



Australian Government

AURHTB002 Diagnose and repair heavy vehicle hydraulic and air over hydraulic braking systems

Release: 1

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Modification History

Release	Comment
Release 1	New unit of competency.

Application

This unit describes the performance outcomes required to diagnose and repair faults in the hydraulic and air over hydraulic braking systems of heavy vehicles. It involves preparing for the task, selecting the correct diagnostic procedure, carrying out the diagnosis and the repair, performing post-repair testing, and completing workplace processes and documentation.

It applies to those working in the automotive service and repair industry. The braking systems include those in agricultural machinery, heavy commercial vehicles or mobile plant machinery. The unit does not apply to hydraulic pressure brakes in agricultural machinery or mobile plant machinery.

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

Competency Field

Mechanical - Heavy Vehicle

Unit Sector

Technical - Brakes

Elements and Performance Criteria

Elements	Performance Criteria
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold and italicised text is used, further information is detailed in the range of conditions section.
1. Prepare to diagnose and repair heavy vehicle	1.1 Job requirements are determined according to workplace instructions

Elements Elements describe the essential outcomes.	Performance Criteria Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold and italicised text is used, further information is detailed in the range of conditions section.
hydraulic and air over hydraulic braking system	1.2 Diagnostic information is sourced and interpreted 1.3 Diagnostic options are analysed and those most appropriate to the circumstances are selected 1.4 Hazards associated with the work are identified and risks are managed 1.5 Diagnostic tools and equipment are selected and checked for serviceability
2. Diagnose braking system	2.1 <i>Diagnostic tests</i> are carried out according to manufacturer specifications, workplace procedures and <i>safety and environmental requirements</i> 2.2 Faults are identified from diagnostic test results and causes of faults are determined 2.3 Diagnosis findings, including recommendations for necessary repairs or adjustments, are reported according to workplace procedures
3. Repair braking system	3.1 <i>Repair information</i> is sourced and interpreted 3.2 Repair options are analysed and those most appropriate to the circumstances are selected 3.3 Repair tools, equipment and materials are selected and checked according to manufacturer procedures 3.4 Repairs and component replacements and adjustments are carried out according to manufacturer specifications, workplace procedures, and safety and environmental requirements, and without causing damage to components or systems 3.5 <i>Post-repair testing</i> is carried out according to workplace procedures to confirm fault rectification, and any further problems detected as having been introduced during the repair process are rectified
4. Complete work processes	4.1 Final inspection is made to ensure work is to workplace expectations and vehicle is presented ready for use 4.2 Work area is cleaned, waste and non-recyclable materials are disposed of, and recyclable material is collected 4.3 Tools and equipment are checked and stored according to workplace procedures 4.4 Workplace documentation is processed according to workplace procedures

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance and are not explicit in the performance criteria.

Skills	Description
Learning skills to:	locate appropriate sources of information efficiently.
Reading skills to:	interpret information from manufacturer and workshop literature when seeking braking system specifications and procedures.
Writing skills to:	legibly and accurately fill out workplace documentation when reporting diagnostic findings, making repair recommendations, and recording parts and material used.
Oral communication skills to:	- clarify instructions - report diagnostic findings and make repair recommendations.
Numeracy skills to:	measure braking system components and use basic mathematical operations, including addition and subtraction, to calculate distances, tolerances and deviations from manufacturer specifications.
Planning and organising skills to:	plan own work requirements and prioritise actions to achieve required outcomes and ensure tasks are completed within workplace timeframes.
Technology skills to:	use braking system diagnostic equipment and measuring equipment, such as vernier calipers, micrometers and brake drum micrometers.

Range of Conditions

This section specifies 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.

Bold italicised wording, if used in the performance criteria, is detailed below.

<i>Diagnostic tests</i> must include:	- friction material wear - drum brake component serviceability - disc brake component serviceability - air braking system testing - hydraulic braking system testing.
<i>Safety and environmental requirements</i> must include:	- work health and safety (WHS) and occupational health and safety (OHS) requirements, including procedures for: - working safely with stored energy in springs and high air pressure systems

	• managing and controlling brake dust and brake fluids • removing and refitting wheel assemblies • environmental requirements, including procedures for trapping, storing and disposing of hazardous materials and substances released from braking systems, including brake fluids and brake dust and fibres.
Repair information must include procedures relating to:	• removing, replacing and adjusting system components • dismantling, repairing, reassembling and adjusting systems.
Post-repair testing must include:	• stall testing of service, park and secondary brakes • dynamic brake performance testing using approved methods or equipment.

