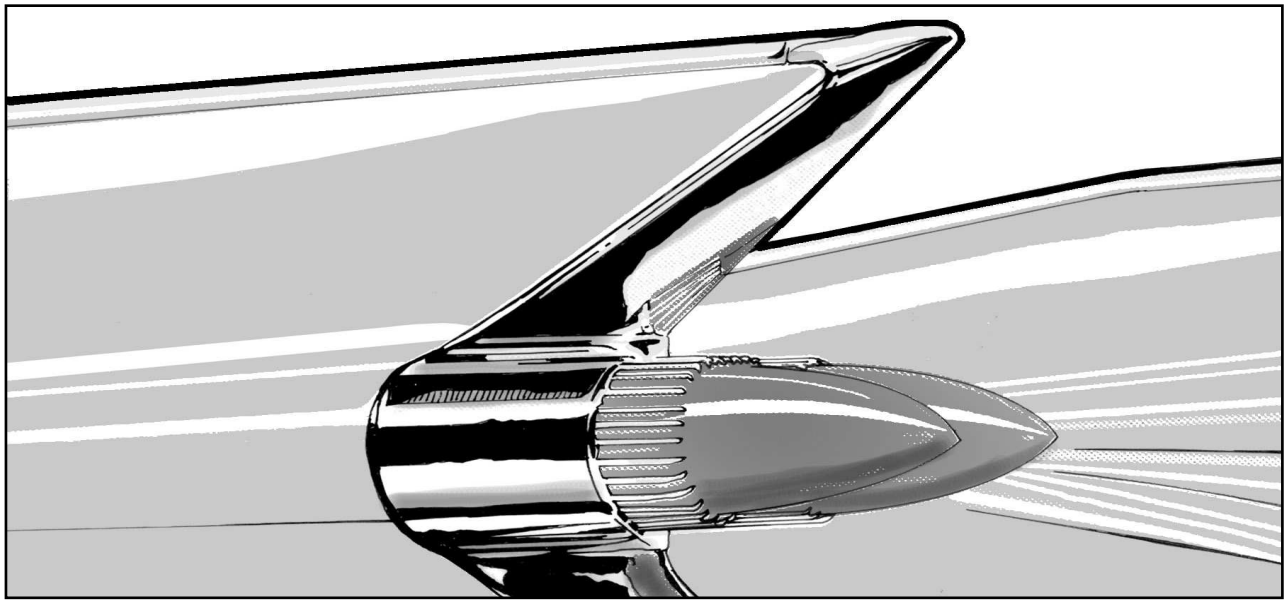
Low Volume Vehicle Technical Association Incorporated

Low Volume Vehicle Standard
125-00-(00)
(Lighting Equipment)

This Low Volume Vehicle Standard corresponds with Land Transport Rule: Vehicle Lighting 2004: Rule 32005.



Original version, effective from: 1 March 2005

Signed in accordance with clause 1.5 of the Low Volume Vehicle Code, on ……..……...by:	
on behalf of the LTSA: ……..……	*on behalf of the LTSA:* ……..……

Background

The Low Volume Vehicle Technical Association Incorporated (LVVTA) represents ten hobbyist and specialist groups who are dedicated to ensuring that their members' 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 groups 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 Land Transport Safety Authority. As a result, the considerable experience in applied safety engineering built up by LVVTA members over the past fifteen 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 Land Transport Safety Authority of New Zealand, and are printed and distributed by the LVVTA. Information on the availability of the low volume vehicle standards may be obtained free of charge from the LVVTA website www.lvvta.org.nz or by writing to the LVVTA at: Low Volume Vehicle Technical Association (Inc.), P O Box 75-790, Manurewa, Auckland, New Zealand.

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Lighting equipment (125-00(00))

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 conspicuity of the vehicle for other road users, during all normal and emergency driving conditions. Note that this low volume vehicle standard does not apply to any lamps that are unmodified original equipment fitted in its original location on a production vehicle.

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)*, that are:

(a) production vehicles that, after 1 March 2005:

(i) are modified in such a way as to become a low volume vehicle; and

(ii) are retro-fitted with non-original lighting equipment;

or

(b) scratch-built on or after 1 March 2005.

1.1(2) 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 dates specified in *1.1(1)*, a low volume vehicle 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 or her 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 *2.3.1* of *Part 2* of the *Low Volume Vehicle Code*, reproduced here in the interest of convenience.

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; and

(d) fitted in a position and perform in a way that is appropriate for the equipment and the vehicle.

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 would 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 conspicuity, 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, may have one or 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) symmetrically arranged.

Positioning of headlamps (width-wise)

2.2(6) A pair of dipped-beam headlamps fitted to a low volume vehicle must be positioned on a horizontal plane, at a width of either:

(a) no further inboard than 400 mm from the outer-most part of the vehicle; or

(b) in the case of a low volume vehicle that is less than 1300 mm in width, no less than 400 mm apart; or

(c) in the case of a low volume vehicle whose body design makes achieving *2.2(6)(a)* impractical, no less than 600 mm apart; or

(d) 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', closer to the vertical centreline of the adjacent tyre than to the longitudinal centreline of the vehicle.

NOTE 1: *2.2(6)(d)* 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.

NOTE 2: 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.

Positioning of headlamps (height-wise)

2.2(7) A dipped-beam headlamp fitted to a low volume vehicle must be positioned at a height of:

(a) no less than 250 mm from the ground; and

(b) no more than 1200 mm from the ground.

2.2(8) 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(9) 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(10) 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(11) 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(12) The wiring system in a low volume vehicle may enable a dipped-beam headlamp to remain illuminated when the main-beam headlamps are operating.

2.2(13) Activation of either the dipped-beam or high-beam headlamps in a low volume vehicle must automatically also activate the:

(a) rearward-facing position lamps; and

(b) registration plate illumination lamps.

Adjustment of headlamps

2.2(14) A headlamp fitted to a low volume vehicle must be designed and installed so as to incorporate sufficient provision for adjustment in order to meet the requirements of *2.2(15)* and *2.2(16),* and continue to meet these requirements despite the changes of height and loading that may occur during the life of the vehicle.

Visibility of headlamps

2.2(15) The horizontal orientation of a headlamp on a low volume vehicle, must, when the vehicle's front wheels are pointing in the straight-ahead position, ensure that the centre-line of the beam of light emitted from the lamp is projected either parallel to, or to the left of, the longitudinal centre-line of the vehicle.

