Title	**Describe heavy rigid vehicle dynamics and handling for safe driving**		
Level	**3**	**Credits**	**3**

Purpose	People credited with this unit standard are able to describe: heavy rigid vehicle dynamics; heavy rigid vehicle stability and handling characteristics; effects of loads on heavy rigid vehicle dynamics and handling; and safe practices for driving heavy rigid vehicles.

Classification	Commercial Road Transport > Commercial Road Transport Skills

Available grade	Achieved

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;
- MITO. (2021 edition). *The Truck Book - Professional Skills for Driving Trucks.* Available from: https://www.mito.org.nz/ and public libraries.

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

Handling characteristics refer to how a vehicle behaves as a result of its design and the dynamics present at the time.

Heavy rigid vehicle refers to a class NC vehicle which has a gross vehicle mass exceeding 12 tonnes.

Heavy rigid vehicle dynamics refer to the motion of the vehicle, and the interaction of the various physical forces that affect that motion.

The *system of vehicle control* refers to placing the vehicle in the correct place on the road, at the right speed and in the right gear in all driving situations but particularly when approaching and negotiating hazards.

Service information may include technical information for a vehicle, machine, or product detailing operation; installation and servicing procedures; manufacturer instructions; technical terms and descriptions; and detailed illustrations.

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
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 heavy rigid vehicle dynamics.

Performance criteria

1.1 The effects of speed on vehicle stability are identified.

1.2 The effect of vehicle weight on acceleration, deceleration, and braking is described.

1.3 The relationship between vehicle speed, weight and kinetic energy are described.

Range includes effects on braking, cornering, and the consequences of an impact.

1.4 The location of vehicle centre of gravity and the effect it has on vehicle handling is described.

1.5 How friction can assist vehicle control is described.

Range includes at least two friction examples.

1.6 The effects of centrifugal force on vehicle handling are described.

Range vehicle weight, speed, centre of gravity.

Outcome 2

Describe heavy rigid vehicle stability and handling characteristics.

Performance criteria

2.1 The effects of vehicle wheelbase and rear overhang are described.

2.2 The influences of road camber, road surface, and lateral wind on vehicle handling characteristics are described.

Outcome 3

Describe the effects of loads on heavy rigid vehicle dynamics and handling.

Performance criteria

3.1 The effects of load placement on vehicle dynamics and handling are described.

3.2 Techniques to minimise the height of the centre of gravity are described.

3.3 Managing the effects of live loads on vehicle stability are described.

3.4 Techniques to minimise load shift are described.

Outcome 4

Describe safe practices for driving heavy rigid vehicles.

Performance criteria

4.1 Techniques for reducing the likelihood of loss of control situations are described.

Range 4-second rule, 12-second rule, vehicle inspections (including on-road checks), system of vehicle control.

4.2 Safe cornering techniques, including observance of recommended cornering speeds are described.

4.3 Techniques for descending steep grades are described.

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	12 February 2001	31 December 2016
Review	2	22 March 2005	31 December 2016
Review	3	22 October 2010	31 December 2016
Review	4	16 April 2015	31 December 2017
Review	5	16 June 2016	31 December 2020
Review	6	29 November 2018	31 December 2025
Revision	7	16 December 2021	31 December 2025
Review	8	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 the 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.