



# **CLOCSA**

**Construction Logistics and Community Safety – Australia**

## **Heavy Vehicle Inspection Guide**



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# Introduction



## CLOCS-A

Construction Logistics and Community Safety – Australia (‘CLOCS-A’) is a national voluntary Standard developed with the goal of reducing community road safety risks and impacts associated with a construction project’s transport and logistics activities.

Through the wider adoption of the CLOCS-A Standard across Australian construction supply chains, it is expected that road trauma involving construction vehicles can be reduced as well as introducing efficiencies to construction project logistics management.

The scheme is designed to achieve its objectives by prioritising safer vehicles, operations, driving standards and logistics planning alongside engaging with the community on road safety initiatives.

Much of the focus is centred around hazard management associated with the interaction between heavy vehicles and Vulnerable Road Users such as pedestrians, cyclists and motorcyclists.

Full details of the scheme can be found in the document ‘Construction Logistics and Community Safety – Australia Standard’.

## Application

The CLOCS-A Standard shall be applied by stakeholders involved in the procurement and delivery of construction projects that are publicly funded.

Unless otherwise stated, the standard is:

- applicable to all sites, (projects) that require deliveries, collections or servicing by construction vehicles during construction activities,
- applicable to all vehicle operations and specifically construction logistics vehicles over 4.5 tonnes gross vehicle mass servicing construction sites. This includes abnormal loads and engineering plant where practicable.

The Principal Client shall specify whether the CLOCS-A Standard applies within supplier contracts based on their assessment of risk and in accordance with any local authority requirements.

Note: Three of the Bronze level standards only apply to projects being carried out in city and urban environments. These standards are:

- Bug Deflectors
- Engine Air Intakes, and
- Bull Bars

On balance, these items of equipment are considered sufficiently worthwhile to remain on vehicles operating in rural and remote environments.

In relation to this point, the Principal Client shall determine and specify whether the project site is classed as city, urban or rural/remote.

## Accreditation

If suppliers to a construction project are required to comply with the CLOCS-A Standard, they must gain accreditation in order to participate.

As a function of a series of defined measures, each project shall be graded by the Principal Client as either Bronze, Silver or Gold level. Suppliers to the project need to gain accreditation in line with the nominated level.

Accreditation is calculated on the basis of meeting certain criteria set out in the Standard and awarded following the initial CLOCS-A Audit and reviewed following the Self-Assessment or follow-up Audit process.

## Heavy Vehicles

As noted above, having safer heavy vehicles is one of the main pillars of the scheme. The CLOCS-A Standard sets out the vehicle requirements for each of the 3 levels.

To meet these requirements, vehicles may need to be ordered, specified, or modified accordingly by their owners or operators. To gain formal accreditation to the scheme, vehicles will need to be examined and passed by an authorised CLOCS-A auditor. To maintain accreditation over the longer term, vehicles may be periodically checked by representatives of the Principal Client – possibly including gate staff at project site entry points.

# Introduction

## This Guide

The purpose of this guide is to provide those associated with the purchase, modification or inspection of heavy vehicles for participation in the CLOCS-A scheme with a nationally consistent set of pass/fail criteria for each item defined in the Standard.

The aim is to minimise ambiguity and make the inspection/audit/accreditation process as objective as is reasonably practicable. Where this is not completely possible, then the “intent” of the standard is set out and the CLOCS-A auditor/inspector will be required to make a reasoned judgement and will have the final say.

Users of the document may include:

- Transport operators and/or drivers of the heavy vehicles participating in the scheme when they are:
  - Initially specifying, purchasing, setting up or modifying a vehicle for participation,
  - Conducting a self-audit of the vehicle at the start of the accreditation process,
  - Reviewing the vehicle periodically for ongoing compliance, or
- In discussion with a CLOCS-A vehicle inspector or Client site representative in relation the vehicle’s current compliance with the standard.
- CLOCS-A auditors carrying out initial and subsequent vehicle standard checks for compliance with the standard.
- Representatives of the Principal Contractors when reviewing vehicles from time to time. As noted above, this may include those working at the entrance gate to a project site who are asked to monitor and act on vehicle compliance as they observe it entering the work site.

The guide is divided into 3 main sections corresponding to the Bronze, Silver and Gold levels. For each item in the CLOCS-A Standard:

- the wording of the Standard is re-stated,
- the intent and purpose of the standard is explained, and
- the pass/fail criteria are set out.

For the purposes of clarity, visual imagery is used wherever possible and appropriate.

## Inspection and Verification Processes

The process of checking vehicles to verify if they comply with the standard will likely take 3 different forms - depending on the standards being checked.

1. The following standards may be checked visually with a truck walk-around:

- Bug Deflectors
- Engine Air Intake Tubes
- Bullbars
- Sunvisors
- Windscreen Decals
- Window Tinting
- Cab Accessories
- Class V and VI Mirrors
- Fresnel Lens
- Amber Beacons
- Conspicuity Marking
- Drawbar Colour
- Warning Signage
- Wheel Indicators & Retainers
- Front Underrun Protection
- Side Underrun Protection for Trucks
- Side Underrun Protection for Trailers
- Rear Underrun Protection

2. The following standards may be checked visually and/or audibly with a truck inspection and require the assistance of the driver to demonstrate that the item is functional:

- Reversing Cameras
- Reversing Sensors
- Reversing BEEPERS
- Blind Spot Camera
- Blind Spot Sensors
- Left Turn Audible Warning
- Daytime Running Lamps
- Telematics Systems

3. The following standards will require documented verification from the vehicle OEM, distributor, dealer, aftermarket provider or AVE (approved by the NHVR) that the equipment has been fitted and/or the standards met:

- ABS for Trucks
- ABS for Trailers
- Electronic Stability Control for Trucks
- Roll Stability Control for Trailers
- Advanced Emergency Braking
- Autonomous Reverse Braking
- ADR 80/03 Emission Standards
- ADR 80/04 Emission Standards
- Zero Emission Vehicles

# Introduction

## Reference Standards

For many (but not all) of the items prescribed in the 3 levels of CLOCS-A there is a technical reference standard of one form or another. For some items there may be 2 or more relevant standards.

These reference standards include:

- Truck Industry Council (TIC) Codes of Practice
- Australian Trucking Association (ATA) Technical Advisory Procedures (TAP)
- NHVR National Heavy Inspection Manual
- NHVR - National Code of Practice Heavy Vehicle Modifications: Vehicle Standards Bulletin 6 (VSB 6)
- Australian Design Rules (ADR)
- European Regulations
- Japanese and US emission standards corresponding to the European regulation.

The equipment or systems on CLOCS-A vehicles should comply with the nominated reference standard. Where an item has more than one reference standard and there exists any meaningful conflict between them, the order of priority for compliance shall be:

- 1st - Australian Design Rules
- 2nd - UN regulation or corresponding Japanese or US standard
- 3rd - Vehicle Standards Bulletin 6 (VSB 6)
- 4th - NHVR National Heavy Vehicle Inspection Manual
- 5th - ATA Technical Advisory Procedure or TIC Code of Practice

The list below sets out CLOCS-A vehicle items and their corresponding reference standards (where they exist).

### Bug Deflectors

- ADR 93/00 – Forward Field of View 2018 (Clause 5.1)
- TIC Code of Practice to ensure an adequate field and clarity of view.

### Engine Air Intake Tubes

- ADR 93/00 – Forward Field of View 2018 (Clause 5.1)
- TIC Code of Practice to ensure an adequate field and clarity of view.

### Bullbars

- ADR 93/00 – Forward Field of View 2018 (Clause 5.1)
- TIC Code of Practice to ensure an adequate field and clarity of view

### Sunvisors

- ADR 93/00 – Forward Field of View 2018 (Clause 5.1)
- TIC Code of Practice to ensure an adequate field and clarity of view

### Windscreen Decals

- ADR 93/00 – Forward Field of View 2018 (Clause 5.1)
- TIC Code of Practice to ensure an adequate field and clarity of view

### Window Tinting

- ADR 93/00 – Forward Field of View 2018 (Clause 5.1)
- TIC Code of Practice to ensure an adequate field and clarity of view

### Cab Accessories

- ADR 93/00 – Forward Field of View 2018 (Clause 5.1)
- NHVR National Heavy Inspection Manual - Section 10.1 f)
- TIC Code of Practice to ensure an adequate field and clarity of view

### Class V and VI Mirrors

- ADR 14/02 – Rear Vision Mirrors 20062

### Conspicuity Marking

- ADR13/00 - Installation of Lighting and Light Signalling Devices on other than L-Group Vehicles 2005
- UN Regulation No. 104
- VSB 12 – Rear Marking Plates for Vehicles over 12T GVM and Trailers over 10T ATM.
- ATA Technical Advisory Procedure TAP - Conspicuity Marking

### Front Underrun Protection

- ADR 84/00 Front Underrun Impact Protection 2009

### SUP for Trucks

- ATA Technical Advisory Procedure - Side Underrun Protection
- UN-ECE R73

# Introduction

## SUP for Trailers

- ATA Technical Advisory Procedure - Side Underrun Protection
- UN-ECE R73

## Rear Underrun Protection

- ADR91/00 - Rear Underrun Impact Protection 2018

## Reversing Cameras

- ADR108/00
- UN Regulation No. 108

## Reversing Sensors

- ADR108/00
- UN Regulation No. 108

## Reversing Beepers

- ADR 42/05 - General Safety Requirements 2018

## Daytime Running Lamps

- ADR76/00 - Daytime Running Lamps 2006

## ADR 80/03 Emission Stds

- ADR 80/03 - Emission Control for Heavy Vehicles 2006
- Euro V
- US EPA 2007
- JE05

## ABS for Trucks

- ADR 35/06 - Commercial Vehicle Brake Systems 2018

## ABS for Trailers

- ADR 38/05 - Trailer Brake Systems 2018

## ESC for Trucks

- ADR 35/06 - Commercial Vehicle Brake Systems 2018

## RSC for Trailers

- ADR 38/00 - Trailer Brake Systems 2006

## AEBS

- ADR 97/00 - Advanced Emergency Braking for Omnibuses, and Medium and Heavy Goods Vehicles 2022

## ARB

- UN Regulation No. 158 - Devices for means of rear visibility or detection

## ADR 80/04 Emission Stds

- ADR 80/04 - Emission Control for Heavy Vehicles 2023
- Euro VI
- US EPA 2010
- Japanese Post New Long-Term Emissions Standards

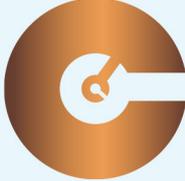
## Zero Emission Vehicles

- ADR 109/00 - Electric Power Train Safety Requirements 2023
- ADR 110/00 - Hydrogen-Fuelled Vehicle Safety Related Performance 2023
- UN Regulation No. 138/01 - Acoustic Vehicle Alert Systems

# Bronze Standard



Bronze Membership Requirements



- Amber Beacons
- Class V and VI Mirrors
- Conspicuity Marking
- Wheel-Nut Position Indicators



- Fresnel Lens
- Warning Signage
- Rear View Cameras  
or  
Reversing Sensors
- Reversing Beeper



- Brightly-Coloured Drawbars

The Minimum Mandatory Standard for all heavy vehicles complying with CLOCS-A technical requirements. Measures and technologies that are relatively low cost and easy to implement.

