

Aftermarket Forward Facing Lamps – Fitting and Use

Purpose

This Vehicle Standards Information sheet No. 64 (VSI.64) is intended to provide advice on the different types of aftermarket forward facing lamps that may be fitted to a light motor vehicle (i.e. those with a GVM of 4.5 tonnes or less), excluding mopeds, motorcycles, and motor-tricycles.

NOTES:

- Advice on fitting aftermarket lamps to heavy vehicles can be obtained from the National Heavy Vehicle Regulator – see Appendix A for contact details.
- In this document:
 - i. The term “lamp” means a device that produces light.
 - ii. High-beam headlamps are also called main-beam headlamps.
 - iii. Low-beam headlamps are also called passing-beam or dipped-beam headlamps.

Introduction

The document covers two aspects of aftermarket forward facing lamps, which are lamps not originally fitted to a vehicle by its manufacturer – their technical specifications and how they are used.

The technical specifications for these lamps are covered by the mandatory vehicle standards referenced in the Road Transport (Vehicle Registration) Regulation 2017 (the Regulation), which incorporates the Australian Design Rules (ADRs).

The requirements for using these lamps are covered in the NSW Road Rules 2014 (the Road Rules).

There is no restriction on a vehicle being fitted with one or more of the different types of lamps covered in this VSI, provided each lamp fitted meets the specified technical requirements.

The lamps described in this VSI.64 may at times be fitted by vehicle manufacturers as original or optional equipment. If that is the case, the overall number of lamps fitted to the vehicle – original and aftermarket – must not exceed the maximum amount allowed under the applicable vehicle standards.

General Requirements

Road Safety

A person may fit as many lamps to their vehicle as is permitted by the vehicle standards, but the driver is responsible for how they're used. A person driving on a NSW road or road related area, must not use, or allow to be used, any lamp fitted to or in the driver's vehicle to dazzle, or in a way that is likely to dazzle any other road users, including occupants of other vehicles, motorcyclists, cyclists and pedestrians. The Road Rules also have specific usage requirements for certain types of lamps, and these are outlined in the applicable sections below.

Vehicle Standards

A lamp can only be fitted to a vehicle if it is a type of lamp required or permitted to be attached to the vehicle by Schedule 2 of the Regulation. Schedule 2 also allocates lamps that flash or that emit specific coloured light to vehicles used to carry out certain activities, which means that non-approved lamps or lamps emitting particular colours, must not be used to personalise a vehicle. For example, flashing lamps may only be fitted to specific vehicles and a lamp that emits red and/or blue light may only be fitted to an emergency services vehicle, such as police vehicle or an ambulance, etc. Refer to VSI 8, *Flashing lights and sirens*, for more information.

NOTE: Details of the applicable legislation and vehicle standards are provided in Appendix B.

Additional lamps fitted to a vehicle must be designed, securely fitted and adjusted in a way that:

- Complies with the specific vehicle standards that apply to the lamp; and
- Do not create a protrusion that increases the likelihood of injury to a person making contact with the vehicle; and
- If mounted on a bumper or bull bar, they must be fitted rearward of the front face of the bumper or bull bar; and
- Do not obstruct the driver's view of the road and traffic to the front or side of the vehicle. In particular, when sitting in the driver's seat with the seat located at the rearmost driving position where the driver can operate the steering wheel and pedals, the driver must be able to see either the surface of the road 11 metres in front of the driver's eye when looking across the top of the driving lamps or the front edge of the original body (See **Figure 1** below); and
- The light they emit, except for high-beam headlamps or driving lamps, must not be capable of dazzling the drivers of other vehicles; and

The light emitted does not reflect off any of the vehicle's surfaces (e.g. the bonnet, bumper or bull bar if fitted) into the driver's eyes. (Note: Anti-glare or matt treatments should be applied to surfaces that are affected such as bonnets or the rear surfaces of bull bars); and

- If fitted in pairs, lamps must operate simultaneously, emit light of the same colour and intensity and must be fitted symmetrically about the vehicle centreline and at the same height; and
- All electrical wiring and connections must be properly insulated, protected, and supported at suitable intervals.

