



Australian Government

Assessment Requirements for MEM29005 Diagnose faults in digital control systems

Release: 1

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Modification History

Release 1. New unit.

Performance Evidence

There must be evidence the candidate has demonstrated the ability to:

- research supplier web sites and technical documentation for:
 - latest developments with digital control systems and their diagnostic procedures
 - information relevant to diagnostic procedures for specific digital control systems
- prepare and justify a plan for diagnosing faults for three different types of digital control system faults
- accurately identify and locate faults in at least three different types of digital control system faults
- use appropriate tools, testing equipment and software applications for diagnosing and rectifying faults on at least three digital control systems
- take accurate measurements during diagnostic procedures on digital control systems
- correct programming-related faults through basic reprogramming
- document and report diagnostic and repair outcomes
- document faults and prepare recommendations for expert assistance, upgrades, or other actions where fault is unable to be repaired immediately.

Note: Where a volume and/or frequency is not specified, demonstration must be provided at least once.

Knowledge Evidence

There must be evidence the candidate has knowledge of:

- types and functions of digital control systems, including microcontroller-based applied digital control
- workplace health and safety (WHS) regulatory requirements relevant to troubleshooting digital control systems
- fault-finding principles in troubleshooting digital control systems
- common digital faults in digital control systems including faults in:
 - signals
 - numbering systems
 - combinational logic circuits
 - digital subsystem building blocks
- types, functions, operation and limitations of digital test equipment
- standards, codes and regulations relevant to troubleshooting digital control systems

- sensors including:
 - classification
 - characteristics
 - types
 - signal transmission including analog transmission and sensor digital conversion and transmission
- micro-electro-mechanical systems (MEMS)
- wireless sensor networking
- interfacing/signal conditioning
- balanced lines and noise reduction
- standard analog 20ma current loops for process control
- analogue to digital conversion process for digital control systems including:
 - signal generation through sensors
 - signal conditioning
 - signal amplification where needed
 - signal processing
- operational amplifiers
- digital to analogue conversion process and types of digital to analogue converters (DACs)
- voltage/current to frequency and frequency to voltage/current conversion
- mechanical switches.
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Assessment Conditions

- Assessors must:
 - have vocational competency in diagnosing faults in digital control 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 that cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.
- There must be 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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Links

Companion Volume Implementation Guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>