

Title	Prepare, bring to steam, and operate a steam driven vehicle and steam boiler		
Level	4	Credits	10

Purpose	<p>This unit standard covers the knowledge and skills required to safely operate the steam boiler and engine of a steam driven vehicle.</p> <p>People credited with this unit standard are able to: check the engine and engine control valves of a steam driven engine; check the structural components and running gear and/or steering gear of a steam driven vehicle; carry out preliminary start-up procedures, prepare a steam driven vehicle for operation, check steam driven vehicle under working conditions, operate a steam driven vehicle, shut down and carry out steam boiler storage procedures, and complete documentation.</p>
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Classification	Commercial Road Transport > Steam Driven Vehicles
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Available grade	Achieved
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Explanatory notes

1. Range
This unit standard covers steam driven vehicles, including steam locomotives, steam traction engines, steam cranes, steam trucks, steam cars, steam rollers and steam trams. It is applicable to both horizontal and vertical type boilers as used in steam driven vehicles. Portable boilers with engines attached and steam driven road or rail vehicles fitted with boilers not exceeding 50 litres water capacity are excluded.
2. All tasks are to be carried out in accordance with the Land Transport Rule: Traction Engines 2010 (the Rule) <http://www.nzta.govt.nz/resources/rules/traction-engines-2010-index.html>.
3. Definitions
Organisational requirements include any legal requirements, standards, codes of practice, organisational and/or site policies and procedures, industry best practice, and manufacturers' instructions. These must be available to candidates, providers, and assessors. The applicable standard is the highest standard specified.
4. Before assessment commences, the boiler must be checked to ensure it has a current boiler certificate.

Outcomes and evidence requirements

Outcome 1

Check the engine and engine control valves of a steam driven vehicle.

Range includes all attached machinery or equipment.

Evidence requirements

- 1.1 The engine and engine control valves are checked for conformity with organisational requirements.

Outcome 2

Check the structural components and running gear and/or steering gear of a steam driven vehicle.

Evidence requirements

- 2.1 The structural components are checked for conformity with organisational requirements.

- 2.2 The running gear is checked for conformity with organisational requirements.

Range may include but is not limited to – drive mechanisms, gear trains, wheels, axles, tyres, flanges, spokes, braking systems, brake rigging.

- 2.3 For road vehicles, the steering gear is checked for conformity with organisational requirements.

Range steering wheel, worm and gear, steering chains, attachments to front axle.

Outcome 3

Carry out preliminary start-up procedures.

Evidence requirements

- 3.1 Steam boiler and auxiliary equipment are checked for conformity with legal standards, organisational requirements, and any applicable rail safety system or safety case.

- 3.2 Steam boiler and auxiliary equipment are checked for conformity with the organisation's requirements and any safety requirements.

Range: items to be checked may include but are not limited to – steam boiler, steam engine, structural components, spark arrestors, auxiliary equipment;
documentation to be checked may include but is not limited to – regulatory documents, certificate of fitness, fault sheets.

3.3 Stores required for the journey are loaded on the vehicle in accordance with organisational requirements.

3.4 Pre-start maintenance and lubrication routines are carried out on steam boiler and engine in accordance with organisational requirements.

Range: structural components, running gear, braking systems, auxiliary equipment.

Outcome 4

Prepare a steam driven vehicle for operation.

Evidence requirements

4.1 Steam boiler is lit up and brought to working pressure in accordance with organisational requirements.

Range: may include but is not limited to – funnel cap removed, ash pan emptied, grate cleared, tubes brushed, boiler water level checked, fires lit, air purged, leakage checked, boiler water level gauges checked, damper control checked.

4.2 Control, monitoring, and safety devices are checked in accordance with organisational requirements.

Range: may include but is not limited to – safety valves, crack detection grooves on lap seam boilers, fusible plug, boiler water level gauges, pressure gauges, whistle, feed injectors, feed check valves, dampers, cylinder drain cocks, steam and water leakage, throttle and regulating gear, brakes, driving belt, governor.

4.3 Steam boiler is warmed up and brought to working steam pressure to enable engine checks to be made.

Range: may include but is not limited to – cylinders heated, drained, parts lubricated, running gear slowly turned over, gently trialled.

4.4 Procedures to deal with contingencies are explained in accordance with the Rule and organisational requirements.

Range: may include but is not limited to – excessive steam pressure, low steam pressure, shortage of water, priming, steam and water leakage, fractured gauge glass, leaking tubes, emergency braking, injector or feed pump operation.

Outcome 5

Check steam driven vehicle under working conditions.

Evidence requirements

- 5.1 The boiler is checked under working pressure and for steam raising capacity and water and steam leakage in accordance with organisational requirements.
- 5.2 Safety valves lifting pressure is verified to be no greater than the working pressure of the boiler, and complies with the boiler certification and organisational requirements.
- 5.3 For road vehicles, the steering gear and all moving parts are checked to ensure they perform in accordance with organisational requirements when the vehicle is in motion.

Outcome 6

Operate a steam driven vehicle.

Evidence requirements

- 6.1 Steam boiler and engine are operated in accordance with the Rule and organisational requirements.

Outcome 7

Shut down and carry out steam boiler storage procedures, and complete documentation.

Evidence requirements

- 7.1 Steam boiler is shut down in accordance with organisational requirements.
- Range: may include but is not limited to – blowing down, checking for faults and defects, banking or drawing the fire, cooling down, removing the ashes, draining, drying out, capping chimney, brakes applied.
- 7.2 Laying up procedures for steam boiler are described in accordance with organisational requirements.
- Range: short-term, long-term.
- 7.3 Documentation is completed in accordance with organisational requirements.
- Range: log books, fault report sheets, inventories.

Planned review date	31 December 2019
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	27 May 2005	31 December 2016
Review	2	16 July 2015	N/A

Consent and Moderation Requirements (CMR) reference	0092
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

Please note

Providers must be granted consent to assess against standards (accredited) by NZQA, before they can report credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be granted consent to assess against standards by NZQA before they can register credits from assessment against unit standards.

Providers and Industry Training Organisations, which have been granted consent and which are assessing against unit standards must engage with the moderation system that applies to those standards.

Requirements for consent to assess and an outline of the moderation system that applies to this standard are outlined in the Consent and Moderation Requirements (CMR). The CMR 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.

Comments on this unit standard

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