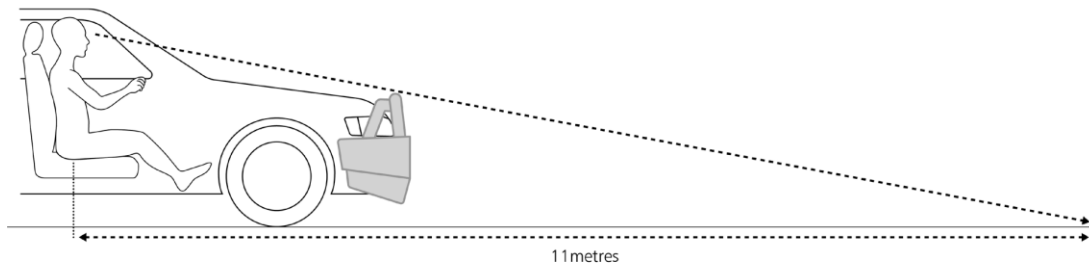


Figure 1 Driver's forward field of view of the road

Types of Lamps

The following types of forward facing lamps are covered by this VSI.64:

1. Driving lamps including light bars – lamps intended to complement the vehicle's high-beam headlamps.
2. Daytime running lamps (DRLs) - lamps that make a vehicle easier to see during normal daytime conditions.
3. Fog lamps – lamps that increase the illumination of the road surface and verges in conditions of poor visibility due to rain, fog, dust or snow.
4. Search or spot lamps - lamps that illuminate small areas, usually within six metres of the vehicle.
5. Cornering lamps – lamps that provide extra lateral illumination in the direction of an intended turn or lane change.
6. Lamps that contain light emitting diode (LED) lamps- lamps that use LEDs instead of traditional halogen globes.
7. High intensity discharge (HID) headlamps - headlamps that use HID globes instead of traditional halogen globes.

1. DRIVING LAMPS, INCLUDING LED LIGHT BARS

Technical requirements

Driving lamps are designed to complement a vehicle’s high-beam headlamps during long distance country driving, and are generally installed at the same level as the vehicle’s headlamps or higher.

Driving lamps must comply with ADR requirements, including ADR 13/00. The technical requirements for driving lamps are summarised in Table 1.

There is currently no regulation that prohibits driving lamps from being fitted to the roof, roll bar or another elevated part of a vehicle. It must be emphasised that driving lamps fitted in these locations greatly increase the likelihood of dazzling other road users, including oncoming drivers. This is a particular problem on undulating, rural roads where a driver may not be aware of an oncoming vehicle, and unwittingly dazzles them. In these situations, a driver may be subject to enforcement action by NSW Police. Elevated driving lamps could also reflect off the bonnet, or the rear of a bull bar, and cause glare that adversely affects the driver’s view of the road.

The vehicle standards treat an LED light bar as a single driving lamp

Item	Requirement
Number	Maximum of four.
Colour	Emitted light must be white.
Position	Longitudinal axis at the front of the vehicle, directing light forward
	Lateral axis must either be fitted in pairs or as a single lamp. When fitted in pairs, they must be fitted symmetrically. A single lamp or light bar must be fitted on the vehicle’s centreline
	Height not specified but the light emitted must not reflect off any of the vehicle’s surfaces into the driver’s eyes. Pairs of lights must be the same height.
Electrical Connections	Driving lamps must be able to be switched off while the high-beam headlamps are operating and must automatically turn off when the vehicle’s high-beam headlamps are switched off
Intensity	Not specified.

Table 1: Technical requirements for driving lamps.

Use

It is an offence to use driving lamps when they will, or are likely to, dazzle any other road user. In addition it is an offence to use driving lamps:

- In areas where street lighting is present, or
- Within 200m when travelling behind another vehicle, or
- Within 200m of an oncoming vehicle or when an approaching vehicle is visible to the driver, whichever is farther away.

2. DAYTIME RUNNING LAMPS (DRLs)

Technical requirements

DRLs must comply with ADR requirements, including ADR 13/00 and ADR 76/00.

The technical requirements for DRLs are summarised in Table 2

Item	Requirement
Number	Maximum of two.
Colour	Emitted light must be white.
Position	Longitudinal axis at the front of the vehicle, directing light forward.
	Lateral axis fitted symmetrically and not more than 400mm from the sides of the vehicle.
	Height fitted symmetrically (ie at the same height) between 250mm and 1500mm above the ground.
Electrical Connections	<p>The DRLs must switch on automatically when the vehicle is switched on, although the engine needn't be operating.</p> <p>The DRL must switch off automatically when the front fog lamps or headlamps are switched ON, except when the latter are used to give intermittent luminous warnings at short intervals.</p> <p>With the exception of direction indicators, all other forward facing lamps must not switch on when the DRLs are switched on.</p> <p>The DRLs must not operate, or must substantially dim, if they are located within 40mm of a direction indicator.</p>
Intensity	<p>Between 400 and 1200 candela</p> <p>If a DRL uses multiple light sources (e.g. globes or LED's), 80% of the minimum intensity requirement shall still be met if one light source fails</p>

Table 2: Technical requirements for daytime running lamps.

