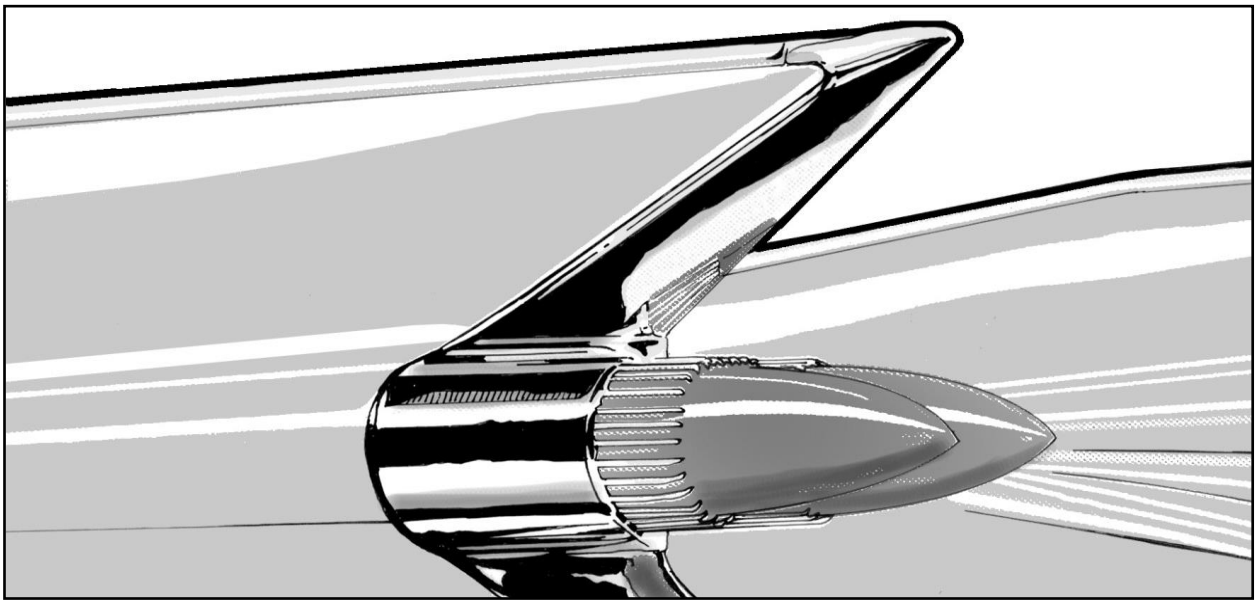
Low Volume Vehicle Technical Association Incorporated

Low Volume Vehicle Standard

125-00(01)

(Lighting Equipment)

This Low Volume Vehicle Standard corresponds with: Land Transport Rule 32005 (Vehicle Lighting)



1st Amendment – effective from: 1 November 2020

Signed in accordance with clause 1.5 of the Low Volume Vehicle Code, on……by:	
on behalf of the New Zealand Transport Agency: ……	*on behalf on the Low Volume Vehicle Technical Association (Inc):* ……

LVV Standard 125-00 Amendment Record:

No:	Detail of amendments:	Version:	Issue date:	Effect date:
1	Initial issue – original version	125-00(00)	1 March 2005	1 March 2005
2	1st Amendment	125-00(01)	15 September 2020	1 November 2020
3				
4				
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Note that highlighted text shows amendments that have been made subsequent to the document's previous issue, and a grey vertical stroke to the left of the text denotes information that is of a technical (rather than a formatting) nature.

Overview

Background

The Low Volume Vehicle Technical Association Incorporated (LVVTA) represents nine specialist automotive groups who are dedicated to ensuring that vehicles, when scratch-built or modified, meet the highest practicable safety standards. The information in these standards has stemmed from work undertaken by LVVTA founding member organisations that commenced prior to 1990 and has been progressively developed as an integral part of NZ Government safety rules and regulations by agreement and in consultation with the New Zealand Transport Agency. As a result, the considerable experience in applied safety engineering built up by LVVTA and the specialist automotive groups over the past twenty years can be of benefit to members of the NZ public who also wish to build or modify light motor vehicles.

Availability of low volume vehicle standards

Low volume vehicle standards are developed by the LVVTA, in consultation with the New Zealand Transport Agency, and are printed and distributed by the LVVTA. The standards are available to the public free of charge from the LVVTA website; www.lvvta.org.nz

Further information on the availability of the low volume vehicle standards may be obtained by contacting the LVVTA at info@lvvta.org.nz.

Copyright

Associated information

Other associated information relevant to the subject matter contained in this low volume vehicle standard, which in the interest of comprehensiveness, should be read in conjunction with this standard, includes:

Document	Pg #/Section/Chapter
• Information Sheet # 07-2005 'Release of New LVV Lighting Equipment Standard, Form-set, and Revised ORS'	Pages 1 & 2
• Information Sheet # 04-2015 'LVV Certification of Weed-spraying Vehicles'	Page 1
• Information Sheet # 05-2016 'LVV Certification Requirements for Under-threshold Items'	Page 3
• New Zealand Transport Agency Vehicle Inspection Requirements Manual	Section 4 Lighting
• NZ Car Construction Manual	Chapter 14 Lighting

Note that all documents referred to in this table, with the exception of the NZ Car Construction Manual, can be accessed from www.lvvta.org.nz free of charge. For information on obtaining the NZ Car Construction Manual, contact info@lvvta.org.nz

Note also that paper copies of documents can become out of date and as such should not be relied upon, therefore LVVTA advises users of this standard to check to ensure that the Associated Information listed here is current, by going to www.lvvta.org.nz/standards.html

Contents

Lighting Equipment (125-00[01])

Purpose of this standard

The purpose of this low volume vehicle standard is to specify safety requirements for lamps that are added, substituted, or modified, and their installation on a low volume vehicle, that will provide safe driving visibility to the driver, and that will increase the conspicuousness of the vehicle for other road users during all driving conditions and weather types. Note that where a production vehicle is fitted with its original lamps in their original location, the requirements in this chapter do not apply.

Section 1 Scope and application of this standard

1.1 Scope of this standard

1.1(1) This low volume vehicle standard applies to all light vehicles other than those specified in *1.1(2)*, which are:

(a) modified on or after 1 January 1992 in such a way that any lighting equipment may, directly or indirectly, be affected; or

(b) scratch-built on or after 1 January 1992.

1.2(1) This low volume vehicle standard does not apply to:

(a) powered bicycles of Class AB; or

(b) motorcycles of Class LA, LB, LC, LD, or LE; or

(c) light trailers of Class TA or TB; or

(d) those vehicles specified in *section 4*.

1.2 Application of this standard

1.2(1) A light vehicle that is modified or scratch-built as in *1.1(1)*, becomes a low volume vehicle, and must:

(a) be certified in accordance with the procedures specified in *chapter 2* of the *Low Volume Vehicle Code*; and

(b) unless *section 3* applies, comply with all applicable technical requirements contained in *section 2* of this standard.

NOTE: Where a light vehicle is required to be certified to the *Low Volume Vehicle Code*, but the modification or construction date precedes the date upon which the original version of this standard takes effect (1 March 2005), an LVV Certifier must ensure that the vehicle meets the general safety requirements contained in *2.1* of this standard, and should use the applicable technical requirements of *section 2* of this standard as a guideline upon which to base his judgements on the safety of the vehicle.

Section 2 Technical requirements of this standard

2.1 General safety requirements for all lamps

2.1(1) A low volume vehicle must:

(a) be designed and constructed using materials and components that are fit for their purpose; and

(b) be safe to be operated on the road.

NOTE: The requirements specified in *2.1(1)* are selected from *2.3* of *Part 2* of the *Low Volume Vehicle Code*, reproduced here in the interest of convenience, and are over-riding requirements which make it clear that, regardless of what technical requirements are or are not in place, every vehicle certified to the *Low Volume Vehicle Code* must be fit for its purpose, and must be safe.

Design and construction of all lamps

2.1(2) A lamp fitted to a low volume vehicle must be:

(a) constructed or coated so as to be corrosion resistant; and

(b) designed, manufactured, and assembled in such a way as to prevent the entry of moisture or foreign material.

2.1(3) A lamp fitted to a low volume vehicle must be designed and attached so as to enable ready access for replacement of bulbs.

Attachment and positioning of all lamps

2.1(4) A lamp fitted to a low volume vehicle must be:

(a) securely mounted; and

(b) free from vibration; and

(c) correctly aligned.

2.1(5) A lamp that is required by this low volume vehicle standard to be fitted to a low volume vehicle must not be obscured by any modifications to the vehicle, fitment of additional equipment, or the carriage of any load.

2.1(6) A lamp fitted to a low volume vehicle, other than a headlamp or fog-lamp, must not be concealed when not in use.

Colour of all lamps

2.1(7) A low volume vehicle must not be fitted with lighting equipment that emits red light that is directly visible from the front of the vehicle.

2.1(8) A low volume vehicle must not be fitted with, except for reversing lamps, a lamp or reflector that emits or reflects other than red or amber light if the light is directly visible from the rear of the vehicle.

2.1(9) Lighting equipment that is fitted as a pair to the front or to the rear of a low volume vehicle must emit light of approximately equal colour when operated.

Performance of all lamps

2.1(10) Lighting equipment fitted to a low volume vehicle must be:

(a) in sound condition and good working order; and

(b) in the case of an LED array, have no more than 25% of the LEDs not working.

2.1(11) The light emitted from a lamp fitted to a low volume vehicle, other than from a direction indicator, must be steady.

2.1(12) Lighting equipment that is fitted as a pair to the front or to the rear of a low volume vehicle must emit light of approximately equal intensity when operated.

2.1(13) Lighting equipment fitted to a low volume vehicle must be capable of providing sufficient illumination, light output or light reflection to:

(a) fulfil its intended purpose; and

(b) enable the vehicle to which it is fitted to be operated safely on a road.

Overlays

2.1(14) An overlay must not be applied to a lens fitted to a low volume vehicle if that overlay could reduce the mechanical and optical properties of the lamp below a safe tolerance.

NOTE: Provided that an overlay is completely clear with no colouring or tinting, as is the case with most commercially manufactured adhesive protective overlays, the requirements specified in *2.1(14)* will be met.

2.2 Headlamp requirements

2.2(1) Headlamps are mandatory lamps that are designed to illuminate the road forward of the vehicle to enable safe night-driving for the driver, in doing so minimising glare for other road users, and must meet all applicable technical requirements specified in *2.2*.

