



Australian Government

AURKTX001 Diagnose and repair powershift transmissions

Release: 1

AURKTX001 Diagnose and repair powershift 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 powershift transmissions. 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 powershift transmissions include those 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 - Mobile Plant

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 powershift transmission	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 circumstances are selected 1.4 Hazards associated with the work are identified and risks are

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.
	managed 1.5 Diagnostic tools and equipment are selected and checked for serviceability
2. Diagnose powershift 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 powershift 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 machinery 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 4.4 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 powershift transmission specifications and procedures - interpret powershift 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 powershift transmission components and use basic mathematical operations, including addition, subtraction, multiplication and division, to calculate ratios, distances, tolerances and deviations from manufacturer specifications - interpret hydraulic pressure gauges and other measuring equipment.
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:	- operate diagnostic and testing equipment - conduct performance testing of components, systems and equipment.

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 isolating and stabilising machines.
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<i>Environmental requirements</i> must include:	procedures for trapping, storing and disposing of hydraulic fluid released from powershift transmissions.
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Unit Mapping Information

Equivalent to AURKTX3001 Diagnose and repair powershift transmissions

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 AURKTX001 Diagnose and repair powershift transmissions

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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 two different vehicles or machines with the following powershift transmissions:
 - multiple countershaft transmission
 - planetary shift transmission
- conduct powershift transmission stall test during above work according to manufacturer specifications and workplace procedures.

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 powershift transmissions, including procedures for isolating and stabilising machines
- environmental requirements, including procedures for trapping, storing and disposing of hydraulic fluid released from powershift transmissions
- operating principles of powershift transmissions and associated components, including:
 - torque converters, torque divider torque converters and variable capacity torque converters
 - electronically modulated transmission
 - countershaft transmissions, including:
 - gear types
 - gear ratios and torque reduction and multiplication
 - simple and compound gear trains
 - compound planetary transmissions, including:

- gear types
 - gear ratios and torque reduction and multiplication
 - simple and compound planetary gear trains
- transmission control valves and solenoids
- hydraulic circuits and schematics
- application, purpose and operation of powershift transmissions and components, including:
 - power flows in:
 - multiple countershaft transmissions
 - compound planetary transmissions
 - torque converters, torque divider torque converters, and variable capacity torque converters
 - hydraulic components and hydraulic control components, including:
 - oil pumps
 - hydraulic valves
 - electronic transmission pressure modulation
 - power train electronic control system
 - mechanical components, including:
 - clutch packs
 - one-way clutches
 - planetary gears
 - compound gear sets
 - powershift electronic control systems
 - transfer cases
 - hydraulic oils and filters
- diagnostic testing procedures for powershift transmissions, including:
 - following safety requirements when stall testing
 - stall testing according to manufacturer specifications and workplace procedures
- dismantling procedures for powershift transmissions, including:
 - measuring clearances and tolerances
 - inspecting components
- repair procedures for powershift transmissions, including procedures for inspecting, evaluating and measuring component wear
- post-repair testing procedures for powershift transmissions, including:
 - stall testing according to manufacturer specifications and workplace procedures.

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 powershift 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 powershift transmission specifications
- two different vehicles or machines with powershift transmission faults
- diagnostic equipment for powershift transmissions
- tools, equipment and materials appropriate for repairing and adjusting powershift transmissions.

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