

<b>Title</b>	<b>Diagnose and rectify faults on the electronic auto-shift on a heavy vehicle manual transmission</b>		
<b>Level</b>	<b>4</b>	<b>Credits</b>	<b>4</b>

<b>Purpose</b>	This unit standard is for people in the automotive repair industry. People credited with this unit standard are able to diagnose and rectify heavy vehicle electronic auto-shift faults on a manual transmission.
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<b>Classification</b>	Motor Industry > Automotive Transmission Systems
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<b>Available grade</b>	Achieved, Merit, and Excellence
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<b>Prerequisites</b>	Appropriate driver licence for the vehicle being driven.
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### Guidance Information

- Legislation and publications relevant to this unit standard include but are not limited to – Health and Safety in Employment Act 1992; Land Transport Rules: Heavy Vehicles 2004, Rule 31002; Vehicle Repair 1998, Rule 34001; *The Official New Zealand Road Code*, Land Transport New Zealand.
- Land Transport Rules are produced for the Minister of Transport by Land Transport New Zealand. These rules are available online at <http://www.landtransport.govt.nz/rules/>. New Zealand Road Code information can be obtained from the following website <http://www.landtransport.govt.nz/roadcode>.
- Definitions  
*Company requirements* refer to instructions to staff on policy and procedures which are documented in memo or manual format and are available in the workplace. These requirements include but are not limited to – company specifications and procedures, work instructions, manufacturer specifications, product quality specifications, and legislative requirements.  
*Heavy vehicle* refers to a motor vehicle that is of Class MD3, MD4, ME, NB, NC, TC or TD; or has a gross vehicle mass that exceeds 3500 kg and is not of a class specified in the Table of vehicle classes as listed from Land Transport New Zealand website <http://www.landtransport.govt.nz/publications/infosheets/infosheet-1-10.html#classes>.  
*Service information* may include but is not limited to – technical information of a vehicle, machine, or product detailing operation; installation and servicing procedures; manufacturer instructions and specifications; technical terms and descriptions; and detailed illustrations. This can be accessed in hard copy or electronic format and is normally sourced from the manufacturer.

*Suitable tools and equipment* means 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.

- 4 Recommended: Unit 2318, *Demonstrate knowledge of the construction and operation of heavy vehicle and equipment manual transmissions*, or demonstrate equivalent knowledge and skills.

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## Outcomes and performance criteria

### Outcome 1

Diagnose heavy vehicle electronic auto-shift faults on a manual transmission.

Range one of – pneumatic, air, hydraulic.

### Performance criteria

- 1.1 Safe working practices are observed throughout the task in accordance with legislative requirements.
- Range personal safety, safety of others, vehicle safety, workshop safety, environmental safety, tools and equipment safety.
- 1.2 The type and model of electronic auto-shift transmission is determined from service information.
- 1.3 Suitable tools and equipment are selected and used that enable the tests to be carried out in accordance with service information.
- 1.4 The transmission fluid is checked in the manner prescribed by the manufacturer.
- Range oil leaks, type of oil, oil level, service period, oil contamination, transmission breather.
- 1.5 Transmission pressures are determined from various pressure tapping points, and the results recorded, in accordance with service information.
- 1.6 The transmission is stall-tested in accordance with service information. The results are compared with service information for normal operation, and any variations are recorded.
- 1.7 The vehicle engine maximum governed speed is established and the vehicle or equipment is operated in accordance with the Road Code. The transmission change speeds are determined using the procedure prescribed by the manufacturer, and the results recorded.
- 1.8 From the information obtained in the transmission tests, any faults and their probable causes are identified and noted in accordance with company requirements.

Range may include but is not limited to – no response to shift lever, shifts at too high and too low a road speed, engine over-speeds on upshift, excessive creep in first gear, low main pressure in one range, low main pressure in all ranges, transmission oil overheating, high and low stall speeds, creep in neutral, clutch slippage, air pressure too high or too low.

1.9 Faults in electronically controlled transmission change speeds are identified from fault codes read from the transmission electronic control unit (ECU), and further action determined, in accordance with service information.

Range on-board fault code display, portable fault code scanner.

## Outcome 2

Rectify electronic auto-shift faults on a manual transmission.

### Performance criteria

2.1 Safe working practices are observed throughout the task in accordance with legislative requirements.

Range personal safety, safety of others, vehicle safety, workshop safety, environmental safety, tools and equipment safety.

2.2 Suitable tools and equipment are selected and used that enable faults to be rectified in accordance with service information.

2.3 Faults are rectified in accordance with service information.

Range excluding procedures requiring removal and disassembly of the transmission.

2.4 The transmission is drained of oil, the sump removed, and adjustments made to shift signal valve pressures in order to raise and lower shift speeds in accordance with service information.

2.5 The transmission sump is installed and the transmission oil replaced with the type and to the level determined by the manufacturer.

2.6 The transmission is retested in accordance with service information to ensure no faults remain.

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**This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.**

**Status information and last date for assessment for superseded versions**

Process	Version	Date	Last Date for Assessment
Registration	1	25 February 2008	31 December 2020
Review	2	26 April 2018	31 December 2020

<b>Consent and Moderation Requirements (CMR) reference</b>	0014
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

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