NOTE: Headlamps are the most important part of a low volume vehicle's lighting system, as they affect the driver's vision, the vehicle's conspicuousness, and oncoming motorists' ability to see without being dazzled. As such, there can be no compromises in relation to headlamps on a low volume vehicle for any reason.

Number of headlamps

2.2(2) A low volume vehicle must be fitted with one pair of dipped-beam headlamps.

2.2(3) A low volume vehicle is not required to be fitted with main-beam headlamps, but if fitted, unless excluded by *3.1(1)*, must not have more than two pairs of main-beam headlamps.

Colour of headlamps

2.2(4) When operated, a headlamp that is fitted to a low volume vehicle must emit a beam of light that is substantially white or amber.

Positioning of headlamps

2.2(5) A pair of headlamps that are fitted to a low volume vehicle must be:

(a) positioned at the front of the vehicle; and

(b) positioned on a horizontal plane; and

(c) symmetrically arranged.

2.2(6) A pair of dipped-beam headlamps fitted to a low volume vehicle must be positioned at a width and height that is in accordance with the requirements specified in Table 1. *[see Table 1: Lamp Positioning Requirements]*

ORIENTATION	REQUIREMENTS
Width:	• no further inboard than 400 mm (16") from the outer-most part of the vehicle; or
	• in the case of a low volume vehicle that is less than 1300 mm (53") in width, no less than 400 mm (16") apart; or
	• in the case of a low volume vehicle whose body design makes achieving this impractical, no less than 600 mm (24") apart; or
	• in the case of a vehicle for which a valid LVV Authority Card issued by the New Zealand Hot Rod Association (Inc) has been issued that specifies 'mudguard exemption' or 'fender exemption', closer to the vertical centreline of the adjacent tyre than to the longitudinal centreline of the vehicle.
Height:	• no less than 250 mm (10") from the ground; and

Notes to accompany Table 1:

- All lamps fitted to a low volume vehicle must be positioned as far toward the outer edges of the vehicle as practicable, so as to reasonably indicate to other road users at night, the approximate width of the vehicle.
- This means that the distance from the lamp to the centreline of the tyre is less than the distance from the lamp to the centreline of the vehicle.

Table 1: Lamp Positioning Requirements

2.2(7) A main-beam headlamp fitted to a low volume vehicle may be positioned at any width or height, which may include the fitment of roof-mounted high-beam headlamps on an off-road vehicle.

Operation of headlamps

2.2(8) A main-beam headlamp fitted to a low volume vehicle must be able to be dipped or extinguished from the driver's seating position.

2.2(9) A low volume vehicle must be fitted with a warning light that is blue in colour, which indicates to the driver that the main-beam headlamps are in operation.

NOTE: A modified production low volume vehicle may be fitted with a main-beam warning light of any colour, provided that the light was fitted as original equipment by the vehicle manufacturer.

Electrical connections for headlamps

2.2(10) The wiring system in a low volume vehicle that is fitted with main-beam headlamps, must extinguish the main-beam headlamps when the dipped-beam headlamps are operated.

2.2(11) The wiring system in a low volume vehicle which is fitted with main-beam headlamps may enable a dipped-beam headlamp to remain illuminated when the main-beam headlamps are operating.

2.2(12) Activation of either the dipped-beam or high-beam headlamps in a low volume vehicle must automatically also activate the:

(a) rear position lamps; and

(b) registration plate illumination lamps.

Adjustment of headlamps

2.2(13) A headlamp assembly in a low volume vehicle must:

(a) be aligned so as to meet the New Zealand Transport Agency's alignment requirements; and

(b) be designed and installed so as to incorporate sufficient provision for adjustment in order to meet the requirements of *2.2(13)(a)*, and continue to meet these requirements despite the changes of height and loading that may occur during the life of the vehicle.

NOTE: A low volume vehicle certifier may accept receipt of documented evidence that the vehicle has been approved for a WOF or COF by an Authorised Vehicle Inspector as verification of compliance with *2.2(13),* particularly in relation to dip angle.

Headlamp sources

2.2(14) A filament bulb or high-intensity gas discharge (HID) headlamp or LED assembly fitted to a low volume vehicle must:

(a) comply with any one or more of the approved standards specified for headlamps listed in *Table 2: Approved Standards for Lamps*, by either incorporating the applicable standards markings on the headlamp lens, or through other supplementary documented evidence; and *[see Table 2: Approved Standards for Lamps]*

(b) be a complete and unmodified assembly.

NOTE 1: For clarification, all headlamps fitted to a low volume vehicle must, in addition to meeting an approved standard specified in *Table 2*, incorporate a beam pattern that meets *2.2(13)(a)*. (For example, an FMVSS-compliant headlamp fitted to a vehicle intended for the US market will probably not dip in the correct direction.)

NOTE 2: High-intensity gas discharge (HID) bulbs or an LED array must not be fitted to a housing which is not designed for use with an HID bulb or LED array, as the intensity and beam pattern will not be correct.

LAMP TYPE	UN/ECE Regulation No:	European Council Directive	Australian Design Rule	Federal Motor Vehicle Safety Standard	Japanese Technical Standard	Japanese Industrial Standard
▪ Headlamps	UN/ECE 1, 5, 8, 20, 31, 98, 112, 113, 123	76/761/EEC	ADR 77	FMVSS 108	Technical Std for Headlamps (Japan)	JIS D5504, JIS D5500
▪ Stop-lamps	UN/ECE 7	76/758/EEC	ADR 49	FMVSS 108	Technical Std for Lamps (Japan)	JIS D5500
▪ High-mounted stop-lamps	UN/ECE 7		ADR 60	FMVSS 108	Technical Std for Auxiliary Stop Lamps (Japan)	JIS D5500
▪ Direction-indicators	UN/ECE 6	76/759/EEC	ADR 6	FMVSS 108	Technical Std for Direction Indicators (Japan)	JIS D5500
▪ Front position lamps	UN/ECE 7	76/758/EEC	ADR 49	FMVSS 108	Technical Std for F&R Position (Side) Lamps (Japan)	JIS D5500
▪ Rear position lamps	UN/ECE 7	76/758/EEC	ADR 49	FMVSS 108	Technical Std for Front & Rear Position (Side) Lamps (Japan) Technical Std for Tail Lamps (Japan)	JIS D5500
▪ Rear registration-plate illumination-lamps	UN/ECE 4	76/760/EEC	ADR 48	FMVSS 108	Technical Std for Number Plate Lamps (Japan)	JIS D5500
▪ Retroreflectors	UN/ECE 3	76/757/EEC	ADR 47	FMVSS 108	Technical Std for Rear Reflex Reflectors (Japan)	JIS D5500
▪ Retro-reflective material	UN/ECE 104	---	---	FMVSS 108	---	---
▪ Daytime running-lamps	UN/ECE 87	---	ADR 45, ADR 76	FMVSS 108	---	---
▪ Reversing-lamps	UN/ECE 23	77/539/EEC	ADR 1	FMVSS 108	Technical Std for Back-up Lamps (Japan)	JIS D5500
▪ Fog-lamps (front)	UN/ECE 19	76/762/EEC	ADR 50	FMVSS 108	Technical Std for Front Fog Lamps (Japan)	JIS D5500
▪ Fog-lamps (rear)	UN/ECE 38	77/538/EEC	ADR 52	FMVSS 108	Technical Std for Rear Fog Lamps (Japan)	JIS D5500

Notes to accompany Table 2:

- 'DOT' marked on a lamp lens denotes that the lamp complies with an approved FMVSS Standard listed in *Table 2*.

Table 2: Approved Standards for Lamps

2.2(15) A filament bulb headlamp that does not meet an approved standard specified in *Table 1: Approved Standards for Lamps* may be fitted to a modified production low volume vehicle, or a scratch-built 'historic replica' low volume vehicle, provided that the lamp lens:

(a) either:

(i) was fitted to a production vehicle as original equipment; or

(ii) is manufactured from glass, by an aftermarket lamp manufacturer as a direct replacement for an original equipment lamp fitted to a production vehicle;

and

(b) the production vehicle for which the lamp is manufactured is a later model vehicle than the low volume vehicle to which the lamp is fitted, or in the case of a scratch-built 'historic replica' low volume vehicle, the vehicle being replicated; and

(c) is a complete and unmodified assembly.

NOTE: *2.2(15)(b)* means where a lamp from a production vehicle is fitted, the lamp must always be from a later-model vehicle, and not an older vehicle, so that the lighting performance of the modified vehicle is always increased, not decreased, as a result of the lamp retro-fitment.

Modern headlamps in old housings

2.2(16) A modified production low volume vehicle, or a scratch-built 'historic replica' low volume vehicle, may incorporate a modern headlamp within an old headlamp housing in order to achieve modern headlamp performance and period aesthetics, provided that:

(a) the performance of the headlamp exceeds that of the headlamp originally fitted to the vehicle; and

(b) the lens fitted to the old headlamp does not adversely affect the optical properties and performance of the modern headlamp or any other lamps such as direction-indicator lamps; and

(c) the installation does not prevent the headlamp from complying with any other headlamp requirement.

NOTE 1: A low volume vehicle certifier may accept receipt of documented evidence that the vehicle has been approved for a WOF or COF by an Authorised Vehicle Inspector as verification of compliance with *2.2(16)(b)*.

NOTE 2: In order to comply with *2.2(16)*, it will usually be necessary to either replace the old factory-supplied lens with unpatterned clear glass, or remove the lens from the new headlamp, so that the new lamp reflector and bulb projects directly through the old lens.

Concealed headlamps

2.2(17) A low volume vehicle may be fitted with concealed headlamps, provided that:

(a) a single switching operation both activates the movement of the headlamp assemblies into position, and illuminates the headlamps; and

(b) in the event of a failure of the mechanism that moves the lamps into their operating position;

(i) the lamp assemblies can be moved into, and will remain located in, their operating positions without the use of tools; and

(ii) the lamps will still illuminate.

Swiveling headlamps

2.2(18) A headlamp fitted to a low volume vehicle may be mechanically controlled by the steered wheels to swivel in the horizontal plane, provided that:

(a) only the main-beam headlamps are able to swivel; and

(b) the dipped-beam headlamps remain fixed; and

(c) the headlamp alignment meets the visibility requirements specified in *2.2(13)* whilst the steered wheels are in the straight-ahead position.

Headlamp compatibility

2.2(19) A bulb fitted to a headlamp in a low volume vehicle must be of a type that is compatible with the bulb holder, lamp housing, and lens.

