



Australian Government

Department of Education, Employment and Workplace Relations

MEM18066B Diagnose and repair microprocessor-based equipment

Release: 2

MEM18066B Diagnose and repair microprocessor-based equipment

Modification History

Single band identifier removed to clarify dual status

Unit Descriptor

Unit descriptor	This unit covers locating, replacing/repairing faulty components in microprocessor-based equipment.
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Application of the Unit

Application of the unit	This unit applies to situations in which the individual has sufficient information and access to microprocessor components to diagnose the functioning of elements within the microprocessor. This unit requires understanding of machine and assembly language and address and bus systems. All specifications and procedures are gained from schematics, circuit drawings, instruction sets, flow charts and data sheets. For routine fault finding within microprocessor systems, refer to Unit MEM18057B (Maintain/service analog/digital electronic equipment). For diagnosis of analog components, Unit MEM18056B (Diagnose and repair analog equipment and components) should also be selected. 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 C5 (AQF level V). Unit Weight: 6
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM05001B	Perform manual soldering/desoldering - electrical/electronic components
	MEM09002B	Interpret technical drawing
	MEM12004B	Perform precision electrical/electronic measurement
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18057B	Maintain/service analog/digital electronic equipment
	MEM18065B	Diagnose and repair digital equipment and components

Employability Skills Information

Employability skills	This unit contains employability skills.
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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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Locate faults	1.1. Equipment function and principles are determined and understood by reference to schematics, circuit diagrams, flow charts, equipment manuals etc. 1.2. Built-in test functions are run and results are interpreted correctly. 1.3. Fault symptoms are reproduced where appropriate and verified using appropriate fault finding techniques. 1.4. Faulty or defect component/s are identified and/or fault cause is isolated using appropriate test equipment.
2. Replace/repair faulty components	2.1. Faulty component is renewed using/ correct and appropriate tools and techniques. 2.2. Faulty component/s are repaired/replaced in accordance with manufacturers' recommended procedure or standard operating procedure. 2.3. Repaired/replaced component/s are fitted using correct and appropriate tools and techniques. 2.4. Equipment is checked and tested for operational compliance to specifications utilising correct and appropriate test procedures and equipment.

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:

- obtaining relevant circuit diagrams, manuals, specifications, schematics, maintenance records, supplier catalogues
- locating, reading/recording and diagnosing built-in fault indicators
- obtaining error code interpretation documents
- running test functions and recording faults and/or equipment status indicated by built-in test functions/displays
- checking microprocessor-based equipment, electronic equipment/sub-assemblies, components, connections and terminations for conformance to specifications

REQUIRED SKILLS AND KNOWLEDGE

- removing and replacing/repairing faulty components and/or microprocessor from the electronic equipment
- recording results tests undertaken on the microprocessor-based equipment
- isolating the microprocessor-based equipment from the power supply
- adjusting/tuning and calibrating the microprocessor-based equipment
- returning to service and testing to specification the repaired microprocessor-based equipment
- reporting/recording return to service
- reproducing fault symptoms in the microprocessor-based equipment and verifying faults using appropriate test equipment and fault finding techniques
- refitting repaired/replaced components into the microprocessor-based equipment

Required knowledge

Look for evidence that confirms knowledge of:

- 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
- errors indicated by built-in devices
- symptoms of the fault in the microprocessor-based equipment
- purpose of reproducing fault symptoms
- test equipment and fault finding techniques necessary to confirm microprocessor-based equipment faults
- procedures for verifying faults in microprocessor-based equipment
- procedures for testing faulty microprocessor-based equipment
- hazards associated with microprocessor-based equipment including electro-static discharge (ESD)
- equipment and techniques to be used to test the faulty microprocessor-based equipment
- probable causes of component failure
- procedures, tools and techniques for removing and/or repairing faulty components from microprocessor-based equipment
- reasons for identifying the faulty component for repair or replacement
- procedures, tools and techniques for refitting repaired/ replaced components into the microprocessor-based equipment
- procedures for testing microprocessor-based equipment performance
- operational specifications of the microprocessor-based equipment
- test equipment and fault finding techniques necessary to check the microprocessor-based equipment performance
- 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 diagnose and repair microprocessor-based equipment. 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 diagnosing and repairing microprocessor-based equipment 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, standards, manuals and reference materials.

EVIDENCE GUIDE**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.

Equipment

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

Fault finding techniques

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

Component/s

Discrete component assemblies or individual components such as resistors, switching devices, capacitors, transformers, solenoids, tubes, semi-conductors, transistors, ICs, digital timers, gate arrays, transmitters, converters and microprocessors

Test equipment

Continuity testers, ammeters, voltmeters, cathode ray oscilloscopes, frequency counters, signal generators, pulse generators, computer and computer software, data analysers and digital probes etc.

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Maintenance and diagnostics
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