- No bug deflectors on bonnetted trucks – City and Urban Projects only
- No engine air intake hardware above bonnet level – City and Urban Projects only
- No large inappropriate bullbars – City and Urban Projects only
- No inappropriate sunvisors
- No overly large decals or lettering attached to any part of the windscreen that may reduce the driver's field of view
- No excessive windscreen or window tinting
- No inappropriate fitment of aftermarket accessories that restrict the driver's field of view





# Item 1.1

## BUG DEFLECTORS – City and Urban Projects only

### CLOCS-A Standard

No bug deflectors mounted on bonneted trucks.

### Reference Standards

ADR 93/00 – Forward Field of View 2018 (Clause 5.1)

TIC Code of Practice to ensure an adequate field and clarity of view.

### Objective

To enhance the visibility and awareness of Vulnerable Road Users to the driver by the elimination of items or equipment that adversely affect direct vision.

### Rationale

ADR 93/00 prescribes that all vehicles must have an adequate field of view when seated in the vehicle with the seat belt fastened. See Section 5.1 of the ADR copied below.

Bug protectors are solid guards typically mounted above the leading edge of bonnets to help deflect flying insects up and over the windscreen. They may be clear, coloured or completely solid. These guards can greatly impede direct forward vision and have contributed to serious incidents and fatalities.

### Criteria

**Pass:** No bug deflector or similar device such as a name plate mounted on the bonnet of the vehicle at all.

**Fail:** A bug deflector or other similar device of any size, made from any material and of any colour (including clear) mounted on top of the bonnet of the vehicle.

### Intent

If there is any doubt in relation to the acceptance of a vehicle, the intent of this particular standard is to eliminate the fitment of unnecessary items or equipment that have the effect of reducing direct vision from the driver's seat.

## ADR 93/00 – Forward Field of View 2018

### 5. REQUIREMENTS

- 5 A vehicle must not be so constructed or equipped, nor must anything be affixed thereto in such a manner as to prevent the driver from having an adequate view of traffic on either side of the vehicle and in all directions in front of the vehicle, to enable the vehicle to be driven with safety.

Figure 1.1 Bug deflector mounted on the bonnet of a truck.



Figure 1.2 Truck with no bug deflector on the bonnet





# ITEM 1.2

## ENGINE AIR INTAKES – City and Urban Projects only

### CLOCS-A Standard

No external engine air intake hardware above bonnet level (on bonneted trucks).

### Reference Standards

ADR 93/00 – Forward Field of View 2018 (Clause 5.1)

TIC Code of Practice to ensure an adequate field and clarity of view.

### Objective

To enhance the visibility and awareness of Vulnerable Road Users to the driver by the elimination of items or equipment that adversely affect direct vision.

### Rationale

Some bonneted trucks have components of their engine's air intake system mounted external to the bonnet - typically on either side. These components may include the engine filter and its housing, steel or plastic tubing and a snorkel type fitting on the top of the tubes to capture air. Some trucks have tall tubes with the snorkel fitting mounted very high for the primary purpose of locating the air intake point above the level of dust blown up when driving for long distances on dirt roads.

These large vertical external air intake tubes and fittings on either side of bonneted trucks create blind spots on both sides of the windscreen. They serve no practical purpose in the city or urban environment.

### Criteria

**Pass:** The bonneted truck has either no external engine intake tubes or filter enclosures at all or has the tubes, filters and fittings mounted or modified such that no hardware protrudes above the line of the upper edge of the bonnet when viewed from the side.

**Fail:** The vehicle has any part of its engine air intake tubes, filters or fittings protruding above the line of the upper edge of the bonnet when viewed from the side. (including clear) mounted on top of the bonnet of the vehicle.

### Intent

If there is any doubt in relation to the acceptance of a vehicle, the intent of this particular standard is to eliminate the fitment of unnecessary items of equipment that have the effect of reducing direct vision from the driver's seat.

Figure 1.3 Truck with engine air intake tubes and snorkel fittings that extend above bonnet level.



Figure 1.4 Truck with engine air intake tubes cut down to below bonnet level.





# ITEM 1.3

## BULL BARS – City and Urban Projects only

### CLOCS-A Standard

No large after-market bullbars that rise above the standard overall bumper height for the particular vehicle.

### Reference Standards

ADR 93/00 – Forward Field of View 2018 (Clause 5.1)

TIC Code of Practice to ensure an adequate field and clarity of view.

### Intent

If there is any doubt in relation to the acceptance of a vehicle, the intent of this particular standard is to eliminate the fitment of unnecessary items of equipment that:

- have the effect of reducing direct vision from the driver's seat, or
- pose the threat of exaggerated injury to a VRU in the event of an accident.

### Objective

To enhance the visibility and awareness of Vulnerable Road Users to the driver by the elimination of items or equipment that adversely affect direct vision.

The elimination of items or equipment that may increase the risk and severity of injuries in incidents involving pedestrians, cyclists or motorcyclists.

### Rationale

Bullbars fitted to trucks are primarily for the purpose of providing protection for the vehicle if it strikes a large animal when travelling in rural or bushland environments.

Large and tall bullbars can serve to reduce direct vision for the driver in front of the truck and may restrict headlight projection. Aggressive bullbars also risk the possibility of accidentally hooking or catching a cyclist. They serve little practical purpose in a city or urban environment.

### Criteria

**Pass:** The bumper fitted to the truck:

- is the standard bumper for that vehicle, or
- if any form of aftermarket bumper or bullbar is fitted, the height of it above ground level does not rise above the height of the standard bumper

**Fail:** The vehicle is fitted with an aftermarket front bumper or bullbar, and where any part of that bumper rises above the overall height above ground level of the standard bumper for that vehicle.

Figure 1.5 Truck fitted with a large aftermarket bullbar that rises well above the standard bumper height.



Figure 1.6 Truck fitted with a substantial aftermarket bumper that does not rise above the standard bumper height for the vehicle.





# ITEM 1.4

## SUNVISORS

### CLOCS-A Standard

No external sunvisors that protrude below the tinted band on the windscreen or the swept path of the wipers.

### Reference Standards

ADR 93/00 – Forward Field of View 2018 (Clause 5.1)

TIC Code of Practice to ensure an adequate field and clarity of view.

### Objective

To enhance the visibility and awareness of Vulnerable Road Users to the driver by the elimination of items or equipment that adversely affect direct vision.

### Rationale

ADR 93/00 prescribes that all vehicles must have an adequate field of view when seated in the vehicle with the seat belt fastened.

Deep sunvisors that protrude below the tinted band on the windscreen or the swept path of the wipers can serve to restrict the effective forward view for the driver.

### Criteria

**Pass:** The sunvisor fitted to the truck:

- is the standard OEM (or OEM-approved) sunvisor for that vehicle, or
- if any form of aftermarket sunvisor is fitted, it does not protrude down below the level of the standard tinted band of the windscreen or below the swept path of the windscreen wipers when viewed from the driver's seat.

**Fail:** The vehicle is fitted with an aftermarket or optional sunvisor where any part of it protrudes down below the level of the standard tinted band of the windscreen or below the swept path of the windscreen wipers when viewed from the driver's seat

### Intent

If there is any doubt in relation to the acceptance of a vehicle, the intent of this particular standard is to eliminate the fitment of unnecessary items of equipment that have the effect of reducing direct vision from the driver's seat.

Figure 1.7 Truck fitted with a large aftermarket sunvisor that protrudes below the level of the swept path of the windscreen wipers.



Figure 1.8 Truck fitted with a standard ex-factory sunvisor.





# ITEM 1.5

## WINDSCREEN DECALS

### CLOCS-A Standard

No overly large lettering or decals attached to any part of the windscreen.

### Reference Standards

ADR 93/00 – Forward Field of View 2018 (Clause 5.1)

TIC Code of Practice to ensure an adequate field and clarity of view.

### Objective

To enhance the visibility and awareness of Vulnerable Road Users to the driver by the elimination of items or equipment that adversely affect direct vision.

### Rationale

ADR 93/00 prescribes that all vehicles must have an adequate field of view when seated in the vehicle with the seat belt fastened.

Fitting large lettering or decals to the windscreen can result in the driver having a reduced field of view, which could lead to an unsafe situation.

### Criteria

**Pass:** The vehicle has no decals or large lettering fitted to the windscreen at all, or if any decals or lettering are fitted, they are: is the standard OEM (or OEM-approved) sunvisor for that vehicle, or

- located wholly within the standard tinted band along the upper edge of the windscreen, or
- fitted along the lower edge of the windscreen and no more than 30mm in total height above that lower edge.

**Fail:** The vehicle had either decals or lettering fitted to the windscreen – any part of which are located out of the standard tinted band along the top edge of the windscreen or above a line 30mm above the lower edge of the windscreen.

### Intent

If there is any doubt in relation to the acceptance of a vehicle, the intent of this particular standard is to eliminate the fitment of unnecessary items of equipment that have the effect of reducing direct vision from the driver's seat.

Figure 1.9 Truck with large lettering attached to the lower edge of the windscreen.





# ITEM 1.6 WINDOW TINTING

### CLOCS-A Standard

No tinting of the windscreen or side windows that reduces light transmittance beyond legal levels.

### Reference Standards

ADR 93/00 – Forward Field of View 2018 (Clause 5.1)

TIC Code of Practice to ensure an adequate field and clarity of view.

- a) The visible light transmittance of any glazing (including any applied film) is less than that detailed in Table 1.1
- b) Tint films are not free of bubbles, scratches or other defects that significantly affect the driver’s vision
- c) Tint films have a reflectance in excess of 10% (e.g. mirror tints).

## Objective

To enhance the visibility and awareness of Vulnerable Road Users to the driver by the elimination of items or equipment that adversely affect direct vision.

## Rationale

“Tinting” refers to both a film applied to glazing to reduce the luminous transmittance and ‘tinted glass’ where the glazing is manufactured with tinting material between the layers of glass.

Driving safely requires the driver to have the best possible vision of the road and other road users. Any reduction in the driver’s vision, particularly in poor light conditions, such as twilight or wet weather conditions, will lead to a reduction in safety. Overly-tinted windows can significantly reduce driver vision. Typically, the OEM will tint the windscreen and side windows to the maximum allowable under the ADRs and therefore cannot legally have any further tint applied.

## Criteria

Legal limits for windscreen and window tinting on heavy vehicles in Australia are set out in Section 10.2 of the **National Heavy Inspection Manual** produced by the NHVR. The reasons for rejection are repeated here. These are:

**Pass:** The window tinting on the truck is either:

- OEM-fitted, or
- no darker than the Australian legal limit.

Note: “OEM” is not necessarily the same as “ex-dealer”. OEM means window tinting provided by the Original Vehicle Manufacturer.