NOTE 1: A headlamp which is designed for a particular light source, such as, for example, a filament bulb, cannot be fitted with any other type of light source such as a high-intensity discharge (HID) bulb, LED bulb, LED strip, or non-OEM 'angel eyes'. Mis-matched headlamp lens and light source combinations can produce poor beam patterns and can be too bright to be safe, which can greatly increase levels of glare to other road users, and will no longer meet the approved standard to which it was originally manufactured.

NOTE 2: Fitment of halogen bulbs into regular filament bulb headlamps are generally a successful, and therefore acceptable, retro-fitment. However, because halogen bulbs operate at a much higher temperature than filament bulbs, the vehicle's wiring and headlamps must be compatible with the light output of the bulb in order to prevent overheating.

2.2(20) A dipped-beam headlamp designed solely for a left-hand drive motor vehicle, where the maximum intensity of the beam is dispersed to the right, must not be fitted to a low volume vehicle.

Headlamp shields and covers

2.2(21) A low volume vehicle may incorporate a headlamp positioned behind a permanent protective shield, provided that:

(a) the protective shield is either:

(i) manufactured from a clear transparent material that is in good unmarked condition; or

(ii) an open wire mesh designed for use as a stone guard;

and

(b) the protective shield does not prevent the headlamp from complying with any other headlamp requirements.

2.2(22) A headlamp fitted to a low volume vehicle may be covered by a readily removable protective cover when it is not in use.

2.3 Stop-lamp requirements

2.3(1) Stop-lamps are mandatory lamps at the rear of the vehicle which are designed to clearly signal to other road users a driver's application of the service brakes, and must meet all applicable technical requirements specified in *2.3*.

Number of stop-lamps

2.3(2) A low volume vehicle must, unless excluded by *3.2(1)*, be fitted with either one or two pairs of stop-lamps.

Colour of stop-lamps

2.3(3) When operated, a stop-lamp fitted to a low volume vehicle must emit diffuse light that is substantially red.

Positioning of stop-lamps

2.3(4) A stop-lamp fitted to a low volume vehicle must be positioned to the rear of the vehicle.

2.3(5) A pair of stop-lamps fitted to a low volume vehicle must be symmetrically-arranged.

2.3(6) A pair of stop-lamps fitted to a low volume vehicle must be positioned at a width and height that is in accordance with the requirements specified in Table 1. *[see Table 1: Lamp Positioning Requirements]*

Operation of stop-lamps

2.3(7) A stop-lamp fitted to a low volume vehicle must illuminate when the vehicle's ignition system is on, and the service brake is applied.

Visibility (output) of stop-lamps

2.3(8) A stop-lamp fitted to a low volume vehicle must, when in operation, provide an output of not less than:

(a) in the case of a filament bulb, 20 watts; or

(b) in the case of a LED array, equivalent brightness as compared to a 20-watt filament bulb stop-lamp.

2.3(9) A stop-lamp fitted to a low volume vehicle must, when in operation, emit light that is clearly visible during conditions of clear daylight, from a distance of 100 m (328') directly behind the vehicle.

2.3(10) A stop-lamp fitted to a low volume vehicle must, when both the stop-lamps and rearward-facing position-lamps are illuminated, be visibly and substantially brighter than the rearward-facing position lamps.

Visibility (angles) of stop-lamps

2.3(11) A stop lamp fitted to a low volume vehicle must, when operated, emit light that is visible within an angle of at least:

(a) on a horizontal plane passing through the lamp:

(i) 15 degrees above; and

(ii) 15 degrees below;

and

(b) 45 degrees either side of a vertical plane that is parallel to the longitudinal centre-line of the vehicle and passing through the lamp. *[see diagram 2.3]*

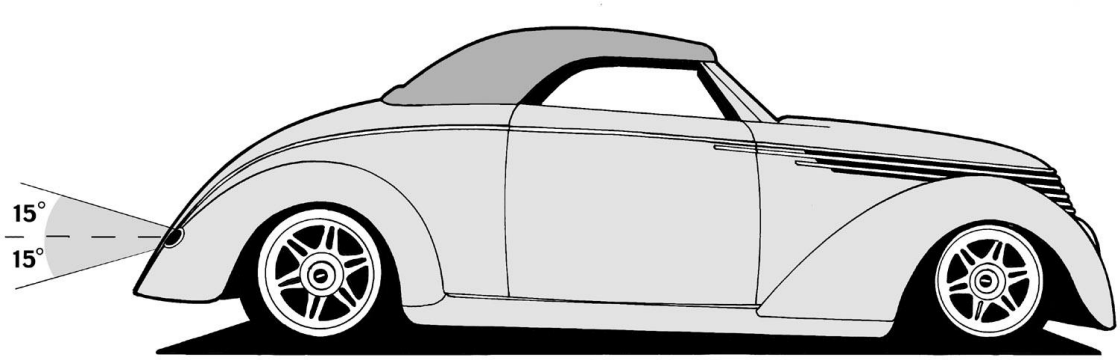


Diagram 2.3(a): Visibility angles for stop-lamps

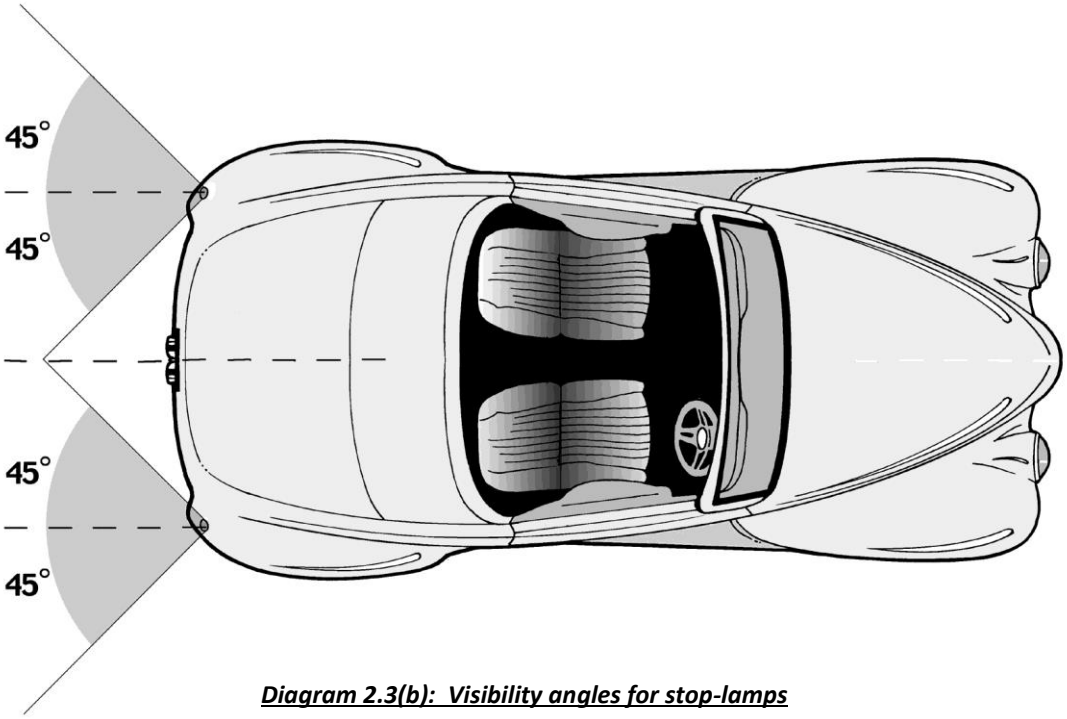


Diagram 2.3(b): Visibility angles for stop-lamps

Size of stop-lamps

2.3(12) A stop-lamp fitted to a low volume vehicle must incorporate a luminated lens surface area of not less than:

(a) in the case of a filament bulb, 22 sq cm (3 ½ sq inches); or

(b) in the case of an LED array, sufficient area so as to provide at least equivalent conspicuousness as a filament bulb specified in *2.3(12)(a)*.

Blue-dot inserts for stop-lamps

2.3(13) A stop-lamp fitted to a low volume vehicle must not incorporate within the lens a blue-dot accessory insert.

Stop-lamp sources

2.3(14) A filament bulb or LED array stop-lamp fitted to a low volume vehicle must comply with any one or more of the approved standards specified for stop-lamps listed in *Table 2: Approved Standards for Lamps*, by either incorporating the applicable standards markings on the stop-lamp lens, or through other supplementary documented evidence. *[see Table 2: Approved Standards for Lamps]*

2.3(15) A filament bulb or LED array stop-lamp fitted to a low volume vehicle which does not meet any one or more of the approved standards specified for stop-lamps listed in *Table 2: Approved Standards for Lamps*, may be fitted provided that the lamp meets the requirements specified in Table 3. *[see Table 3: Other Lamp Sources]*

LAMP SOURCE	REQUIREMENTS
Lamps (filament bulb) sourced from production vehicles with no standards markings – OK if:	• was fitted to a production vehicle as original equipment; or • lens is manufactured from glass, by an aftermarket lamp manufacturer as a direct replacement for an OE production vehicle lamp; and
	• the production vehicle for which the lamp is manufactured is a later model vehicle than the low volume vehicle to which the lamp is fitted (or in the case of a scratch-built low volume vehicle, the vehicle being replicated);* and
	• in the case of a lamp that does not incorporate a reflector or reflectorised housing behind the bulb, reflected light is maximised by either: ➢ covering the face of the lamp housing behind the bulb with reflective aluminium tape**; or ➢ installing a reflector disc behind the bulb.
Custom-manufactured (filament bulb) lamp OK if:	• made from materials and incorporate components that are resistant to atmospheric and weather degradation, in particular elastomeric materials used for weather sealing; and
	• lens is either: ➢ part of an OE lamp fitted to a production vehicle which meets an approved standard specified in Table 2; or; *** ➢ custom-manufactured from sheet material, documented evidence is provided to the LVV certifier to substantiate that the optical properties and ultra-violet light resistance of the sheet-material is acceptable. ****
Custom-manufactured (LED array) OK if:	• has been assessed and approved in writing by the LVVTA as complying with specified photometric and other performance requirements. *****

Notes to accompany Table 3:

- *This requires that where a lamp from a production vehicle is fitted, the lamp must always be from a later-model vehicle, and not an older vehicle, so that the lighting performance of the modified vehicle is always increased, and not decreased, as a result of the lamp retro-fitment.
- **The application of aluminium tape is successful only where the body of the housing is flat or tapered. Where a bulb sits within a deep recess in the housing with predominantly vertical sides, a reflector disc should be installed rather than tape.
- ***If a stop-lamp lens is custom-made from a part of an OE lamp from a production vehicle, and the custom-made stop-lamp lens does not incorporate the approved standards markings from the OE lens, the remainder of the OE lens (from which the custom-made stop-lamp lens is cut) should be retained and made available to the LVV certifier in order to verify to the LVV certifier the origin of the custom-made lens.
- ****In such cases, the LVVTA should be consulted to confirm the suitability of the material.
- *****Over-intensity is an inherent potential problem with a custom-manufactured LED array lamp, and such a lamp cannot be correctly assessed without photometric laboratory testing on a case-by-case basis.
- This Table does not apply to headlamps, high-mounted stop-lamps, or retroreflectors.

