



Australian Government

AURTTX008 Overhaul manual transmissions

Release: 1

AURTTX008 Overhaul manual transmissions

Modification History

Release	Comment
Release 1	New unit of competency.

Application

This unit describes the performance outcomes required to return a manual transmission to original manufacturer tolerances and clearances. It involves preparing for the task, dismantling and evaluating the transmission, carrying out the overhaul procedures, reassembling and testing the transmission, and completing workplace processes and documentation.

It applies to those working on manual transmissions in vehicles from all sectors of the industry.

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

Competency Field

Mechanical Miscellaneous

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 dismantle manual transmission	1.1 Job requirements are determined from workplace instructions 1.2 Dismantling information is sourced and interpreted 1.3 Dismantling options are analysed and those most appropriate to the circumstances are selected

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.
	1.4 Hazards associated with the work are identified and risks are managed 1.5 Dismantling tools and equipment are selected and checked for serviceability
2. Dismantle and evaluate manual transmission and components	2.1 Transmission is dismantled in a logical sequence according to manufacturer and workplace procedures, and <i>safety and environmental requirements</i> , and without causing unnecessary damage to components or systems 2.2 Components are cleaned for evaluation according to workplace procedures and safety and environmental requirements 2.3 Components are measured and compared with manufacturer specifications and serviceability is determined 2.4 Component repair method is determined 2.5 Unserviceable parts are identified and replacement parts sourced
3. Carry out overhaul	3.1 Overhaul information is sourced and interpreted 3.2 Overhaul options are analysed and those most appropriate to the circumstances are selected 3.3 Overhaul tools and equipment are selected and checked for serviceability 3.4 Components are machined, repaired and replaced as required, and adjustments are carried out according to manufacturer specifications, workplace procedures, and safety and environmental requirements, and without causing damage to components or systems
4. Assemble transmission and components	4.1 Transmission is assembled according to manufacturer specifications, workplace procedures, and safety and environmental requirements 4.2 Tolerances and clearances are measured against manufacturer specifications and necessary adjustments are made 4.3 Assembly of transmission is completed within workplace timeframes and without causing damage to other components or systems 4.4 Post-assembly testing is carried out according to workplace procedures and safety and environmental requirements, and any problems detected as having been introduced during the assembly process are rectified

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.
5. Complete work processes	5.1 Final inspection is made to ensure work is to workplace expectations and transmission is presented ready for use or storage 5.2 Work area is cleaned, waste and non-recyclable materials are disposed of, and recyclable material is collected 5.3 Tools and equipment are checked and stored according to workplace procedures 5.4 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 sources of information for manual transmissions efficiently.
Reading skills to:	interpret and assess information from manufacturer and workshop literature when seeking manual transmission 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 evaluation findings and make overhaul recommendations.
Numeracy skills to:	measure manual transmission components and use basic mathematical operations, including addition, subtraction, multiplication and division, to calculate distances, areas, volumes, tolerances and deviations from manufacturer specifications.
Planning and organising skills to:	plan own work requirements and prioritise and sequence actions to achieve required outcomes and ensure tasks are completed within workplace timeframes.
Technology skills to:	use precision measuring equipment, such as vernier calipers and micrometers

Skills	Description
	• use specialised manual transmission overhaul equipment, such as: • dummy shafts • bearing pullers and presses.

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 and environmental requirements</i> must include:	• work health and safety (WHS) and occupational health and safety (OHS) requirements, including procedures for using: • specialised manual transmission overhaul tools, equipment and machinery • chemicals and toxic substances • manual and mechanical lifting equipment • environmental requirements, including procedures for trapping, storing and disposing of fluids released from manual transmissions.
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Unit Mapping Information

Equivalent to AURTTX4008 Overhaul transmissions (manual)

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 AURTTX008 Overhaul manual 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:

- overhaul three different manual transmissions, one of which must include a transaxle 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 overhauling manual transmissions, including procedures for using:
 - specialised manual transmission overhaul tools, equipment and machinery
 - chemicals and toxic substances
 - manual and mechanical lifting equipment
- environmental requirements, including procedures for trapping, storing and disposing of fluids released from manual transmissions
- types, characteristics and operating principles of manual transmissions, including transaxles and conventional transmissions
- manual transmission overhaul procedures, including:
 - methods for cleaning and preparing manual transmissions for overhaul
 - transmission dismantling procedures
 - transmission component inspection, measuring and evaluation procedures, including:
 - non-destructive testing procedures, including dye penetrant testing and magnetic particle testing
 - assessing transmission case damage and alignment to engine

- measuring tolerances and clearances of components, including extension housing seal and bushing, bearings, gear wear and damage, synchroniser units and baulk rings, shift rails and forks, detents and interlock systems, and input, main, counter and output shafts
- transmission component repair and adjustment procedures, including:
 - bearings and shims
 - seals and bushings
 - speedometer drive gears
- transmission assembly procedures, including procedures for adjusting component tolerances, including:
 - bearing preload
 - shaft end float
 - final drive bearing preload
- post-overhaul testing procedures for manual 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 manual 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:

- mechanical repair workplace or simulated workplace
- workplace instructions
- manufacturer manual transmission specifications
- three different manual transmissions requiring overhaul, one of which must be a transaxle
- tools, equipment and materials appropriate for overhauling and adjusting manual transmissions.

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