

Title	Demonstrate knowledge of vehicle powertrain electronic control systems, and testing and rectifying faults		
Level	4	Credits	3

Purpose	People credited with this unit standard are able to demonstrate knowledge of: powertrain electronic control systems in vehicles; and testing and rectifying powertrain electronic control system faults.
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Classification	Motor Industry > Automotive Electrical and Electronics
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Available grade	Achieved
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Guidance Information

- 1 It is recommended that people hold credit for Unit 24131, *Demonstrate knowledge of electronic components and their application in the automotive industry* before being assessed against this unit standard.
- 2 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.
- 3 Performance of the outcomes of this unit standard must comply with the following:
Health and Safety at Work Act 2015;
Land Transport Rule: Vehicle Repair 1998.
- 4 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.
- 5 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.
Control systems include open loop, closed loop, fail safe, and limp home systems.
Powertrain in the context of this unit standard refers to engine and transmission systems.
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 means 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 powertrain electronic control systems in vehicles.

Performance criteria

- 1.1 The purpose of powertrain electronic control systems is described.
- 1.2 Prime components in the systems are identified and their functions described.
- Range electronic control modules (ECMs), sensors, fuses, connectors, switches, motor, relays, diagnostic data link, wiring circuit, warning lamps, actuators, resistors, thermistors, capacitors, diodes, light emitting diodes (LEDs), transistors, silicon controlled rectifiers (SCRs), integrated circuits (ICs), microprocessors.
- 1.3 Operating principles of powertrain electronic control systems are described.
- Range description assisted by sketches showing working circuits using block diagrams for components, International Organization for Standardization (ISO) symbols, colour and number coding, terminal location; fail safe, limp home system, communication networks.
- 1.4 The way in which powertrain electronic control systems integrate into a central control unit or vehicle network bus is explained.

Outcome 2

Demonstrate knowledge of testing and rectifying powertrain electronic control system faults.

Performance criteria

- 2.1 Precautions to prevent damage to components, and using suitable tools and equipment when working on powertrain electronic control systems are described.
- Range obtaining specifications and instructions, using compatible equipment, isolating components, cleanliness, screening, earthing, control unit memory retention; disconnecting and connecting circuits and plugs, access point location, pin connection and wiring damage, unsealing and sealing, retaining circuit memory, control unit isolation; electrostatic discharge.

2.2 The importance of obtaining specific and current test information before any testing is carried out is described.

Range workshop manuals, technical bulletins, computer.

2.3 Diagnostic test procedures are described.

Range tracing circuits, wiring diagram, test points, reading and interpreting self-diagnostic test codes, recommended test equipment.

2.4 Rectification procedures for system faults are explained.

Range replacement, repair, adjustment.

Replacement information	This unit standard, unit standard 24119, unit standard 24121, unit standard 24122, and unit standard 24123 replaced unit standard 2348 and unit standard 5463.
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Planned review date	31 December 2025
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	25 January 2008	31 December 2022
Review	2	25 March 2021	N/A

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>.

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.