Table 3: Other Lamp Sources

2.4 High-mounted stop-lamp requirements

2.4(1) A high-mounted stop-lamp is an additional mandatory centrally-mounted stop-lamp designed to supplement the vehicle's main stop-lamps, and must meet all applicable technical requirements specified in 2.4.

Number of high-mounted stop-lamps

2.4(2) A low volume vehicle of Class-MA manufactured on or after 1 January 1990 must be fitted with one high-mounted stop-lamp.

Colour of high-mounted stop-lamps

2.4(3) When operated, a high-mounted stop-lamp fitted to a low volume vehicle must emit diffuse light that is substantially red.

Positioning of high-mounted stop-lamps

2.4(4) A high-mounted stop lamp fitted to a low volume vehicle must be fitted:

(a) in a central high-mounted position at the rear of the vehicle, so that no part of its illuminated area is lower than 150 mm (6") below the bottom edge of the rear window of the vehicle; or

(b) in the case of a vehicle that does not have a rear window, or whose rear window is not visible from behind the vehicle, in a central high-mounted position at the rear of the vehicle.

Size of high-mounted stop-lamps

2.4(5) A high-mounted stop-lamp fitted to a low volume vehicle must be:

(a) not less than 22 sq cms (3 ½ sq inches); and

(b) predominantly rectangular in shape.

Operation of high-mounted stop-lamps

2.4(6) A high-mounted stop-lamp fitted to a low volume vehicle must illuminate:

(a) when the vehicle's ignition system is on, and the service brake is applied; and

(b) in conjunction with the main stop-lamps.

Visibility of high-mounted stop-lamps

2.4(7) A high-mounted stop-lamp fitted to a low volume vehicle must, when in operation, provide an output of not less than:

(a) in the case of a filament bulb, 15 watts; or

(b) in the case of a LED array, equivalent brightness as compared to a 15-watt filament bulb high-mounted stop-lamp.

2.4(8) A high-mounted stop-lamp fitted to a low volume vehicle must, when in operation, emit light that is clearly visible during conditions of clear daylight, from a distance of 100 m (328') directly behind the vehicle.

High-mounted stop-lamp sources

2.4(9) A filament bulb or LED array high-mounted stop-lamp may be fitted to a low volume vehicle provided that the lamp is proven to comply with any one or more of the approved standards specified for high-mounted stop-lamps listed in *Table 2: Approved Standards for Lamps*, by either incorporating the applicable standards markings on the high-mounted stop-lamp lens, or through other supplementary documented evidence. (see *Table 2: Approved Standards for Lamps*)

2.4(10) A filament bulb high-mounted stop-lamp that is custom-manufactured, must be made from materials and incorporate components, that are resistant to atmospheric and weather degradation, in particular elastomeric materials used for weather sealing.

2.4(11) A lens for a filament bulb high-mounted stop-lamp that is custom-manufactured, may be fitted to a low volume vehicle, provided that either:

(a) the lens is part of a stop-lamp, high-mounted stop-lamp, or rearward-facing position-lamp lens that was fitted to a post-1979 production vehicle as original equipment when the vehicle was manufactured; or

(b) in the case of a lens custom-manufactured from sheet material, the lens is supported by documented evidence to the LVV certifier to substantiate that the optical properties and ultra-violet light resistance of the sheet material is acceptable.

NOTE 1:	If a high-mounted stop-lamp lens is custom-made from a part of an OE lamp from a production vehicle, and the custom-made high-mounted stop-lamp lens does not incorporate the approved standards markings from the OE lens, the remainder of the OE lens from which the custom-made high-mounted stop-lamp lens is cut should be retained and made available to the LVV certifier in order to verify the origin of the custom-made lens.
NOTE 2:	Where *2.4(11)(b)* applies, the LVVTA should be consulted to confirm the suitability of the material.

Custom-manufactured (LED-array) high-mounted stop-lamps

2.4(12) A custom-manufactured LED-array high-mounted stop-lamp must not be fitted to a low volume vehicle unless the lamp has been assessed and approved in writing by the Low Volume Technical Association Incorporated as complying with specified photometric and other performance requirements.

NOTE:	Over-intensity is an inherent potential problem with a custom-manufactured LED array lamp, and such a lamp cannot be correctly assessed without photometric laboratory testing on a case-by-case basis.

2.5 Direction-indicator lamp requirements

2.5(1) Direction-indicator lamps are mandatory lamps that are designed to signal to other road users the driver's intention to perform a turning manoeuvre, and must meet all applicable technical requirements specified in 2.5.

Number of direction-indicator lamps

2.5(2) A low volume vehicle must, unless excluded by *3.3(1)*, be fitted with one or two pairs of direction-indicator lamps to the front, and one or two pairs of direction-indicator lamps to the rear of the vehicle.

Colour of direction-indicator lamps

2.5(3) When operated, a forward-facing direction-indicator lamp fitted to a low volume vehicle must emit flashing light that is substantially white or amber.

2.5(4) When operated, a rearward-facing direction-indicator lamp fitted to a low volume vehicle must emit flashing light that is substantially red or amber.

2.5(5) When operated, if fitted, a side-facing direction-indicator lamp fitted to a low volume vehicle must emit flashing light that is substantially amber.

Positioning of direction-indicator lamps

2.5(6) A pair of direction-indicator lamps fitted to a low volume vehicle must be symmetrically arranged.

2.5(7) A direction-indicator lamp fitted to the front of a low volume vehicle must be positioned within a housing that is separate to the headlamp housing, so that the performance of both the direction-indicator and the headlamp cannot adversely affect each other.

2.5(8) A pair of direction-indicator lamps fitted to a low volume vehicle must be positioned at a width and height that is in accordance with the requirements specified in Table 1. *[see Table 1: Lamp Positioning Requirements]*

Size of direction-indicator lamps

2.5(9) A direction-indicator lamp fitted to a low volume vehicle must incorporate a luminated lens surface area of not less than:

(a) in the case of a filament bulb, 22 sq cm (3 ½ sq inches); or

(b) in the case of an LED array, sufficient area so as to provide at least equivalent conspicuity as a filament bulb specified in *2.5(9)(a).*

Operation of direction-indicator lamps

2.5(10) The light emitted from a direction-indicator fitted to a low volume vehicle must operate at a fixed frequency of:

(a) not less than 60 flashes per minute; and

(b) not more than 120 flashes per minute.

2.5(11) A direction-indicator system fitted to a low volume vehicle must incorporate, either visually or audibly, when in operation:

(a) a warning system to inform the driver that the direction-indicator lamps are in operation; and

(b) a warning system to inform the driver of the failure of one or more bulbs within the direction-indicator system.

2.5(12) A direction-indicator system fitted to a low volume vehicle must:

(a) flash each direction-indicator within the system in phase with each other; and

(b) switch all direction-indicator lamps on either side of the vehicle on and off together with a single control.

Electrical connections for direction-indicator lamps

2.5(13) A direction-indicator fitted to the rear of a low volume vehicle may be either:

(a) an individual item of lighting equipment; or

(b) incorporated within the rear position lamp and stop-lamp circuits, so that when in operation, the direction-indicator illuminates or cancels, as necessary, the rear position lamp and stop-lamp.

NOTE: A direction-indicator incorporated within the rearward-facing position-lamp is the standard system that has been used in the American automobile industry for over 50 years.

2.5(14) A low volume vehicle may be fitted with a switching device that activates all direction-indicator lamps simultaneously to function as hazard lamps.

Visibility (output) of direction-indicator lamps

2.5(15) A direction-indicator lamp fitted to a low volume vehicle must, when in operation, provide an output of not less than:

(a) in the case of a filament bulb, 15 watts; or

(b) in the case of a LED array, equivalent brightness as compared to a 15-watt filament bulb direction-indicator lamp.

2.5(16) A direction-indicator lamp fitted to a low volume vehicle must, when in operation, emit light, both with and without the dipped-beam headlamp in operation, throughout the visibility angles specified in *2.5(17)*, that is clearly visible during conditions of clear daylight from a distance of 100 m (328').

Visibility (angles) of direction-indicator lamps

2.5(17) A direction-indicator lamp fitted to a low volume vehicle must, when operated, emit light that is visible within an angle of at least:

(a) on a horizontal plane passing through the lamp:

(i) 15 degrees above; and

(ii) 15 degrees below;

and

(b) on a vertical plane that is parallel to the longitudinal centre-line of the vehicle, and passing through the lamp:

(i) 45 degrees inboard; and

(ii) 80 degrees outboard, or in the case of a vehicle manufactured before 1970, or whose body replicates a vehicle manufactured before 1970, and the design of the body makes achieving an 80-degree outboard visibility angle impractical, 45 degrees. *[see diagram 2.5]*

NOTE:	The 80-degree visibility requirement in *2.5(18)(ii)* may be met by the fitment of an automotive side repeater lamp which may use bulbs of less output than as specified in *2.5(16).*

