Vehicle Standards Guide 32 (VSG-32)
Enhanced Braking Visibility

This guide provides information for operators and owners of heavy vehicles about ways to improve braking visibility. It describes three methods that may increase the visibility of a heavy vehicle during braking events.

Note: The items outlined below include the requirements for the simplest methods of complying and are not an exhaustive account of all means of compliance.

To determine if other lights or systems can be compliantly fitted, please refer to ADR13/.. .

Background

The heavy vehicle industry is well known for taking a proactive approach towards improving safety. Unfortunately, the frequency of heavy vehicle related fatalities remains too high and there is an urge to help identify opportunities that increase vehicle safety.

To assist industry in reducing incidents that occur when traffic slows quickly or stops suddenly, the Queensland Trucking Association (QTA) and National Heavy Vehicle Regulator (NHVR) have identified ways to improve braking visibility.

These include:

- Additional rear lights and reflectors
- Emergency braking light signalling
- Rear collision avoidance

This guide steps out how operators can fit additional lights, reflectors or features that improve safety while maintaining compliance with the vehicle standards.

Additional rear lights and reflectors

Installing additional rear lights at the top of the vehicle structure may provide earlier warning for following vehicles. The design of many heavy vehicles allows for these additional rear lights to be fitted high enough that warnings that can be seen by vehicles further back in traffic than the traditional low mounted lights. Making these warning lights more visible translates to extra time for other drivers to react when approaching slowed traffic or an incident.

Compliance requirements

Additional lights fitted to a heavy vehicle must comply with the lighting requirements detailed in Australian Design Rule (ADR) 13/.. including the types and position of any additional lights.

ADR 13/.. allows the following additional lights to be installed:

- direction indicator
- stop (brake) lights
- rear position (tail) lights
- rear retro-reflectors

Where these additional lights are installed, they must be positioned as close as possible to the maximum height of the vehicle. Refer to figures 1 and 2 for position requirements.

Additional lights and reflectors should be positioned symmetrically, that is the same place and number on both sides of the vehicle. Use the light/reflector spacing from the existing rear lights/reflectors a general guide when adding additional rear lights at the top of the vehicle.

The abridged requirements from ADR 13/00 are shown below, noting that the distances are measured from the closest edge of the light for each requirement. i.e., the distance between the outer edge of light to edge of vehicle, or inner edge of light to inner edge of light for light separation.

Note: Many lights and reflectors have visibility requirements. When installing the lights/reflectors in a recessed position, ensure care is taken, recesses may reduce the visibility of the lights or reflectors, causing them to become non-compliant.

Direction Indicator

Direction indicators are used to indicate to other road users the driver's intention to change direction to the right or left. They may also be used as part of an emergency stop light system or a rear-end collision alert signal (RECAS) lights (see figure 1 for positioning and visibility requirements). Direction indicators must be:

- category 2a or 2b (look for markings on the packaging for the light or manufacturer's fact sheets)
- amber in colour

- a maximum of 400mm in from the outside edge of vehicle
- mounted symmetrically on the back of the vehicle
- visible at an angle of 80˚ outwards, 45˚ towards the middle and 15˚ downwards

Stop (brake) light

Stop or brake lights, are designed to warn road users to the rear of the vehicle that the vehicle is slowing or stopping (see figure 2 for positioning and visibility requirements). Stop lights must be:

- red in colour
- a minimum of 600mm apart from the light on the opposite side of the vehicle
- mounted symmetrically on the back of the vehicle
- visible at an angle of 45˚ outwards, 45˚ towards the middle and 15˚ downwards Rear

Rear Position (tail) Lights

Rear Position (tail) lights are designed assist road users to identify where and how wide the rear of the vehicle is in the dark (see figure 1 for positioning and visibility requirements). Position lights must be:

- red in colour
- a maximum of 400mm in from the outside edge of the vehicle
- mounted symmetrically on the back of the vehicle
- visible at an angle of 80˚ outwards, 45˚ towards the middle and 15˚ downwards

Rear Retro-reflectors

Rear retro-reflectors, are designed assist road users to identify heavy vehicles in low light. Rear retro-reflectors show the location and size of stationary, unlit vehicles (see figure 1 for positioning and visibility requirements). Rear retro-reflectors must be:

- red in colour
- a maximum of 400mm in from the outside edge of the vehicle
- mounted symmetrically on the back of the vehicle
- at least visible at an angle of 30˚ outwards, 30˚ towards the middle and 10˚ downwards

Emergency Stop Lights

Emergency stop lights are a special function on a vehicle that flashes the direction indicators when the vehicle rapidly slows. The flashing of these lights is intended to let following road users know the vehicle is slowing quickly and if fitted will apply automatically under certain activation conditions.

Installation

The Emergency Stop Lights use the existing direction indicators fitted to a vehicle, so no additional lights need to be installed. If you have fitted additional direction indicator lights at the top of the vehicle, these must flash as part of the Emergency Stopping signal.