Use

When wired correctly DRLs operate automatically and require no driver action.

1. FRONT FOG LAMPS

Technical requirements

Front fog lamps provide a wide, bar-shaped beam of light directed close to the ground and with a sharp cut off so that light is not projected above the lamp.

Front fog lamps must comply with ADR requirements, including ADR 13/00 and ADR 50/00.

A non-flashing tell-tale lamp displaying the following symbol and emitting green light must be fitted on the dash to warn the driver that the front fog lamp(s) are lit.



Figure 2 Fog lamp tell-tale.

The technical requirements for Front Fog Lamps are summarised in Table 3.

Item	Requirement
Number	Maximum of two.
Colour	Emitted light must be white or yellow.
Position	<p>Longitudinal axis at the front of the vehicle directing light forward.</p> <p>Lateral axis fitted symmetrically, not more than 400 mm from the sides of the vehicle unless the centres of the lamps are at least 600mm apart.</p> <p>Height fitted symmetrically (ie at the same height) between 250mm, and the lesser of either the height of the low-beam headlamps or 800mm above the ground.</p>
Geometric Visibility	The angle of the beam of emitted light must be between 10° inwards and 45° outwards and between 5° upwards and 5° downwards.
Electrical Connections	Must be operable independently from the high-beam headlamps, low-beam headlamps and driving lamps.
Intensity	Not specified.
Tell-tale lamp	A non-flashing warning lamp emitting green light and showing the symbol contained in Figure 2, shall be fitted to warn the driver that the fog lamps are illuminated.

Table 3: Technical requirements for front fog lamps.

Use

Front fog lamps must only be activated when driving in fog or other hazardous weather conditions causing reduced visibility. They must not be used instead of DRLs or to supplement standard headlamps during fine weather.

Front fog lamps should only be used in conjunction with parking lamps.

3. SEARCH/SPOT LAMPS

Technical requirements

A search/spot lamp may be fitted to a vehicle in any location.

The technical requirements for search/spot lamps are summarised in Table 4.

Item	Requirement
Number	Maximum of one.
Colour	Emitted light must be white.
Position	Not specified.
Electrical Connections	Not specified.
Intensity	Not specified.

Table 4: Technical requirements for search / spot lamps.

Use:

A person must not use a spot or search lamp fitted to a vehicle on a road or road-related area unless:

- the vehicle is stationary and the lamp is used only for the purpose of examining or making adjustments or repairs to a vehicle, and the light is not projected more than six metres, or
- the lamp is used for the temporary purpose of reading any sign, notice board or house number, or
- the vehicle is being driven or used by a police officer, governmental, or other authority in the performance of their duty.

A person may fit a spot or search lamp to their vehicle for purposes such as hunting. However these cannot be used on a road or road-related area except as stipulated above.

These lamps should not be able to be switched on/off from the driver's seating position and should be pointed rearwards and downwards while the vehicle is being driven on a road or road related area.

5. CORNERING LAMPS

Technical requirements

Cornering lamps illuminate in conjunction with the turn signals, though they don't flash. They can also be wired to illuminate when the vehicle is shifted into reverse gear.

Cornering lamps must comply with ADR requirements, including ADR 13/00 and ADR 87/00.

The technical requirements for cornering lamps are summarised in Table 5.

Item	Requirement
Number	Maximum of Two.
Colour	Emitted light must white.
Position	Longitudinal axis within 1m of the front of the vehicle
	Lateral axis fitted symmetrically
	Height between 250mm and 900mm above the ground and not higher than the low-beam headlamps.
Geometric Visibility	The angle of the beam of emitted light must be between 30° to 60° outwards, and between 10° upwards and 10° downwards.
Electrical Connections	<p>The cornering lamps must be connected so that they cannot be activated unless either the high or low-beam headlamps are switched ON.</p> <p>The cornering lamp on one side of the vehicle may only be activated automatically when the direction indicators on the same side of the vehicle are switched ON and/or when the steering angle is changed from the straight-ahead position towards the same side of the vehicle.</p> <p>When the reversing lamp is on, both cornering lamps may switch on automatically, independently from the steering wheel or direction indicator position. In this case, the cornering lamps must switch OFF when the reversing lamp is switched off.</p> <p>The cornering lamps must not be activated at vehicle speeds above 40km/h.</p>
Intensity	Not specified.

Table 5: Technical requirements for cornering lamps.

