Title	**Demonstrate knowledge of automotive oscilloscopes**		
Level	**4**	**Credits**	**2**

Purpose	People credited with this unit standard are able to demonstrate knowledge of: oscilloscope types, operation, and terminology; automotive oscilloscope features; and automotive oscilloscope display interpretations.

Classification	Motor Industry > Automotive Electrical and Electronics

Available grade	Achieved

Guidance Information

It is recommended that people seeking credit for this unit standard first hold credit for Unit 21676, *Select test equipment and test an automotive electrical circuit*.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of oscilloscope types, operation, and terminology.

Performance criteria

1.1 The oscilloscope as a graph-displaying device is described in accordance with oscilloscope manufacturer specifications.

Range vertical (Y) axis representing voltage, horizontal (X) axis representing time, intensity (Z) axis representing display brightness.

1.2 The uses of the screen grid and display controls to control and measure waveforms are described in accordance with oscilloscope manufacturer specifications.

Range vertical, horizontal, and trigger settings.

1.3 Types of equipment and their set-up procedures are described in accordance with oscilloscope manufacturer specifications.

Range analogue, digital;
set-up procedures – grounding, controls, probes.

1.4 Oscilloscope terminology is described in terms of measurement and performance.

Range waveform types – sine waves, square and rectangular waves, triangle and sawtooth waves, step and pulse shapes;
waveform measurements – frequency and period, voltage, phase and phase shift;
performance – bandwidth, rise time, vertical sensitivity, sweep speed, gain accuracy, time base or horizontal accuracy, sample rate, resolution, record length.

Outcome 2

Demonstrate knowledge of automotive oscilloscope features.

Performance criteria

2.1 Features of automotive oscilloscopes are described in accordance with oscilloscope manufacturer specifications.

Range includes but is not limited to – automotive software and updates, universal serial bus (USB) compatible port connection, protection against overloads and short circuits, high resolution, large memory, ability to capture multiple waveforms from various sensors at once, ease of operation, workshop-based and mobile, ability to test and measure wide range of electrical and electronic automotive components and circuits.

Outcome 3

Demonstrate knowledge of automotive oscilloscope display interpretations.

Performance criteria

3.1 An oscilloscope graticule is interpreted in terms of major and minor divisions.

3.2 Voltage measurements are interpreted in terms of voltage peak and peak-to-peak voltage.

3.3 Time and frequency measurements are interpreted in accordance with the oscilloscope scale and screen area.

3.4 Rise time and pulse width measurement points are interpreted in terms of voltage percentages.

3.5 Phase shift measurements are interpreted in terms of cycle time or XY mode.

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	25 January 2008	31 December 2020
Review	2	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.