



Australian Government

MEM18065 Diagnose and repair digital equipment and components

Release: 1

MEM18065 Diagnose and repair digital equipment and components

Modification History

Release 1. Supersedes and is equivalent to MEM18065B Diagnose and repair digital equipment and components

Application

This unit of competency defines the skills and knowledge required to locate faults in digital electronic equipment or sub-assemblies and replace faulty components.

Where soldering of components is required to advanced or military specifications, where the reliability of electrical connections is critical, or where surface mounted devices are being soldered/de-soldered then unit MEM05002 Perform high reliability soldering and desoldering should also be selected.

Where termination of cables is required unit MEM10002 Terminate and connect electrical wiring and unit MEM18063 Terminate signal and data cables, should also be selected as appropriate.

Where the selection and use of engineering measurement is required unit MEM12023 Perform engineering measurements should also be selected.

Where the selection and use of power tools/hand held operations is required unit MEM18002 Use power tools/hand held operations should also be selected.

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

Band

This unit has dual status and is to be regarded as both a Specialisation Band A unit and Specialisation Band B unit for progression to C7 (AQF level IV).

Unit Weight: 10

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
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

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	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 system/equipment functions and principles by reference to equipment manuals and circuit diagrams
		2.2	Run built-in test functions and check and review fault indicators error codes and appropriate maintenance records
		2.3	Reproduce fault symptoms and verify using fault-finding techniques
		2.4	Isolate faulty equipment and remove from system using appropriate tools and techniques
		2.5	Check and test equipment using appropriate test equipment and fault finding techniques
		2.6	Identify faulty component and/or isolate fault cause

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

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|---|---|-----|---|
| 3 | Repair/replace faulty components | 3.1 | Remove faulty component using appropriate tools and techniques |
| | | 3.2 | Repair/replace faulty component in accordance with site/manufacturers' recommended procedures |
| | | 3.3 | Refit repaired/replacement components |
| | | 3.4 | Refit repaired equipment to system |
| | | 3.5 | Check and test systems/equipment for compliance with specifications using 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
 - communication
 - consumer audio/video
 - electronic appliances
 - scanning systems
 - security/fire systems
 - power supplies
 - test equipment

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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

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

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

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

Unit Mapping Information

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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 MEM18065 Diagnose and repair digital equipment and components

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 digital equipment and components
- checking electronic equipment/sub-assemblies, components, connections and terminations for compliance to specifications
- locating, reading/recording and diagnosing built-in fault 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
- checking and testing equipment using appropriate test equipment and fault-finding techniques for compliance to specifications
- reproducing fault symptoms in the electronic equipment and verifying faults using appropriate test equipment and fault-finding techniques to locate and isolate faulty component or fault cause
- removing and replacing faulty components from the electronic equipment
- adjusting/tuning, calibrating and testing the repaired electronic equipment/sub-assemblies 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
- analog and digital electronics, including amplifiers, oscillators, power suppliers, filters, transistors, ICs, digital timers, gate arrays, transmitters and converters
- function(s) of the electronic equipment/sub-assembly
- procedures for:
 - running built-in test functions

- verifying faults in electronic equipment/sub-assemblies
- isolating electronic equipment/sub-assemblies
- removing sub-assemblies from electronic equipment
- testing faulty sub-assemblies
- removing and repairing/replacing faulty components from electronic equipment
- fitting repaired/replaced components into sub-assemblies and sub-assemblies into electronic equipment
- testing electronic equipment/sub-assembly performance
- errors indicated by built-in devices
- symptoms of the fault in the electronic equipment/sub-assembly and purpose of reproducing fault symptoms
- test equipment and techniques necessary to confirm electronic equipment/sub-assembly faults
- tools and techniques to be used to remove/refit/repair/replace the faulty sub-assemblies/component from the electronic equipment
- operational specifications of the sub-assembly
- equipment and techniques to be used to test the faulty sub-assemblies/component and probable causes of component failure
- operational specifications of the electronic equipment/sub-assembly/component
- test equipment and techniques necessary to check electronic equipment/sub-assembly performance.

Assessment Conditions

- Assessors must:
 - have vocational competency in diagnosing and repairing digital equipment and components 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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