

<b>Title</b>	<b>Repair an engine cooling system</b>		
<b>Level</b>	<b>3</b>	<b>Credits</b>	<b>4</b>

<b>Purpose</b>	This unit standard is for people in the automotive repair industry. People credited with this unit standard are able to: test the engine cooling system and locate and identify any faults; repair cooling system faults; and test the cooling fan assembly for correct operation and rectify any faults.
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<b>Classification</b>	Motor Industry > Engine Repairs
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<b>Available grade</b>	Achieved
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**Explanatory notes**

- 1 The following legislation and its amendments are required to be consulted and followed where applicable:  
Health and Safety in Employment Act, 1992;  
Ozone Layer Protection Act, 1996;  
Resource Management Act, 1991 (disposal of coolant).
- 2 Reference to *suitable tools and equipment* means industry approved tools and equipment that are recognised within the industry as being the most suited to complete the task to a professional and competent manner with due regard to safe working practices.
- 3 Because of the particular nature of this unit standard, it is essential that the practical assessment evidence is obtained from commercial jobs in the workplace under normal workplace conditions.

**Outcomes and evidence requirements**

**Outcome 1**

Test the engine cooling system and locate and identify any faults.

**Evidence requirements**

- 1.1 Safe working practices are observed throughout the task.  
  
Range personal safety, safety of others, equipment and vehicle safety.
- 1.2 Suitable equipment is selected and used that enable the cooling system to be tested.

- 1.3 Any fan cowling faults are identified and noted.
- 1.4 The cooling system is pressure tested for leaks, and all sources of leaks are identified and noted.
- 1.5 Any other cooling system faults are located and identified.
- Range anti-freeze concentration, thermostat operation, coolant blockages, water pump operation, sensors, oil cooling systems, corrosion, erosion, contamination.

## Outcome 2

Repair cooling system faults.

### Evidence requirements

- 2.1 Safe working practices are observed throughout the task.
- Range personal safety – handling inhibitor, hot pressurised cooling system, keeping clear of moving parts, protective clothing, no loose objects, being aware of sharp edges; safety of others; equipment and vehicle safety.
- 2.2 Suitable tools and equipment are selected and used that enable cooling system faults to be repaired.
- 2.3 Concentration of the antifreeze is tested and corrected according to manufacturer's specifications.
- 2.4 Coolant leaks, and their causes, are repaired to restore full serviceability.
- Range engine water jacket components and gaskets, water pump, hoses, housings and valves.
- 2.5 Severely corroded and damaged parts are replaced to restore full serviceability.
- 2.6 Radiator, heater core, engine oil cooler, and transmission oil cooler are replaced with parts to manufacturer's specifications.
- 2.7 Blockages in any coolant passages are cleared without damage to components.
- 2.8 The feasibility of repairing a water pump is determined based on relevant factors.
- Range type and extent of repair required, cost of repair, availability and cost of replacement, parts warranty.
- 2.9 All water pump faults are rectified to restore full serviceability.

**Outcome 3**

Test the cooling fan assembly for correct operation and rectify any faults.

**Evidence requirements**

- 3.1 Safe working practices are observed throughout the task.  
Range personal safety, safety of others, equipment and vehicle safety.
- 3.2 Suitable tools and equipment are selected and used that enable cooling fan tests to be carried out and faults rectified.
- 3.3 A decision is made as to whether to repair or replace the fan assembly based on relevant factors.  
Range type and extent of repair required, cost of repair, availability and cost of replacement, parts warranty.
- 3.4 Fan assembly is replaced according to manufacturer's workshop manual instructions.
- 3.5 Component parts of an electric fan circuit are tested and faults rectified so as to restore full serviceability.
- 3.6 Pulleys, belt(s) and drive hub of a belt driven fan are checked for wear and damage, and are replaced to restore full serviceability.
- 3.7 Blades of the cooling fan are checked for damage and cracks, and are replaced to manufacturer's specifications.

<b>Replacement information</b>	This unit standard, unit standard 965, and unit standard 3391 have been replaced by unit standard 24269, unit standard 24270, and unit standard 24271.
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**This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.**

**Status information and last date for assessment for superseded versions**

Process	Version	Date	Last Date for Assessment
Registration	1	29 October 1993	31 December 2016
Review	2	4 October 1996	31 December 2016
Review	3	26 February 1999	31 December 2016
Review	4	25 January 2008	31 December 2020
Rollover	5	19 November 2010	31 December 2020
Rollover	6	22 August 2014	31 December 2020

<b>Consent and Moderation Requirements (CMR) reference</b>	0014
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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.

**This unit standard is expiring**