2.2(16) The vertical orientation of a main-beam headlamp on a low volume vehicle must be such that, under all conditions of use, the centre-line of the beam of light emitted from the lamp does not rise above a plane that passes through the centre of the lamp and that is parallel to the surface on which the vehicle is standing.

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(15)* and *2.2(16)*, particularly in relation to dip angle.

Headlamps that meet approved standards

2.2(17) A filament bulb or high-intensity gas discharge headlamp may be fitted to a low volume vehicle, provided that the lamp lens is proven to comply with any one or more of the following approved standards by either incorporating the applicable standards markings on the headlamp lens, or through other supplementary documented evidence:

(a) *UN/ECE Regulation numbers 1, 5, 8, 20, 31, 98, 112,* and *113*; or

(b) *European Council Directive 76/761/EEC*; or

(c) *Australian Design Rule (ADR) 47*; or

(d) *Federal Motor Vehicle Safety Standard (FMVSS) 108*; or

(e) *Technical Standard for Headlamps (Japan)*; or

(f) *Japanese Industrial Standard (JIS) D5504* and *D5500*.

NOTE: 'DOT' markings confirm compliance with an FMVSS Standard listed in *2.2(17)(d).*

Headlamps sourced from production vehicles

2.2(18) A filament bulb headlamp that does not meet an approved standard specified in *2.2(17)* 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 when the vehicle was manufactured; 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.

NOTE: *2.2(18)(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(19) 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; 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(19)(b)*.

NOTE 2: In order to comply with *2.2(19)*, 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(20) 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.

Swivelling headlamps

2.2(21) 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(15)* and *2.2(16)* whilst the steered wheels are in the straight-ahead position.

Headlamp compatibility

2.2(22) 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: *2.2(22)* refers in particular to the fitting of HID (high intensity discharge) bulbs to normal lamps. HID bulbs are not compatible with regular lamps, as this combination greatly increases levels of glare to other road users, and therefore HID bulbs must not be retro-fitted to housings not designed for use with HID bulbs.

NOTE 2: Fitment of quartz halogen bulbs into regular lamps are generally a successful, and therefore acceptable, retro-fitment. However, the wattage of any headlamp bulb should not exceed 65 watts.

2.2(23) 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(24) 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(25) 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 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.

Positioning of stop-lamps (width-wise)

2.3(6) A pair of stop-lamps fitted to a low volume vehicle must be positioned at a width of, either:

(a) no further inboard than 400 mm from the outer-most part of the vehicle; or

(b) in the case of a low volume vehicle that is less than 1300 mm in width, no less than 400 mm apart; or

(c) in the case of a low volume vehicle whose body design makes achieving *2.3(6)(a)* impractical, no less than 600 mm apart; or

(d) 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', closer to the vertical centreline of the adjacent tyre than to the longitudinal centreline of the vehicle.

NOTE 1: *2.3(6)(d)* 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.

NOTE 2: 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.

Positioning of stop-lamps (height-wise)

2.3(7) A stop-lamp fitted to a low volume vehicle must be positioned at a height of:

(a) no less than 250 mm from the ground; and

(b) no more than 1500 mm from the ground.

Operation of stop-lamps

2.3(8) 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(9) 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(10) 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 directly behind the vehicle.

2.3(11) 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(12) 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]*

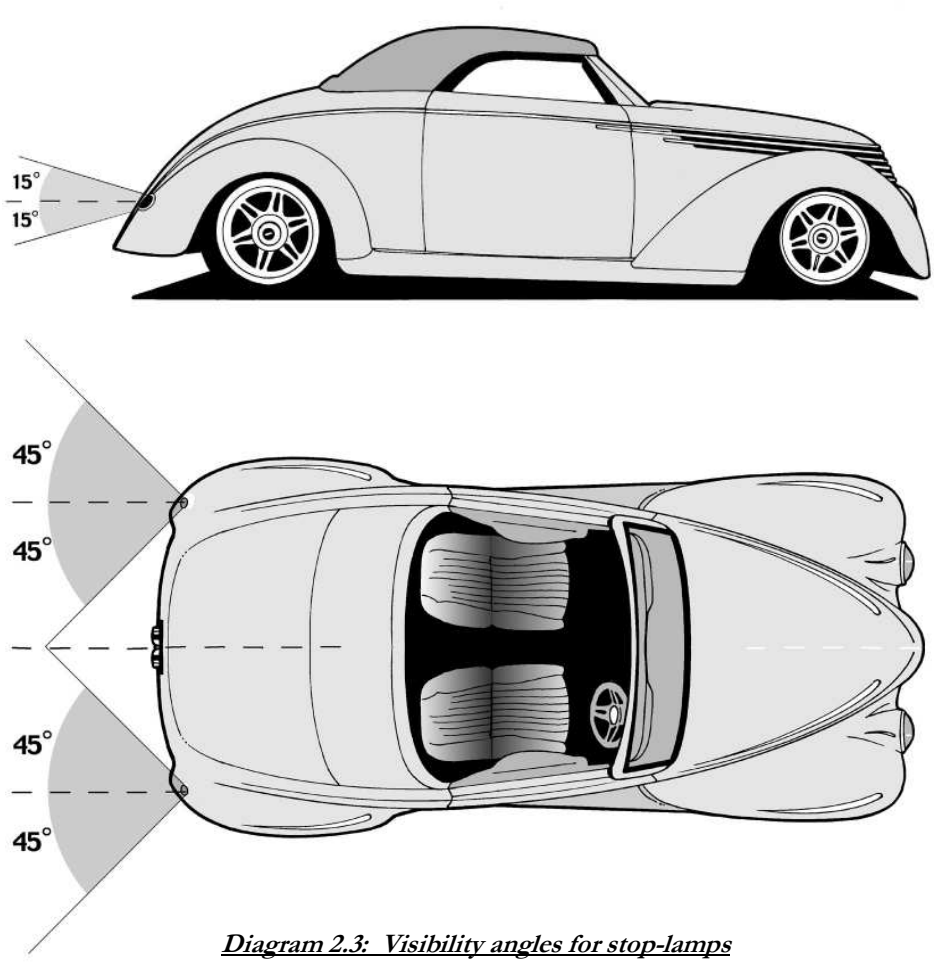


Diagram 2.3: Visibility angles for stop-lamps

Size of stop-lamps

2.3(13) 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 conspicuity as a filament bulb specified in *2.3(13)(a)*.

