

Title	Demonstrate knowledge of the construction and operation, and servicing requirements of outboard engines		
Level	2	Credits	4

Purpose	<p>This theory-based unit standard is intended for people in the trailer boat repair industry.</p> <p>People credited with this unit standard are able to demonstrate knowledge of: outboard engine construction and operation; and outboard engine servicing requirements.</p>
----------------	---

Classification	Motor Industry > Engines
-----------------------	--------------------------

Available grade	Achieved
------------------------	----------

Guidance Information

- 1 Evidence presented for assessment against this unit standard must be consistent with safe working practices and be in accordance with applicable service information, and company requirements and legislative requirements. This includes the knowledge and use of suitable tools and equipment.
- 2 Performance of the outcomes of this unit standard must comply with the following: Health and Safety at Work Act 2015.
- 3 Any new, amended or replacement Acts, regulations, standards, codes of practice, guidelines, or authority requirements or conditions affecting this unit standard will take precedence for assessment purposes, pending review of this unit standard.
- 4 Definitions

Company requirements refer to instructions to staff on policy and procedures that are available in the workplace. These requirements may include – company policies and procedures, work instructions, product quality specifications and legislative requirements.

Service information refers to technical information for a vehicle, machine, or product detailing operation; installation and servicing procedures; manufacturer instructions; technical terms and descriptions; and detailed illustrations.

Suitable tools and equipment refer to industry approved tools and equipment that are recognised within the industry as being the most suited to complete the task in a professional and competent manner with due regard to safe working practices.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of outboard engine construction and operation.

Performance criteria

1.1 Types and characteristics of outboard engines are identified.

Range types – two-stroke petrol, four-stroke petrol, four-stroke diesel;
characteristics – in-line, vee.

1.2 Typical position of components are shown and labelled.

Range two-stroke, four-stroke;
components include but are not limited to – powerhead assembly
components, midsection, gearcase components, ignition system,
electrical system, cooling system, fuel system, exhaust system.

1.3 Types of bearings and their application on outboard engines are described.

Range includes but is not limited to – ball, roller, needle, shell.

1.4 Internal water flow paths are identified.

1.5 Lubrication requirements are identified.

1.6 Gearbox layouts are described.

Range components in gearbox layout include but are not limited to –
propeller shaft assembly, clutch dog, shift mechanisms, forward
and reverse gears, pinions, bearings and seals.

1.7 Layout of cooling system components is described.

1.8 The method of scavenging used on outboard engines is described.

Range includes but is not limited to – cross flow, loop.

1.9 Operation of outboard engine systems is described.

Range includes but is not limited to – fuel system, lubrication and oiling
systems, starting and charging systems, cooling system, electric
systems, drive system, power trim.

Outcome 2

Demonstrate knowledge of outboard engine servicing requirements.

Range two-stroke, four-stroke.

Performance criteria

- 2.1 Precautions to be observed when servicing an outboard engine are identified.
- Range includes but is not limited to – accidental starting, operating the engine in water, using test wheels, wearing safety equipment, using an engine stand, precautions when handling hazardous substances, using equivalent replacement parts, conducting tests on running engines, testing electronic components, replacing locking type fasteners.
- 2.2 Engine inspection procedures are identified.
- Range power head assembly, gearcase.
- 2.3 Lubrication requirements are identified.
- 2.4 Refuelling procedures are identified.
- Range includes but is not limited to – removing stale or contaminated fuel, following manufacturer fuel and oil mixing instructions for two-stroke engines, using correct octane rating fuel.
- 2.5 New engine preparation procedures are identified.
- 2.6 Off-season storage procedures are identified.
- 2.7 Pre-season service procedures are identified.
- Range includes but is not limited to – visual inspection, lubrication check, battery check, control system installation, electrical check, fuel system check, cooling system check, synchronisation and linkage adjustment checks, engine tune check.

Planned review date	31 December 2025
----------------------------	------------------

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	23 February 1999	31 December 2022
Revision	2	13 March 2001	31 December 2022
Revision	3	16 April 2003	31 December 2022
Review	4	25 January 2008	31 December 2022
Review	5	29 April 2021	N/A

Consent and Moderation Requirements (CMR) reference	0014
--	------

This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

Comments on this unit standard

Please contact MITO New Zealand Incorporated info@mito.org.nz if you wish to suggest changes to the content of this unit standard.