

Title	Describe automotive lighting requirements and lighting circuit diagnosis		
Level	4	Credits	3

Purpose	People credited with this unit standard are able to: describe vehicle lamp requirements and application; describe vehicle interior light requirements and describe vehicle light circuitry and diagnosis procedures.
----------------	--

Classification	Motor Industry > Automotive Electrical and Electronics
-----------------------	--

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;
Vehicle Inspection Requirements Manual (VIRM) In-service Certification;
Land Transport Rule: Vehicle Lighting 2004;
Land Transport Rule: Vehicle Standards Compliance 2002.
- 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

Describe vehicle lamp requirements and application.

Performance criteria

1.1 Types of lamps that can be mounted on a vehicle are described.

Range headlamps (main beam, dipped beam), park lamps and side lamps, auxiliary headlamps, driving lamps, fog lamps, tail lamps, stop lamp, high level stop lamp, reversing lamp, number plate lamp, direction indicator lamps, hazard warning lamps, daylight running lights, night parking lamps.

1.2 The operating principles to convert electric power to light are described.

Range tungsten bulbs, halogen bulbs, gas discharge lamps, high intensity discharge (HID), light emitting diode (LED).

1.3 The method of headlamp construction is described.

Range parabolic reflector type, ellipsoid reflector type; bi-focus, multi-focus, di-axial ellipsoid (DE) system, free form system.

1.4 The quality of the reflector and the pattern of the lens in relation to light output are described.

Range reflective capabilities, directional focus, regulation requirements.

1.5 The importance and effect of light focusing in respect to light output are described.

Range Land Transport Rules, the VIRM; light output, avoiding a hazardous situation to road users.

1.6 Types of light pattern created by lenses are described.

Range parabolic, ellipsoid, driving lamp lenses, fog lamp lenses.

1.7 Types of bulbs, their applications, and efficiency are described.

Range contact configuration, base sizes, pin position-parallel, offset, capless; types include – tungsten, halogen, gas discharge, HID, LED.

1.8 Lighting system electronic systems are described.

Range adaptive front lighting systems (levelling and swiveling systems), automatic headlight switch on, automatic dipping, lamp failure monitor, concealed headlamps.

Outcome 2

Describe vehicle interior light requirements.

Performance criteria

2.1 The purpose and value of vehicle instrument panel warning lamps are described.

Range to indicate a change of condition, a medium to attract the driver's attention, to prevent damage occurring, using in conjunction with gauges, using in conjunction with voice and buzzer alarms.

2.2 Instrument panel warning light operation is described.

Range types of sensors used, method of switching, circuit operation, warning light indicating more than one fault.

2.3 Types and operation of courtesy lamps are described.

Range types of sensors used, method of switching, delayed systems.

2.4 The use and operation of interior lights on buses and passenger service vehicles are described.

Range reading lights, passenger warning lights, aisle illumination, footwell illumination.

Outcome 3

Describe vehicle light circuitry and diagnosis procedures.

Performance criteria

3.1 The principles and operation of vehicle lighting circuits are described.

Range circuits with relays and relay operation, circuits with switches in both the supply and return lines, two and four headlight systems, circuits for daylight running lamps, operating circuits for retractable headlamps, remote height adjustable headlamps, circuit requirements for fitting auxiliary fog and long range lamps, circuits for moveable spot lights, circuits for gas discharge lamps, circuits for cornering lamps, rotating headlights (with steering), automatic dipping, headlamp alignment, lamp failure, failure monitors, concealed headlamps, automatic switch on.

- 3.2 Testing and diagnostic equipment to diagnose light circuit faults are described.
- 3.3 Testing and diagnostic procedures for light circuits are described.
- 3.4 Safe working practices when working on lighting systems are described.

Range lighting circuits, other circuits, lighting components, electronic systems, personal safety, safety of others, vehicle safety, workshop safety, environmental safety, tools and equipment safety.

Replacement information	This unit standard and unit standard 24128 replaced unit standard 3399.
--------------------------------	---

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

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.