



Australian Government

AURKTX101 Diagnose and repair powershift transmissions

Release: 1

AURKTX101 Diagnose and repair powershift transmissions

Modification History

Release	Comments
Release 1	This version first released with AUR Automotive Retail, Service and Repair Training Package Version 6.0

Application

This unit describes the skills and knowledge required to diagnose and repair faults in powershift transmissions. The unit involves preparing for the task, sourcing a diagnostic testing strategy, diagnosing the cause of the fault, carrying out the repair, performing post-repair testing, and completing workplace processes and documentation.

The unit 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.

Unit Sector

Mechanical Mobile Plant Technical – Transmissions

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Prepare to diagnose and repair powershift transmission	1.1 Identify job requirements from workplace instructions 1.2 Identify required information for diagnosis activity 1.3 Analyse diagnostic options and source testing strategy to identify cause of fault using workplace and manufacturer procedures 1.4 Identify hazards and environmental issues associated with diagnose and repair activity, assess potential risks and implement control measures in line with workplace policies and procedures 1.5 Identify tools and equipment required for testing strategy and establish serviceability according to workplace

ELEMENTS	PERFORMANCE CRITERIA
	procedures
2. Diagnose powershift transmission	2.1 Implement diagnostic tests set out in testing strategy according to manufacturer and workplace procedures, and workplace health and safety requirements 2.2 Identify cause of fault through analysis of diagnostic test results 2.3 Confirm and report cause of fault according to workplace procedures 2.4 Develop and report recommendations for necessary repairs according to workplace procedures
3. Repair powershift transmission	3.1 Identify required information for repair activity 3.2 Identify tools, equipment and materials required for repair activity and establish serviceability according to workplace procedures 3.3 Carry out repairs according to workplace and manufacturer procedures, manufacturer specifications, workplace health and safety and environmental requirements 3.4 Carry out post-repair testing according to workplace procedures, workplace health and safety and environmental requirements
4. Complete work processes	4.1 Conduct final inspection according to workplace procedures and confirm vehicle or machinery is ready for use 4.2 Clear work area and dispose of or recycle materials according to workplace procedures 4.3 Complete documentation according to workplace procedures

Foundation Skills

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

SKILL	DESCRIPTION
Learning	• Locates required sources of information efficiently • Develops a sequenced plan for a specific task.
Reading	• Organises and interprets technical information from workplace procedures, manufacturer procedures and manufacturer specifications.
Oral communication	• Clarifies instructions • Obtains information from customers and supervisors.

SKILL	DESCRIPTION
Numeracy	• Measures powershift transmission components • Uses mathematical operations • Calculates deviations and tolerances from manufacturer specifications • Interprets hydraulic pressure gauges and other measuring equipment.
Planning and organising	• Plans own work requirements • Prioritises actions to achieve required outcomes • Ensures tasks are completed within workplace timeframes.
Technology	• Operates diagnostic and testing equipment.

Unit Mapping Information

Supersedes and is equivalent to AURKTX001 Diagnose and repair powershift transmissions.

Links

Companion Volume Implementation Guide is found on VETNet -

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

Assessment Requirements for AURKTX101 Diagnose and repair powershift transmissions

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Performance Evidence

The candidate must demonstrate the ability to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including evidence of the ability to:

- diagnose and repair a fault in two different vehicles or machines with the powershift transmissions as follows:
 - one with multiple countershaft transmission
 - one with planetary shift transmission
- conduct powershift transmission stall test during above work according to manufacturer specifications and workplace procedures.

Knowledge Evidence

The candidate must be able to demonstrate knowledge to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including knowledge of:

- methods to locate and interpret information required to diagnose and repair powershift transmissions, including:
 - information provided by customers and supervisors
 - manufacturer specifications and procedures or equivalent documentation
- workplace procedures required to diagnose and repair powershift transmissions, including:
 - establishing serviceability of tools and equipment
 - documentation procedures
 - housekeeping procedures, including:
 - examination of tools and equipment
 - storage of equipment
 - identification, tagging and isolation of faulty equipment
 - disposal of excess materials
 - recycling procedures
- workplace health and safety (WHS) requirements relating to diagnosing and repairing powershift transmissions, including procedures for isolating and stabilising machines

- environmental requirements relating to diagnosing and repairing powershift transmissions, 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
- 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
- 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

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.

Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.

Links

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