Stop-lamps that meet approved standards

2.3(14) A filament bulb or LED array 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 following approved standards by either incorporating the applicable standards markings on the stop-lamp lens, or through other supplementary documented evidence:

(a) *UN/ECE Regulation No. 7*; or

(b) *European Council Directive 76/758/EEC*; or

(c) *Australian Design Rule (ADR) 49*; or

(d) *Federal Motor Vehicle Safety Standard (FMVSS) 108*; or

(e) *Technical Standard for Stop Lamps (Japan)*; or

(f) *Japanese Industrial Standard (JIS) D5500*.

NOTE: 'DOT' markings confirm compliance with an FMVSS Standard listed in *2.3(14)(d)*.

Stop-lamps sourced from production vehicles

2.3(15) A filament bulb stop-lamp that does not meet an approved standard specified in *2.3(14)* may be fitted to a low volume vehicle provided that the lamp:

(a) either:

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

(ii) incorporates a lens that 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 low volume vehicle, the vehicle being replicated; and

(c) in the case of a lamp that does not incorporate a reflector or reflectorised housing behind the bulb, the lamp is modified to maximise its optical performance through increasing the amount of reflected light, by either:

(i) covering the face of the lamp housing behind the bulb with reflective aluminium tape; or

(ii) installing a reflector disc behind the bulb.

NOTE 1: *2.3(15)(b)* 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.

NOTE 2: The application of aluminium tape referred to in *2.3(15)(c)(i)* 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.

Stop-lamps (mass-manufactured) from other sources

2.3(16) A mass-manufactured stop-lamp that is not provided for in either *2.3(14)* or *2.3(15)* may only be used if the lamp has been assessed and approved by the Low Volume Vehicle Technical Association Incorporated as complying with specified photometric and other performance requirements, as listed in *LVVTA Information Sheet; Schedule of LVVTA-Approved Lighting Equipment.*

Custom-manufactured (filament bulb) stop-lamps

2.3(17) A filament bulb 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.

2.3(18) A lens for a filament bulb stop-lamp that is custom-manufactured may be fitted to a low volume vehicle, provided that either:

(a) the lens is:

(i) part of a lens that was fitted as original equipment to a production vehicle; and

(ii) meets one or more of the approved standards specified in *2.3(14)*;

or

(b) in the case of a lens 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.

NOTE 1: 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.

NOTE 2: Where *2.3(18)(b)* applies, the LVVTA should be consulted to confirm the suitability of the material.

Custom-manufactured (LED-array) stop-lamps

2.3(19) A custom-manufactured LED-array 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 Vehicle 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.

Blue-dot inserts for stop-lamps

2.3(20) A stop-lamp fitted to a low volume vehicle must not incorporate within the lens a blue-dot accessory insert.

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 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.

2.4(3) A low volume vehicle is not required to be fitted with a high-mounted stop-lamp if the vehicle is either:

(a) manufactured before 1 January 1990; or

(b) of a class other than MA.

NOTE: In addition to the requirements specified in *2.4(2)* and *2.4(3),* the New Zealand entry compliance process requires that any MA-class vehicle (irrespective of age) first registered in New Zealand on or after 1 January 1990 must be fitted with a high-mounted stop-lamp.

Colour of high-mounted stop-lamps

2.4(4) 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(5) 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 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(6) 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(7) 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 stop-lamps.

Visibility of high-mounted stop-lamps

2.4(8) 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

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

2.4(9) 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 directly behind the vehicle.

High-mounted stop-lamps that meet approved standards

2.4(10) A filament bulb or LED array high-mounted stop-lamp may be fitted to a low volume vehicle provided that the lamp either is proven to comply with one or more of the following approved standards by either incorporating the applicable standards markings on the lamp lens, or through other supplementary documented evidence:

(a) *UN/ECE Regulation No. 7*; or

(b) *Australian Design Rule (ADR) 60*; or

(c) *Federal Motor Vehicle Safety Standard (FMVSS) 108*; or

(d) *Technical Standard for Auxiliary Stop Lamps (Japan)*; or

(e) *Japanese Industrial (JIS) D5500*.

NOTE: 'DOT' markings confirm compliance with an FMVSS Standard listed in *2.4(10)(a)(iii).*

Custom-manufactured (filament bulb) high-mounted stop-lamps

2.4(11) 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(12) 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(12)(b)* applies, the LVVTA should be consulted to confirm the suitability of the material.

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

2.4(13) 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 be fitted with two or four direction-indicator lamps to the front, and two or four 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 be affected by each other.

Positioning of direction-indicator lamps (width-wise)

2.5(8) A pair of direction-indicator lamps fitted to a low volume vehicle must be positioned at a width of, either:

(a) no further inboard than 400 mm from the outer-most part of the vehicle; or

(b) in the case of a low volume vehicle that is less than 1300 mm in width, no less than 400 mm apart; or

(c) in the case of a low volume vehicle whose body design makes achieving *2.5(8)(a)* impractical, no less than 600 mm apart; or

(d) 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', closer to the vertical centreline of the adjacent tyre than to the longitudinal centreline of the vehicle.

NOTE 1: *2.5(8)(d)* 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.

NOTE 2: 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.

Positioning of direction-indicator lamps (height-wise)

2.5(9) A direction-indicator lamp fitted to a low volume vehicle must be positioned at a height of:

(a) no less than 250 mm from the ground; and

(b) no more than 1500 mm from the ground.

Size of direction-indicator lamps

2.5(10) 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(10)(a)*.

Operation of direction-indicator lamps

2.5(11) 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(12) A direction-indicator system fitted to a low volume vehicle must incorporate, either visually or audibly, when in operation:

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

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

2.5(13) 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(14) 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 rearward-facing position-lamp and stop-lamp circuits, so that when in operation, the direction-indicator illuminates or cancels, as necessary, the rearward-facing 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(15) 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(16) 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(17) 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(18*), that is clearly visible during conditions of clear daylight from a distance of 100 m.

Visibility (angles) of direction-indicator lamps

2.5(18) 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;

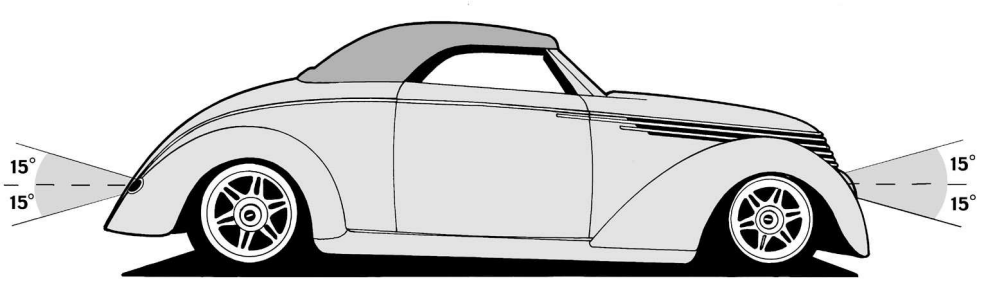
and

(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)*.



