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| **Title** | **Demonstrate knowledge of automotive instruments and gauges, and testing and rectifying system faults** | | |
| **Level** | **4** | **Credits** | **2** |

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| **Purpose** | People credited with this unit standard are able to demonstrate knowledge of: analogue and digital automotive instruments and gauges; and testing and rectifying faults in automotive gauge systems, instrument panels, and associated circuits and sensors. |

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| **Classification** | Motor Industry > Automotive Electrical and Electronics |

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| **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;
Traffic Regulations 1976;
Land Transport Rule: Vehicle Repair 1998.

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* 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 analogue and digital automotive instruments and gauges.

### Performance criteria

1.1 Electromagnetic gauges are identified, and their method of operation described.

Range fuel, temperature, oil pressure, voltage, speedometer, tachometer.

1.2 Thermal gauges are identified, and their method of operation described.

Range fuel, temperature, oil pressure, voltage.

1.3 The need for voltage stabilisation on an instrument panel is identified, and methods of achieving it are described.

Range bi-metal and solid state devices.

1.4 The differences between light emitting diode (LED), liquid crystal display (LCD), and vacuum fluorescent (VF) displays are identified.

1.5 The operating principles of electronic gauges and instruments are defined in block diagram form.

1.6 A magnetic and mechanical speedometer and odometer are identified, and their method of operation described.

1.7 The most common types of gauge sensors (senders) are identified and their method of operation described.

Range types include – variable resistance, rheostat, capacitive, semi-conductor.

1.8 The function of head-up displays (HUDs) is described.

### Outcome 2

Demonstrate knowledge of testing and rectifying faults in automotive gauge systems, instrument panels, and associated circuits and sensors.

Range electromagnetic excluding speedometer and tachometer, thermal and electronic types.

**Performance criteria**

2.1 Safe working practices when working with gauges, instrument panels and associated circuits and sensors are explained.

Range personal safety, safety of others, vehicle safety, workshop safety, environmental safety, tools and equipment safety.

2.2 Suitable tools and equipment used for testing a gauge and instrument panel and associated circuits and sensors for faults are described.

2.3 Procedures for testing gauges and instrument panels, and associated circuits and sensors for faults are described.

2.4 Procedures for rectifying faulty components are described.

Range wiring, printed circuit boards, gauges.

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| **Replacement information** | This unit standard and unit standard 24114 replaced unit standard 910. |

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| **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 | 25 January 2008 | 31 December 2022 |
| Review | 2 | 25 March 2021 | N/A |

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| **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.