**Fail:** Any windscreen glazing has any coating which reduces its light transmittance.

Note: A coating that reduces light transmittance may be fitted to either the area above the highest point of the windscreen that is swept by a windscreen wiper or the upper 10% of the windscreen, whichever is greater.

Table 1.1 Light transmittance requirements

Glazing	Minimum light transmittance readings	Vehicles NOT TO BE REJECTED until meter readings are LESS than
Windscreen	70%	65%
All other windows (no tinting)	70%	65%
All other windows level with or forward of the drivers seated position (with tinting)	35%	30%
All other windows (with tinting)	0%	0%



- ★ **Windscreen**
  - No film at all allowed on the lower part of the windscreen
  - Minimum 70% VLT
  - Tinted or opaque band allowed at the top of the windscreen. It is not to extend below the portion swept by the wipers or 10% of the depth of the windscreen
- **Windows**
  - Minimum 35% VLT
  - Must be no more than 10% reflective
  - Film must not be damaged, bubbled or discoloured
- **Windows rearward of driver**
  - No minimum VLT specified for rear windows
  - Must be no more than 10% reflective

## Intent

If there is any doubt in relation to the acceptance of a vehicle, the intent of this particular standard is to eliminate the fitment of unnecessary items of equipment that have the effect of reducing direct vision from the driver’s seat.

# ITEM 1.7

## CAB ACCESSORIES

### CLOCS-A Standard

No aftermarket accessories (such as screens or mobile phones) inappropriately mounted inside the cab that create blind spots and obscure the driver's field of view.

### Reference Standards

ADR 93/00 – Forward Field of View 2018 (Clause 5.1)

TIC Code of Practice to ensure an adequate field and clarity of view

NHVR National Heavy Vehicle Inspection Manual – Section 10.1 f)

### Objective

To enhance the visibility and awareness of Vulnerable Road Users to the driver by eliminating the inappropriate mounting of items or equipment that would adversely affect direct vision.

### Rationale

ADR 93/00 prescribes that all vehicles must have an adequate field of view when seated in the vehicle with the seat belt fastened. See Section 5.1 of the ADR copied below.

Inappropriately fitting aftermarket components such as screens and mobile phones above dashboard level can create blind spots and result in the driver having a reduced critical field of view. The driver of the vehicle should have an unhidden view of the road and traffic ahead.

### Criteria

A definition of the driver's critical area of view that must remain unobstructed may be found in Section 10.1 f) of the **National Heavy Inspection Manual** produced by the NHVR. The reasons for acceptance and rejection are repeated here. These are:

**Pass:** The vehicle has no additional aftermarket items fitted in Area A shown in Figure 1.11 OEM-fitted, or

**Fail:** Items that obscure the driver's view are placed in area A shown in Figure 1.11 or the corresponding area on the other side of the windscreen.

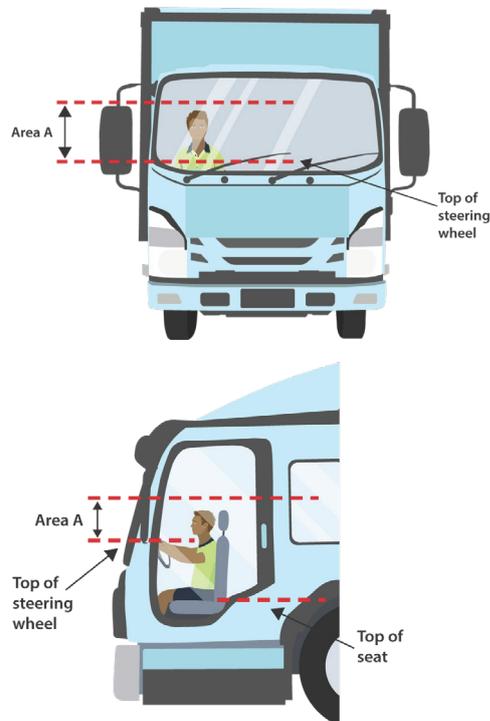
### Intent

If there is any doubt in relation to the acceptance of a vehicle, the intent of this particular standard is to eliminate the inappropriate mounting of equipment inside the cabin that would otherwise have the effect of reducing direct vision from the driver's seat.

Figure 1.10 Truck fitted with a large aftermarket navigation screen.



Figure 1.11 Driver's field of vision.



### ADR 93/00 – Forward Field of View 2018

#### 5. REQUIREMENTS

5.1. A vehicle must not be so constructed or equipped, nor must anything be affixed thereto in such a manner as to prevent the driver from having an adequate view of traffic on either side of the vehicle and in all directions in front of the vehicle, to enable the vehicle to be driven with safety.

# ITEM 1.8

## CLASS V AND VI MIRRORS

### CLOCS-A Standard

Fit a Class V mirror above the passenger window and a Class VI mirror to the cabin (of COE trucks) or the equivalent fitted to the front left corner of the bonnet (on bonneted trucks).

### Referenece Standards

ADR 14/02 – Rear Vision Mirrors 2006

### Objective

To enhance the visibility and awareness of Vulnerable Road Users to the driver by the use of items or equipment that improve indirect vision.

### Rationale

A Class V mirror is typically a rectangular shaped convex mirror that is fitted outside and above the passenger-side window. This allows the driver to see down and into the blindspot adjacent to that side of the vehicle.

A Class VI mirror is a convex circular mirror that can be mounted on the front of the vehicle to provide a view of the blindspot across the front of the truck and adjacent to the left steer wheel. On bonneted trucks, this may be referred to a cross-over mirror.

### Criteria

Class V and Class VI mirrors are defined in Australian Design Rule 14/02 – Rear Vision Mirrors 2006.

Generally, these mirrors are defined as follows:

Class V – “Close-proximity exterior mirror” - the field of vision shall be such that the driver can see a flat horizontal portion of the road along the passenger-side of the vehicle as set out in Fig 1.15 below.

Class VI – “Front mirror” - the field of vision shall be such that the driver can see at least a flat horizontal portion of the road directly in front of the vehicle as set out in Fig 1.16 below.

**Pass:** The vehicle has both a Class V and Class VI mirror attached that complies with the definition set out above and are in sound condition

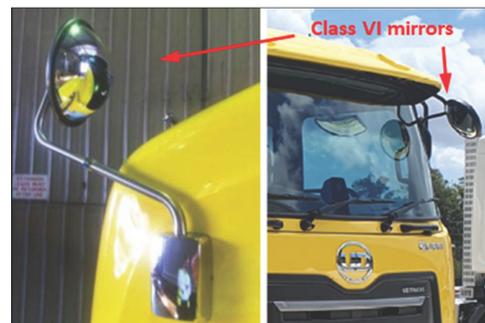
**Fail:** The vehicle does not have both a Class V and Class VI mirror fitted, or where they are fitted, any reflective surface of the mirrors:

- a) has a missing section,
- b) is cracked,
- c) is deteriorated, blemished or tarnished reducing the view, or
- d) is obscured.

Figure 1.12 Truck fitted with a Class V mirror.



Figure 1.13 Class VI mirrors fitted to a bonneted truck (left) and a cab-over truck (right).



### Intent

If there is any doubt in relation to the acceptance of a vehicle, the intent of this standard is for compliant vehicles to have two functional mirrors that provide the driver with a view of the ground along the passenger side of the truck cabin (and bonnet) and across the front of the vehicle near to the front bumper in order to readily facilitate a view of Vulnerable Road Users who may be close the cabin.



# ITEM 1.8

## CLASS V AND VI MIRRORS

Figure 1.14 Field of vision of Class V - Close proximity mirror

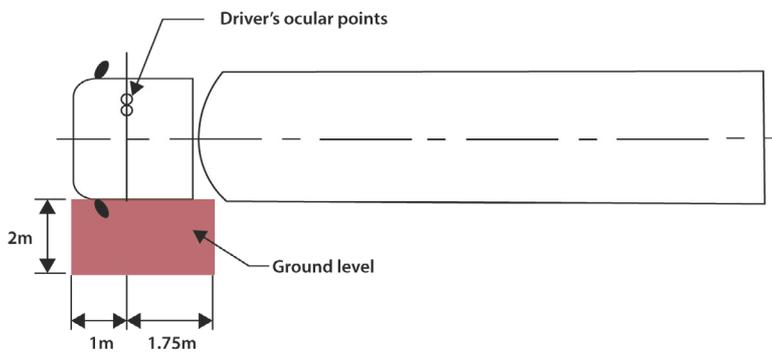
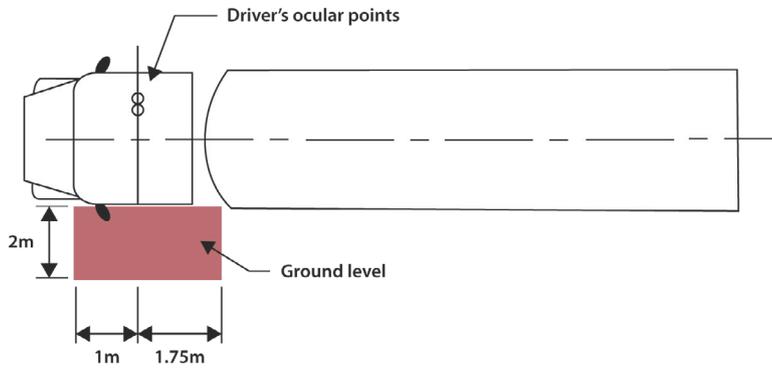
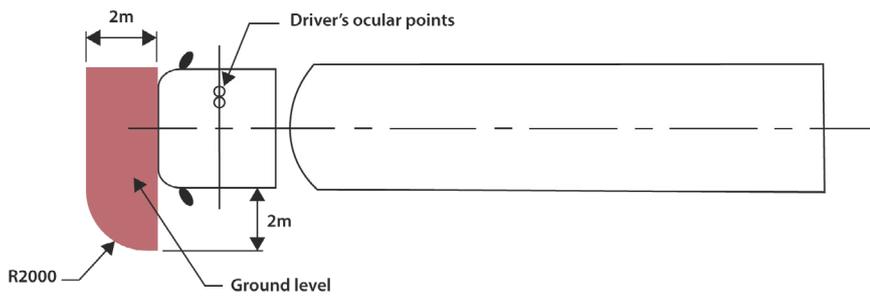


Figure 1.15 Field of vision of Class VI - Front mirror



# ITEM 1.9

## FRESNEL LENS

### CLOCS-A Standard

Fit a Fresnel lens to the passenger door window or peeper window.

### Objective

To enhance the visibility and awareness of Vulnerable Road Users to the driver by the use of items or equipment that improve indirect vision.

### Rationale

A Fresnel Lens is a clear, thin, flat plastic lens that is press-fitted to a truck's passenger door window or peeper window. Its provides an extra downwards view for the truck driver so that at a glance he/she can see a vulnerable road user that might be hidden in the mirror's blind spot, alongside his passenger door.

Fresnel lens are inexpensive, quick and easy to fit, with minimal ongoing maintenance.

