Title	**Operate a manual constant mesh non-synchromesh transmission**		
Level	**3**	**Credits**	**4**

Purpose	People credited with this unit standard are able to: describe the operation of a manual constant mesh non-synchromesh transmission; and demonstrate correct operation of a manual constant mesh non-synchromesh transmission.

Classification	Commercial Road Transport > Commercial Road Transport Skills

Available grade	Achieved

Prerequisites	Drivers must hold a current full driver licence appropriate to the class of vehicle being driven.

Guidance Information

1 Legislation, regulations, references and/or industry standards relevant to this unit standard include but are not limited to the:

- Health and Safety at Work Act 2015;
- Land Transport Act 1998.

Any new, amended or replacement Acts, regulations, standards, codes of practice, guidelines, or authority requirements or conditions affecting this unit standard will take precedence for assessment purposes, pending review of this unit standard.

2 Definitions

Compound shifting occurs when the driver operates both the gear shift lever, a splitter control and/or a range change control to change to a higher or lower gear.
Countershaft brake and *clutch brake* refer to transmission brakes that stop the gears from turning when the vehicle is stationary so that the driver can select a gear to move off from rest.
Manual constant mesh non-synchromesh transmission refers to a gearbox that is not operated electronically and where a gear can only be selected when the driver operates a normal gear shift lever and/or its associated controls.
Manufacturer's instructions refer to instructions provided by manufacturers of substances, equipment, and machinery. These instructions may include details on safe and correct handling, use and storage of substances and/or details on substance properties. Examples are labels on substance containers, product data sheets, and operator's manuals.
Progressive gear shifting impacts positively on fuel economy and is achieved when up shifting by only using enough engine revolutions per minute to ensure the next gear is selected smoothly within the operating range.

RPM refers to revolutions (revs) per minute.
Simple shifting occurs when the driver changes up or down using only the gear shift lever.
Skip shifting occurs when the driver deliberately misses at least one gear when changing up or down.
Splitter shifts occur when the driver changes up or down only half a gear using the splitter control.
Workplace procedures refer to organisation policies and procedures that are documented in memo, electronic, or manual format and available in the workplace. They may include but are not limited to – standard operating procedures, site specific procedures, site safety procedures, equipment operating procedures, quality assurance procedures, product quality specifications, manufacturer's requirements, references, approved codes of practice, housekeeping standards, environmental considerations, on-site briefings, supervisor's instructions, and procedures to comply with legislative and local body requirements relevant to the commercial road transport sector.

3 Assessment information
For the purposes of assessment against this unit standard, electronically controlled automated transmissions must not be used.

Evidence presented for assessment against this unit standard must be consistent with safe working practices and be in accordance with applicable service information, workplace procedures and legislative requirements.

Outcomes and performance criteria

Outcome 1

Describe the operation of a manual constant mesh non-synchromesh transmission.

Performance criteria

1.1 Operating techniques for a non-synchromesh transmission are described in terms of correctly matching engine and road speeds to reflect vehicle and road conditions.

Range use of the tachometer, skip shifting, compound shifting, simple shifting, application of observation techniques.

1.2 The procedures for operating a non-synchromesh transmission are described in terms of the different shift patterns.

Range two of – 18 speed, 15 speed, 13 speed, 10 speed, 9 speed.

1.3 Procedures to be followed in the event of a missed gear change are described.

Range flat ground, uphill grades, downhill grades.

Outcome 2

Demonstrate correct operation of a manual constant mesh non-synchromesh transmission.

Performance criteria

2.1 Operation of clutch is demonstrated in accordance with the manufacturer's instructions and the safe and reliable life of the transmission.

Range includes – double clutching when shifting, clutch stroke, use of countershaft brake or clutch brake;
may include – during splitter shifts and compound shifts.

2.2 Use of range change and, where fitted, splitter controls is demonstrated in accordance with the manufacturer's instructions and the safe and reliable life of the transmission.

2.3 Gears are selected to avoid clashing or grinding of gears.

Range engine RPM, timing, anticipating changes in terrain or traffic, selection of proper gear.

2.4 Progressive gear shifting is demonstrated in accordance with the manufacturer's instructions and the safe and reliable life of the gearbox.

2.5 Correct gear is selected and maintained to reflect road and traffic conditions with consideration given to engine speed, vehicle mass and auxiliary brake performance.

Range moving off, urban driving, rural driving, highway or motorway driving;
may include – ascents and descents.

Planned review date	31 December 2028

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	25 May 1999	31 December 2022
Review	2	22 March 2005	31 December 2022
Review	3	22 October 2010	31 December 2022
Review	4	29 April 2021	31 December 2025
Review	5	29 June 2023	N/A

Consent and Moderation Requirements (CMR) reference	0014

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

Comments on this unit standard

Please contact Hanga-Aro-Rau Manufacturing, Engineering and Logistics Workforce Development Council qualifications@hangaarorau.nz if you wish to suggest changes to the content of this unit standard.