



Australian Government

MEM18066 Diagnose and repair microprocessor-based equipment

Release: 1

MEM18066 Diagnose and repair microprocessor-based equipment

Modification History

Release 1. Supersedes and is equivalent to MEM18066B Diagnose and repair microprocessor-based equipment

Application

This unit of competency defines the skills and knowledge required to locate, replace/repair faulty components in microprocessor-based equipment.

It applies to situations in which the individual has sufficient information and access to microprocessor components to diagnose the functioning of elements within the microprocessor and requires an understanding of machine and assembly language and address and bus systems.

Where diagnosis of analog components is required unit MEM18056 Diagnose and repair analog equipment and components should also be selected.

Where routine fault finding within microprocessor systems is required unit MEM18057 Maintain/service analog/digital electronic equipment should also be selected.

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

Band: B

Unit Weight: 6

Pre-requisite Unit

MEM05001	Perform manual soldering/desoldering - electrical/electronic components
MEM09002	Interpret technical drawing
MEM11011	Undertake manual handling
MEM12004	Perform precision electrical/electronic measurement
MEM12023	Perform engineering measurements
MEM13015	Work safely and effectively in manufacturing and engineering
MEM16006	Organise and communicate information
MEM18001	Use hand tools

MEM18057	Maintain/service analog/digital electronic equipment
MEM18065	Diagnose and repair digital equipment and components

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.								
1 Determine job requirements	<table><tr><td>1.1</td><td>Follow standard operating procedures (SOPs)</td></tr><tr><td>1.2</td><td>Comply with work health and safety (WHS) requirements at all times</td></tr><tr><td>1.3</td><td>Use appropriate personal protective equipment (PPE) in accordance with SOPs</td></tr><tr><td>1.4</td><td>Identify job requirements from specifications, drawings, job sheets or work instructions</td></tr></table>	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
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2 Locate fault	<table><tr><td>2.1</td><td>Determine equipment function and principles by reference to schematics, circuit diagrams, flow charts and equipment manuals</td></tr><tr><td>2.2</td><td>Run built-in test functions and interpret results</td></tr><tr><td>2.3</td><td>Reproduce fault symptoms and verify using fault-finding techniques</td></tr><tr><td>2.4</td><td>Identify faulty or defect component/s and/or isolate fault cause</td></tr></table>	2.1	Determine equipment function and principles by reference to schematics, circuit diagrams, flow charts and equipment manuals	2.2	Run built-in test functions and interpret results	2.3	Reproduce fault symptoms and verify using fault-finding techniques	2.4	Identify faulty or defect component/s and/or isolate fault cause
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3 Replace/repair faulty components	<table><tr><td>3.1</td><td>Remove faulty component using appropriate tools and techniques</td></tr><tr><td>3.2</td><td>Repair/replace faulty component/s in accordance with site/manufacturers' recommended procedures</td></tr></table>	3.1	Remove faulty component using appropriate tools and techniques	3.2	Repair/replace faulty component/s in accordance with site/manufacturers' recommended procedures				
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- 3.3 Re-fit repaired/replaced component/s
- 3.4 Check and test equipment for compliance to specifications utilising correct and appropriate test procedures and equipment

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.

Equipment includes one (1) or more of the following:

- digital hardware
- sub-assemblies of systems
- discrete equipment used in computer, communication, consumer audio/video, electronic appliances, scanning systems, security/fire systems, power supplies and test equipment

Fault-finding techniques include one (1) or more of the following:

- signal injection
- substitution
- monitoring
- measurement
- heating/cooling
- sound
- visual
- touch
- smell
- use of inbuilt software and hardware diagnostics

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Test equipment includes one (1) or more of the following:

- continuity testers
- ammeters
- voltmeters
- cathode ray oscilloscopes
- frequency counters
- signal generators
- digital probes
- pulse generators
- computer and computer software
- data analysers

Components include (1) one or more of the following:

- discrete component assemblies
- individual components, including:
 - resistors
 - switching devices
 - capacitors
 - transformers
 - solenoids
 - tubes
 - semi-conductors
 - transistors
 - ICs
 - digital timers
 - gate arrays
 - transmitters
 - converters
 - microprocessors

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM18066B Diagnose and repair microprocessor-based equipment

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 MEM18066 Diagnose and repair microprocessor-based equipment

Modification History

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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 equipment specifications, manuals, circuit and schematic diagrams, maintenance records and supplier catalogues and obtaining relevant data with respect to diagnosing and repairing microprocessor-based equipment
- locating, reading/recording and diagnosing built-in indicators and obtaining error code interpretation documents and running test functions and recording faults and/or equipment status indicated by built-in test functions/displays
- reproducing fault symptoms in the microprocessor-based equipment and verifying faults using appropriate test equipment and fault-finding to locate and isolate faulty component or fault cause
- checking microprocessor-based equipment, electronic equipment/sub-assemblies, components, connections and terminations for conformance to specifications
- removing and replacing faulty components and/or microprocessor from the electronic equipment/sub-assemblies
- checking and testing equipment using appropriate test equipment and fault-finding techniques for conformance with specifications
- adjusting/tuning, calibrating and testing the repaired microprocessor-based equipment to specifications
- returning the repaired equipment and components to service 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)
- implications of electro-static discharge (ESD) upon the electronic equipment
- microprocessor systems, architecture, circuits and dedicated chips
- function(s) of the microprocessor-based equipment
- electronic principles utilised in the operation of the microprocessor-based equipment
- procedures for:

- running built-in test functions
- verifying faults in microprocessor-based equipment
- testing faulty microprocessor-based equipment
- testing microprocessor-based equipment performance
- removing/refitting/repairing/replacing faulty components from microprocessor-based equipment and tools and techniques to be used
- errors indicated by built-in devices
- symptoms of the fault in the microprocessor-based equipment and purpose of reproducing fault symptoms
- test equipment and fault-finding techniques necessary to confirm microprocessor-based equipment faults
- test equipment and techniques to be used to test the faulty microprocessor-based equipment and probable causes of component failure
- reasons for identifying the faulty component for repair or replacement
- operational specifications of the microprocessor-based equipment
- test equipment and fault-finding techniques necessary to check the microprocessor-based equipment performance.

Assessment Conditions

- Assessors must:
 - have vocational competency in diagnosing and repairing microprocessor-based 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* 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.

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