



Australian Government

MEM27022 Maintain, fault find and repair traction drive mechanics

Release: 1

MEM27022 Maintain, fault find and repair traction drive mechanics

Modification History

Release 1: New unit

Application

This unit of competency defines the skills and knowledge required to maintain and repair traction drive systems on transport and mobile equipment.

It covers the skills and knowledge for mechanical related maintenance and fault finding of traction drive systems, including fault finding and rectifying mechanical systems and components supporting the operation of the traction drive system.

Where the connection and disconnection of electrical equipment operating above 36 volts is required, see unit MEM18045 Fault find and repair electrical equipment/components up to 250 volts single phase supply or unit MEM18046 Fault find and repair electrical equipment/components up to 1000 volts a.c./1500 volts d.c.

The application of the skills and knowledge described in this unit in some states/territories may require an authority to practice in the workplace. Other conditions may apply under state and territory legislative and regulatory requirements.

Band: A

Unit Weight: 4

Pre-requisite Unit

MEM09002	Interpret technical drawing
MEM11011	Undertake manual handling
MEM12023	Perform engineering measurements
MEM13015	Work safely and effectively in manufacturing and engineering
MEM16006	Organise and communicate information
MEM18001	Use hand tools
MEM18002	Use power tools/hand held operations
MEM18055	Dismantle, replace and assemble engineering components
MEM27006	Diagnose and rectify batteries, low voltage sensors and circuits

MEM27016 Diagnose and maintain electronic controlling systems on mobile and stationary plant

Competency Field

Fixed and Mobile Plant

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 and work instructions 1.5 Check equipment operational records and fault reports and codes for indications of traction system problems
2 Diagnose and rectify traction drive mechanical components	2.1 Observe engine and alternator or generator during operation for signs of abnormal shaft vibration and noise 2.2 Inspect shafts and bearings from prime mover to alternator or generator for poor lubrication, wear, overheating, corrosion or other faults 2.3 Rectify shafts and bearings through repair or replacement 2.4 Align shaft to manufacturer specifications using specified procedures and test instruments 2.5 Assess coupler and bearing clearances and adjust, as required 2.6 Check dynamic retarding components, including resistance grids, cooling air ducts and fan/blowers for operation and blockages and repair/rectify damaged components

Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
		2.7	Check wheel motor assemblies for alignment, wear, vibration and rectify faults to manufacturer specifications
		2.8	Test operation of solenoids, valves, sensors, links to electronic control modules (ECMs) and rectify where required
		2.9	Arrange for repair/rectification of any identified electrical related faults
3	Remove or install new, repaired or replacement major traction drive components	3.1	Ensure equipment is parked safely, engine off and battery, other electrical and hydraulic systems de-energised
		3.2	Check all cables, hoses and pipes are disconnected
		3.3	Remove or install major component according to manufacturer specifications
		3.4	Remove or refit ancillary components, hoses, pipes, sensors, fieldbus links and connections
		3.5	Arrange for connection of low and/or high voltage power supply connections
4	Complete repair or installation	4.1	Test run equipment and make any required post-installation adjustments
		4.2	Document work undertaken on traction drive according to workplace procedure

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.

Major traction drive components include the following:

- alternator
- generator
- drive shaft from engine
- cooling grid/s
- inverters
- rectifiers
- wheel motors
- blowers/fans

Actions to rectify faults include one (1) or more of the following:

- on-site repair, including in an on-site workshop
- removal of component to a specialist off-site repair facility
- referral of the fault to other trade, technical or professional personnel for rectification

Unit Mapping Information

No equivalent unit.

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 MEM27022 Maintain, fault find and repair traction drive mechanics

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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 specifications, charts, lists, drawings and other applicable reference documents to perform engine repair or replacement
- testing procedures for traction drive components
- checking traction drive and equipment performance against specifications
- checking components and parts for abnormal wear or defects and identifying whether to reuse, repair or replace components and parts
- aligning shafts from engine to alternator or generator
- replacement of worn or faulty parts
- obtaining and recording measurements and interpreting readings for replacement or reuse as being under or over size
- assembly and disassembly of traction drive components using appropriate tools, equipment and techniques.

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)
- tools, techniques and equipment to be used and reasons for selection
- criteria for identifying components for reuse or replacement
- traction system layout and principles, including:
 - types of engines (prime movers) and operating principles and power output
 - relationship of alternator/generator speed/load to engine performance
 - power path to motors, including role of engine, alternators/generators, inverters and rectifiers, and dynamic retarding, including function of cooling grid and blower, and wheel motors
- controls and instrumentation, including systems and controls for remote operation and monitoring

- action to be taken when abnormal wear or defects are observed in the traction drive components
- test instruments and tools used for traction drive service and maintenance.

Assessment Conditions

- Assessors must:
 - have vocational competency in maintaining, fault finding and repairing traction drive mechanics 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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