



Australian Government

AURHTX003 Diagnose and repair heavy vehicle automatic transmissions

Release: 1

AURHTX003 Diagnose and repair heavy vehicle automatic transmissions

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 automatic transmissions 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 automatic transmissions include those in agricultural machinery, heavy commercial vehicles or mobile plant machinery. The unit does not apply to electronic control drive management systems or power shift transmissions.

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

Competency Field

Mechanical - Heavy Vehicle

Unit Sector

Technical - Transmission

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 from workplace instructions 1.2 Diagnostic information is sourced and interpreted

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.
automatic transmission	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 automatic transmission	2.1 Diagnostic tests are carried out according to manufacturer specifications, workplace procedures, and environmental and safety requirements 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 automatic transmission	3.1 Repair information 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 Post-repair testing 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 or transmission 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 4.5 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 automatic transmission system specifications and procedures - interpret automatic transmission hydraulic and electrical circuit diagrams.
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 transmission system components and use basic mathematical operations, including addition, subtraction, multiplication and division, to calculate distances, tolerances and deviations from manufacturer specifications - calculate gear ratios and torque reduction and multiplication - interpret hydraulic and electrical test equipment scales.
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 precision measuring equipment, such as micrometers and vernier calipers - use test and diagnostic equipment, such as electronic test equipment and pressure gauges.

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>Safety requirements</i> must include:	- work health and safety (WHS) and occupational health and safety (OHS) requirements, including procedures for: - using transmission lifting and supporting equipment - isolating and stabilising vehicles.
---	---

<i>Environmental requirements</i> must include:	procedures for trapping, storing and disposing of oils and fluids released from automatic transmissions.
--	--

Unit Mapping Information

Equivalent to AURHTX3003 Repair transmissions - automatic (heavy vehicle)

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 AURHTX003 Diagnose and repair heavy vehicle automatic transmissions

Modification History

Release	Comment
Release 1	New unit of competency.

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:

- disassemble and reassemble one heavy vehicle automatic transmission
- diagnose and repair a fault in two of the following components of a heavy vehicle automatic transmission:
 - torque converter
 - transmission oil pump
 - front pump seal
 - valve body
 - shift or pressure solenoid
 - clutch pack
 - one-way clutch
 - planetary gear set
 - internal bearings or thrust washers
 - gasket and seal leaks
 - governor
 - sensors
 - heat exchanger
- remove, refit or replace a heavy vehicle automatic transmission.

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 automatic transmissions, including procedures for:

- using transmission lifting and supporting equipment
- isolating and stabilising vehicles
- environmental requirements, including procedures for trapping, storing and disposing of oils and fluids released from automatic transmissions
- operating principles of heavy vehicle automatic transmissions and associated components, including:
 - fluid couplings
 - mechanical systems, including:
 - gear types
 - gear ratios and torque
 - simple and compound planetary gear trains
 - gear range and transfer case power flows
 - hydraulic systems
 - electronic systems, including:
 - electronic control unit (ECU)
 - electronic sensors
 - solenoids
- application, purpose and operation of heavy vehicle automatic transmissions and components, including:
 - torque converters, including:
 - impeller, stator, one-way clutch and turbine operation
 - lock-up torque converters
 - automatic transmission mechanical components, including:
 - clutch packs, one-way clutches, simple and compound planetary gear sets, and transfer case
 - power flows, including:
 - longitudinal automatic transmissions
 - transfer case
 - power take-off
 - automatic transmission hydraulic components and hydraulic control components, including:
 - oil pumps
 - valve body and hydraulic valves
 - heat exchanger
 - automatic transmission electronic components, including:
 - ECU input sensors
 - ECU outputs
- diagnostic testing procedures for heavy vehicle automatic transmissions, including:
 - stall testing
 - pressure testing
 - scan tool testing

- repair procedures for heavy vehicle automatic transmissions, including for hydraulic, mechanical and electrical components
- dismantling procedures for heavy vehicle automatic transmissions, including:
 - measuring clearances and tolerances
 - inspecting components
- post-repair testing procedures for heavy vehicle automatic transmissions.

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 automatic transmissions 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 automatic transmission specifications
- one heavy vehicle with faults in its automatic transmission
- diagnostic equipment for heavy vehicle automatic transmissions
- tools, equipment and materials appropriate for repairing and adjusting heavy vehicle automatic transmissions.

Links

Companion Volume implementation guides are found in VETNet -

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

Companion Volume implementation guides are found in VETNet -

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