



Australian Government

AURHTB001 Diagnose and repair heavy vehicle air braking systems

Release: 1

AURHTB001 Diagnose and repair heavy vehicle air braking systems

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 air 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 air braking systems include those in agricultural machinery, heavy commercial vehicles 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 air braking system	1.1 Job requirements are determined from workplace instructions 1.2 Diagnostic information is sourced and interpreted 1.3 Diagnostic options are analysed and those most appropriate to the

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.
	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 air 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 air 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 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 pressure 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 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, emergency and secondary brakes • dynamic brake performance testing using approved methods or equipment.

Unit Mapping Information

Equivalent to AURHTB3001 Repair air 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 AURHTB001 Diagnose and repair heavy vehicle air 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 three heavy vehicle air braking systems as follows:
 - one disc braking system, in which the work must involve removing and refitting or replacing the brake actuators, disc pads and disc rotors
 - one drum braking system, in which the work must involve removing and refitting or replacing the brake actuators, brake shoes and drums
 - one air braking system, in which the work must involve removing and refitting or replacing the following:
 - air compressor, delivery and storage components
 - slack adjusters
 - pneumatic and electronic control circuits and valves.

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 air 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 requirements, including procedures for trapping, storing and disposing of hazardous materials and substances released from braking systems, including brake dust and fibres
- Australian Design Rules ADR35 and ADR38 relating to repairing heavy vehicle brakes

- operating principles of air braking systems and associated components, including:
 - levers
 - friction
 - pneumatics
 - electronics
- application, purpose and operation of heavy vehicle air braking systems and components, including:
 - disc braking systems
 - drum braking systems
 - air compressors, air storage, air dryers and valves
 - brake actuators
 - foot valves
 - air control valves
 - manual and automatic slack adjusters
 - trailer brake valves
 - pneumatic and electronic control circuits and valves
- diagnostic testing procedures for air braking systems, including:
 - air control system testing
 - air brake component inspection and evaluation
 - brake system stationary and mobile performance tests
- repair procedures for air braking system components, including:
 - wheel end components, including:
 - disc braking systems
 - drum braking systems
 - air compressors, air storage, air dryers and valves
 - brake actuators
 - foot valves
 - manual and automatic slack adjusters
 - trailer brake valves
 - pneumatic and electronic control circuits and valves
- post-repair testing procedures for air 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 air 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 different heavy vehicles with faults in the air braking systems specified in the performance evidence
- diagnostic equipment for heavy vehicle air braking systems
- Australian Design Rules ADR35 and ADR38
- tools, equipment and materials appropriate for repairing and adjusting heavy vehicle air braking systems.

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