

<b>Title</b>	<b>Demonstrate knowledge of heavy vehicle and equipment automatic transmission operation</b>		
<b>Level</b>	<b>3</b>	<b>Credits</b>	<b>5</b>

<b>Purpose</b>	This theory-based unit standard is for people in the automotive heavy repair industry. People credited with this unit standard are able to demonstrate knowledge of hydrodynamic drives, epicyclic gearing, and heavy vehicle and equipment automatic transmissions.
----------------	--

<b>Classification</b>	Motor Industry > Automotive Transmission Systems
-----------------------	--

<b>Available grade</b>	Achieved
------------------------	----------

---

### Guidance Information

#### Definitions

*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.

---

### Outcomes and performance criteria

#### Outcome 1

Demonstrate knowledge of hydrodynamic drives.

#### Performance criteria

1.1 The principles and operation of fluid couplings and hydraulic retarders are described in accordance with service information.

Range fluid flow, kinetic energy, blade configuration, energy transfer efficiency, cooling.

- 1.2 The principles and operation of hydraulic torque converters are described in accordance with service information.

Range fluid flow, fluid pressure, blade configuration, torque multiplication, power transfer efficiency, cooling, stator, one-way clutch.

**Outcome 2**

Demonstrate knowledge of epicyclic gearing.

**Performance criteria**

- 2.1 The operation of a single epicyclic gear set is described in accordance with service information.

Range sun gear input – ring gear held; ring gear input – sun gear held; carrier input – sun gear held; sun gear input – carrier held.

- 2.2 The operation of the Simpson compound planetary gear set is described in accordance with service information.

**Outcome 3**

Demonstrate knowledge of heavy vehicle and equipment automatic transmissions.

**Performance criteria**

- 3.1 Types of heavy vehicle and equipment automatic transmissions are identified from service information.

- 3.2 The positions of the gear sets in the transmission are identified and shown diagrammatically in accordance with service information.

- 3.3 The power path through the transmission is described diagrammatically in accordance with service information.

- 3.4 The hydraulic control circuit of a gear selection is described in accordance with service information.

Range includes but is not limited to - pump, accumulator, pressure regulator, manual valve, servo and brake band, shift valve, governor, throttle valve, downshift valve, electronic control (shift-by-wire), electro-pneumatic control.

<b>Replacement information</b>	This unit standard, unit standard 2318, and unit standard 3385 were replaced by unit standard 31227.
--------------------------------	--

**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	28 September 1994	31 December 2020
Review	2	21 February 1999	31 December 2020
Review	3	25 February 2008	31 December 2020
Review	4	26 July 2018	31 December 2020

**Consent and Moderation Requirements (CMR) reference**

0014

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