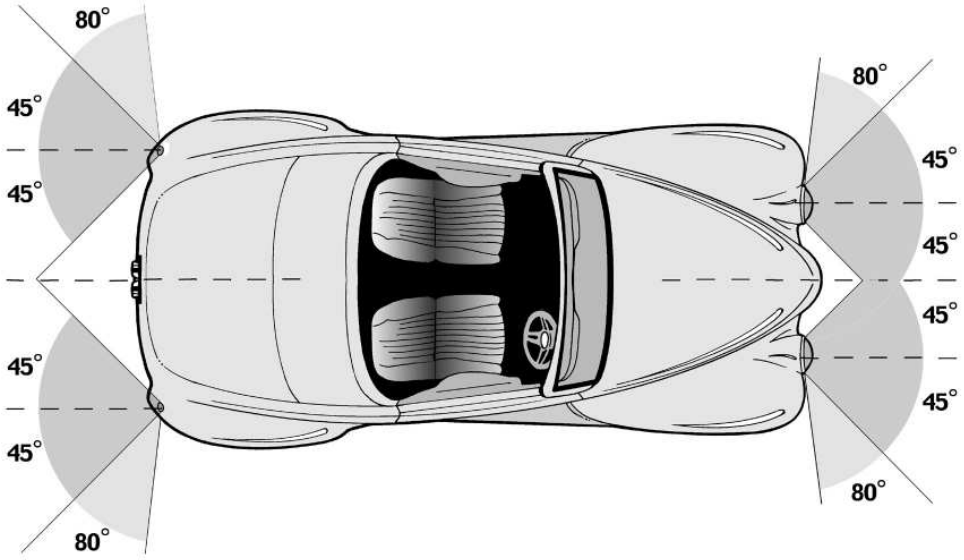


Diagram 2.5: Visibility angles for direction-indicators

Direction-indicator lamps that meet approved standards

2.5(19) A filament bulb or LED array direction-indicator lamp may be fitted to a low volume vehicle, provided that the lamp is proven to comply with any one or more of the following approved standards by either incorporating the applicable standards markings on the lamp lens, or through other supplementary documented evidence:

(a) *UN/ECE Regulation No. 6*; or

(b) *European Council Directive 76/759/EEC*; or

(c) *Australian Design Rule (ADR) 6*; or

(d) *Federal Motor Vehicle Safety Standard (FMVSS) 108*; or

(e) *Technical Standard for Direction Indicators (Japan)*; or

(f) *Japanese Industrial Standard (JIS) D5500*.

NOTE: 'DOT' markings confirm compliance with an FMVSS Standard listed in *2.5(19)(d)*.

Direction-indicator lamps sourced from production vehicles

2.5(20) A direction-indicator lamp that does not meet an approved standard specified in *2.5(19)* may be fitted to a low volume vehicle provided that the lamp:

(a) either:

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

(ii) incorporates a lens that 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 low volume vehicle, the vehicle being replicated; and

(c) in the case of a lamp that does not incorporate a reflector or reflectorised housing behind the bulb, the lamp is modified to maximise its optical performance through increasing the amount of reflected light, by either:

(i) covering the face of the lamp housing behind the bulb with reflective aluminium tape; or

(ii) installing a reflector disc behind the bulb.

NOTE 1: *2.5(20)(b)* 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.

NOTE 2: The application of aluminium tape referred to in *2.5(20)(c)(i)* 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.

Direction-indicator lamps from other sources

2.5(21) A mass-manufactured direction-indicator lamp that is not provided for in either *2.5(19)* or *2.5(20)* may only be used if the lamp has been assessed and approved by the Low Volume Vehicle Technical Association Incorporated as complying with specified photometric and other performance requirements, as listed in *LVVTA Information Sheet; Schedule of LVVTA-Approved Lighting Equipment.*

Custom-manufactured (filament bulb) direction-indicator lamps

2.5(22) A filament bulb direction-indicator 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.

2.5(23) A lens for a filament bulb direction-indicator lamp that is custom-manufactured may be fitted to a low volume vehicle, provided that either:

(a) the lens is:

(i) part of a lens that was fitted as original equipment to a production vehicle; and

(ii) meets one or more of the approved standards specified in *2.5(19)*;

or

(b) in the case of a lens 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.

NOTE 1: If a direction-indicator lamp lens is custom-made from a part of an OE lamp from a production vehicle, and the custom-made direction-indicator lamp lens does not incorporate the approved standards markings from the OE lens, the remainder of the OE lens from which the custom-made direction-indicator 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.

NOTE 2: Where *2.5(23)(b)* applies, the LVVTA should be consulted to confirm the suitability of the material.

Custom-manufactured (LED-array) direction-indicator lamps

2.5(24) A custom-manufactured LED-array direction-indicator lamp must not be fitted to a low volume vehicle unless the lamp has been assessed and approved in writing by the Low Volume Vehicle 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.

2.6 Forward-facing position-lamp (park) requirements

2.6(1) Forward-facing 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 forward-facing position-lamps

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

Colour of forward-facing position-lamps

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

Positioning of forward-facing position-lamps

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

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

(b) symmetrically arranged.

Positioning of forward-facing position-lamps (width-wise)

2.6(5) A pair of forward-facing position-lamps fitted to a low volume vehicle must be positioned at a width of, either:

(a) no further inboard than 400 mm from the outer-most part of the vehicle; or

(b) in the case of a low volume vehicle that is less than 1300 mm in width, no less than 400 mm apart; or

(c) in the case of a low volume vehicle whose body design makes achieving *2.6(5)(a)* impractical, no less than 600 mm apart; or

(d) 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', closer to the vertical centreline of the adjacent tyre than to the longitudinal centreline of the vehicle.

NOTE 1: *2.6(5)(d)* 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.

NOTE 2: 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.

Positioning of forward-facing position-lamps (height-wise)

2.6(6) A forward-facing position-lamp fitted to a low volume vehicle must be positioned at a height of:

(a) no less than 250 mm from the ground; and

(b) no more than 1500 mm from the ground.

Size of forward-facing position-lamps

2.6(7) A forward-facing 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 *2.6(7)(a)*.

