-in fault indicators and obtaining error code interpretation documents and run test functions and recording faults and/or equipment status indicated by built-in functions/display
- applying diagnostic techniques in fault-finding electronic equipment down to sub-assembly and/or plug-in card level
- isolating and removing faulty item and selecting replacement item from appropriate sources
- adjusting/tuning and calibrating in accordance with specifications
- verifying repaired electronic equipment for compliance to specifications
- completing all documentation 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 PPE
- function(s) and operational specifications of the electronic equipment/sub-assembly and electrical principles associated with electronic sub-assemblies
- implications of electro-static discharge (ESD) upon the electronic equipment
- procedures for running built-in test functions and recording identified faults
- equipment and techniques to be used to test the electronic equipment, including the use of specialised test equipment
- diagnostic techniques, including:
 - visual inspection
 - signal injection
 - half-split rule and component isolation

- procedures for running built-in test functions and recording faults identified
- errors indicated by built-in devices
- procedures for isolating electronic equipment/sub-assemblies
- tools and techniques to be used to remove/replace components from/into electronic equipment
- procedures and techniques for adjusting/tuning and calibrating electronic equipment/sub-assemblies
- test procedures and specifications for returning repaired equipment/sub-assemblies to service.

Assessment Conditions

Assessors must:

- have vocational competency in troubleshooting analog and digital electronic 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* and comply with the *National Vocational Education and Training Regulator Act 2011* or equivalent legislation covering VET regulation in a non-referring State 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 that 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 manufacturer 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.

Links

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