### Criteria

**Pass:** The vehicle is fitted with a Fresnel lens to either the passenger side door window or peeper window

**Fail:** The vehicle is not fitted with a Fresnel lens, or if fitted, the lens:

- a) is deteriorated, blemished or tarnished reducing the view, or
- b) is obscured.

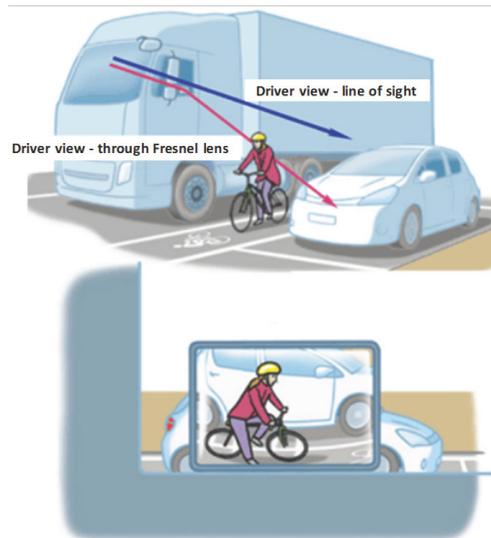
### Intent

If there is any doubt in relation to the acceptance of a vehicle, the intent of this standard is for compliant vehicles to have a Fresnel lens fitted in order to facilitate a view of a Vulnerable Road User who may be close to the left of the cabin.

Figure 1.16 Driver looking towards a Fresnel lens fitted to the passenger door window.



Figure 1.17 Altered line of sight made available to the driver via a Fresnel lens.





# ITEM 1.10

## REVERSING CAMERA

### CLOCS-A Standard

Fit an in-cab screen and rear-facing camera to the rearmost HV unit (i.e. either the truck or the trailer if a trailer is in use) to monitor the situation behind the vehicle when reversing and/or tipping off.

### Reference Standards

ADR 108/00 – Reversing Technologies 2022  
UN Regulation No. 108

### Objective

To enhance the visibility and awareness of Vulnerable Road Users to the driver by the use of items or equipment that improve indirect vision.

### Rationale

A Fresnel Lens is a clear, thin, flat plastic lens that is press-fitted to a truck's passenger door window or peeper window. Its provides an extra downwards view for the truck driver so that at a glance he/she can see a vulnerable road user that might be hidden in the mirror's blind spot, alongside his passenger door.

Fresnel lens are inexpensive, quick and easy to fit, with minimal ongoing maintenance.

### Criteria

**Pass:** The vehicle is equipped with a video camera at the back of the rearmost unit connected to a suitable display monitor/screen in the cabin of the truck. The field of vision of the camera shall be such that the driver can see at least a flat horizontal portion of the road directly to the rear of the vehicle as set out in Fig 1.18.

The in-cab screen may shall be activated when the ignition is on, and the reverse gear is selected.

The system is fully functional.

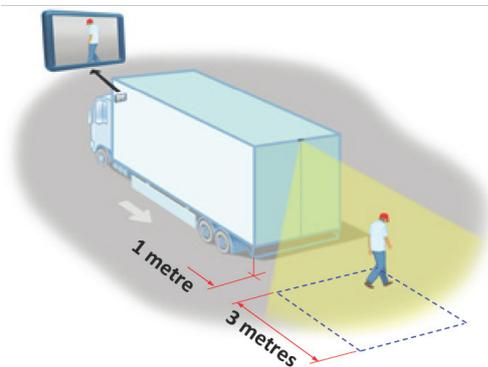
**Fail:** The vehicle is not fitted with a reversing camera system as described above, or if a system is fitted:

- a) the camera or screen are deteriorated, blemished or tarnished significantly reducing the quality of the image,
- b) the screen in the cab is positioned such that it is not readily viewable by the driver when reversing his vehicle, or
- c) the screen is obscured.

### Intent

If there is any doubt in relation to the acceptance of a vehicle, the intent of this standard is for compliant vehicles to have a fully functional reversing camera system that readily facilitates a clear view of a Vulnerable Road User, site worker, other person or object that may be close to the rear of the vehicle when it is being reversed or about to be reversed.

Figure 1.18 Minimum area of coverage for a heavy vehicle reversing camera.





# ITEM 1.11

## REVERSING SENSORS

### CLOCS-A Standard

Fit a reversing sensor system to the rearmost HV unit (i.e. either the truck or the trailer if a trailer is in use) to monitor the situation behind the vehicle when reversing and/or tipping off.

### Reference Standards

ADR 108/00 – Reversing Technologies 2022

UN Regulation No. 108

### Objective

To enhance the visibility and awareness of Vulnerable Road Users to the driver by the use of items or equipment that improve indirect vision.

### Rationale

Reversing a heavy vehicle on an active construction site or in any congested environment can be a hazardous activity. Past accidents have resulted in serious injuries and deaths. Sensors systems can detect the presence of a person or an object close to the rear of vehicle and alert the driver with an audio-visual alarm.

ADR 108/00 is a new regulation based on the United Nations Regulation No. 158. It specifies technical and performance requirements for reversing technologies fitted to light, medium and heavy vehicles.

### Criteria

**Pass:** The vehicle is equipped with sensors at the back of the rearmost unit connected to a suitable display or alarm system in the cabin of the truck. The effective field of coverage of the sensors shall be equivalent to at least a flat horizontal portion of the road directly to the rear of the vehicle as set out in Fig 1.19.

At the discretion of the vehicle owner, the system may be activated whenever the ignition is on, or just when the vehicle is being reversed.

The system is fully functional.

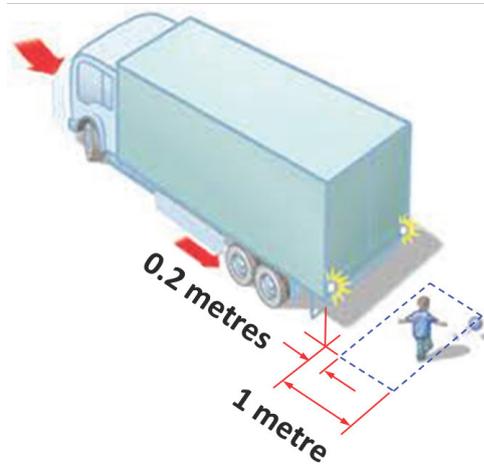
**Fail:** The vehicle is not fitted with a reversing sensor system as described above, or if a system is fitted:

- a) the sensors or other hardware are deteriorated reducing the sensitivity and accuracy of the system,
- b) the display or alarm system in the cabin is of insufficient volume or positioned such that it is not readily hearable by the driver when reversing his vehicle, or
- c) the display or alarm is obscured.

### Intent

If there is any doubt in relation to the acceptance of a vehicle, the intent of this standard is for compliant vehicles to have a fully functional reversing sensor system that effectively detects a person or object that may be close to the rear of the vehicle when it is being reversed or about to be reversed and provides a warning to the driver.

Figure 1.19 Minimum area of coverage for heavy vehicle reversing sensor system.





# ITEM 1.12

## REVERSING BEEPER

### CLOCS-A Standard

Fit a reversing beeper to the truck and/or trailer.

### Reference Standards

ADR 42/05 – General Safety Requirements 2018

### Objective

To enhance the awareness of trucks to Vulnerable Road Users by audible means.

### Rationale

Reversing alarms are a critical piece of technology designed to warn anyone in a vehicle's path that it is moving backwards. They are now fitted to most trucks, but few trailers. The original high-pitched electronic "beep – beep" sound has now fallen out of favour because of concerns for environmental impact and noise pollution. 'Quackers' are a much more environmentally friendly and safe alternative, as the sound dissipates at twice the rate of conventional alarms. They also make it easy to tell which vehicle is emitting the sound, using a unique white sound frequency. This sound is more detectable to people wearing hearing protection or earmuffs, and also to people with hearing loss.

### Criteria

**Pass:** The vehicle is equipped with a reversing beeper that emits a sound that is readily audible to people nearby when the vehicle is reversing.

The beeping sound shall be the "white noise" sound described above.

The system is fully functional.

**Fail:** The vehicle is not fitted with a reversing beeper system as described above, or if a system is fitted and the sound is:

- a) not readily audible, or
- b) not the "white sound" type described above.

### Intent

If there is any doubt in relation to the acceptance of a vehicle, the clear intent of this standard is for compliant vehicles to have a fully functional reversing beeper system that provides an audible warning to any person that may be close to the rear of the vehicle when it is being reversed or about to be reversed.

Figure 1.20 Depiction of truck's trailer fitted with a reversing beeper.





# ITEM 1.13 AMBER BEACONS

### CLOCS-A Standard

Fit a revolving or flashing amber beacon to the roof of the truck cabin that can be seen from both sides and in front of the vehicle.

### Objective

To enhance the awareness of trucks to Vulnerable Road Users by visual means.

### Rationale

Flashing amber beacons fitted to the roof-top of truck cabs are a simple but effective means of attracting the attention of pedestrians, other road users and construction site employees. Once their attention is gained, then both parties are in better position to take action and keep out of each others way.

### Criteria

**Pass:** The vehicle is fitted with one or more amber beacons to the roof of the truck cabin.

The beacon may be either a mechanically revolving incandescent light or a flashing LED type.

The light(s) must be readily seen by a person standing at distance of approximately 6 metres from the truck cabin for a 270 degree angle around the truck cabin (Fig. 1.23)

The beacon(s) is fully functional.

**Fail:** The vehicle is not fitted with an amber beacon(s) as described above, or if a beacon is fitted and the beacon:

- a) does not work at all,
- b) does not flash or rotate,
- c) is deteriorated reducing its effectiveness,
- d) is a strobe light, or
- e) is obscured or cannot be readily seen at a distance of 6 metres for a 270-degree angle around the truck.

### Intent

If there is any doubt in relation to the acceptance of a vehicle, the clear intent of this standard is for compliant vehicles to have a fully functional reversing beeper system that provides an audible warning to any person that may be close to the rear of the vehicle when it is being reversed or about to be reversed.

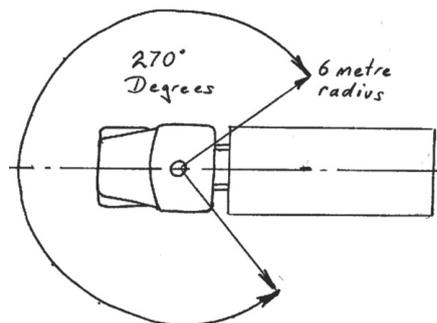
Figure 1.21 Amber beacon with mechanical revolving device fitted to the roof of a prime mover.



Figure 1.22 LED type amber beacon that flashes fitted to the roof of a truck.



Figure 1.23 LED type amber beacon that flashes fitted to the roof of a truck.





# ITEM 1.14 CONSPICUITY MARKING

### CLOCS-A Standard

Fit hi-vis retro-reflective conspicuity marking tape to the sides and rear of trucks and trailers.