Operation of forward-facing position-lamps

2.6(8) A forward-facing 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 forward-facing position-lamps

2.6(9) A forward-facing position-lamp that is fitted to a low volume vehicle must automatically operate if the headlamps are activated.

2.6(10) Forward-facing position-lamps fitted to a low volume vehicle must operate simultaneously with the rearward-facing position lamps, through a single and common activation.

Visibility (output) of forward-facing position-lamps

2.6(11) A forward-facing 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 forward-facing position-lamp.

2.6(12) A forward-facing position-lamp fitted to a low volume vehicle must emit light that is clearly visible from a distance of 200 m during the hours of darkness.

Visibility (angles) of forward-facing position-lamps

2.6(13) A forward-facing 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]*

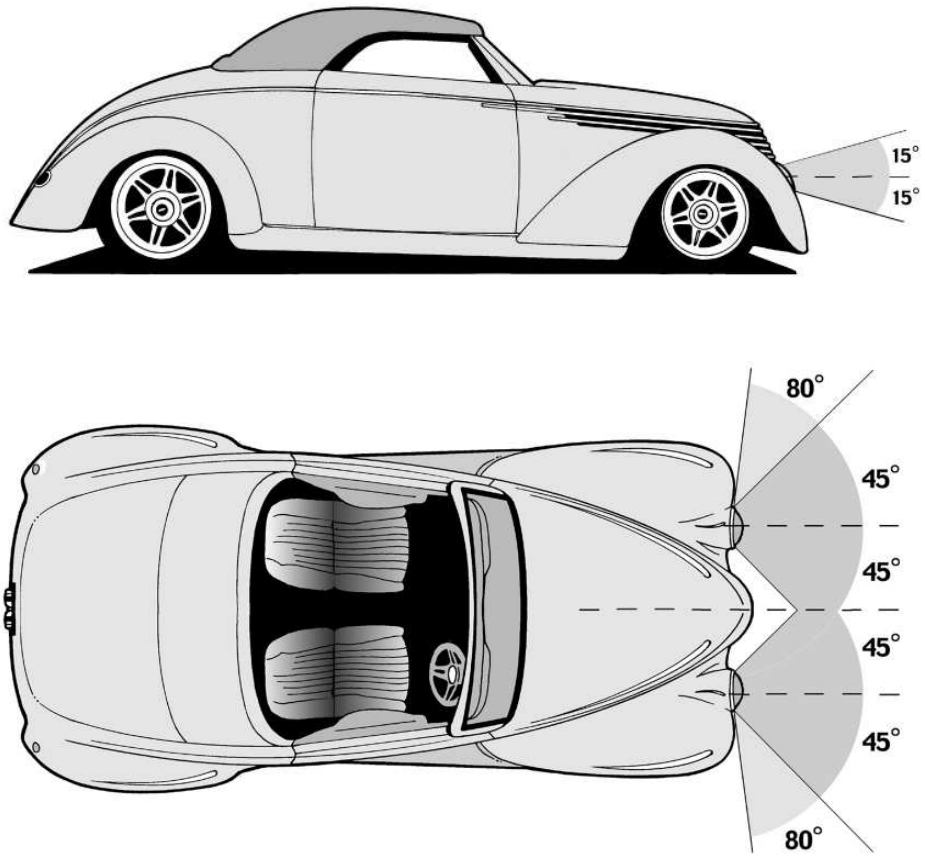


Diagram 2.6: Visibility angles for forward-facing position-lamps

Forward-facing position-lamps that meet approved standards

2.6(14) A filament bulb or LED array forward-facing position-lamp may be fitted to a low volume vehicle, provided that the lamp is proven to comply with any one or more of the following approved standards by either incorporating the applicable standards markings on the lamp lens, or through other supplementary documented evidence:

(a) *UN/ECE Regulation No. 7*; or

(b) *European Council Directive 76/758/EEC*; or

(c) *Australian Design Rule (ADR) 49*; or

(d) *Federal Motor Vehicle Safety Standard (FMVSS) 108*; or

(e) *Technical Standard for Front and Rear Position (Side) Lamps (Japan)*; or

(f) *Japanese Industrial Standard (JIS) D5500*.

NOTE: 'DOT' markings confirm compliance with an FMVSS Standard listed in *2.6(14)(d)*.

Forward-facing position-lamps sourced from production vehicles

2.6(15) A filament bulb forward-facing position-lamp that does not meet an approved standard specified in *2.6(14)* may be fitted to a low volume vehicle provided that the lamp:

(a) either:

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

(ii) incorporates a lens that 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 low volume vehicle, the vehicle being replicated; and

(c) in the case of a lamp that does not incorporate a reflector or reflectorised housing behind the bulb, the lamp is modified to maximise its optical performance through increasing the amount of reflected light, by either:

(i) covering the face of the lamp housing behind the bulb with reflective aluminium tape; or

(ii) installing a reflector disc behind the bulb.

NOTE 1: *2.6(15)(b)* 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.

NOTE 2: The application of aluminium tape referred to in *2.6(15)(c)(i)* 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.

Forward-facing position-lamps from other sources

2.6(16) A mass-manufactured forward-facing position-lamp that is not provided for in either *2.6(14)* or *2.6(15)* may only be used if the lamp has been assessed and approved by the Low Volume Vehicle Technical Association Incorporated as complying with specified photometric and other performance requirements, as listed in *LVVTA Information Sheet; Schedule of LVVTA-Approved Lighting Equipment*.

Custom-manufactured (filament bulb) forward-facing position-lamps

2.6(17) A filament bulb forward-facing position-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.

2.6(18) A lens for a filament bulb forward-facing position-lamp that is custom-manufactured may be fitted to a low volume vehicle, provided that either:

(a) the lens is:

(i) part of a lens that was fitted as original equipment to a production vehicle; and

(ii) meets one or more of the approved standards specified in *2.6(14)*;

or

(b) in the case of a lens 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.

NOTE 1: If a forward-facing position-lamp lens is custom-made from a part of an OE lamp from a production vehicle, and the custom-made forward-facing position-lamp lens does not incorporate the approved standards markings from the OE lens, the remainder of the OE lens from which the custom-made forward-facing position-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.

NOTE 2: Where *2.6(18)(b)* applies, the LVVTA should be consulted to confirm the suitability of the material.

Custom-manufactured (LED-array) forward-facing position-lamps

2.6(19) A custom-manufactured LED-array forward-facing position-lamp must not be fitted to a low volume vehicle unless the lamp has been assessed and approved in writing by the Low Volume Vehicle 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.

