

Title	Describe open and closed engine cooling system operation on a power boat		
Level	3	Credits	4

Purpose	People credited with this unit standard are able to describe open and closed engine cooling system operation on a power boat.
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Classification	Motor Industry > Trailer Boat Systems
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Available grade	Achieved
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Guidance Information

- 1 Definition
Manufacturers' specifications refer to technical information of a boat or product detailing: operation, installation and servicing procedures; technical terms and descriptions; and illustrations. Manufacturer specifications must be followed to ensure compliance with manufacturer warranty, safe operation, and operation that meets manufacturer performance claims.
- 2 Assessment information
 Evidence presented for assessment against this unit standard must be in accordance with manufacturer's specifications.

Outcomes and performance criteria

Outcome 1

Describe open and closed engine cooling system operation on a power boat.

Performance criteria

- 1.1 Marine engine raw water and closed cooling system operating principles are described.
 Range identifying components, describing component functions, water flow through system when engine is cold and at normal operating temperature.
- 1.2 Ancillary equipment coolers operating principles and applications are described.
 Range oil coolers, heat exchangers, intercoolers and aftercoolers, fuel coolers, transom coolers, keel cooling, hot water systems.

1.3 Cooling system additives are explained in terms of their properties and applications.

Range inhibitors and anti-freeze.

1.4 Deterioration in a cooling system is described.

Range cavitation, corrosion (galvanic and electrolytic), microbial.

1.5 Thermostat function and operation are explained.

Range when engine is cold, when engine is hot.

1.6 Water pump operating principles and functions are explained.

Range centrifugal circulating pump, raw water impeller pump, pick-up pump, flexible impeller pump.

1.7 The function and characteristics of various cooling water intake and valve types are explained.

Range gear case pick ups, transom-mounted pick ups, through-hull pick-ups, inertia pick-ups, seacocks, strainers, vents.

1.8 Pressurisation of a cooling system is explained in terms of its effect on system performance.

Planned review date	31 December 2030
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	26 June 2025	N/A

Consent and Moderation Requirements (CMR) reference	0136
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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.