Activation conditions

Where a vehicle has an emergency stopping system fitted, the system must operate as set out in ADR 13/.. including:

- activate only when the brakes are applied, and the vehicle speed is above 50km/h
- activate under a moderate to heavy braking situation, (set by the standards as a deceleration rate is 4 m/s^2 or more)
- deactivate when the braking effort returns to that of a normal braking application (set by the standards as a deceleration rate of 2.5m/s^2).

Light Operation

Where a vehicle is fitted with Emergency Stop Lights, when activated, the lights must:

- only operate the direction indicators and no other lights on the vehicle
- activate automatically
- flash all at the same time
- flash 3 to 4 times per second.

Note: The above requirements apply to each vehicle but not to the combination. This means that where a truck is towing one or more trailers, the lights on the truck do not need to flash at the same time as each of the trailer(s).

Rear-end collision alert signal

Rear-end collision alert signal (RECAS) is a newer system that monitors the speed of vehicles approaching from behind. When the system detects the vehicle is approaching too fast, RECAS activates the rear direction indicator lights to catch the attention of the approaching driver so that they can take action to avoid a collision.

Installation

RECAS uses the existing direction indicators fitted to a vehicle, so no additional lights need to be installed. If you have fitted additional direction indicator lights at the top of the vehicle, these must flash as part of the RECAS.

Activation conditions

Where a vehicle is fitted with RECAS, the system must operate as set out in ADR 13/.. including:

- not activate if the direction indicators, hazard lights or emergency stop signals are already active

- not be active for more than 3 seconds
- activate in accordance with the requirements specified in ADR 13/..

Light Operation

Where a vehicle is fitted with RECAS, when activated, the lights must:

- only operate the direction indicators and no other lights on the vehicle
- activate automatically
- flash all at the same time
- flash between 3 and 4 times per second.

Installation advice

While installing additional lights is quite simple, emergency stop lights and RECAS systems are more complex. In some cases, these functions may already be options that can be activated or added by the vehicle manufacturer or the trailer braking system manufacturer.

If looking to install these advanced systems, the NHVR recommends contacting the vehicle manufacturer or trailer brake manufacturer for their assistance in fitting or activating these systems.

Complying with the Heavy Vehicle National Law

The operator of a heavy vehicle must ensure their vehicle complies with the *Australian Design Rules* (ADRs) and *Heavy Vehicle (Vehicle Standards) National Regulation*. Using or permitting another person to use a defective heavy vehicle on a road is an offence.

A defective heavy vehicle is a vehicle that:

- does not comply with the heavy vehicle safety standards; or
- has a part that does not perform its intended function; or
- has deteriorated to an extent that it cannot be reasonably relied on to perform its intended function.

Penalties can include on-the-spot fines or prosecution. Formal warnings or a defect notice may also be issued. For more information see the Heavy vehicle defects—Compliance and enforcement bulletin at www.nhvr.gov.au/ce-bulletins.

For more information:

Subscribe: www.nhvr.gov.au/subscribe
Visit: www.nhvr.gov.au/hvmodifications
Phone: 13 NHVR* (13 64 87)
Email: vehiclestandards@nhvr.gov.au

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VSG32 Revision history	
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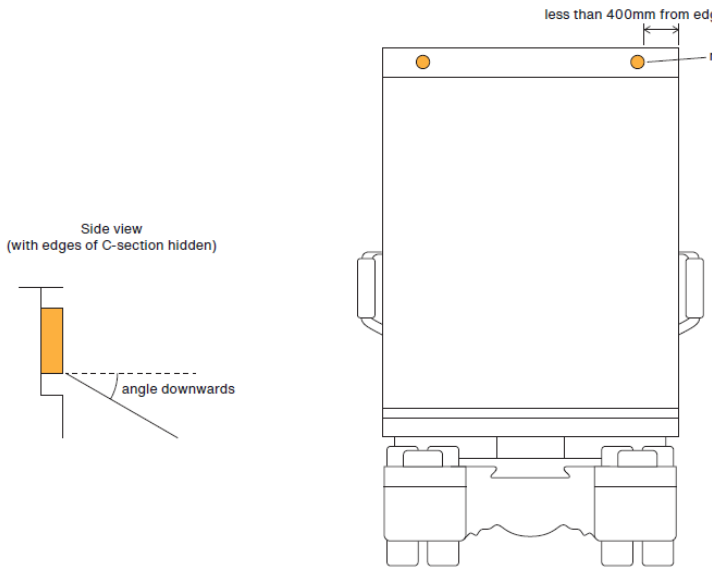
Appendix A: Figures and diagrams

Rear indicator or reflector positioning



Light/reflector	Colour	Angle		
		Outwards	Towards centre	Downwards
Indicator	Amber	80°	45°	15°
Rear position	Red	80°	45°	15°
Rear reflector	Red	30°	30°	10°

Brake light positioning