2.7 Rearward-facing position-lamp (tail) requirements

2.7(1) Rearward-facing 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 rearward-facing position-lamps

2.7(2) A low volume vehicle must be fitted with one or two pairs of rearward-facing position-lamps.

Colour of rearward-facing position-lamps

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

Positioning of rearward-facing position-lamps

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

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

(b) symmetrically arranged.

Positioning of rearward-facing position-lamps (width-wise)

2.7(5) A pair of rearward-facing position lamps fitted to a low volume vehicle must be positioned at a width of, either:

(a) no further inboard than 400 mm from the outer-most part of the vehicle; or

(b) in the case of a low volume vehicle that is less than 1300 mm in width, no less than 400 mm apart; or

(c) in the case of a low volume vehicle whose body design makes achieving *2.7(5)(a)* impractical, no less than 600 mm apart; or

(d) 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', closer to the vertical centreline of the adjacent tyre than to the longitudinal centreline of the vehicle.

NOTE 1: *2.7(5)(d)* 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.

NOTE 2: 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.

Positioning of rearward-facing position-lamps (height-wise)

2.7(6) A rearward-facing position lamp fitted to a low volume vehicle must be positioned at a height of:

(a) no less than 250 mm from the ground; and

(b) no more than 1500 mm from the ground.

Size of rearward-facing position-lamps

2.7(7) A rearward-facing 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(7)(a)*.

Electrical connections for rearward-facing position-lamps

2.7(8) A rearward-facing position lamp that is fitted to a low volume vehicle must automatically operate if the headlamps are activated.

2.7(9) Rearward-facing position lamps fitted to a low volume vehicle must operate simultaneously with the forward-facing position lamps and headlamps, through a single and common activation.

Visibility (output) of rearward-facing position-lamps

2.7(10) A rearward-facing 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 rearward-facing position-lamp.

2.7(11) A rearward-facing position-lamp fitted to a low volume vehicle must emit light that is clearly visible from a distance of 200 m during the hours of darkness.

Visibility (angles) of rearward-facing position-lamps

2.7(12) A rearward-facing 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]*

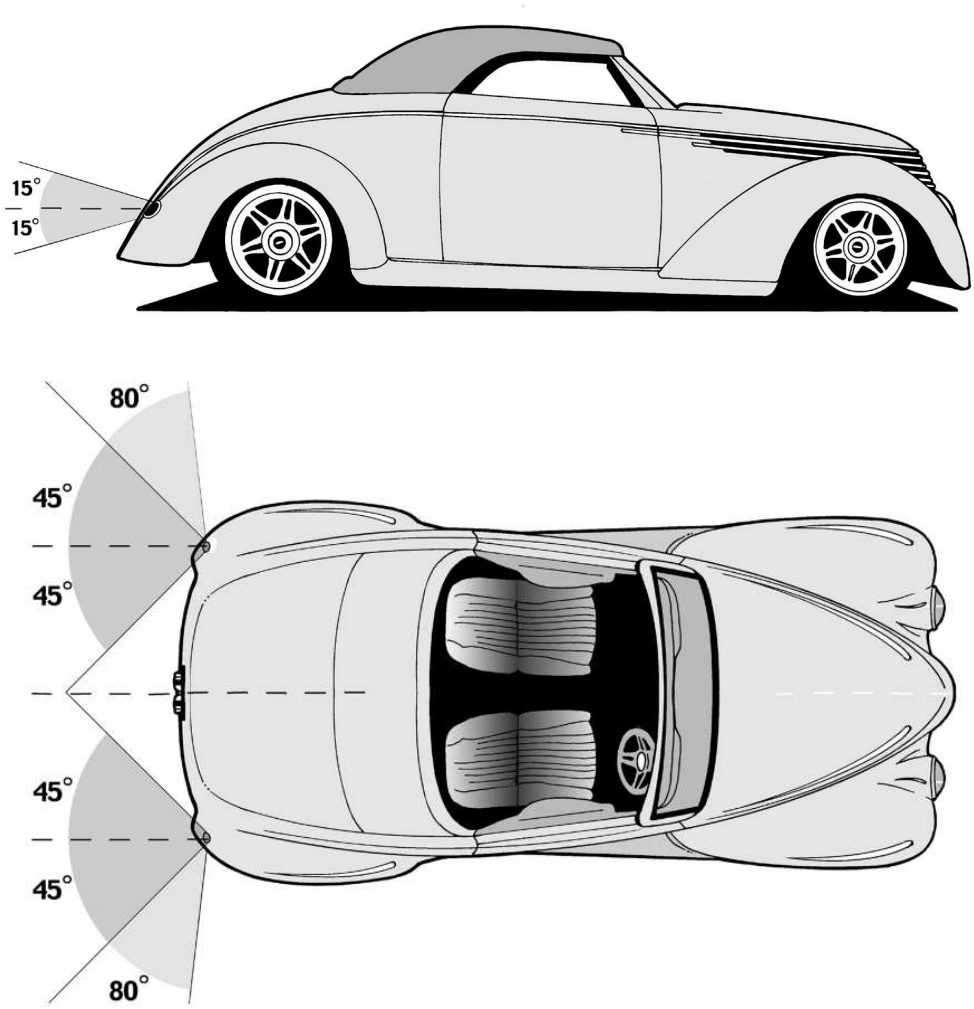


Diagram 2.7: Visibility angles for rearward-facing position-lamps

Rearward-facing position-lamps that meet approved standards

2.7(13) A filament bulb or LED array rearward-facing position-lamp may be fitted to a low volume vehicle, provided that the lamp is proven to comply with any one or more of the following approved standards by either incorporating the applicable standards markings on the lamp lens, or through other supplementary documented evidence:

(a) *UN/ECE Regulation No. 7*; or

(b) *European Council Directive 76/758/EEC*; or

(c) *Australian Design Rule (ADR) 49*; or

(d) *Federal Motor Vehicle Safety Standard (FMVSS) 108*; or

(e) *Technical Standard for Front and Rear Position (Side) Lamps (Japan)*; or

(f) *Japanese Industrial Standard (JIS) D5500*.

NOTE: 'DOT' markings confirm compliance with an FMVSS Standard listed in *2.7(13)(d)*.

