Title	**Describe the primary systems and principal components of heavy motor vehicles**		
Level	**3**	**Credits**	**5**

Purpose	People credited with this unit standard are able to describe the: primary systems of a heavy motor vehicle; and the principal components of primary systems of a heavy motor vehicle.

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;
- Land Transport Act 1998;
- Heavy Motor Vehicle Regulations 1974;
- Land Transport (Driver Licensing) Rule 1999;
- Land Transport (Driver Licensing) Amendment Rule 2006;
- Land Transport Rule: Heavy Vehicles 2004;
- Land Transport (Road User) Rule 2004;
- MITO New Zealand. (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

ABS stands for anti-lock braking system.
EBS stands for electronic braking system.
Heavy vehicle may include 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 Waka Kotahi NZTA website https://www.nzta.govt.nz/.
Hub and stub axle assembly include front wheels and tyres.
Load sensing is a means (mechanical, electronic and/or pneumatic) of proportioning air pressure to heavy vehicle braking systems to reflect load mass over individual axles or axle groups.
Primary system refers to a system that is crucial to the operation of the vehicle.

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.
Stability control relates to the ability of an electronic braking system to sense excessive lateral acceleration and automatically apply brakes to counter that acceleration.
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
Range statements are to be applied where relevant to the vehicle powertrain. Components will vary for non-internal combustion engines, such as hydrogen powered and electric vehicles.

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 primary systems of a heavy motor vehicle.

Performance criteria

1.1 Primary systems of a heavy motor vehicle are described.

Range engine, engine cooling system, fuel and air supply system, exhaust and emission control system, drivetrain, braking system, steering system, electrical system, suspension system.

1.2 Auxiliary braking systems are described.

Range exhaust brake, engine brake, driveline retarder.

1.3 Trailer coupling systems are described.

Range turntable, ringfeder, locking function.

Outcome 2

Describe the principal components of primary systems of a heavy motor vehicle.

Performance criteria

2.1 Engine components and their function are described.

Range engine block, cylinder head, sump.

2.2 Engine cooling system components and their function are described.

Range water pump, radiator, hoses, fan assembly.

2.3 Fuel and air supply system components and their function are described.

Range fuel tank, fuel lines, fuel filters, injection system, electronic control module, air filter, intercooler, inlet manifold, turbo-charger.

2.4 Exhaust system components and their function are described.

Range exhaust manifold, exhaust pipes, emission control.

2.5 Drivetrain components and their function are described.

Range clutch, clutch brake, gearbox, drive shafts, differential, axles, wheels and wheel nuts, tyres, central tyre inflation, differential lock and power divider, transfer case.

2.6 Braking system components and their function are described.

Range brake lines, brake assemblies, park brake control, air compressor, brake chambers, spring brakes, air reservoirs, ABS, EBS, load sensing, stability control.

2.7 Steering system components and their function are described.

Range steering reservoir, steering column, steering box, steering linkages, steering pump and hoses, hub and stub axle assembly.

2.8 Electrical system components and their function are described.

Range batteries, alternator, starter motor, wiring loom, lighting, circuit protection, electronic control units.

2.9 Chassis components and their function are described.

2.10 Suspension system components and their function are described.

Range springs, air bags, suspension mounts, shock absorbers.

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	23 February 2000	31 December 2017
Review	2	22 March 2005	31 December 2017
Review	3	22 October 2010	31 December 2017
Review	4	16 April 2015	31 December 2020
Review	5	28 March 2019	31 December 2025
Review	6	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.