Demonstrate knowledge of automotive lighting requirements and lighting circuit diagnosis

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**Purpose**  
This theory-based unit standard is for people in the automotive electrical repair industry. People credited with this unit standard are able to demonstrate knowledge of: vehicle lamp requirements and application; vehicle interior light requirements; and vehicle light circuitry and diagnosis procedures.

**Subfield**  
Motor Industry

**Domain**  
Automotive Electrical and Electronics

**Status**  
Registered

**Status date**  
25 January 2008

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25 January 2008

**Planned review date**  
31 December 2012

**Entry information**  
Open.

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

**Accreditation**  
Evaluation of documentation and visit by NZQA and industry.

**Standard setting body (SSB)**  
NZ Motor Industry Training Organisation (Incorporated)

**Accreditation and Moderation Action Plan (AMAP) reference**  
0014


**Special notes**

1. Legislation and publications relevant to this unit standard include but are not limited to – Land Transport Rules: Vehicle Lighting 2004, Rule 32005; Vehicle Lighting Amendment 2005, Rule 32005/1; Vehicle Lighting Amendment 2007, Rule 32005/2; Vehicle Standards Compliance 2002, Rule 35001/1; Vehicle Inspection Requirements Manual (VIRM) – In-service Certification.
2 Land Transport Rules are produced for the Minister of Transport by Land Transport New Zealand. These rules are available online at http://www.landtransport.govt.nz/rules/

The VIRM is published by Land Transport New Zealand and is available online at http://www.landtransport.govt.nz/certifiers/virm-in-service/index.html.

3 Definition

*Service information* may include but is not limited to – technical information of a vehicle, machine, or product detailing operation; installation and servicing procedures; manufacturer instructions and specifications; technical terms and descriptions; and detailed illustrations. This can be accessed in hard copy or electronic format and is normally sourced from the manufacturer.

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### Elements and performance criteria

**Element 1**

Demonstrate knowledge of vehicle lamp requirements and application.

**Performance criteria**

1.1 Types of lamps that can be mounted on a vehicle, that conform with legislative requirements, are defined in accordance with manufacturer specifications.

   **Range** includes but is not limited to – 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 in accordance with manufacturer specifications.

   **Range** includes but is not limited to – tungsten bulbs, halogen bulbs, gas discharge lamps, high intensity discharge (HID), light emitting diode (LED).

1.3 The method of headlamp construction is described in accordance with manufacturer specifications.

   **Range** includes but is not limited to – 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 in accordance with manufacturer specifications.

   **Range** reflective capabilities, directional focus, regulation requirements.
1.5 The importance and effect of light focusing in respect to light output are described in accordance with legislative requirements.

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 in accordance with manufacturer specifications.

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

1.7 Types of bulbs, their applications, and efficiency are described in accordance with manufacturer specifications.

Range contact configuration, base sizes, pin position-parallel, offset, capless; types include but are not limited to – tungsten, halogen, gas discharge, HID, LED.

1.8 Lighting system electronic systems are described in accordance with manufacturer specifications.

Range includes but is not limited to – adaptive front lighting systems (levelling and swiveling systems), automatic headlight switch on, automatic dipping, lamp failure monitor, concealed headlamps.

Element 2

Demonstrate knowledge of vehicle interior light requirements.

Performance criteria

2.1 The purpose and value of vehicle instrument panel warning lamps are described in accordance with manufacturer specifications.

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 in accordance with manufacturer specifications.

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 in accordance with manufacturer specifications.

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 in accordance with Land Transport Rules.

Range includes but is not limited to – reading lights, passenger warning lights, aisle illumination, footwell illumination.

Element 3

Demonstrate knowledge of vehicle light circuitry and diagnosis procedures.

Performance criteria

3.1 The principles and operation of vehicle lighting circuits are described in accordance with manufacturer specifications.

Range includes but is not limited to – 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 in accordance with service information.

3.3 Testing and diagnostic procedures for light circuits are described in accordance with service information.

3.4 Safe working practices when working on lighting systems are described in accordance with manufacturer specifications and legislative requirements.

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

Please note

Providers must be accredited by NZQA, or an inter-institutional body with delegated authority for quality assurance, before they can report credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be accredited by NZQA before they can register credits from assessment against unit standards.

Accredited providers and Industry Training Organisations assessing against unit standards must engage with the moderation system that applies to those standards.
Accreditation requirements and an outline of the moderation system that applies to this standard are outlined in the Accreditation and Moderation Action Plan (AMAP). The AMAP also includes useful information about special requirements for organisations wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.

Comments on this unit standard

Please contact the NZ Motor Industry Training Organisation (Incorporated) info@mito.org.nz if you wish to suggest changes to the content of this unit standard.