



Australian Government

MEM27009 Diagnose and rectify braking systems

Release: 1

MEM27009 Diagnose and rectify braking systems

Modification History

Release 1. Supersedes and is equivalent to MEM18035B Diagnose and rectify braking systems

Application

This unit of competency defines the skills and knowledge required to check and assess braking systems, and replace/repair/overhaul braking system components associated with mobile equipment.

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

Band: A

Unit Weight: 6

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

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.

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|---|---|-----|--|
| 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 | Check and assess braking system | 2.1 | Identify braking system types, components and arrangements, including anti-lock systems |
| | | 2.2 | Apply knowledge of friction and heat principles and component functions to check and assess braking system operation |
| | | 2.3 | Assess braking system, including control devices, for compliance with relevant specifications, regulations and standards |
| | | 2.4 | Assess serviceability of friction materials, discs and drums |
| | | 2.5 | Assess braking system communication and control modules and bus connections for correct operation and compliance with specifications |
| | | 2.6 | Measure and record minimum operating dimensions and determine corrective action |
| | | 2.7 | Diagnose faults to component level and determine appropriate corrective action |
| | | | |
| 3 | Rectify and overhaul braking system components | 3.1 | Interpret characteristics of surface finishes and wear patterns associated with braking components |
| | | 3.2 | Interpret measurements and part condition when determining reuse/replacement |

Elements describe the essential outcomes.

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

- 3.3 Remove braking system components and disassemble
- 3.4 Clean components using appropriate fluid and procedure
- 3.5 Adjust friction material to reaction member clearance to specification
- 3.6 Ensure system is free of leaks/restrictions after repair work
- 3.7 Adjust all levers, linkages and pedal clearances to specifications
- 3.8 Recommission and test braking system according to manufacturer recommendations or appropriate standard/regulation

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.

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Braking system arrangements include one (1) or more of the following:

- air
- hydraulic
- air over hydraulics
- mechanical
- electric
- disc
- multi-wet disc
- drum
- wheel brakes
- track brakes
- anti-locking braking systems
- transmission brakes and service
- park and emergency brakes

Braking system control devices include one (1) or more of the following:

- communication and control circuit cabling and connectors
- bus systems
- data logger connections for braking system
- power circuits and connectors for modules

Relevant regulations/standards include one (1) or more of the following:

- Australian Design Rules
- mines regulations
- transport regulations

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM18035B Diagnose and rectify braking systems

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 MEM27009 Diagnose and rectify braking systems

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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, including brake dust, fibre and fluid control and protection procedures
- identifying and interpreting specifications, charts, lists, drawings and service documents to diagnose and rectify braking systems
- checking braking system for conformance to specifications and for compliance with relevant regulations
- checking friction materials and identifying as being serviceable or to be replaced
- undertaking calculations and numerical operations for diagnosing and rectifying braking systems
- measuring and recording brake operating dimensions and identifying variations of brake operating measurement from specifications
- checking operation of braking system for compliance to specifications and identifying faulty components for replacement
- checking braking system interaction with equipment control and recording systems and components
- removing, dismantling, handling and replacing braking system components safely
- cleaning components using appropriate solutions and safety precautions
- adjusting brake clearance, levers, linkages and pedal clearances using appropriate tools, equipment and procedures
- testing and recommissioning the braking system for compliance with specifications/regulations.

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 friction and heat as applied to braking systems
- function of the components of a variety of braking system types and arrangements
- typical applications of different types of braking systems
- requirements of relevant regulations as applying to mobile plant braking systems

- tools, techniques and equipment used to remove and dismantle braking system components
- procedures for:
 - checking braking systems for compliance with regulations
 - measuring brake operating dimensions recording brake operating dimensions
 - checking braking system operation
 - removing and dismantling braking system components
 - cleaning braking system components and solutions to be applied
 - adjusting brake clearances, levers, linkages and pedal clearances
 - checking for hydraulic, air and vacuum system leaks and restrictions
 - testing and recommissioning the braking system
- worn and defective friction materials
- specifications of the braking system
- corrective action to be taken when brake operating measurement varies from specification
- corrective action to be taken when faulty braking system components are identified
- characteristics of surface finishes and wear patterns as applied to braking system components
- reasons for identifying the components for reuse or replacement
- precautions to be taken when handling braking systems components
- reasons for selecting the chosen tools, techniques and equipment
- tests, tools, techniques and equipment required to test the braking system and reasons for selection.

Assessment Conditions

- Assessors must:
 - have vocational competency in diagnosing and rectifying braking 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. 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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