### Reference Standards

ADR 13/00 – Installation of Lighting and Light Signalling Devices on other than L-Group Vehicles) 2005)

UN Regulation No. 104

VS12 – Rear Marking Plates for Vehicles over 12T GVM and Trailers over 10T ATM.

ATA Technical Advisory Procedure TAP – Conspicuity Marking

Figure 1.24 Full contour marking with retro-reflective tape on a rigid tipper truck.



Figure 1.25 Full contour marking.

### Objective

To enhance the awareness of trucks to Vulnerable Road Users by visual means.

### Rationale

Awareness or “conspicuity” markings on heavy vehicles help to ensure they are more visible, particularly outside of daylight hours. This is best done with special purpose retro-reflective tape that acts similar to a conventional reflector when a light is shone on it.

### Criteria

It is recommended that both vehicle owners and CLOCS-A vehicle auditors refer to the Technical Advisory Procedure produced by the Australian Trucking Association titled “Conspicuity Marking”.

This document (available free on-line) outlines the use of retroreflective tape to improve the visibility of heavy vehicles and its recommended placement. Exerts from these guidelines are used below.

**Pass:** Each vehicle in a combination must have Class 1A conspicuity tape suitably applied to the sides and rear of the vehicle. Applying tape to the front of a vehicle is optional.

Tape colours must only be red on the rear, amber/yellow on the sides and white on the front.

Three levels of marking are acceptable:

1. Full contour marking (highly preferable)
2. Partial contour marking
3. Line marking

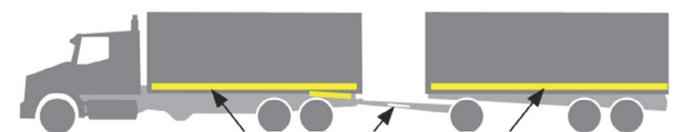
See figures 1.25, 1.26 and 1.27.



Figure 1.26 Partial contour marking.



Figure 1.27 Line marking.



# ITEM 1.15

## DRAWBAR COLOUR

### CLOCS-A Standard

Finish drawbars on dog trailers in a bright colour such as yellow to improve conspicuity of this vehicle danger zone.

### Objective

To enhance the awareness of the gaps between trucks and dog trailers to Vulnerable Road Users by visual means.

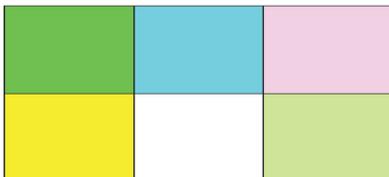
### Rationale

The gap between a truck and dog trailer is not practically possible to protect with any form of solid barrier – particularly a tipper truck. This presents a potential danger for Vulnerable Road Users.

Making the drawbar as highly visible as possible offers an effective form of defence. Drawbars painted dark colours such as black or grey can be difficult to see against the background. Finishing drawbars in very bright colours such as a safety yellow can significantly improve their conspicuity.

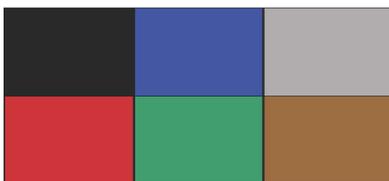
### Criteria

**Pass:** The drawbar on the trailer is finished in a bright colour similar to the types indicated below.



The colour on the drawbar is still largely intact and not substantially faded or worn away.

**Fail:** The drawbar on the trailer is finished in a dark or dull colour similar to the types indicated below.



The drawbar is finished in a dark colour and fitted with some retro-reflective tape.

The paint on the drawbar is substantially faded or worn away.

Figure 1.28 A drawbar painted bright yellow in the foreground with a similar drawbar painted grey in the background.



Figure 1.29 A drawbar painted dark green.



### Intent

If there is any doubt in relation to the acceptance of a vehicle, the intent of this particular standard is to for drawbars on trailers to be highly visible at glance and stand out in contrast to the background by virtue of its colour.

# ITEM 1.16

## WARNING SIGNAGE

### CLOCS-A Standard

Fit warning signs to the left rear of trucks and trailers to highlight the potential dangers to Vulnerable Road Users. Minimum size of 300mm wide x 400mm high.

### Objective

To enhance the awareness of trucks to Vulnerable Road Users by visual means

### Rationale

Trucks turning left at intersections are one of the major causes of incidents involving Vulnerable Road Users.

Specific signs are available to warn cyclists and motorcyclists of the potential danger of passing a truck in its blind spot on the left hand side - as it may be about to turn across their path. The message is preferably displayed on a flat metal sign on the left rear of the vehicle.

### Criteria

This sign is essentially targeted at cyclists and motorcyclists that have approached a truck from behind and are considering to either move into the truck's blind spot or pass it on the left side if the truck is in a right-hand lane.

It must be designed to:

- specifically attract the attention of cyclists or motorcyclists,
- indicate that there is a blind spot on the left side of the truck and that this represents danger, and
- indicate that the truck may be about to turn left across in front of them.

Ideally, the sign should have:

- clear and obvious graphics relating to all of the above 3 points,
- only a few words (such as "DANGER Blind Spot")
- in large writing that may be readily seen and understood by a moving cyclist or motorcyclist, and
- no small writing and/or 6 or more words intended to be read by the cyclist or motorcyclist.

The preferred design is shown in Fig 1.30.

**Pass:** The vehicle is fitted with a flat warning sign measuring at least 300mm wide x 400mm high.

The sign design complies with the details set out in the Criteria above.

The sign is located on the left rear of the vehicle similar to that shown in Fig 1.30.

Figure 1.30 The preferred blind spot warning sign design and the required location on the left rear of a vehicle.



**Fail:** The vehicle is not fitted with a warning sign at all, or the vehicle is fitted with a warning sign, but:

- the sign does not comply with each of the details set out above,
- the sign is not located on the left rear of the vehicle,
- the sign is deteriorated reducing its clarity, or
- the sign is obscured.

### Intent

If there is any doubt in relation to the acceptance of a vehicle, the intent of this standard is for compliant vehicles to have a warning sign on the left rear of the vehicle that attracts the attention of cyclists and clearly and obviously warns them of a danger zone on the left side of the truck.



# ITEM 1.17

## WHEEL NUT POSITION INDICATORS OR RETAINERS

### CLOCS-A Standard

Fit wheel-nut position indicators or wheel-nut retainers to all wheels on both trucks and trailers.

### Objective

To reduce the likelihood of heavy vehicles being involved in incidents by facilitating regular safety checks.

### Rationale

The loss of wheels from trucks or trailers when driving is an extremely hazardous event - particularly in congested environments.

Following strict procedures when re-fitting wheels to heavy vehicles and then conducting daily checks of the wheel-nuts is an important safety discipline.

Position indicators help to facilitate easy and frequent checks by drivers and retainers help to stop wheel-nuts coming off.

### Criteria

There are many wheel-nut position indicators and retainer designs now available on the market.

The preferred design of position indicators is the simple pointer type as shown in Fig. 1.31. With wheel-nuts in the fully tightened position, adjacent indicators should point towards each other.

Indicator or retainer colours should be bright and strong and not dull or a similar colour to that of the vehicle's wheel.

On any given vehicle, colours must all be the same.

**Pass:** The vehicle is fitted with wheel-nut position indicators or retainers on every nut on every wheel of the vehicle

The indicators or retainers are the same colour and design across the entire vehicle or combination, and in good condition.

**Fail:** The vehicle is not fitted with wheel-nut position indicators or retainers, or if they are fitted:

- they are not fitted to every nut on every wheel,
- the design and colours are not the same across the entire vehicle or combination,
- the colour of the retainers or indicators are similar to the wheel colour, or
- some, many or all are deteriorated or faded reducing clarity and effectiveness.

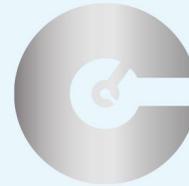
Figure 1.31 An example of a style of wheel-nut position indicator and the preferred orientation that indicates all nuts are still in position and not working loose.



Figure 1.32 An example of a design of wheel-nut retainer designed to help prevent nuts from coming loose or falling off.



# Silver Standard



Left-Side Blind Spot Cameras

or

Left-Side Proximity Sensors

Left Turn Audible Warning



Daytime Running Lamps

Front Underrun Protection

Side Underrun Protection – Trucks

ABS – For Trucks



Rear Underrun Protection

ADR 80/03 Emission Standard (Euro V)

Side Underrun Protection – Trailers

ABS - For Trailers

A higher standard of equipment that is preferred for heavy vehicles complying with CLOCS-A technical requirements. Similar to UK CLOCS and broadly aligned to current NSW/VIC government major projects. Accreditation to Silver also requires prior accreditation to Bronze.

No bug deflectors on bonnetted trucks – City and Urban Projects only

No engine air intake hardware above bonnet level – City and Urban Projects only

No large inappropriate bullbars – City and Urban Projects only

No inappropriate sunvisors

No overly large decals or lettering attached to any part of the windscreen that may reduce the driver's field of view

No excessive windscreen or window tinting

No inappropriate fitment of aftermarket accessories that restrict the driver's field of view





# ITEM 2.1

## BLIND SPOT CAMERA

### CLOCS-A Standard

Fit a camera system and in-cab screen to the vehicle to monitor the presence of left-side blind-spot objects.

### Objective

To enhance the visibility and awareness of Vulnerable Road Users to the driver by the use of items or equipment that improve indirect vision.

### Rationale

A blind spot camera and monitor system can provide images of areas close to a truck or trailer which are usually hidden from the driver given their position in the cab. Drivers can observe the monitor and take evasive action as necessary. Sophisticated systems can now have multiple cameras and split screens on the monitor. Footage can be recorded and held and even relayed back to the depot in real time.

### Criteria

**Pass:** The vehicle is equipped with a camera or cameras near to the front of the left side of the vehicle (specifically for the purpose of detecting a person or object out of the direct line of sight of the driver) and connected to a suitable monitor/display in the cabin of the truck as depicted in Fig 2.1.

At the discretion of the vehicle owner, the system may be activated whenever the ignition is on, or just when the left turn indicator is engaged.

The system is fully functional.

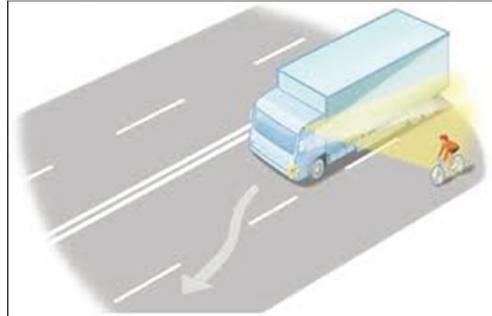
**Fail:** The vehicle is not fitted with a left-side blind-spot camera system as described above, or if a system is fitted:

- a) the camera or screen are deteriorated, blemished or tarnished significantly reducing the quality of the image, or
- b) the screen in the cab is positioned such that it is not readily viewable by the driver, or
- c) the screen is obscured.

### Intent

If there is any doubt in relation to the acceptance of a vehicle, the intent of this standard is for compliant vehicles to have a fully functional camera system that effectively views a person or object that is close to the left side of the vehicle (and may otherwise in blind-spot for the driver) and relays that image to the driver.