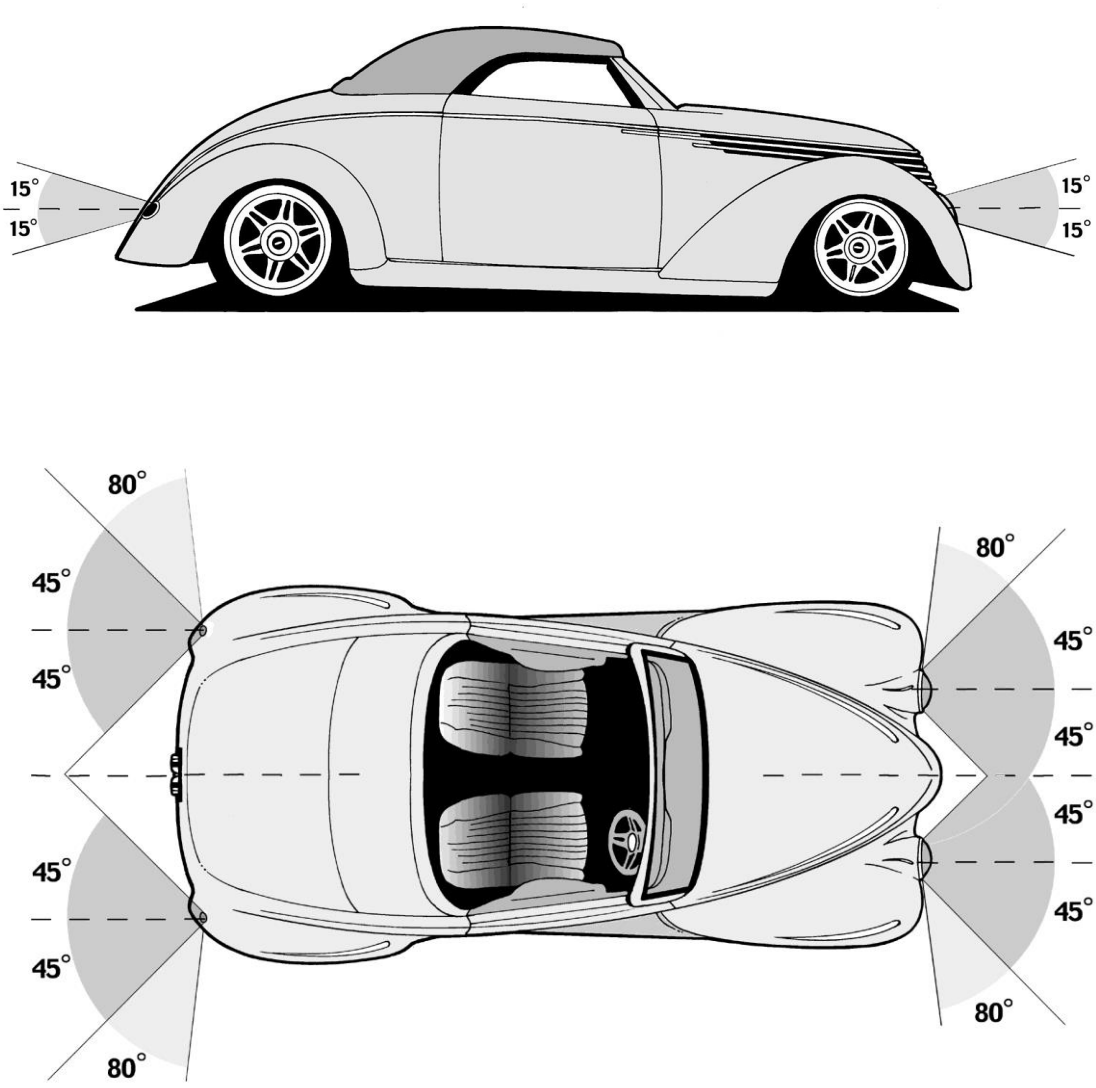


Diagram 2.5: Visibility angles for direction-indicators

Direction-indicator lamp sources

2.5(18) A filament bulb or LED array direction-indicator lamp fitted to a low volume vehicle must comply with any one or more of the approved standards specified for direction-indicator lamps listed in *Table 2: Approved Standards for Lamps*, by either incorporating the applicable standards markings on the direction-indicator lamp lens, or through other supplementary documented evidence. *[see Table 2: Approved Standards for Lamps]*

2.5(19) A filament bulb or LED array direction-indicator lamp fitted to a low volume vehicle which does not meet any one or more of the approved standards specified for direction-indicator lamps listed in *Table 2: Approved Standards for Lamps*, may be fitted provided that the lamp meets the requirements specified in Table 3. *[see Table 3: Other Lamp Sources]*

2.6 Front position lamp (park) requirements

2.6(1) Front position lamps are mandatory lamps that are designed to, during darkness, provide an indication to road users in front of the vehicle, of the vehicle's position, orientation, movement, and approximate width, and must meet all applicable technical requirements specified in *2.6*.

Number of front position lamps

2.6(2) A low volume vehicle must be fitted with one pair of front position lamps.

Colour of front position lamps

2.6(3) When operated, a front position lamp fitted to a low volume vehicle must emit diffuse light that is substantially white or amber.

Positioning of front position lamps

2.6(4) A pair of front position lamps fitted to a low volume vehicle must be:

(a) positioned at the front of the vehicle; and

(b) symmetrically arranged.

2.6(5) A pair of front position lamps fitted to a low volume vehicle must be positioned at a width and height that is in accordance with the requirements specified in Table 1. *[see Table 1: Lamp Positioning Requirements]*

Size of front position lamps

2.6(6) A front position lamp fitted to a low volume vehicle must incorporate a luminated lens surface area of not less than:

(a) in the case of a filament bulb, 22 sq cm (3 ½ sq inches); or

(b) in the case of an LED array, sufficient area so as to provide at least equivalent conspicuousness as a filament bulb specified in *2.6(6)(a)*.

Operation of front position lamps

2.6(7) A front position lamp fitted to a low volume vehicle may be either:

(a) an individual item of lighting equipment; or

(b) a lamp that is incorporated as part of the headlamp assembly.

Electrical connections for front position lamps

2.6(8) A front position lamp that is fitted to a low volume vehicle must automatically operate if the headlamps are activated.

2.6(9) A front position lamp fitted to a low volume vehicle must operate simultaneously with the rear position lamps, through a single and common activation.

Visibility (output) of front position lamps

2.6(10) A front position lamp fitted to a low volume vehicle must, when in operation, provide an output of not less than:

(a) in the case of a filament bulb, 5 watts; or

(b) in the case of a LED array, equivalent brightness as compared to a 5-watt filament bulb front position lamp.

2.6(11) A front position lamp fitted to a low volume vehicle must emit light that is clearly visible from a distance of 200 m (656') during the hours of darkness.

Visibility (angles) of front position lamps

2.6(12) A front position lamp fitted to a low volume vehicle must, when operated, emit light that is visible within an angle of at least:

(a) on a horizontal plane passing through the lamp:

(i) 15 degrees above; and

(ii) 15 degrees below;

and

(b) on a vertical plane that is parallel to the longitudinal centre-line of the vehicle, and passing through the lamp:

(i) 45 degrees inboard; and

(ii) 80 degrees outboard, or in the case of a vehicle manufactured before 1970, or whose body replicates a vehicle manufactured before 1970, and the design of the body makes achieving an 80-degree outboard visibility angle impractical, 45 degrees. *[see diagram 2.6]*

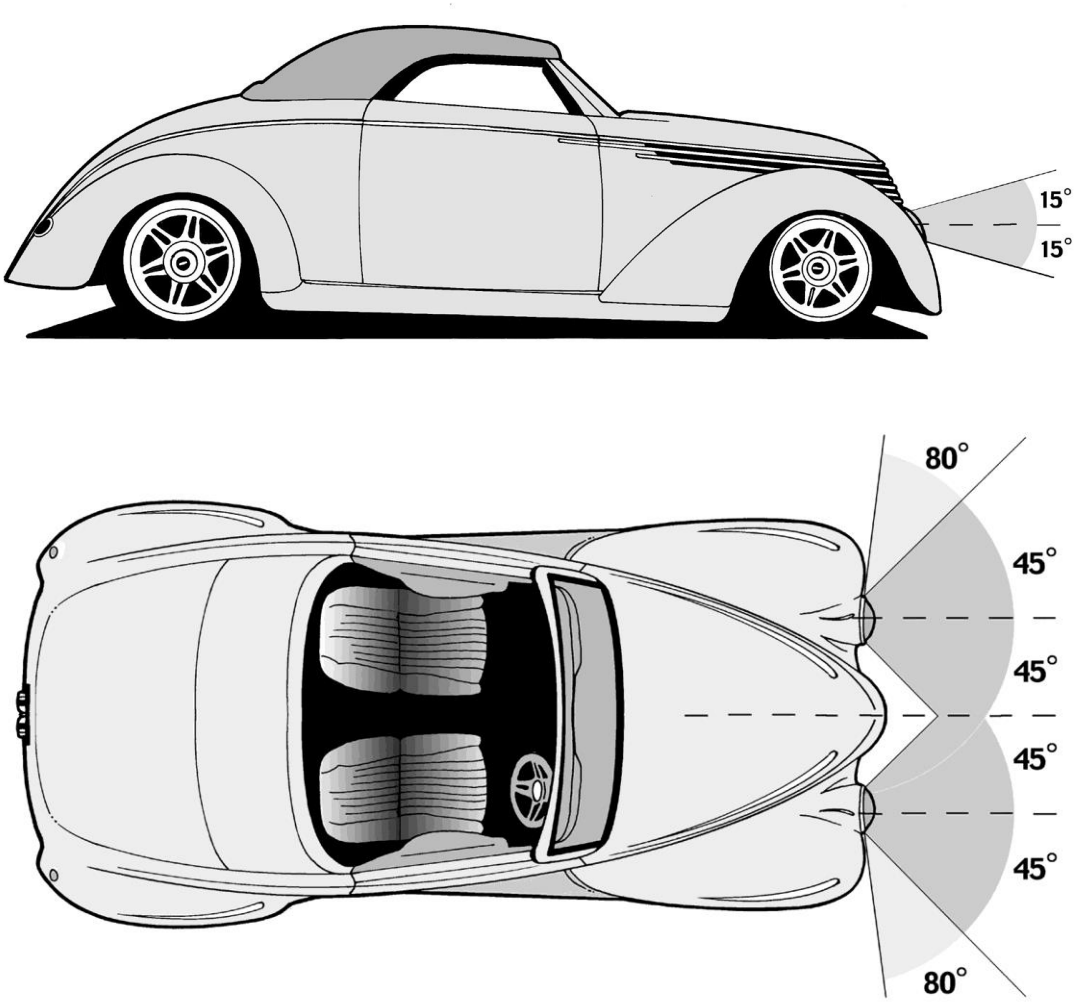


Diagram 2.6: Visibility angles for front position lamps

Front position lamp sources

2.6(13) A filament bulb or LED array front position lamp fitted to a low volume vehicle must comply with any one or more of the approved standards specified for front position lamps listed in *Table 2: Approved Standards for Lamps*, by either incorporating the applicable standards markings on the front position lamp lens, or through other supplementary documented evidence. *[see Table 2: Approved Standards for Lamps]*

2.6(14) A filament bulb or LED array front position lamp fitted to a low volume vehicle which does not meet any one or more of the approved standards specified for front position lamps listed in *Table 2: Approved Standards for Lamps*, may be fitted provided that the lamp meets the requirements specified in Table 3. *[see Table 3: Other Lamp Sources]*

2.7 Rear position lamp (tail) requirements

2.7(1) Rear position lamps are mandatory lamps that are designed to, during darkness, provide an indication to road users to the rear of the vehicle, of the vehicle's position, orientation, movement, and approximate width, and must meet all applicable technical requirements specified in *2.7*.

