

<b>Title</b>	<b>Demonstrate knowledge of manual drive systems used on outdoor powered equipment</b>		
<b>Level</b>	<b>3</b>	<b>Credits</b>	<b>4</b>

<b>Purpose</b>	People credited with this unit standard are able to demonstrate knowledge of outdoor powered equipment manual transmissions, transaxles, angle drive units, and differential assemblies.
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<b>Classification</b>	Motor Industry > Automotive Transmission Systems
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<b>Available grade</b>	Achieved
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## Guidance Information

### Definition

*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.

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## Outcomes and performance criteria

### Outcome 1

Demonstrate knowledge of outdoor powered equipment manual transmissions.

### Performance criteria

- 1.1 The types of gears used in manual transmissions are identified in accordance with service information.
- Range spur gears, bevel gears.
- 1.2 The component parts of manual transmissions are identified, and their functions described, in accordance with service information.
- Range shifter assembly, countershaft, input shaft and gear, shifter and brake shaft assembly, spur gears, bevel spur gear, reverse gear and chain assembly, output sprocket.
- 1.3 Transmission shaft layout and location are described in accordance with service information.

Range input shaft, countershaft, shifter and brake shaft.

- 1.4 Methods of lubricating gears, bearings, and bushes are described in accordance with service information.

Range pressure fed, splash, sealed, impregnated.

- 1.5 Power flow is traced out for any selected gear, from the input shaft to the output sprocket.

## Outcome 2

Demonstrate knowledge of outdoor powered equipment transaxles.

### Performance criteria

- 2.1 The component parts of manual transaxles are identified, and their functions described, in accordance with service information.

Range includes but is not limited to – shifter assembly, countershaft, input shaft and gear, shifter and brake shaft assembly, spur gears, bevel spur gear, reverse gear and chain assembly, output and pinion gears, differential assembly, drive axles.

- 2.2 Transaxle shaft layout and location are described in accordance with service information.

Range input shaft, countershaft, shifter and brake shaft, output shaft.

- 2.3 Power flow is traced out for any selected gear, from the input shaft to the output shaft.

- 2.4 The layout and operation of a reduction gear and differential unit assembly powered by a hydrostatic pump are described in accordance with service information.

## Outcome 3

Demonstrate knowledge of outdoor powered equipment angle drive units.

### Performance criteria

- 3.1 The component parts of angle drive units are identified, and their functions described, in accordance with service information.

Range includes but is not limited to – input shaft, driving gear, output gear, output shaft, bearing assembly, oil seals.

- 3.2 The operation of an angle drive is described in accordance with service information.

## Outcome 4

Demonstrate knowledge of outdoor powered equipment differential assemblies.

### Performance criteria

4.1 The component parts of differential assemblies are identified, and their functions described, in accordance with service information.

Range includes but is not limited to – axles, bevel gears, bevel pinions, ring gear, differential carrier, thrust bearings and washers.

4.2 The operation of a differential is described in accordance with service information.

Range conventional differential, limited slip differential.

<b>Planned review date</b>	31 December 2023
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### Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	23 February 1999	31 December 2020
Revision	2	16 April 2003	31 December 2020
Review	3	25 February 2008	31 December 2020
Review	4	30 August 2018	N/A

<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>.

### Comments on this unit standard

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