Figure 2.1 Depiction of trucks fitted with a left-side blind-spot camera indicating the intended area of coverage.





# ITEM 2.2

## BLIND SPOT SENSOR

### CLOCS-A Standard

Fit a proximity sensor and alarm system to the vehicle to monitor the presence of objects in the left-side blind-spot.

### Objective

To enhance the visibility and awareness of Vulnerable Road Users to the driver by the use of items or equipment that improve indirect vision.

### Rationale

Proximity sensors can be mounted to the side of a truck, and detect when an object has entered the driver's blind spot. These systems will provide an audible and/ or visual alert to the driver. The visual alert may be a "traffic light" system where a green, amber or red light is displayed dependent on how close an object is to the sensor. An audible alarm may sound if the object is very close to the sensor.

### Criteria

**Pass:** The vehicle is equipped with a sensor or sensors near to the front of the left side of the vehicle (specifically for the purpose of detecting a person or object out of the direct line of sight of the driver) and connected to a suitable monitor/display/warning system in the cabin of the truck as depicted in Fig 2.2.

At the discretion of the vehicle owner, the system may be activated whenever the ignition is on, or just when the left turn indicator is engaged.

The system is fully functional.

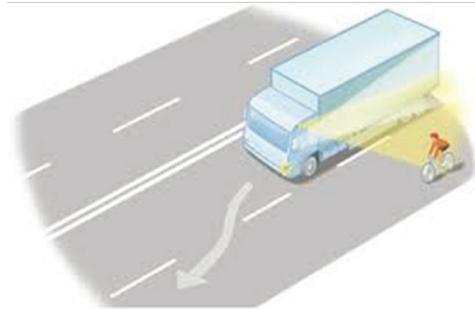
**Fail:** The vehicle is not fitted with a left-side blind-spot camera system as described above, or if a system is fitted:

- a) the camera or screen are deteriorated, blemished or tarnished significantly reducing the quality of the image, or
- b) the screen in the cab is positioned such that it is not readily viewable by the driver, or
- c) the screen is obscured.

### Intent

If there is any doubt in relation to the acceptance of a vehicle, the intent of this standard is for compliant vehicles to have a fully functional sensor system that effectively detects a person or object that is close to the left side of the vehicle (and may otherwise in blind-spot for the driver) and provides a suitable warning/alert for the driver.

Figure 2.2 Depiction of trucks fitted with a left-side blind-spot sensor system indicating the intended area of coverage.





# ITEM 2.3 BLIND SPOT SENSOR

## CLOCS-A Standard

Fit a speed-sensitive left turn indicator that incorporates a recorded (spoken) audible warning message able to be heard by cyclists and pedestrians near to the left side of the vehicle.

## Objective

To enhance the awareness of trucks to Vulnerable Road Users by audible means.

## Rationale

Trucks turning left at intersections are one of the major causes of incidents involving Vulnerable Road Users. If cyclists or pedestrians are not well positioned relative to the truck they may not be able to see the vehicle turn indicators. A left turn audible warning alarm can help to alert cyclists and pedestrians that a truck is turning left by way of a recorded message or alarm. The message is usually triggered when the vehicle is travelling at below a predetermined speed and the left turn indicator is selected. In contrast to most form of alarms, this device warns the cyclist and pedestrian rather than the driver

## Criteria

**Pass:** The vehicle is equipped with a left turn audible warning device. The device is triggered by the vehicle's left turn indicator and emits a pre-recorded audible signal that would be able to be readily heard by pedestrians and cyclists near to the left of truck.

The audible message will say something similar to "Warning, this vehicle is turning left".

The system will not be activated above a pre-set road speed.

The system is fully functional.

**Fail:** The vehicle is not fitted with a left turn audible warning device as described above, or if a system is fitted:

- a) the audible message is either far too loud or too soft,
- b) the message is deemed inappropriate,
- c) the system is not de-activated above a certain pre-set road speed.

## Intent

If there is any doubt in relation to the acceptance of a vehicle, the clear intent of this standard is for compliant vehicles to have a fully functional system that produces an effective audible warning message designed to advise nearby cyclists and pedestrians that the vehicle is about to turn left.

Figure 2.3 Depiction of a truck fitted with a left turn audible warning device.



Figure 2.4 A cyclist approaching a truck prior to the truck turning left.





# ITEM 2.4

## DAYTIME RUNNING LAMPS

### CLOCS-A Standard

Have 2 compliant LED daytime running lamps fitted to the front of the truck.

### Reference Standards

ADR 76/00 – Daytime Running Lamps 2006

### Objective

To enhance the awareness of trucks to Vulnerable Road Users by visible means.

### Rationale

Fundamental to improving Vulnerable Road User safety around heavy vehicles is taking measures to practically enhance awareness of the vehicle to VRUs. “Daytime running lamps” are lights facing in a forward direction used to make the vehicle more easily visible when driving during daytime.

### Criteria

**Pass:** The vehicle is fitted with 2 daytime running lamps that comply with ADR 76/00.

Very generally:

- The lights must be white and face forward.
- The minimum light distribution from each light is 10 degrees above and 5 degrees below the horizontal and 20 degrees either side of the vertical
- The area of the apparent surface in the direction of the axis of reference shall be not less than 25 cm<sup>2</sup> and not more than 200 cm<sup>2</sup>.
- The luminous intensity of the light emitted by each daytime running lamp shall not be less than 400 cd in the axis of reference.

The system is fully functional.

**Fail:** The vehicle is not fitted with a daytime running lamps at all, or if they are fitted:

- a) the lights do not comply with the points described above,
- b) the lights are deteriorated, blemished or tarnished significantly reducing the quality of their light, or
- c) the lights are obscured.

### Intent

If there is any doubt in relation to the acceptance of a vehicle, the clear intent of this standard is for compliant vehicles to have a pair of white daytime running lamps

fitted to the front of the truck that are sufficiently effective to make the vehicle more easily visible to VRUs and other road users during the daytime.

Figure 2.5 Depiction of a truck fitted with daytime running lamps.

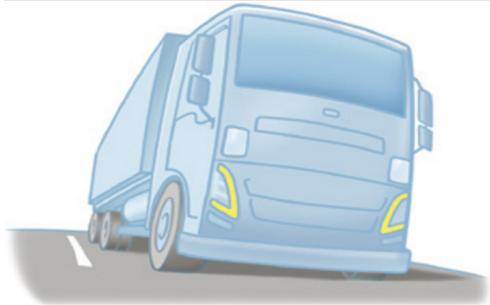
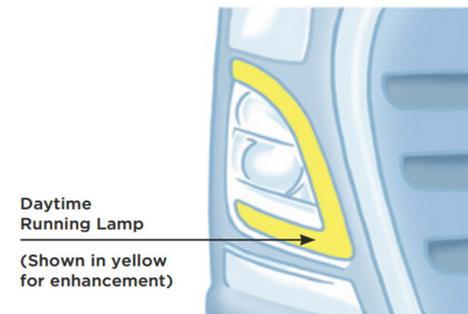


Figure 2.6 Depiction of “factory fitted” LED daytime running lamps adjacent to the headlights. .cyclapproaching a truck prior to the truck turning left.





# ITEM 2.5 FRONT UNDERRUN PROTECTION

### CLOCS-A Standard

Have trucks over 12 tonne GVM fitted with a conforming Front Underrun Protection Device - FUPD.

### Reference Standards

ADR 84/00 – Front Underrun Impact Protection 2009.  
NHVR Vehicle Standards Bulletin 6 (VSB6) Version 3.2 – Section H Chassis, Modification Code H6 – Install approved front underrun protection.

### Objective

To help to reduce the severity of incidents by the fitment of protection devices..

### Rationale

Frontal impacts involving heavy vehicles can result in serious injuries. Front Underrun Protection Devices (FUPD) are designed to help reduce the seriousness of such incidents. Conforming FUPDs fitted to trucks:

- ensure that crash forces are evenly distributed across the front of the truck,
- can help to minimise injuries by preventing smaller vehicles from going underneath the front of trucks in the event of an accident, and
- prevent the car damaging the trucks steering – allowing the truck to be brought to a controlled stop.

### Criteria

Front Underrun Protection Devices (FUPD) have been mandatory on all new trucks over 12 tonne sold in Australia since 1st Jan 2011 for new models and since 1st Jan 2012 for all models. See Vehicle Standard **ADR 84/00** – Front Underrun Impact Protection 2009.

It is also possible to retro-fit a compliant aftermarket FUPD to most heavy vehicles that were not fitted with such a device by the OEM. Heavy vehicles retrofitted with a FUPD must have a Heavy Vehicle Modification Plate attached to the device as set out in VSB6 (and similar to Fig. 2.8).

The “MOD CODE” for a compliant OEM-fitted FUPD is “H6”. The “MOD CODE” for a compliant aftermarket FUPD is “H7”.

Heavy vehicles with a FUPD fitted by the OEM and sold after 1st Jan 2012 do not require such a compliance plate.

**Pass:** If the truck is over 12 tonne GVM and originally sold in Australia during or after 2012, then by law it should have a compliant FUPD.

If the truck was originally sold prior to 2012, then it must have a compliant FUPD fitted by the OEM or retrofitted aftermarket. The FUPD must have a Heavy Vehicle Modification Plate (as described in VSB6) attached.

If fitted by the OEM, the modification plate must have “H6” engraved in the MOD CODE field. If fitted aftermarket, the modification plate must have “H7” engraved in the MOD CODE field.

**Fail:** The vehicle is not fitted with a compliant FUPD as described above, or if a FUPD is fitted:

- a) the height off the ground is greater than 400mm, or
- b) the device is damaged, deteriorated or poorly attached to the vehicle such as to make it ineffective or non-compliant,
- c) a Heavy Vehicle Modification Plate (as described in VSB6) is not attached to the device.
- d) The Heavy Vehicle Modification Plate does not have either “H6” or H7” engraved in the MOD CODE field.

Figure 2.7 A truck fitted with a Front Underrun Protection Device.



Figure 2.8 An example of a Heavy Vehicle Modification Plate compliant with VSB6



# ITEM 2.6

## SIDE UNDERRUN PROTECTION FOR TRUCKS

### CLOCS-A Standard

Have trucks fitted with Side Underrun Protection Devices - SUPD.

### Reference Standards

ATA Technical Advisory Procedure – Side Underrun Protection

UN – ECE R73

### Objective

To help to reduce the severity of incidents by the fitment of protection devices.

### Rationale

Vulnerable Road Users such as pedestrians and cyclists are at risk of falling under the rear wheels of a truck or trailer in the event of a traffic incident.

Side Underrun Protection Devices (SUPD) or Lateral Protection Devices (LPD) are either solid panels (preferred) or several horizontal bars that occupy the larger spaces between axle groups on a heavy vehicle. They are intended to minimize the risk of pedestrians and/or cyclists falling under the side of a vehicle and being caught under the wheels.