Unit Mapping Information

Equivalent to AURHTB3002 Diagnose and repair heavy vehicle hydraulic braking systems

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b4278d82-d487-4070-a8c4-78045ec695b1>

Assessment Requirements for AURHTB002 Diagnose and repair heavy vehicle hydraulic and air over hydraulic braking systems

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Performance Evidence

Before competency can be determined, individuals must demonstrate they can perform the following according to the standards defined in this unit's elements, performance criteria, range of conditions and foundation skills:

- diagnose and repair a fault in a heavy vehicle hydraulic braking system, including:
 - master cylinder and wheel cylinders
 - disc and drum brake wheel end components
 - parking brake
- diagnose and repair a fault in a heavy vehicle air over hydraulic braking system, including:
 - disc and drum brake wheel end components
 - air compressor, delivery and storage components
 - foot valves
 - parking brake.

Knowledge Evidence

Individuals must be able to demonstrate knowledge of:

- work health and safety (WHS) and occupational health and safety (OHS) requirements relating to diagnosing and repairing heavy vehicle hydraulic and air over hydraulic braking systems, including procedures for:
 - working safely with stored energy in springs and high air pressure systems
 - managing and controlling brake dust and brake fluids
 - removing and refitting wheel assemblies
- environmental procedures for trapping, storing and disposing of hazardous materials and substances released from braking systems, including brake fluids and brake dust and fibres

- operating principles of heavy vehicle hydraulic braking systems and associated components, including:
 - levers
 - friction
 - pneumatics
 - hydraulics
- Australian Design Rules ADR35 and ADR38 relating to repairing heavy vehicle brakes
- application, purpose and operation of heavy vehicle hydraulic and air over hydraulic braking systems and components, including:
 - hydraulic braking systems, including:
 - disc and caliper assemblies
 - drum and lining assemblies
 - master cylinder and boosters
 - brake lines and hydraulic valves
 - load compensating valves
 - proportioning valves
 - air over hydraulic braking systems, including:
 - air storage
 - brake valves
 - air compressor
 - brake lines and valves
 - receiver drier
 - parking brake systems
- diagnostic testing procedures for heavy vehicle hydraulic and air over hydraulic braking systems, including:
 - air control system tests
 - hydraulic system component inspection and evaluation
 - air braking system component inspection and evaluation
 - brake fluid tests
 - parking brake operational tests
 - drum and disc brake operational tests
 - drum brake and shoes, disc and pad measurement and evaluation
 - stationary and mobile performance tests
- repair procedures for heavy vehicle hydraulic and air over hydraulic braking systems, including:
 - removal, replacement and adjustment procedures for hydraulic system components, including:
 - disc and caliper assemblies
 - drum and lining assemblies
 - master cylinder and boosters
 - brake lines and valves

- switches
- removal, replacement and adjustment procedures for hydraulic and air over hydraulic braking system components, including:
 - brake valves
 - air compressors
 - air storage
 - brake lines and valves
 - receiver driers
- post-repair testing procedures for heavy vehicle hydraulic and air over hydraulic braking systems, including stationary and mobile performance tests.

Assessment Conditions

Assessors must satisfy NVR/AQTF assessor requirements.

Competency is to be assessed in the workplace or a simulated environment that accurately reflects performance in a real workplace setting.

Assessment must include direct observation of tasks.

Where assessment of competency includes third-party evidence, individuals must provide evidence that links them to the heavy vehicle hydraulic and air over hydraulic braking systems that they have worked on, e.g. repair orders.

Assessors must verify performance evidence through questioning on skills and knowledge to ensure correct interpretation and application.

The following resources must be made available:

- automotive repair workplace or simulated workplace
- workplace instructions
- manufacturer braking system specifications
- two heavy vehicles with the faults and braking systems specified in the performance evidence
- diagnostic equipment for heavy vehicle hydraulic and air over hydraulic braking systems
- Australian Design Rules ADR35 and ADR38
- tools, equipment and materials appropriate for repairing and adjusting heavy vehicle hydraulic and air over hydraulic braking systems.

Links

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