

<b>Title</b>	<b>Demonstrate knowledge of the maintenance and repair of steam driven vehicles</b>		
<b>Level</b>	<b>4</b>	<b>Credits</b>	<b>10</b>

<b>Purpose</b>	People credited with this unit standard are able to: demonstrate knowledge of the maintenance and repair requirements for the boiler, engine, structural components, and running and/or steering gear of a steam driven vehicle; and explain record keeping requirements for the maintenance and repair of steam driven vehicles.
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<b>Classification</b>	Commercial Road Transport > Steam Driven Vehicles
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<b>Available grade</b>	Achieved
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<b>Entry information</b>	
<b>Recommended skills and knowledge</b>	Recommended: Unit 21755, <i>Prepare, bring to steam, and operate a steam driven vehicle and steam boiler</i> , or demonstrate equivalent knowledge and skills.

### Explanatory notes

1. Range  
This unit standard applies to steam driven vehicles, including steam locomotives, steam traction engines, steam cranes, steam trucks, steam cars, steam rollers and steam trams. It applies to both horizontal and vertical type boilers used in steam driven vehicles. Steam driven 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.  
*Repair* refers to diagnosis, identification, and the rectification of faults and defects.
4. Proprietary feedwater treatment chemicals may be used, provided that they can be shown to meet the requirements of the Rule or the organisational requirements.

5. Achievement of competency in this unit standard does not recognise the ability to fire up or drive a steam driven vehicle.

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## Outcomes and evidence requirements

### Outcome 1

Explain maintenance and repair requirements for the boiler of a steam driven vehicle.

#### Evidence requirements

- 1.1 The explanation includes the maintenance required to keep the boiler within the manufacturer's specifications for safe operation.

Range: may include but is not limited to – internal shell, internal feed pipe, internal steam pipe, stays, grate, fire box, crown stays, radial or bridge girder type or corrugated crown, palm and longitudinal stays, broken firebox stays, tube plates, smoke and stay tubes, superheater tubes, superheater header, external shell, boiler casing, steam manifold, lagging, furnace refractory, ash pan, steam pipe to engine, dampers, spark arrestors.

- 1.2 The explanation includes the maintenance required to keep the boiler fittings within the manufacturer's specifications for safe operation.

Range: may include is but not limited to – safety valves, water gauge glass, water gauge glass mountings, regulator, fusible plug, feed injector, feed valve, feed pump, whistle, steam pressure gauge, draught pressure gauge.

- 1.3 The explanation includes the feedwater treatment required to keep the internals of the boiler in good and clean condition and to prevent scale and deterioration.

Range: may include but is not limited to – impurities in feedwater, scale, corrosion, caustic embrittlement, grooving, feedwater treatment, removal of impurities from boiler water, feedwater tests, blow downs, priming.

### Outcome 2

Explain maintenance and repair requirements for the engine of a steam driven vehicle.

#### Evidence requirements

- 2.1 The explanation includes engine maintenance required to maintain function at the manufacturer's rated horsepower.

Range: may include but is not limited to – cylinders, pistons, piston rings, cylinder lubrication, carbonisation, blast pipe, drains, piston rods, glands, cross heads.

2.2 The explanation includes maintenance of the control valves required to obtain the manufacturer's rated horsepower.

Range: valve condition, valve fit, valve setting.

2.3 The explanation includes regulator maintenance required to control the engine during manoeuvring.

2.4 The explanation includes the maintenance and adjustment of the engine governor required to allow the engine to maintain a predetermined RPM.

### Outcome 3

Explain maintenance and repair requirements for the structural components and running and/or steering gear of a steam driven vehicle.

#### Evidence requirements

3.1 The explanation includes the maintenance and repair of the structural components of the vehicle required to meet the manufacturer's specifications for safe operation.

Range: may include but is not limited to – chassis, funnel, tender, foot plate, apron plate, draw gear.

3.2 The explanation includes the maintenance, adjustment, and repair of rolling and running gear required to meet the manufacturer's specifications for safe operation.

Range: may include but is not limited to – drive mechanisms, gear trains, wheels, axles.

3.3 The explanation includes the maintenance, adjustment, and repair of steering gear for steam driven road vehicles required to meet the manufacturer's specifications for safe operation.

Range: may include but is not limited to – steering wheel, worm and gear, steering chains and attachments to front axle;  
excludes – rail vehicles.

### Outcome 4

Explain record keeping requirements for the maintenance and repair of steam driven vehicles.

#### Evidence requirements

4.1 The explanation includes model documents in the Rule and/or organisational requirements.

Range: record of maintenance, record of repair.

- 4.2 The explanation includes document and record retention in accordance with organisational requirements.

<b>Planned review date</b>	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	23 January 1998	31 December 2001
Revision	2	16 May 2003	31 December 2016
Review	3	27 May 2005	31 December 2016
Review	4	16 July 2015	N/A

<b>Consent and Moderation Requirements (CMR) reference</b>	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](mailto:info@mito.org.nz) if you wish to suggest changes to the content of this unit standard.