Number of rear position lamps

2.7(2) A low volume vehicle must, unless excluded by *3.2(1)*, be fitted with one or two pairs of rear position lamps.

Colour of rear position lamps

2.7(3) When operated, a rear position lamp fitted to a low volume vehicle must emit diffuse light that is substantially red.

Positioning of rear position lamps

2.7(4) A pair of rear position lamps fitted to a low volume vehicle must be:

(a) positioned at the rear of the vehicle; and

(b) symmetrically arranged.

2.7(5) A pair of rear position lamps fitted to a low volume vehicle must be positioned at a width and height that is in accordance with the requirements specified in Table 1. *[see Table 1: Lamp Positioning Requirements]*

Size of rear position lamps

2.7(6) A rear position lamp fitted to a low volume vehicle must incorporate a luminated lens surface area of not less than:

(a) in the case of a filament bulb, 22 sq cm (3 ½ sq inches); or

(b) in the case of an LED array, sufficient area so as to provide at least equivalent conspicuity as a filament bulb specified in *2.7(6)(a)*.

Electrical connections for rear position lamps

2.7(7) A rear position lamp that is fitted to a low volume vehicle must automatically operate if the headlamps are activated.

2.7(8) A rear position lamp fitted to a low volume vehicle must operate simultaneously with the front position lamps and headlamps, through a single and common activation.

Visibility (output) of rear position lamps

2.7(9) A rear position lamp fitted to a low volume vehicle must, when in operation, provide an output of not less than:

(a) in the case of a filament bulb, 5 watts, or

(b) in the case of a LED array, equivalent brightness as compared to a 5-watt filament bulb rear position lamp.

2.7(10) A rear position lamp fitted to a low volume vehicle must emit light that is clearly visible from a distance of 200 m (656') during the hours of darkness.

Visibility (angles) of rear position lamps

2.7(11) A rear position lamp fitted to a low volume vehicle must, when operated, emit light that is visible within an angle of at least:

(a) on a horizontal plane passing through the lamp:

(i) 15 degrees above; and

(ii) 15 degrees below;

and

(b) on a vertical plane that is parallel to the longitudinal centre-line of the vehicle, and passing through the lamp:

(i) 45 degrees inboard; and

(ii) 80 degrees outboard, or in the case of a vehicle manufactured before 1970, or whose body replicates a vehicle manufactured before 1970, and the design of the body makes achieving an 80-degree outboard visibility angle impractical, 45 degrees. *[see diagram 2.7]*

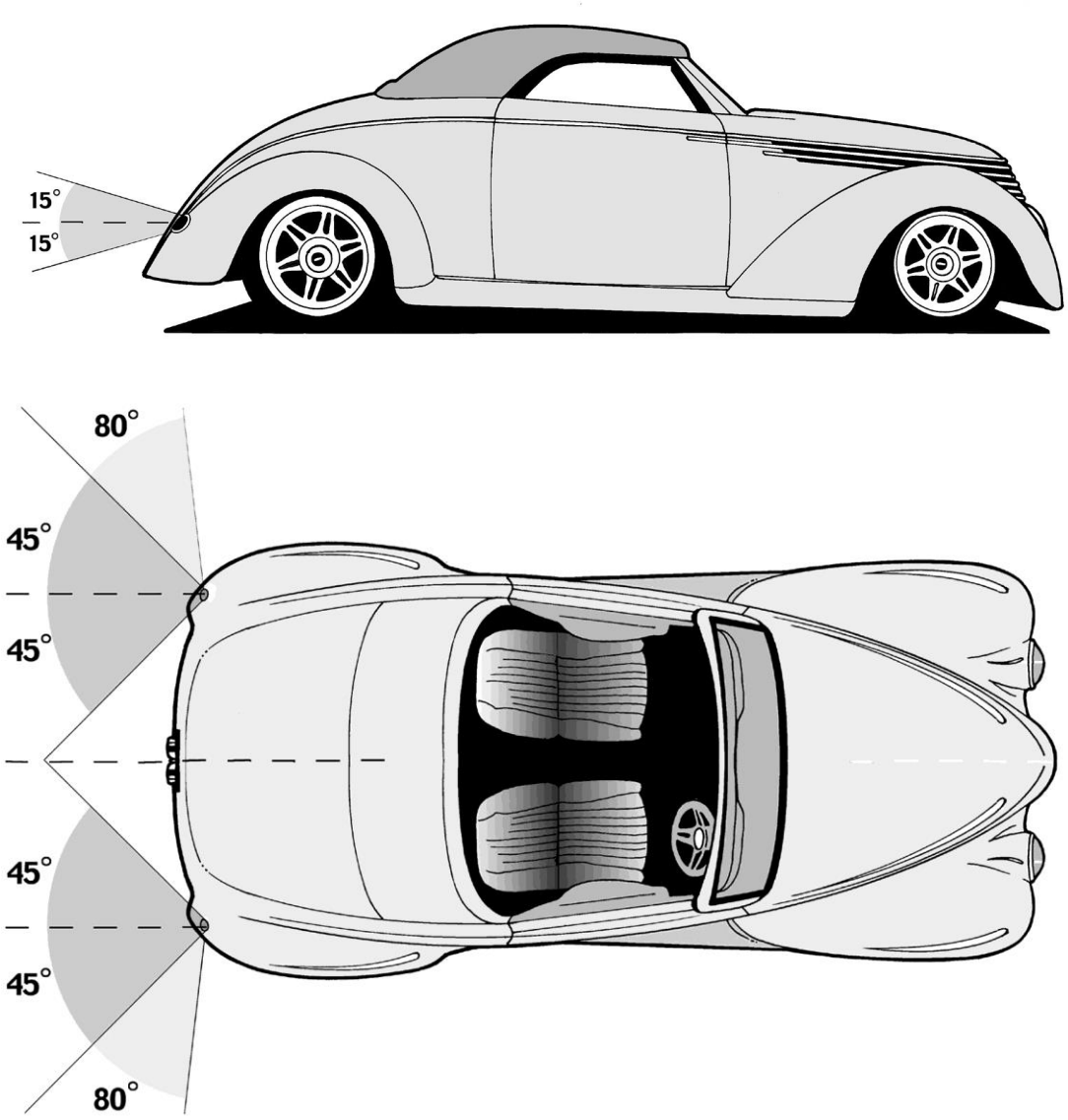


Diagram 2.7: Visibility angles for rear position lamps

Rear position lamp sources

2.7(12) A filament bulb or LED array rear position lamp fitted to a low volume vehicle must comply with any one or more of the approved standards specified for rear position lamps listed in *Table 2: Approved Standards for Lamps*, by either incorporating the applicable standards markings on the rear position lamp lens, or through other supplementary documented evidence. *[see Table 2: Approved Standards for Lamps]*

2.7(13) A filament bulb or LED array rear position lamp fitted to a low volume vehicle which does not meet any one or more of the approved standards specified for rear position lamps listed in *Table 2: Approved Standards for Lamps*, may be fitted provided that the lamp meets the requirements specified in Table 3. *[see Table 3: Other Lamp Sources]*

Blue-dot inserts for rear position lamps

2.7(14) A rear position lamp fitted to a low volume vehicle must not incorporate within the lens a blue-dot accessory insert.

2.8 Rear registration-plate illumination-lamp requirements

2.8(1) A rear registration-plate illumination-lamp is a lamp that is designed to ensure that the rear registration-plate is visible from the rear of the vehicle during darkness, and must meet all applicable technical requirements specified in *2.8*.

Number of rear registration-plate illumination-lamps

2.8(2) A low volume vehicle must be fitted with at least one rear registration-plate illumination-lamp.

Colour of rear registration-plate illumination-lamps

2.8(3) When operated, a rear registration-plate illumination-lamp fitted to a low volume vehicle must emit diffuse light that is substantially white.

Positioning of rear registration-plate illumination-lamps

2.8(4) A rear registration-plate illumination-lamp that is fitted to a low volume vehicle must be positioned so as to illuminate the figures and letters of the rear registration-plate.

Electrical connections for rear registration-plate illumination-lamps

2.8(5) A rear registration-plate illumination-lamp fitted to a low volume vehicle must automatically operate if the headlamps are activated.

Visibility of rear registration-plate illumination-lamps

2.8(6) When operated, the light source of a rear registration-plate illumination lamp fitted to a low volume vehicle must not be directly visible to the rear of the vehicle.

2.8(7) When operated, a rear registration-plate illumination-lamp fitted to a low volume vehicle must illuminate the figures and letters of a rear registration-plate so that they are visible during the hours of darkness from a distance of 20 m (66’).

Rear registration-plate illumination-lamps sources

2.8(8) A filament bulb or LED array rear registration-plate illumination-lamp fitted to a low volume vehicle must comply with any one or more of the approved standards specified for rear registration-plate illumination-lamps listed in *Table 2: Approved Standards for Lamps*, by either incorporating the applicable standards markings on the rear registration-plate illumination-lamp lens, or through other supplementary documented evidence. *[see Table 2: Approved Standards for Lamps]*

2.8(9) A filament bulb or LED array rear registration-plate illumination-lamp fitted to a low volume vehicle which does not meet any one or more of the approved standards specified for rear registration-plate illumination-lamps listed in *Table 2: Approved Standards for Lamps*, may be fitted provided that the lamp meets the requirements specified in Table 3. *[see Table 3: Other Lamp Sources]*

2.9 Retroreflector (reflector) requirements

2.9(1) Retroreflectors are mandatory items fitted to a vehicle which reflect light back from a light source, to enable other road users to the rear of the vehicle to be aware of the presence of the vehicle during darkness, even if the vehicle's lights are switched off, and must meet all applicable technical requirements specified in *2.9*.

