

Title	Demonstrate knowledge of, test, and repair a motorcycle engine cooling system		
Level	3	Credits	5

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

- 1 The following legislation and their amendments are required to be consulted and followed where applicable:
 - Health and Safety in Employment Act, 1992
 - 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

Demonstrate knowledge of motorcycle cooling systems.

Evidence requirements

- 1.1 Types of motorcycle cooling systems are described according to workshop manual descriptions.

Range direct air, forced air, liquid cooling – water coolant, oil coolant.

- 1.2 Factors which determine cooling system performance are identified.
- Range condition of fins, hoses, inhibitor, coolant flow, air flow.
- 1.3 Cooling system test equipment and their application are identified.
- Range pressure tester, pH test, hydrometer, thermometer, electrical test equipment.
- 1.4 Servicing procedures are described according to manufacturer's recommendations and legislative requirements.
- Range disposal of coolant, flushing, adding inhibitor, cleaning, reverse flushing, thermostat testing, visual inspection, parts replacement, bleeding air from the system.

Outcome 2

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

Evidence requirements

- 2.1 Safe working practices are observed throughout the task.
- Range personal safety – handling anti-freeze, working with hot pressurised systems, wearing protective clothing, no loose objects, being aware of sharp edges; safety of others; equipment and motorcycle safety.
- 2.2 Suitable equipment is selected and used to enable the cooling system to be tested.
- 2.3 Ducting and blower fan faults are identified and noted.
- 2.4 Cooling system faults are located and identified.
- Range anti-freeze concentration, thermostat operation, coolant blockages, corrosion, water pump operation, cooling fan operation, sensor operation, oil cooling system operation, contamination.

Outcome 3

Repair motorcycle cooling system faults.

Evidence requirements

- 3.1 Safe working practices are observed throughout the task.
- Range personal safety – handling anti-freeze, working with hot pressurised systems, wearing protective clothing, no loose objects, being aware of sharp edges; safety of others; equipment and motorcycle safety.
- 3.2 Suitable tools and equipment are selected and used to enable cooling system faults to be repaired.
- 3.3 Cylinder head fin damage is rectified to restore full serviceability of the head.
- 3.4 Concentration of the antifreeze is tested and corrected according to manufacturer's specifications.
- 3.5 Coolant leaks, and their causes, are repaired to restore full serviceability of the system.
- Range engine water jacket components and gaskets, water pump, hoses, housings and valves.
- 3.6 Severely corroded and/or damaged parts are replaced to restore full serviceability of the system according to manufacturer's specifications.
- 3.7 Radiator and oil cooler components are replaced with parts that meet manufacturer's specifications.
- 3.8 Blockages in any coolant passages are cleared without damage to components.
- 3.9 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.
- 3.10 Water pump faults are rectified to restore full serviceability according to manufacturer's specifications.

Outcome 4

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

Evidence requirements

- 4.1 Safe working practices are observed throughout the task.
- Range personal safety, safety of others, equipment and motorcycle safety.
- 4.2 Suitable tools and equipment are selected and used to enable cooling fan tests to be carried out and faults rectified.
- 4.3 A decision is made as to whether to repair or replace the fan components based on relevant factors.
- Range type and extent of repair required, cost of repair, availability and cost of replacement, parts warranty.
- 4.4 Ducting and blower fan faults of a forced air system are rectified according to manufacturer's workshop manual instructions.
- 4.5 Component parts of an electric fan circuit are tested and faults rectified so as to restore full serviceability of the system.
- 4.6 Fan assembly is replaced according to manufacturer's workshop manual instructions.

Replacement information	This unit standard has been replaced by unit standard 24285 and unit standard 24286.
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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	23 February 1999	31 December 2016
Revision	2	16 April 2003	31 December 2016
Review	3	25 January 2008	31 December 2016
Rollover	4	19 November 2010	31 December 2016
Rollover	5	18 February 2016	31 December 2020

Consent and Moderation Requirements (CMR) reference	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, or an inter-institutional body with delegated authority for quality assurance, 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.

Consent requirements 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.

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