### Criteria

The fitment of Side Underrun Protection Devices (SUPD) or Lateral Protection Devices (LPD) to trucks or trailers is highly recommended wherever possible.

The Australian Trucking Association (ATA) produces a series of Technical Advisory Procedures (TAP). This includes a guide on Side Underrun Protection. It covers both trucks and trailers and is available free online.

The procedure explains how to design and install SUPD / LPD and includes guidance about how to fit the devices to prime movers and rigid trucks (including construction trucks) in compliance with the UN ECE international standards for motor vehicles.

It is recommended that both vehicle owners and CLOCS-A vehicle auditors refer to this TAP.

**Pass:** The truck is fitted with SUPD / LPD in accordance with the above ATA guide in terms of design, dimensions, construction and fitment. Noting that (as set out in the document) some existing equipment and devices on trucks may qualify as conforming protection by virtue of their size, shape and position on the vehicle.

Figure 2.9 A rigid truck fitted with a Side Underrun Protection Device. Note that this SUPD is a solid panel and includes retroreflective conspicuity marking tape and a warning to Vulnerable Road Users.

Solid panels are not technically a requirement of the UN regulation but are highly recommended.



Figure 2.10 Side Underrun Protection Devices consisting of 2 rails and a conforming vertical forward edge.



**Fail:** The vehicle is not fitted with SUPD / LPD in accordance with the above ATA guide, or if the equipment is fitted:

- a) gaps between the devices and the other relevant parts of the truck exceed the maximum dimensions set out in the ATA guide, or
- b) the devices are in poor condition or poorly attached such as to make them ineffective or dangerous.

### Intent

If there is any doubt in relation to the acceptance of a vehicle, the intent of this standard is for compliant vehicles to have Side Underrun Protection on both sides of the truck that will be effective in helping to prevent pedestrians and cyclist from falling under the side of a vehicle and being caught under the wheels.

# ITEM 2.7

## SIDE UNDERRUN PROTECTION FOR TRAILERS

### CLOCS-A Standard

Where a trailer is included in a heavy vehicle combination, have the trailer fitted with Side Underrun Protection Devices - SUPD.

### Reference Standards

ATA Technical Advisory Procedure – Side Underrun Protection

UN – ECE R73

### Objective

To help to reduce the severity of incidents by the fitment of protection devices.

### Rationale

Vulnerable Road Users such as pedestrians and cyclists are at risk of falling under the rear wheels of a truck or trailer in the event of a traffic incident.

Side Underrun Protection Devices (SUPD) or Lateral Protection Devices (LPD) are either solid panels (preferred) or horizontal bars that occupy the larger spaces between axle groups on a heavy vehicle. They are intended to minimize the risk of pedestrians and/or cyclists falling under the side of a vehicle and being caught under the wheels.

### Criteria

The fitment of Side Underrun Protection Devices (SUPD) or Lateral Protection Devices (LPD) to trucks or trailers is highly recommended wherever possible.

The Australian Trucking Association (ATA) produces a series of Technical Advisory Procedures (TAP). These include a guide on Side Underrun Protection. It covers both trucks and trailers and is available free online.

The procedure explains how to design and install SUPD / LPD and includes guidance about how to fit the devices in compliance with the UN ECE international standards for motor vehicles.

It is recommended that both vehicle owners and CLOCS-A vehicle auditors refer to this TAP.

**Pass:** The trailer is fitted with SUPD / LPD in accordance with the above ATA guide in terms of design, dimensions, construction and fitment. Noting that (as set out in the document) some existing equipment and devices on trailers may qualify as conforming protection by virtue of their size, shape and position on the vehicle.

Figure 2.11 A tipper dog trailer fitted with a Side Underrun Protection Device consisting of 2 aluminium rails. Note that this SUPD includes retroreflective conspicuity marking tape.



Figure 2.12 Semi-trailer fitted with conforming SUPD.



**Fail:** The trailer is not fitted with SUPD / LPD in accordance with the above ATA guide, or if the equipment is fitted:

- a) gaps between the devices and the other relevant parts of the trailer exceed the maximum dimensions set out in the ATA guide, or
- b) the devices are in poor condition or poorly attached such as to make them ineffective or dangerous.

### Intent

If there is any doubt in relation to the acceptance of a vehicle, the intent of this standard is for compliant vehicles to have Side Underrun Protection on both sides of the trailer that will be effective in helping to prevent pedestrians and cyclist from falling under the side of a vehicle and being caught under the wheels.



# ITEM 2.8 REAR UNDERRUN PROTECTION DEVICES

### CLOCS-A Standard

Have the rearmost HV unit (i.e., either the truck or the trailer if a trailer is in use) fitted with a compliant Rear Underrun Protection Device - RUPD

### Reference Standards

ADR 91/00 Rear Underrun Impact Protection 2018

### Objective

To help to reduce the severity of incidents by the fitment of protection devices.

### Rationale

Rear Underrun Protection Devices (RUPD) are continuous rear bumpers on heavy vehicles that conform with prescribed dimension and strength requirements. They can help to minimise the risk of injury in the event of smaller vehicles underrunning heavy vehicles in rear end crashes.

### Criteria

Rear Underrun Protection Devices (RUPD) are defined in **ADR 91/00 – Rear Underrun Impact Protection 2018**.

This ADR only applies to all Medium (TC) and Heavy (TD) semi-trailers manufactured on or after 1st July 2019.

For the purposes of vehicles gaining accreditation to CLOCS-A Silver level, the general dimension and strength requirements as set out in the standard (for semi-trailers) will apply to the rearmost HV unit (i.e., either the truck or the trailer if a trailer is in use) whether or not it is a semitrailer and regardless of when it was manufactured.

These requirements are defined in “Section 5 – Requirements” of the ADR and are copied below.

Note that Clause 5.1 (c) of the standard states that “where the rearmost point of the tyres is within 600 mm of the ‘Rear End’ of the vehicle, the tyres will be considered as meeting the requirements over their width”. This is expected to be applicable to almost all dog trailers and most rigid construction vehicles.

**Pass:** The rearmost HV unit (i.e., either the truck or the trailer if a trailer is in use) meets the general requirements as set out in “Section 5. Requirements” of ADR 91/00 (copied below), including all exceptions as they may apply.

**Fail:** The rearmost HV unit (i.e., either the truck or the trailer if a trailer is in use) does not meet the general requirements as set out in “Section 5. Requirements” of ADR 91/00 (copied below), including exceptions

as they may apply, or if the vehicle does meet these requirements, the RUPD is in such poor condition or poorly attached such as to make the device ineffective or dangerous.

Figure 2.13 Semi-trailers fitted with a Rear Underrun Protection Device.



### Intent

If there is any doubt in relation to the acceptance of a vehicle, the clear intent of this standard is for compliant vehicles to have Rear Underrun Protection on the rearmost vehicle in a combination that will effectively help to minimise the risk of injury due to smaller vehicles underrunning the heavy vehicle in rear end crashes.



## ITEM 2.8

# REAR UNDERRUN PROTECTION DEVICES

### Vehicle Standard (Australian Design Rule 91/00 – Rear Underrun Impact Protection) 2018.

#### 5. REQUIREMENTS

- 5 Except as provided in clause 5.2 or 5.3 below, every 'Semi-trailer' must be provided with a continuous rear bumper, so constructed and located that:
- (a) with the vehicle unladen, the lower edge of the bumper bar across its width is not more than 600 mm from the ground; and
  - (b) the bumper contact surface is located not more than 600 mm forward of the rear of the vehicle; and
  - (c) the ends of the bumper extend to within 300 mm of each side of the vehicle, unless the rearmost point of the tyres is within 600 mm of the 'Rear End' of the vehicle, in which case the tyres will be considered as meeting the requirements over their width; and
  - (d) the member which is, or directly supports, the bumper contact surface is of material having no less strength than steel tubing of 100 mm outside diameter and 8 mm wall thickness; and
  - (e) the structure supporting the member referred to in (d) above can transmit no less force than that member can sustain and provides a continuous force path to vehicle members of a strength consistent with the forces to be sustained.
- 5 Clause 5.1 does not apply to 'Semi-trailers' so constructed that:
- (a) cargo access doors, tailgates or other such structures when closed afford comparable protection; or
  - (b) a vertical plane tangential to the rearmost surface of the rear tyres is 155 mm or less from a parallel vertical plane containing the 'Rear End' of the 'Semi-trailer'.



# ITEM 2.9

## ADR 80/03 EMISSION STANDARDS (Euro V and Alternatives or Technical Equivalents)

### CLOCS-A Standard

The use of trucks with engines that comply with ADR 80/03 (or higher) emission standards.

### Reference Standards

ADR 80/03 - Emission Control for Heavy Vehicles 2006 Euro V

US EPA 2007

Japanese JE05

### Objective

To reduce the impact of heavy vehicle exhaust emissions on the Australian public by the adoption of vehicles that comply with more stringent regulations.

### Rationale

Noxious emissions from road vehicles reduce urban air quality, leading to illness and premature deaths among Australians.

The current emission standards for all new heavy vehicles sold in Australia are set out in ADR 80/03. This was mandated for new trucks in 2010/11. The standard lists alternate or technical equivalent Japanese MLIT, UN or US EPA regulations.

Replacing older trucks with post-2010/11 vehicles that comply with ADR 80/03 emission standards will contribute to a reduced incident of disease and premature deaths attributable to air pollution.

### Criteria

The following is a direct excerpt from ADR 80/03.

#### 2 APPLICABILITY AND IMPLEMENTATION

- 2 This vehicle standard applies to vehicles of the M and N categories, with a GVM greater than 3.5 tonnes, as provided in clause 2.2.
- 2 This vehicle standard applies:
  - 2 from 1 January 2010 in relation to new model vehicles produced on or after 1 January 2010; and
  - 2 from 1 January 2011 in relation to vehicles produced on or after 1 January 2011, other than new model vehicles referred to in clause 2.2.1.
- 2 For the purposes of clause 2.2.1, a new model vehicle is a vehicle of a model first produced with a date of manufacture on or after 1 January 2010.

Note: Vehicles with engines that comply with a higher emission standard such as ADR80/04 or Euro VI and its alternatives or technical equivalents necessarily comply with ADR 80/03 and this CLOCS-A Silver standard item.

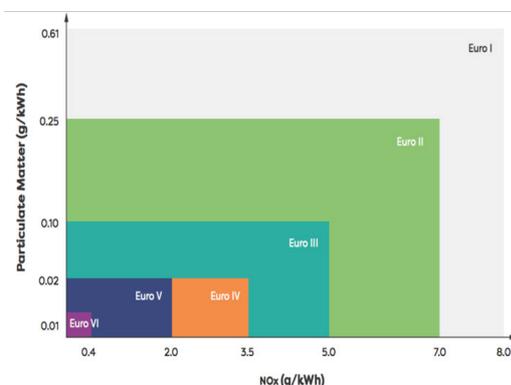
**Pass:** In relation to category M or N vehicles with a GVM greater than 3.5 tonnes:

- a) Any vehicle produced after 1 January 2011, or
- b) Any vehicle produced between 1 January 2010 and 1 January 2011 that was a new model at the time of manufacture (as defined in Clause 2.3 above)
- c) Any vehicle produced prior to 1 January 2010 with a diesel engine that meets ADR 80/03 (or higher) emission standards and where the owner of the vehicle can produce readily verifiable documentation from the manufacturer, distributor or Approved Vehicle Examiner (authorised by the NHVR) stating that it does so.

