

Title	Diagnose complex faults in light vehicle engine management systems and reflect on diagnostic procedures		
Level	5	Credits	10

Purpose	People credited with this unit standard are able to: explain light vehicle engine management system operation to enable complex fault diagnosis; diagnose the cause of complex faults in a light vehicle engine management system; and reflect on learning experience in response to diagnosing complex faults in a light vehicle engine management system.
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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 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 and legislative requirements. This includes the knowledge and use of suitable tools and equipment.
- 2 Legislation, regulations and industry standards relevant to this unit standard include but are not limited to the:
Health and Safety at Work Act 2015.

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.

- 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.
Light vehicle refers to classes as listed from Waka Kotahi NZ Transport Agency website table [Vehicle classes | Waka Kotahi NZ Transport Agency \(nzta.govt.nz\)](https://www.nzta.govt.nz/vehicle-classes/): passenger vehicle MA, MB, MC; omnibus MD, MD1, MD2; and goods vehicle NA.
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.

4 Range

Complex faults may include – faults within multiple systems, intermittent faults, faults caused indirectly by the effect of external systems or caused through system repairs. *Engine management systems* applies to either petrol or diesel engines and may include – fuel, induction, emission, ignition.

Fault diagnosis would require applying a complex investigative diagnostic process to rectify them.

Learning experience involves a reflection on the overall process to form a holistic viewpoint. This may refer to one or more learning experiences.

- 5** It is recommended that people hold credit for Unit 31048, *Diagnose and repair engine management system faults*, before being assessed against this unit standard.

Outcomes and performance criteria**Outcome 1**

Explain light vehicle engine management system operation to enable complex fault diagnosis.

Performance criteria

- 1.1** Comprehensive operation of the engine management system to enable system fault diagnosis is explained.

Range interaction of components; sensors, control unit, actuators; comprehensive operation may include – communication protocol, signal type; pulse width modulation, digital, analogue.

Outcome 2

Diagnose the cause of complex faults in a light vehicle engine management system.

Range evidence of at least one fault in three different systems, each on a different vehicle is required.

Performance criteria

- 2.1** Complex engine management systems fault is analysed.

Range operator description, diagnostic testing.

- 2.2** Cause of complex engine management system fault is determined.

Outcome 3

Reflect on learning experience in response to diagnosing complex faults in a light vehicle engine management system.

Performance criteria

- 3.1 Experience of diagnosing complex faults in a light vehicle engine management system is reflected on and described in relation to the knowledge and analytical skills acquired.
- 3.2 Improvements to future diagnostic procedures are identified based on own reflection.

Planned review date	31 December 2027
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	26 January 2023	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 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.