



Australian Government

**Assessment Requirements for MEM27023
Diagnose and rectify fieldbus circuits in
mobile and stationary plant and equipment**

Release: 1

Assessment Requirements for MEM27023 Diagnose and rectify fieldbus circuits in mobile and stationary plant and equipment

Modification History

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, standard operating procedures (SOPs) and safe work practices
- identifying and interpreting specifications, standards, charts, lists, SOPs, electrical drawings and diagrams to diagnose and rectify fieldbus circuits in mobile and stationary plant and equipment
- selecting and using the correct test instrument, including multimeters, amp meters and circuit testers for bus and control system circuits and components
- assessing condition and serviceability of components, including connectors, resistors, harnesses, boards, sensors, switches, fuses and seals
- applying Ohm's Law to determine the required values of current, voltage and resistance of a range of electrical circuits, including series, parallel and series parallel
- connecting electrical test instruments into given circuits to determine the required values of current, voltage and resistance in a safe and effective manner
- connecting and adjusting multi-channel and general purpose oscilloscopes to a given electrical circuit to measure wave forms at nominated points in the circuit
- fault finding using fault-finding techniques to identify wiring faults in electrical circuits
- selecting appropriate replacement cables according to size, rating and insulation resistance from supplier catalogues
- making up replacement wiring looms, strip and prepare cable ends for termination and terminate to specifications
- testing terminations for continuity and to comply with requirements
- removing and/or neutralising corrosion from terminals and connections and applying appropriate protective coating.

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)
- principles of electron theory
- definitions of current, voltage and resistance in terms of electrical circuits

- Ohm's Law and the relationships between current, voltage and resistance for a variety of given electrical circuits
- instruments and procedures to be used to measure current, voltage and resistance and safety precautions to be taken
- procedures for maintaining electrical test equipment
- principles and functions of two wire differential serial bus systems, including:
 - communication and power cables for bus systems
 - voltage states relative to shield or ground and role in information transfer
 - logic states
 - channels
 - communication protocols, including message priority and identification
 - electronic control modules (ECMs)
 - engine control modules
 - power distribution boards
 - ground modules
 - typical diagnostic codes and faults
 - cabin displays
- symbols used in electrical drawings/diagrams
- components of a variety of electrical circuits identified by given electrical drawings/diagrams
- differences between series and parallel electrical circuits
- function of a general purpose and multi-channel oscilloscopes and procedures for connecting oscilloscopes to bus and control system circuits and components
- use of wave forms in the testing of circuits
- accuracy to which electrical test equipment can be read
- examples and causes of common faults in electrical wiring and test procedures for isolating wiring faults
- specifications of cables and wires including insulation resistance used in given electrical circuits
- test procedures for terminated wiring and cables
- effect of corrosion on the performance of electrical circuits and connections
- common faults and causes in sensors, relays, solenoids, contacts and circuits and procedures for testing circuit components.

Assessment Conditions

- Assessors must:
 - have vocational competency in diagnosing and rectifying fieldbus circuits in mobile and stationary plant and 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

Links

Companion Volume implementation guides are found in VETNet -

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