Rearward-facing position-lamps sourced from production vehicles

2.7(14) A filament bulb rearward-facing position-lamp that does not meet an approved standard specified in *2.7(13)* may be fitted to a low volume vehicle provided that the lamp:

(a) either:

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

(ii) incorporates a lens that 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 low volume vehicle, the vehicle being replicated; and

(c) in the case of a lamp that does not incorporate a reflector or reflectorised housing behind the bulb, the lamp is modified to maximise its optical performance through increasing the amount of reflected light, by either:

(i) covering the face of the lamp housing behind the bulb with reflective aluminium tape; or

(ii) installing a reflector disc behind the bulb.

NOTE 1: *2.7(14)(b)* 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.

NOTE 2: The application of aluminium tape referred to in *2.7(14)(c)(i)* 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.

Rearward-facing position-lamps from other sources

2.7(15) A mass-manufactured rearward-facing position-lamp that is not provided for in either *2.7(13)* or *2.3(14)* may only be used if the lamp has been assessed and approved by the Low Volume Vehicle Technical Association Incorporated as complying with specified photometric and other performance requirements, as listed in *LVVTA Information Sheet; Schedule of LVVTA-Approved Lighting Equipment*.

Custom manufactured (filament bulb) rearward-facing position-lamps

2.7(16) A filament bulb rearward-facing position-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.

2.7(17) A lens for a filament bulb rearward-facing position-lamp that is custom-manufactured may be fitted to a low volume vehicle, provided that either:

(a) the lens is:

(i) part of a lens that was fitted as original equipment to a production vehicle; and

(ii) meets one or more of the approved standards specified in *2.7(13);*

or

(b) in the case of a lens 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.

NOTE 1: If a rearward-facing position-lamp lens is custom-made from a part of an OE lamp from a production vehicle, and the custom-made rearward-facing position-lamp lens does not incorporate the approved standards markings from the OE lens, the remainder of the OE lens from which the custom-made rearward-facing position-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.

NOTE 2: Where *2.7(17)(b)* applies, the LVVTA should be consulted to confirm the suitability of the material.

Custom manufactured (LED-array) rearward-facing position-lamps

2.7(18) A custom-manufactured LED-array rearward-facing position-lamp must not be fitted to a low volume vehicle unless the lamp has been assessed and approved in writing by the Low Volume Vehicle 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.

Blue-dot inserts for rearward-facing position-lamps

2.7(19) A rearward-facing 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) Rear registration-plate illumination-lamps are lamps that are 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.

Rear registration-plate illumination-lamps that meet approved standards

2.8(8) A filament bulb or LED array rear registration-plate illumination-lamp may be fitted to a low volume vehicle, provided that the lamp is proven to comply with any one or more of the following approved standards by either incorporating the applicable standards markings on the lamp lens, or through other supplementary documented evidence:

(a) *UN/ECE Regulation No. 4*; or

(b) *European Council Directive 76/760/EEC*; or

(c) *Australian Design Rule (ADR) 48*; or

(d) *Federal Motor Vehicle Safety Standard (FMVSS) 108*; or

(e) *Technical Standard for Number Plate Lamps (Japan)*; or

(f) *Japanese Industrial Standard (JIS) D5500*.

NOTE: 'DOT' markings confirm compliance with an FMVSS Standard listed in *2.8(8)(d)*.

Rear registration-plate illumination-lamps sourced from production vehicles

2.8(9) A filament bulb rear registration-plate illumination-lamp that does not meet an approved standard specified in *2.8(8)* may be fitted to a low volume vehicle provided that the lamp either:

(a) was fitted to a production vehicle as original equipment when the vehicle was manufactured; or

(b) incorporates a lens that is manufactured from glass, by an aftermarket lamp manufacturer as a direct replacement for an original equipment lamp fitted to a production vehicle.

Custom-manufactured (filament bulb) rear registration-plate illumination-lamps

2.8(10) A lens for a filament bulb rear registration-plate illumination-lamp that is custom-manufactured may be fitted to a low volume vehicle, provided that either:

(a) the lens is:

(i) part of a lens that was fitted as original equipment to a production vehicle; and

(ii) meets one or more of the approved standards specified in *2.8(8)*;

or

(b) in the case of a lens 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.

NOTE 1: If a rear registration-plate illumination-lamp lens is custom-made from a part of an OE lamp from a production vehicle, and the custom-made rear registration illumination lamp lens does not incorporate the approved standards markings from the OE lens, the remainder of the OE lens from which the custom-made rear registration illumination 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.

NOTE 2: Where *2.8(10)(b)* applies, the LVVTA should be consulted to confirm the suitability of the material.

2.8(11) A filament bulb rear registration-plate illumination-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.

Custom-manufactured (LED-array) rear registration-plate illumination-lamps

2.8(12) A custom-manufactured LED-array rear registration-plate illumination-lamp must not be fitted to a low volume vehicle unless the lamp has been assessed and approved in writing by the Low Volume Vehicle 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.

2.9 Retro-reflector lamp (reflector) requirements

2.9(1) Retro-reflectors are mandatory lamps fitted to a vehicle that 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 retro-reflectors

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

Colour of retro-reflectors

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

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

Positioning of retro-reflectors

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

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

(b) symmetrically arranged.

Positioning of retro-reflectors (width-wise)

2.9(6) A pair of retro-reflectors fitted to a low volume vehicle must be positioned at a width of, either:

(a) no further inboard than 400 mm from the outer-most part of the vehicle; or

(b) in the case of a low volume vehicle that is less than 1300 mm in width, no less than 400 mm apart; or

(c) in the case of a low volume vehicle whose body design makes achieving *2.9(6)(a)* impractical, no less than 600 mm apart; or

(d) 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', closer to the vertical centreline of the adjacent tyre than to the longitudinal centreline of the vehicle.

NOTE 1: *2.9(6)(d)* means that the distance from the retro-reflector to the centreline of the tyre is less than the distance from the retro-reflector to the centreline of the vehicle.

NOTE 2: All retro-reflectors 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.

Positioning of retro-reflectors (height-wise)

2.9(7) A retro-reflector fitted to a low volume vehicle must be positioned at a height of:

(a) no less than 250 mm from the ground; and

(b) no more than 1500 mm from the ground.

Size of retro-reflectors

2.9(8) A retro-reflector fitted to a low volume vehicle must incorporate a luminated lens surface area of not less than 22 sq cm (3 ½ sq inches).

2.9(9) A retro-reflector 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 retro-reflectors

2.9(10) A retro-reflector 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.