Use:

When wired correctly cornering lamps operate automatically and require no driver action.

6. LAMPS CONTAINING LIGHT EMITTING DIODES (LEDs)

LED lamps are common on modern vehicles due to their high efficiency. There is also an increasing range of LED globes that are intended as replacements for traditional filament globes, both in headlamps as well as other lamps such as indicators. Retrofitted LED globes are permitted as long as they are designed as a direct replacement for the original globe, and maintain the compliance of the lamp with the relevant requirements. Some aftermarket LED globes may fit directly into the original vehicle housing, but these still need to be assessed that they comply with the applicable vehicle standards.

Except for a vehicle manufacturer's approved replacement part, before purchasing an aftermarket LED lamp or replacement LED globe for a fitted lamp, check that its manufacturer clearly states on its packaging that the lamp/globe is suitable for road use and complies with the relevant ADR requirements.

Technical requirements

Lamps containing LED globes must comply with the same technical requirements, including ADR 51/00 as those containing filament/incandescent globes, including the intensity, distribution, and colour of their emitted light.

Use

Lamps containing LED globes are subject to the same operational requirements as those containing filament/incandescent globes.

7. HIGH INTENSITY DISCHARGE HEADLAMPS (HID)

HID headlamps have been popular in the past due to their high light output. Retrofitted HID kits may be used providing they are designed as a direct replacement for the original globe, and maintain the compliance of the lamp with the relevant requirements.

HID headlamps produce more light than traditional fluorescent and incandescent headlamps, so they are more likely to dazzle other road users. HID headlamps that produce more than 2000 lumens must be both self-levelling and self-cleaning (ie headlamp cleaner systems must be fitted).

Except for a vehicle manufacturer's approved optional conversion kit, before purchasing an aftermarket HID Headlamp conversion kit, check that its manufacturer clearly states on its packaging that the kit is suitable for road use and complies with the relevant ADR requirements.

It is also important to check that the body of the lamp is suitable for the increased heat produced by HID light source, and that damage to the lens, reflector or body will not occur.

Technical requirements

HID Headlamps must comply with ADR requirements including ADR 77/00 and ADR 78/00.

HID Headlamps are subject to the same technical requirements as incandescent low and high-beam headlamps. Particular care is required with installing retro-fitted HID kits into non-HID lamps since this modification will result in non-complying headlamps unless self-cleaning or self-levelling mechanisms are present or fitted. Headlamp self-cleaning systems must comply with ADR 75/00.

Use

HID Headlamps are subject to the same operational requirements as incandescent low and high-beam headlamps.

APPENDIX A CONTACT INFORMATION

FURTHER INFORMATION

Roads and Maritime Services (RMS) Technical Enquiries Unit
<http://www.rms.nsw.gov.au> | Tel. 1300 137 302 or 13 22 13
Email: technical.enquiries@rms.nsw.gov.au

RMS Vehicle Standards & Investigations Unit
<http://www.rms.nsw.gov.au/roads/registration/get-nsw-registration/standards/vsi/index.html>
Email: vs&i@rms.nsw.gov.au

National Heavy Vehicle Regulator (NHVR)
<https://www.nhvr.gov.au> | Tel. 1300 696 487
Email: info@nhvr.gov.au or vehiclestandards@nhvr.gov.au

Department of Infrastructure and Regional Development (NHVR)
<https://infrastructure.gov.au/vehicles> | Tel. 1800 075 001 or 02 6274 7444

APPENDIX B LIGHT VEHICLE LEGISLATION AND STANDARDS

Road Transport (Vehicle Registration) Regulation 2017

- Part 5 Vehicle Standards
- Schedule 2 Light Vehicle Standards Rules

Australian Design Rules (ADRs)

- ADR 8/01 Safety Glazing Material
- ADR 13/00 Installation of Lighting and Light Signalling Devices on other than L-Group Vehicles
- ADR 42/05 General Safety Requirements
- ADR 45/01 Lighting and Light Signalling Devices not Covered by ECE Regulations
- ADR 46/00 Headlamps
- ADR 49/00 Front and Rear Position (Side) Lamps, Stop Lamps and End-outline Marker Lamps
- ADR 50/00 Front Fog Lamps
- ADR 51/00 Filament Lamps
- ADR 75/00 Headlamp Cleaners
- ADR 76/00 Daytime Running Lamps
- ADR 77/00 Gas Discharge Headlamps
- ADR 78/00 Gas Discharge Light Sources
- ADR 87/00 Cornering Lamps

Road Rules 2014

- Part 13 Lights and Warning Devices