Title	**Demonstrate knowledge of light vehicle automatic transmission components and fault diagnosis procedures**		
Level	**4**	**Credits**	**8**

Purpose	This unit standard is intended for people in the automotive engineering repair industry. People credited with this unit standard are able to demonstrate knowledge of: torque converters; light vehicle automatic transmission gear trains; hydraulic systems used in light vehicle automatic transmissions; and light vehicle automatic transmission fault diagnosis procedures.

Classification	Motor Industry > Automotive Transmission Systems

Available grade	Achieved

Guidance Information

1 It is recommended that people hold credit for Unit 30562, *Demonstrate knowledge of automatic transmissions* before being assessed against this unit standard.

2 Evidence presented for assessment against this unit standard must be consistent with safe working practices and be in accordance with applicable service information, and company requirements and legislative requirements. This includes the knowledge and use of suitable tools and equipment.

3 Performance of the outcomes of this unit standard must comply with the following: Health and Safety at Work Act 2015.

4 Any new, amended or replacement Acts, regulations, standards, codes of practice, guidelines, or authority requirements or conditions affecting this unit standard will take precedence for assessment purposes, pending review of this unit standard.

5 Definitions
Company requirements refer to instructions to staff on policy and procedures that are available in the workplace. These requirements may include – company policies and procedures, work instructions, product quality specifications and legislative requirements.
Light vehicle refers to classes MA, MB, MC, MD, MD1, MD2 and NA as specified in the Vehicle equipment standards classifications at https://www.nzta.govt.nz/vehicles/vehicle-types/vehicle-classes-and-standards/vehicle-classes/.

Service information refers to information such as technical information for a vehicle, machine, or product detailing operation; installation and servicing procedures; manufacturer instructions; technical terms and descriptions; and detailed illustrations. *Suitable tools and equipment* refer to industry approved tools and equipment that are recognised within the industry as being the most suited to complete the task in a professional and competent manner with due regard to safe working practices.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of torque converters.

Performance criteria

1.1 The general construction of a torque converter is described.

1.2 The way in which the torque converter transmits power and how it multiplies torque are explained.

1.3 The location and purpose of a lockup clutch are described.

1.4 The way in which a lockup clutch is applied is described.

Outcome 2

Demonstrate knowledge of light vehicle automatic transmission gear trains.

Performance criteria

2.1 The main components of a planetary gear set are identified, and the methods of achieving forward and reverse motion, increase and decrease in speed, and direct drive are explained.

Range components – sun gear, planet gear carrier, planetary gears (pinions), annulus (ring gear).

2.2 The basic power flow is traced out for each item in each range from the input to output shafts.

Range includes but is not limited to – reverse, first gear, second gear, third gear, fourth gear, overdrive.

2.3 Characteristics and operation of compound gear sets are described.

Range Simpson, Ravigneaux, Wilson, Lepelletier.

Outcome 3

Demonstrate knowledge of hydraulic systems used in light vehicle automatic transmissions.

Performance criteria

3.1 The requirements of an automatic transmission fluid are described.

Range power transmission, cooling, lubrication, no loss of clutch friction, hydrostatic control.

3.2 The purpose of the pump, and a means of driving it, are described.

3.3 Clutches, bands, and servos are identified, and their function and operation (including overlap shift control) are described.

3.4 The methods of deriving line pressure, throttle pressure, and governor pressure are described.

3.5 The uses for line, throttle, and governor pressures of automatic transmissions are described.

Range up-shift, down-shift, kick-down, lockup.

3.6 Electronic control operation (including driver shift override) is described.

Outcome 4

Demonstrate knowledge of light vehicle automatic transmission fault diagnosis procedures.

Performance criteria

4.1 Procedures to gather data as an aid to diagnosing faults are described.

Range includes but is not limited to – customer and/or driver complaint, obtaining technical service information, accessing fault codes, visual inspection, fluid check, pressure checks, road test.

4.2 Procedures, precautions, and limitations required to carry out a stall test are described.

4.3 Transmission fluid appearance as an aid to diagnosis is described.

Range colour, odour, solid particles, water ingress.

4.4 Procedures to determine source of external fluid leaks are described.

4.5 The use of fault-finding charts to diagnose faults is explained.

Range includes but is not limited to – poor shift quality, failure to start or starting in drive gears, slippage, abnormal noise, no drive, no park lock.

Planned review date	31 December 2025

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	29 October 1993	31 December 2022
Review	2	4 October 1996	31 December 2022
Review	3	26 February 1999	31 December 2022
Review	4	25 February 2008	31 December 2022
Review	5	27 May 2021	N/A

Consent and Moderation Requirements (CMR) reference	0014

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

Comments on this unit standard

Please contact MITO New Zealand Incorporated info@mito.org.nz if you wish to suggest changes to the content of this unit standard.