Retro-reflectors that meet approved standards

2.9(11) A retro-reflector may be fitted to a low volume vehicle, provided that it is proven to comply with any one or more of the following approved standards by either incorporating the applicable standards markings on the retro-reflector, or through other supplementary documented evidence:

(a) *UN/ECE Regulation No. 3*; or

(b) *European Council Directive 76/757/EEC*; or

(c) *Australian Design Rule (ADR) 47*; or

(d) *Federal Motor Vehicle Safety Standard (FMVSS) 108*; or

(e) *Technical Standard for Rear Reflex Reflectors (Japan)*; or

(f) *Japanese Industrial Standard (JIS) D5500*; or

NOTE: 'DOT' markings confirm compliance with an FMVSS Standard listed in *2.9(11)(d)*.

Retro-reflectors sourced from production vehicles

2.9(12) A retro-reflector that does not meet an approved standard specified in *2.9(11)* may be fitted to a low volume vehicle provided it:

(a) either:

(i) was fitted to a production vehicle as original equipment when the vehicle was manufactured; 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 low volume vehicle, the vehicle being replicated.

NOTE 1: *2.9(12)(b)* 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.

Custom-manufactured retro-reflectors

2.9(13) A retro-reflector that is custom-manufactured may be fitted to a low volume vehicle, provided that either:

(a) the retro-reflector is:

(i) part of a retro-reflector, or lens that incorporates a retro-reflector, that was fitted as original equipment to a production vehicle; and

(ii) meets one or more of the approved standards specified in *2.9(11)*;

or

(b) in the case of a retro-reflector 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.

NOTE 1: If a retro-reflector is custom-made from a part of an OE lamp from a production vehicle, and the custom-made retro-reflector does not incorporate the approved standards markings from the OE lens, the remainder of the OE lens from which the custom-made retro-reflector 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.

NOTE 2: Where *2.9(13)(b)* applies, the LVVTA should be consulted to confirm the suitability of the material.

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 diagram 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 forward-facing 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 forward-facing 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 rearward-facing 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 rearward-facing 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

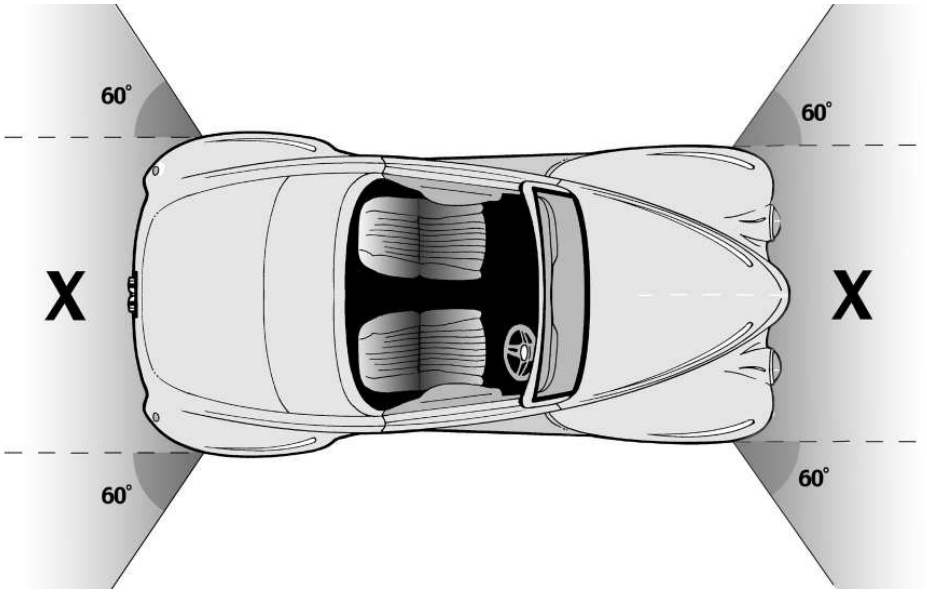
(d) is positioned so that no part of the light source is situated within 250 mm of any lamp required by this low volume vehicle standard; and

(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

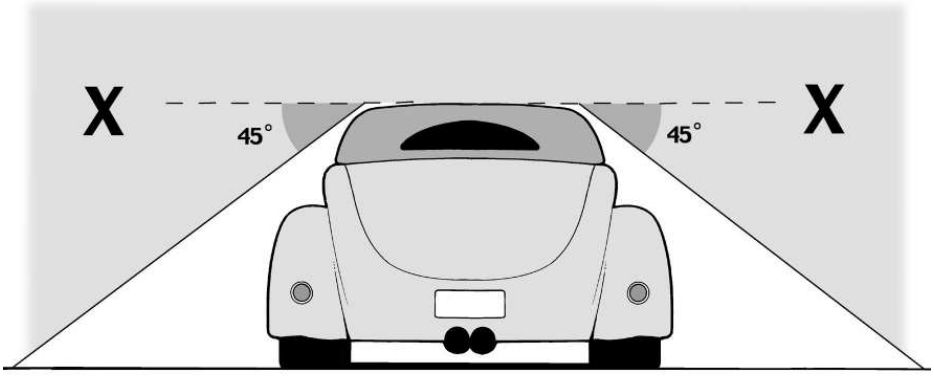


Diagram 2.10: Light source visibility angles

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 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 are fitted by a high volume vehicle manufacturer when the vehicle is 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 *LTSA 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.

NOTE: A low-wattage decorative hood ornament may only be fitted to a vehicle for which a valid Vintage Car Club of New Zealand 'Lighting Equipment Endorsement' is issued.

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 does not operate.

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 Motorsport exclusions

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 rearward-facing position-lamp and stop-lamp exclusions

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 rearward-facing 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 in width; or

(b) was manufactured before 1 January 1978; and

(i) was originally equipped with only one rearward-facing 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

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 that are not required to be certified to this standard

4.1 Vehicles that pre-date legal requirements

A low volume vehicle is not required to be certified to this low volume standard if the lighting fitted to the vehicle is the same as that fitted at the time of the vehicle's construction, provided that the vehicle's modification or construction date was before 1 January 2005.

4.2 Modifications that do not require certification

A modified production low volume vehicle is not required to be certified to this low volume standard if the retro-fitting, addition, or modification of lighting equipment is the only modification to the vehicle.

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 Land Transport New Zealand-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.

Forward-facing position-lamp means a park-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 forward-facing position lamp; and

(b) a rearward-facing 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.

Rearward-facing position-lamp means a tail-lamp.

Reflective material (or retro-reflective material) means any material that reflects light back towards the light source.

Reflector (or retro-reflector) 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 Land Transport New Zealand-appointed authorised vehicle inspection certifier.