Number of retroreflectors

2.9(2) A low volume vehicle must be fitted with at least one pair of rearward-facing retroreflectors.

Colour of retroreflectors

2.9(3) A rearward-facing retroreflector fitted to a low volume vehicle must reflect any white light shining on it as substantially red light.

2.9(4) A forward-facing retroreflector, if fitted, to a low volume vehicle must reflect any white light shining on it as substantially white or amber light.

Positioning of retroreflectors

2.9(5) A pair of rearward-facing retroreflectors fitted to a low volume vehicle must be:

(a) positioned at the rear of the vehicle; and

(b) symmetrically arranged.

2.9(6) A pair of rearward-facing retroreflectors fitted to a low volume vehicle must be positioned at a width and height that is in accordance with the requirements specified in Table 1. *[see Table 1: Lamp Positioning Requirements]*

Size of retroreflectors

2.9(7) A retroreflector fitted to a low volume vehicle must incorporate a luminated lens or reflective material surface area of not less than 22 sq cm (3 ½ sq inches).

2.9(8) A rearward-facing retroreflector fitted to a low volume vehicle may be either:

(a) an individual item of lighting equipment; or

(b) incorporated within the rearward-facing position-lamp.

Visibility of retroreflectors

2.9(9) A retroreflector fitted to a low volume vehicle must reflect light so as to improve the visibility of the vehicle to other road users, without causing undue dazzle or discomfort to those road users.

Retroreflector sources

2.9(10) A retroreflector fitted to a low volume vehicle must comply with any one or more of the approved standards specified for retroreflectors listed in *Table 2: Approved Standards for Lamps*, by either incorporating the applicable standards markings on the retroreflector, or through other supplementary documented evidence. *[see Table 2: Approved Standards for Lamps]*

2.9(11) A retroreflector fitted to a low volume vehicle which does not meet any one or more of the approved standards specified for retroreflectors listed in *Table 2: Approved Standards for Lamps*, may be fitted provided that it meets the requirements specified in Table 3. *[see Table 3: Other Lamp Sources]*

2.10 Optional (cosmetic) lamp requirements

2.10(1) A low volume vehicle is not required to be fitted with cosmetic lamps, however one or more lamps that are not otherwise specified in this low volume vehicle standard may be fitted, provided that the lamp:

(a) complies with the general safety requirements specified for all lamps in *2.1*; and

(b) is positioned so that the light source is not directly visible when viewed from a position, either: *[see diagrams 2.10]*

(i) in front of the vehicle, to the right of a vertical plane that passes through the centre of the vehicle's right front position lamp at an angle of 60 degrees to the longitudinal centre-line of the vehicle; or to the left of a vertical plane that passes through the centre of the vehicle's left front position lamp at an angle of 60 degrees to the longitudinal centre-line of the vehicle; or

(ii) behind the vehicle, to the right of a vertical plane that passes through the centre of the vehicle's left rear position lamp at an angle of 60 degrees to the longitudinal centre-line of the vehicle; or to the left of a vertical plane that passes through the centre of the vehicle's right rear position lamp at an angle of 60-degrees to the longitudinal centre-line of the vehicle; or

(iii) on either side of the vehicle, above a plane that passes downwards from the top of the vehicle at an angle of 45 degrees to the horizontal;

and

(c) emits light that is diffuse; and

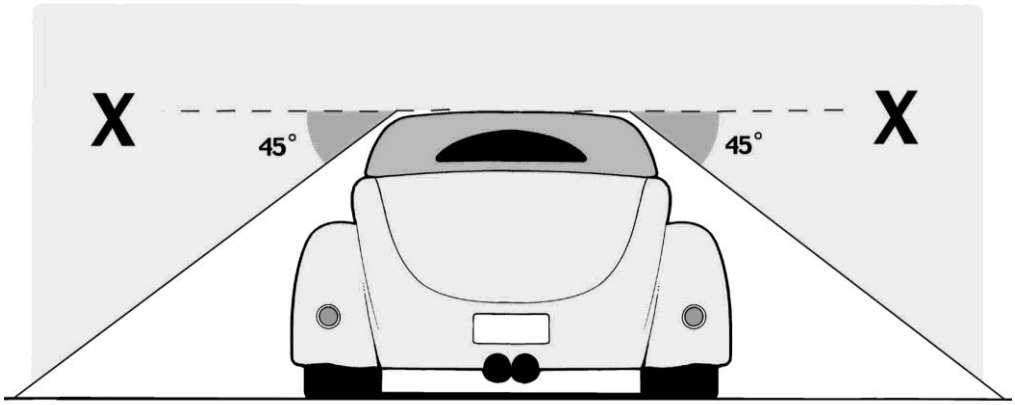
(d) is positioned so that no part of the light source is situated within 250 mm (10") of any lamp required by this low volume vehicle standard; and

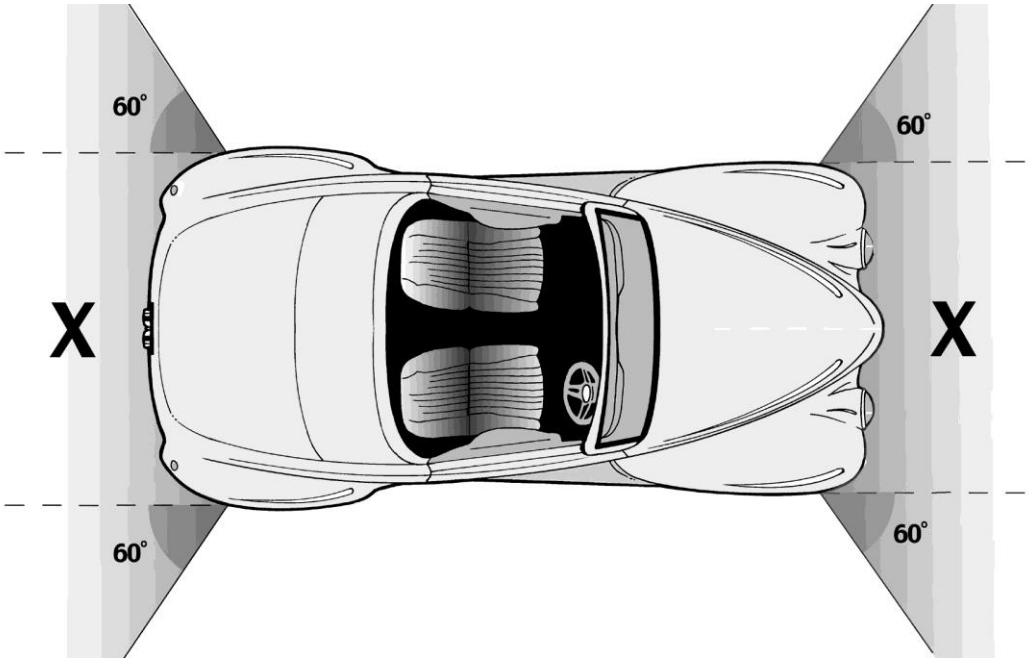
(e) emits light that does not flash or otherwise vary in intensity or colour; and

(f) is in a fixed position on the vehicle, and does not revolve, rotate or otherwise move; and

(g) is fitted in such a way, and is of a luminance, that it does not dazzle, confuse or distract other road users; and

(h) does not cause confusion as to the orientation of the vehicle.





Light sources must not be directly visible from the shaded regions in diagrams

Diagram 2.10: Light source visibility angles

2.11 Other optional lamp requirements

Interior lamps

2.11(1) A low volume vehicle is not required to be fitted with an interior lamp, however one or more interior lamps serving to light the interior of a low volume vehicle for the convenience of passengers may be fitted, in which case they must not, when in use and whilst the vehicle is in motion:

(a) adversely affect the driver's vision; or

(b) cause undue dazzle or discomfort to other road users.

Daytime running-lamps

2.11(2) A low volume vehicle is not required to be fitted with daytime running-lamps, however one pair of daytime running-lamps may be fitted to the front of the vehicle, in which case they must:

(a) meet one or more of the approved standards specified for daytime running-lamps in *Land Transport Rule: Vehicle Lighting 2004*; and

(b) when operated, emit light that is substantially white or amber; and

(c) not operate when a front fog-lamp or headlamp is in use.

Reversing-lamps

2.11(3) A low volume vehicle is not required to be fitted with reversing-lamps, however one or two reversing-lamps may be fitted to the rear of the vehicle, in which case they must:

(a) meet one or more of the approved standards specified for reversing-lamps in *Land Transport Rule: Vehicle Lighting 2004*; and

(b) emit light that is substantially white; and

(c) emit a diffuse light or a dipped beam of light; and

(d) be able to be operated only when:

(i) the reverse gear is engaged; or

(ii) the headlamps are extinguished.

Cornering-lamps

2.11(4) A low volume vehicle is not required to be fitted with cornering lamps, however one pair of cornering lamps may be fitted for use when cornering, provided that:

(a) the cornering lamps were fitted by a high-volume vehicle manufacturer when the vehicle was manufactured; and

(b) when operated, the cornering lamps emit light that is substantially white or amber; and

(c) the vehicle is not modified in a way that affects the performance of the cornering lamps.

Fog-lamps

2.11(5) A low volume vehicle is not required to be fitted with one or more fog-lamps, however, if fitted, fog-lamps must:

(a) meet one or more of the approved standards specified for fog-lamps in *Land Transport Rule: Vehicle Lighting 2004*; and

(b) comply with the technical requirements specified for fog-lamps in the New Zealand Transport Agency's *Vehicle Inspection Requirements Manual for In-Service Vehicles*.

2.11(6) A front fog-lamp fitted to a low volume vehicle may be covered by a readily removable protective cover when it is not in use.

Moveable spot-lamps

2.11(7) A moveable spot-lamp may be fitted to a low volume vehicle provided that:

(a) the vehicle to which the spot-lamp is fitted is a production vehicle manufactured before 1960; and

(b) the spot lamp was a factory or aftermarket accessory available at the time of the vehicle's manufacture.

Decorative hood ornament lamps

2.11(8) A low-wattage decorative lamp may be incorporated within a hood ornament fitted to a low volume vehicle, provided that:

(a) the vehicle to which the hood ornament is fitted is a production vehicle; and

(b) the hood ornament was a factory or aftermarket accessory available at the time of the vehicle's manufacture; and

(c) the vehicle to which the hood ornament is fitted has been issued with a valid 'Lighting Equipment Endorsement' from the Vintage Car Club of New Zealand.

