Title	**Demonstrate knowledge of automotive turbochargers**		
Level	**4**	**Credits**	**4**

Purpose	People credited with this unit standard are able to demonstrate knowledge of automotive turbochargers and describe conditions that affect turbocharger operation.

Classification	Motor Industry > Automotive Fuel Systems and Exhaust

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 Legislation, regulations or industry standards relevant to this unit standard include but are not limited to the – current version of the Health and Safety at Work Act 2015; and any subsequent amendments and replacements.

3 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 may include – technical information for a vehicle, machine, or product detailing operation; installation and servicing procedures; manufacturer instructions; technical terms and descriptions; and detailed illustrations.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of automotive turbochargers.

Performance criteria

1.1 The components of a turbocharger are described.

Range air intake, compressor, turbine, internal components, exhaust manifold, wastegate, actuators, oil supply, intercooler.

1.2 The principles of turbocharging are described.

Range turbocharger location, volumetric efficiency, air ratios, engine performance, boost pressure, exhaust gas circulation, lubrication and cooling, pressure control including electronic.

1.3 Variable turbocharger operation is described.

Range compound (series) turbocharging, variable geometry turbocharger (VGT), variable nozzle turbocharger (VNT), rotary electronic actuator (REA).

Outcome 2

Describe conditions that affect turbocharger operation.

Performance criteria

2.1 The importance of cleanliness when working with turbochargers is described.

Range contamination, precise machine tolerances and close operating fits of components, damage and premature failure.

2.2 Faults that affect turbocharger operation are described.

Range air contamination and restrictions, air leaks, impact damage, wear, oil contamination and feed, housing damage, precise machine tolerances and close operating fits of components, excessive shaft play, imbalance of rotating parts, control system failures.

2.3 Causes of wear on components are described.

Range lack of lubricant, foreign object ingestion, contamination of lubricant.

2.4 Symptoms that can indicate turbocharger faults are described.

Range engine lacks power, black exhaust smoke, blue exhaust smoke, excessive engine oil consumption, noisy turbocharger operation.

Planned review date	31 December 2023

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	30 August 2018	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.