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| Title | Diagnose and rectify faults in manual drive systems used on outdoor powered equipment | | |
| Level | 4 | Credits | 5 |

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| Purpose | This unit standard is for people in the outdoor power equipment repair industry. People credited with this unit standard are, on outdoor powered equipment, able to: diagnose faults in a manual transmission and clutch; dismantle and inspect the clutch; reassemble and adjust the clutch; remove, dismantle, and inspect a manual transmission unit; and reassemble, adjust, and refit the transmission unit. |
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| Classification | Motor Industry > Automotive Transmission Systems |
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| Available grade | Achieved |
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Guidance Information

- 1 Legislation relevant to this unit standard includes but is not limited to – Health and Safety in Employment Act 1992.
- 2 **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.
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.
- 3 For this unit standard, it is essential that the practical assessment evidence is obtained in the workplace under normal workplace conditions.
- 4 Recommended for entry: Unit 15415, *Demonstrate knowledge of manual drive systems used on outdoor powered equipment*.

Outcomes and performance criteria

Outcome 1

Diagnose faults in a manual transmission and clutch on outdoor powered equipment.

Performance criteria

- 1.1 Safe working and driving practices are observed throughout the task in accordance with legislative requirements.
- Range personal safety, safety of others, machine or equipment safety, workshop safety, environmental safety, tools and equipment safety.
- 1.2 The level and condition of the transmission oil are checked visually and by feel, and any problems noted in accordance with company requirements.
- 1.3 Clutch operation and gear selection are tested with the vehicle stationary and the engine running, and any problems noted, in accordance with service information.
- 1.4 The machine is operated to reproduce the fault symptoms, and to test the operation of the clutch and transmission in each of the gears under various terrain and load conditions, and details of conditions when the symptoms occur are noted in accordance with company requirements.
- Range conditions – hilly and level terrain; accelerating, overrun, constant speed.
- 1.5 The test results are analysed in accordance with service information to determine the probable causes of any faults found.

Outcome 2

Dismantle and inspect the clutch on outdoor powered equipment.

Performance criteria

- 2.1 Safe working practices are observed throughout the task in accordance with legislative requirements.
- Range personal safety, safety of others, machine or equipment safety, workshop safety, environmental safety, tools and equipment safety.
- 2.2 Suitable tools and equipment are selected and used to enable the clutch to be dismantled and inspected in accordance with service information.
- 2.3 The clutch and/or transmission is drained of oil, and the oil is disposed of in an environmentally safe manner in accordance with company requirements.

- 2.4 The clutch assembly is disassembled in accordance with service information.
- 2.5 The clutch components are inspected for signs of damage, wear, and overheating, and an assessment is made to determine which parts are suitable for further use in accordance with company requirements.
- Range pressure plate, clutch hub inner and outer, steel and/or friction discs, bearings, springs, weights, levers.
- 2.6 Any parts that are not suitable for further service are replaced to manufacturer specifications in accordance with service information.

Outcome 3

Reassemble and adjust the clutch on outdoor powered equipment.

Performance criteria

- 3.1 Safe working practices are observed throughout the task in accordance with legislative requirements.
- Range personal safety, safety of others, machine or equipment safety, workshop safety, environmental safety, tools and equipment safety.
- 3.2 Suitable tools and equipment are selected and used to enable the clutch assembly to be assembled and adjusted in accordance with service information.
- 3.3 The clutch is reassembled in accordance with service information.
- 3.4 The clutch and/or transmission is filled with oil in accordance with manufacturer specifications.
- 3.5 The clutch operating mechanism is connected and adjusted to comply with manufacturer specifications.

Outcome 4

Remove, dismantle, and inspect a manual transmission unit on outdoor powered equipment.

Range in-line and transaxle types.

Performance criteria

- 4.1 Safe working practices are observed throughout the task in accordance with legislative requirements.
- Range personal safety, safety of others, machine or equipment safety, workshop safety, environmental safety, tools and equipment safety.

- 4.2 Suitable tools and equipment are selected and used to enable the transmission to be removed, dismantled, and inspected in accordance with service information.
- 4.3 The transmission assembly is removed from the equipment in accordance with service information.
- 4.4 The transmission is cleaned externally to prevent the ingress of dirt and foreign matter during disassembly.
- 4.5 The transmission is disassembled, and signs that could indicate causes of faults identified and noted, in accordance with service information.

Outcome 5

Reassemble, adjust, and refit the transmission unit on outdoor powered equipment.

Range in-line and transaxle types.

Performance criteria

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

Range personal safety, safety of others, machine or equipment safety, workshop safety, environmental safety, tools and equipment safety.
- 5.2 Suitable tools and equipment are selected and used to enable the transmission assembly to be assembled, adjusted, and refitted in accordance with service information.
- 5.3 All transmission components are cleaned and inspected for wear, damage, and blockage of passageways. Any faults are rectified in accordance with service information.
- 5.4 The transmission is reassembled in accordance with service information. Any clearances and preloads are adjusted to comply with manufacturer specifications.
- 5.5 The transmission is filled with oil in accordance with manufacturer specifications.
- 5.6 The transmission is refitted to the equipment in accordance with service information.
- 5.7 The machine is operated to ensure the transmission operates to manufacturer specifications.

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 | 23 February 1999 | 31 December 2021 |
| Revision | 2 | 16 April 2003 | 31 December 2021 |
| Review | 3 | 25 February 2008 | 31 December 2021 |
| Review | 4 | 22 August 2019 | 31 December 2021 |

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