Towing-lamps

2.11(9) A low volume vehicle may be fitted with a roof-mounted blue-lens towing-lamp, provided that:

(a) the vehicle to which the towing-lamp is fitted is a production vehicle manufactured prior to 1960; and

(b) the towing lamp is not operational.

NOTE: A blue roof-mounted towing-lamp was a common new car dealer-installed accessory during the 1940s to 1960s, to signal to other motorists that a trailer was being towed.

Section 3 Exclusions to this standard

3.1 Motor sport exclusions

3.1(1) A low volume vehicle that is issued with a valid *LVV Authority Card* issued by MotorSport New Zealand is not required to meet the requirements of *2.2(3)*, provided that:

(a) the additional headlamps are used only in competition events that are closed to the motoring public; and

(b) the additional headlamps can be disconnected from the regulatory main-beam and dipped-beam headlamps by a circuit-breaker that is within easy reach of the driver.

3.2 Single rear position lamp and stop-lamp exclusions

3.2(1) A low volume vehicle is not required to meet the requirements of *2.3(2)* and *2.7(2)* and may be fitted with a single rear position lamp and a single stop-lamp, positioned at, or to the right of, the longitudinal centreline of the vehicle, if the vehicle either:

(a) is less than 1.5 m (5') in width; or

(b) was manufactured before 1 January 1978; and

(i) was originally equipped with only one rear position lamp and one stop-lamp by the vehicle manufacturer; and

(ii) the vehicle's performance characteristics have not been substantially enhanced from its as-manufactured condition.

3.3 Direction-indicator lamp exclusions

3.3(1) A low volume vehicle is not required to be fitted with direction-indicators, and therefore does not have to meet the requirements specified for direction-indicators in *2.5* if the vehicle:

(a) was manufactured before 1 January 1967; and

(b) was not originally equipped with direction-indicators by the vehicle manufacturer; and

(c) the vehicle's performance characteristics have not been substantially enhanced from its as-manufactured condition.

Section 4 Vehicles not required to be certified to this standard

4.1 Vehicles not covered by this standard

4.1(1) A light vehicle is not required to be certified to this low volume vehicle standard, if the vehicle is modified for the purposes of law enforcement or the provision of emergency services.

4.2 Vehicles that pre-date legal requirements

4.2(1) A light vehicle is not required to be certified to this low volume vehicle standard, if the vehicle was either:

(a) modified before 1 January 1992 in such a way that the lighting equipment may, directly or indirectly, be affected, and the lighting equipment fitted to the vehicle is the same as that fitted at the time of the vehicle's modification; or

(b) scratch-built before 1 January 1992, and the lighting equipment fitted to the vehicle is the same as that fitted at the time of the vehicle's construction.

4.3 Modifications that do not require certification

4.3(1) A modification to, or the addition of, lighting equipment is not required to be certified to the *Low Volume Vehicle Code*, provided that the safe performance of the vehicle is not compromised.

Section 5 Terms and definitions within this standard

Aftermarket means a manufacturer or supplier who produces components on a production-run basis for the mass-market.

Asymmetric dipped-beam headlamp means a dipped-beam headlamp that emits a beam of light with a distinct horizontal cut-off from at least the centre to the edge of the beam.

Blue-dot accessory lamp means a small accessory cosmetic lens incorporated as part of a stop-lamp lens that causes a purple-coloured hue to be emitted when the stop lamp is illuminated.

COF means a Certificate of Fitness, issued by a New Zealand Transport Agency-appointed authorised vehicle inspection certifier.

Class in relation to vehicles, means a category of vehicle of one of the Groups A, L, M, N and T, as specified in *Table A* of the *Land Transport Rule Vehicle Lighting 2004* 'vehicle classes'.

Class-MA means a passenger vehicle (other than a Class-MB or Class-MC vehicle) that has no more than nine seating positions (including the driver's seating position).

Class-MB means a passenger vehicle (other than a Class MC vehicle) that:

(a) has not more than nine seating positions (including the driver's seating position); and

(b) in which the centre of the steering wheel is in the forward quarter of the vehicle's total length

Class-MC means a passenger vehicle, designed with special features for off-road operation, that has not more than nine seating positions (including the driver's seating position), and that:

(a) has four-wheel drive; and

(b) has at least four of the following characteristics when the vehicle is unladen on a level surface and the front wheels are parallel to the vehicle's longitudinal centre-line and the tyres are inflated to the vehicle manufacturer's recommended pressure:

(i) an approach angle of not less than 28 degrees; and

(ii) a break-over angle of not less than 14 degrees; and

(iii) a departure angle of not less than 20 degrees; and

(iv) a running clearance of not less than 200 mm; and

(v) a front axle clearance, rear axle clearance, or suspension clearance of not less than 175 mm.

Cornering lamp means a lamp designed to emit light at the front of the vehicle to supplement a vehicle's headlamps by illuminating the road ahead in the direction of the turn.

Cut-off	means that part of a dipped beam that marks a separation between areas of higher and lower luminance.
Custom-manufactured	means a one-off component built by an individual or company, as opposed to a component that is one of a production run.
Daytime running-lamp	means a lamp designed to emit a low-intensity light forward of a vehicle to make it more easily seen in the daytime.
Diffuse	means a light that is spread out and not concentrated in one place.
Dipped beam	means a beam of light, emitted from a lamp fitted to a vehicle, that is angled downwards in such a way that it prevents undue dazzle or discomfort to oncoming drivers and other road users.
Dipped-beam headlamp	means a headlamp designed to emit a dipped beam.
Direction-indicator lamp	means a lamp designed to emit a flashing light to signal the driver's intention to change the direction of the vehicle to the right or to the left.
Driver	includes the rider of a motorcycle, moped, cycle, mobility device, or wheeled recreational device.
EEC, EC	are abbreviations for directives of the European Economic Community and, later, the European Communities.
Elastomeric	means able to return to its natural shape when a deforming force is removed.
Federal Motor Vehicle Safety Standard	means a vehicle standard of the United States of America.
Fog-lamp	means a high intensity lamp designed to aid the driver or other road users in conditions of severely reduced visibility, including fog or snow but not including clear atmospheric conditions under the hours of darkness, and that is: (a) a front fog-lamp; or (b) a rear fog-lamp.
Front position lamp	is the same as a park-lamp, and was previously referred to as a forward-facing position lamp.

Front fog-lamp means a fog-lamp designed to provide a dipped beam of light to the front of a motor vehicle.

Group in relation to vehicles, means a collective category of the vehicle classes that are specified in *Table A* of the *Land Transport Rule Vehicle Lighting 2004* 'vehicle classes', as follows:

(a) Group A means vehicles of Class AA and Class AB;

(b) Group L means vehicles of Classes LA, LB, LC, LD, and LE;

(c) Group M means vehicles of Classes MA, MB, MC, MD, and ME;

(d) Group N means vehicles of Classes NA, NB, and NC;

(e) Group T means vehicles of Classes TA, TB, TC, and TD.

Headlamp means a lamp designed to illuminate the road ahead of a vehicle, and that is:

(a) a dipped-beam headlamp; or

(b) a main-beam headlamp; or

(c) a combination of a dipped-beam headlamp and a main-beam headlamp.

High-mounted stop lamp means a stop-lamp that is designed to be fitted in a central, high-mounted position at the rear of a vehicle.

Illumination means the amount of light flux per unit area at a specified distance from a light source.

Interior lamp means a lamp designed to illuminate the interior of the vehicle for the convenience of passengers.

Lamp means a device designed to emit light, and includes an array of separate light sources that appear as a continuous illuminated surface.

LED means a light emitting diode.

Lighting equipment means equipment, designed both to emit or reflect light and to be fitted to a vehicle, and includes a reflector and reflective material.

Light motor vehicle means a motor vehicle except one defined as a 'heavy motor vehicle'.

Light output	means the intensity or brightness of light emitted from lighting equipment per unit area in a given direction.
Light source	means a device that emits light, including an incandescent or fluorescent light bulb, with each filament in an incandescent bulb having multiple filaments deemed to be a separate light source.
m	is an abbreviation for metres.
Main-beam headlamp	means a headlamp designed to illuminate the road over a long distance ahead of a vehicle, and includes a driving lamp.
Photometric	means the process of measuring the intensity of illumination from a particular light source, and comparing it with that produced by a standard source.
Position lamp	means a low intensity lamp that is designed to indicate to other road users the presence and dimensions of a vehicle, and that is: (a) a front position lamp; and (b) a rear position lamp; and (c) a side-marker lamp; and (d) an end-outline marker lamp.
Rear fog-lamp	means a fog-lamp designed to indicate to other road users the presence of the rear of the vehicle.
Rear registration-plate illumination-lamp	means a lamp designed to illuminate the rear registration-plate of a motor vehicle.
Rear position lamp	is the same as a tail-lamp, and was previously referred to as a rearward-facing position lamp.
Reflective material (or retro-reflective material)	means any material that reflects light back towards the light source.
Reflector (or retroreflector)	means a discrete item of lighting equipment that is designed to reflect light back towards the light source, but does not include reflective material.
Replica	in relation to a motor vehicle, means a motor vehicle built out of period, with or without period parts, imitating a design of the period.

Reversing lamp	means a lamp designed to illuminate the area behind a vehicle while it is reversing and to warn other road users that the vehicle is reversing or about to reverse.
Safe tolerance	means the tolerance within which the safe performance of the vehicle, its structure, systems, components or equipment is not compromised, having regard to any manufacturer's operating limits.
Scratch-built 'historic replica'	means a vehicle that is a combination of parts and components which has never previously existed in its complete form as a production vehicle, but which is an authentic replica of a specific make and model of production vehicle that was manufactured before 1960, which uses period components, systems, materials, and similar engineering principles throughout its construction, and either: (a) uses a significant proportion of original primary mechanical components from an original example of the vehicle being replicated; or (b) is not readily distinguishable from an original example of the vehicle being replicated.
Service brake	means a brake for intermittent use that is normally used to slow down and stop a vehicle.
Stop lamp	means a lamp that is designed to operate when the brake pedal is depressed.
Symmetric dipped-beam headlamp	means a dipped-beam headlamp that is not an asymmetric dipped-beam headlamp.
WOF	means a Warrant of Fitness, issued by a New Zealand Transport Agency-appointed authorised vehicle inspection certifier.

NOTE: The terms and definitions found in section 5 are limited to those terms and definitions that are unique to this low volume vehicle standard, and are not necessarily contained within the terms and definitions section of the *Low Volume Vehicle Code*.