

## Diagnose and rectify heavy vehicle or equipment manual transmission faults

**Level** 4

**Credits** 6

**Purpose** This unit standard is for people in the automotive repair industry. People credited with this unit standard are able to: diagnose transmission faults in, and remove the transmission from, a heavy vehicle or equipment; disassemble, inspect, rectify faults in, and reassemble the transmission; and re-install the transmission.

**Subfield** Motor Industry

**Domain** Automotive Transmission Systems

**Status** Registered

**Status date** 25 February 2008

**Date version published** 25 February 2008

**Planned review date** 31 December 2012

**Entry information** Prerequisite: Appropriate driver licence for the vehicle or equipment being driven.

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

**Accreditation** Evaluation of documentation and visit by NZQA and industry.

**Standard setting body (SSB)** NZ Motor Industry Training Organisation (Incorporated)

**Accreditation and Moderation Action Plan (AMAP) reference** 0014

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

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### Special notes

- 1 Legislation relevant to this unit standard includes but 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.

*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.

- 3 In element 3, transmission testing is to be arranged. The driver will require a Class 2, 3, 4 or 5 driver licence appropriate for the heavy motor vehicle being driven.

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## Elements and performance criteria

### Element 1

Diagnose transmission faults in, and remove the transmission from, a heavy vehicle or equipment.

### Performance criteria

- 1.1 Safe working practices are observed throughout the task in accordance with legislative requirements.
- Range personal safety, safety of others, vehicle or equipment safety, workshop safety, environmental safety, tools and equipment safety.
- 1.2 The need for repair is established and the faults noted in accordance with company requirements.
- Range driver report, service record, visual inspection, road test.
- 1.3 Suitable tools and equipment are selected and used that enable transmission faults to be determined, and the transmission to be removed, in accordance with service information.
- 1.4 The transmission is drained of oil, and the controls and output shaft disconnected and safely supported when detached from the engine, in accordance with service information.

- 1.5 The transmission is removed from the vehicle or machine, without personal injury and damage to the heavy vehicle or equipment and transmission, in accordance with service information.
- 1.6 The transmission is externally cleaned so as to remove all foreign matter, and securely attached to a repair stand in accordance with company requirements.

## **Element 2**

Disassemble, inspect, rectify faults in, and reassemble the 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 or equipment safety, workshop safety, environmental safety, tools and equipment safety.
- 2.2 Suitable tools and equipment are selected and used that enable the transmission to be disassembled in accordance with service information.
- 2.3 The transmission is disassembled, with any gear timing requirements met, in accordance with service information.
- 2.4 The parts are cleaned and inspected for wear and damage, and the results recorded, in accordance with company requirements.
- 2.5 The parts are stored to maintain their cleanliness and positional integrity in accordance with company requirements.
- 2.6 A decision is made on the serviceability of the parts inspected. Repairable components are repaired, and those not repairable are replaced with replacement parts to meet manufacturer specifications.
- 2.7 The transmission is reassembled, achieving any gear timing and axial clearance requirements of the components, in accordance with service information.

## **Element 3**

Re-install the transmission.

### **Performance criteria**

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

- 3.2 The assembled transmission is lifted into position in the vehicle or equipment, with no injury or damage to the heavy vehicle, equipment, or transmission, in accordance with company requirements.
- 3.3 The transmission is attached to the heavy vehicle or equipment engine and secured in accordance with service information.
- 3.4 The transmission gear and/or range change controls are fitted and tested to ensure correct operation in accordance with company requirements.
- 3.5 The drive shaft is attached, the transmission lubricated, and clutch and clutch brake adjustments made, to ensure operation meets manufacturer specifications.
- 3.6 The transmission is arranged to be tested using the manufacturer's recommended procedure, and its performance is noted in accordance with company requirements.

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### **Please note**

Providers must be accredited by NZQA, or an inter-institutional body with delegated authority for quality assurance, before they can report credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be accredited by NZQA before they can register credits from assessment against unit standards.

Accredited providers and Industry Training Organisations assessing against unit standards must engage with the moderation system that applies to those standards.

Accreditation requirements and an outline of the moderation system that applies to this standard are outlined in the Accreditation and Moderation Action Plan (AMAP). The AMAP also includes useful information about special requirements for organisations wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.

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### **Comments on this unit standard**

Please contact the NZ Motor Industry Training Organisation (Incorporated) [info@mito.org.nz](mailto:info@mito.org.nz) if you wish to suggest changes to the content of this unit standard.