**Fail:** In relation to category M or N vehicles with a GVM greater than 3.5 tonnes.

- a) Any vehicle produced prior to 1 January 2010, unless the owner of the vehicle can produce readily verifiable documentation from the manufacturer, distributor or Approved Vehicle Examiner (authorised by the NHVR) stating that the diesel engine meets ADR 80/03 (or higher) emission standards.
- b) Any vehicle produced between 1 January 2010 and 1 January 2011 that was not a new model at the time of manufacture (as defined in Clause 2.3 above) unless the owner of the vehicle can produce readily verifiable documentation from the manufacturer, distributor or Approved Vehicle Examiner (authorised by the NHVR) stating that the diesel engine meets ADR 80/03 (or higher) emission standards.

Figure 2.14 The change in particulate and Nitrous Oxide emissions from diesel engines in line with the change in European standards





# ITEM 2.10

## ANTI-LOCK BRAKING SYSTEM FOR TRUCKS

### CLOCS-A Standard

Have trucks fitted with an Anti-lock Braking System - ABS

### Reference Standards

ADR 35/06 - Commercial Vehicle Brake Systems 2018

### Objective

To reduce the likelihood of heavy vehicles being involved in incidents via advanced electronic driving aids.

### Rationale

Antilock Braking Systems (ABS) emerged more than 20 years ago and were designed to prevent wheel lock up during braking, and thus assist the driver to maintain directional control of the vehicle, particularly on wet or slippery roads surfaces.

In emergency stops, ABS for trucks has proven to be highly effective and is widely accepted as an invaluable safety feature.

### Criteria

ABS has been mandatory on all new trucks in Australia since 1 July 2015, but has been fitted to most new trucks by default since 2008 in conjunction with the ADR 80/02 (Euro IV) emission control package.

ABS requirements for trucks in Australia are set out in **ADR 35/06**.

**Pass:** The vehicle was manufactured after 1st July 2015, or

The vehicle was manufactured prior to 1st July 2015 and the owner of the vehicle can produce readily verifiable documentation from the manufacturer, distributor or Approved Vehicle Examiner (authorised by the NHVR) stating that the vehicle is fitted with an Anti-lock Braking System.

**Fail:** The vehicle was manufactured prior to 1st July 2015 and the owner of the vehicle is unable to produce readily verifiable documentation from the manufacturer, distributor or Approved Vehicle Examiner (authorised by the NHVR) stating that the vehicle is fitted with an Anti-lock Braking System.

Figure 2.15 ABS can help vehicles maintain direction control on wet or slippery surfaces.





# ITEM 2.11

## ANTI-LOCK BRAKING SYSTEM FOR TRAILERS

### CLOCS-A Standard

Where a trailer is included in a heavy vehicle combination, have the trailer fitted with an Anti-lock Braking System - ABS.

### Reference Standards

ADR 38/05 - Trailer Brake Systems 2018

### Objective

To reduce the likelihood of heavy vehicles being involved in incidents via advanced electronic driving aids.

### Rationale

Antilock Braking Systems (ABS) emerged more than 20 years ago and were designed to prevent wheel lock up during braking, and thus assist the driver to maintain directional control of the vehicle, particularly on wet or slippery roads surfaces.

In emergency stops, ABS has proven to be highly effective and is widely accepted as an invaluable safety feature.

By eliminating trailer wheel lock-up the system helps to reduce the occurrence of trailer swing and jack-knifing.

### Criteria

ABS has been mandatory on all new trailer in Australia since 1 November 2019.

ABS requirements for trailers in Australia are set out in **ADR 38/05**.

**Pass:** The trailer was manufactured after 1st November 2019, or

The trailer was manufactured prior to 1st November 2019 and the owner of the vehicle can produce readily verifiable documentation from the manufacturer, distributor or Approved Vehicle Examiner (authorised by the NHVR) stating that the trailer is fitted with an Anti-lock Braking System.

**Fail:** The vehicle was manufactured prior to 1st November 2019 and the owner of the vehicle is unable to produce readily verifiable documentation from the manufacturer, distributor or Approved Vehicle Examiner (authorised by the NHVR) stating that the trailer is fitted with an Anti-lock Braking System.

Figure 2.16 ABS can help vehicles maintain direction control on wet or slippery surfaces.



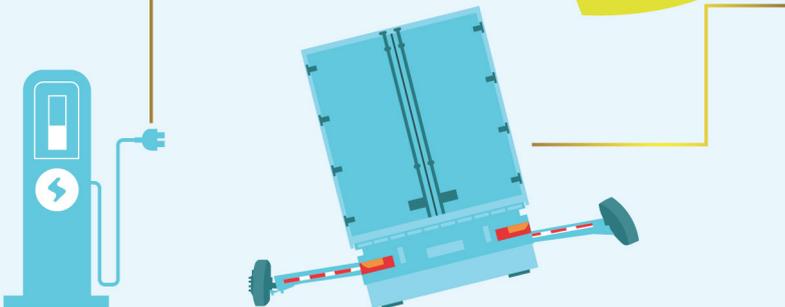
# Gold Standard



- Telematics
- Electronic Stability Control – Trucks
- Advanced Emergency Braking



- Autonomous Reverse Braking
- Euro VI Emission Standard  
or
- Zero Emission Vehicle
- Roll Stability Control – Trailers



The highest standard of equipment that is being sought for heavy vehicles complying with CLOCS-A technical requirements. Encourages leading safety technologies & to future-proof vehicles. Accreditation to Gold also requires prior accreditation to Silver.

- No bug deflectors on bonnetted trucks – City and Urban Projects only
- No engine air intake hardware above bonnet level – City and Urban Projects only
- No large inappropriate bullbars – City and Urban Projects only
- No inappropriate sunvisors
- No overly large decals or lettering attached to any part of the windscreen that may reduce the driver's field of view
- No excessive windscreen or window tinting
- No inappropriate fitment of aftermarket accessories that restrict the driver's field of view





# ITEM 3.1 TELEMATICS SYSTEMS

### CLOCS-A Standard

Fit a telematics system to the truck with position monitoring, driver behaviour monitoring and fatigue management functions.

### Objective

To reduce the likelihood of heavy vehicles being involved in incidents via advanced electronic driving aids.

### Rationale

Telematics relates to the exchange of data and information to and from a vehicle. It is now a powerful technology that provides businesses with an opportunity to remotely supervise drivers and provide a wide range of real-time information including – location, speed and direction of travel, driver behaviour such as harsh cornering and braking, loaded or unloaded status, automatic calculation of driving time and the upcoming need for rest breaks for fatigue management purposes.

### Criteria

ABS has been mandatory on all new trailer in Australia since 1 November 2019.

ABS requirements for trailers in Australia are set out in **ADR 38/05**.

**Pass:** The vehicle is equipped with a telematics system that at least includes the functions of:

- Vehicle position monitoring
- Driver behaviour monitoring, and
- Driver fatigue management

The on-board vehicle equipment is backed up by a management system and service provider that enables full functionality and reporting for at least the three functions noted above.

The system is fully operational.

**Fail:** The vehicle is not equipped with a telematics system at all, or if it has a telematics system, it

a) does not include the functions of:

- Vehicle position monitoring
- Driver behaviour monitoring, and
- Driver fatigue management, or

b) The on-board vehicle equipment is not effectively backed up by a management system and service provider that enables full functionality and reporting for at least the three functions noted above, or

c) The system is not fully operational.

### Intent

If there is any doubt in relation to the acceptance of a vehicle, the intent of this standard is for compliant vehicles to have on-board telematics equipment that operates as part of a fully functional system that permits the transport operators to remotely monitor the behaviour of the driver, the position of the vehicle in real time and facilitate the effective management of the driver’s legal fatigue status

Figure 3.1 Telematics can allow drivers to concentrate more on the driving and less on the distractions.





# ITEM 3.2

## ELECTRONIC STABILITY CONTROL FOR TRUCKS

### CLOCS-A Standard

Have trucks fitted with an Electronic Stability Control system - ESC.

### Reference Standards

ADR 35/06 - Commercial Vehicle Brake Systems 2018

### Objective

To reduce the likelihood of heavy vehicles being involved in incidents via advanced electronic driving aids.

### Rationale

Electronic Stability Control (ESC) is an active vehicle safety system that continuously monitors the speed, steering angle and lateral acceleration of the vehicle and compares it to the critical threshold at which point rollover may occur.

If a driver enters a corner too fast for the conditions, an ESC system will automatically intervene and help to prevent a rollover or at least reduce the severity of the incident.

### Criteria

ESC is a relatively new mandatory requirement through ADR 35/06. It applies to new model NB and NC category vehicles from 1 November 2020 and all NB and NC vehicle from 1 January 2022. And where:

#### NB - MEDIUM GOODS VEHICLE

- A goods vehicle with a 'Gross Vehicle Mass' exceeding 3.5 tonnes but not exceeding 12.0 tonnes, and

#### NC - HEAVY GOODS VEHICLE

- A goods vehicle with a 'Gross Vehicle Mass' exceeding 12.0 tonnes

**Pass:** The truck is an NB or NC category vehicle sold new after 1 November 2020 and was a new model at the time,

The truck is an NB or NC category vehicle sold new after 1 January 2022, or

The owner of the vehicle can produce readily verifiable documentation from the manufacturer, distributor or Approved Vehicle Examiner (authorised by the NHVR) stating that the truck is fitted with an Electronic Stability Control system.

**Fail:** The truck is not fitted with an Electronic Stability Control system, or

If a system is fitted, the owner of the vehicle is unable to produce readily verifiable documentation from the

manufacturer, distributor or Approved Vehicle Examiner (authorised by the NHVR) stating that the truck is fitted with ESC.

Figure 3.2 ESC system testing and calibration being carried out on a specially equipped truck in a controlled environment.





# ITEM 3.3

## ROLL STABILITY CONTROL FOR TRAILERS

### CLOCS-A Standard

Where a trailer is included in a heavy vehicle combination, have the trailer equipped with a Roll Stability Control system (RSC)

### Reference Standards

ADR 38/00 – Trailer Brake Systems 2006

### Objective

To reduce the likelihood of heavy vehicles being involved in incidents via advanced electronic driving aids.

### Rationale

Roll Stability Control (RSC) is an active vehicle safety system that continuously monitors the speed and lateral acceleration of the vehicle and compares it to the critical threshold at which point rollover may occur.

If a driver enters a corner too fast for the conditions, a Roll Stability Control system will automatically intervene and help to prevent a rollover or at least reduce the severity of the incident.

### Criteria

RSC has been mandatory on all new large trailers sold in Australia as of 1 November 2019.

RSC requirements for trailers are defined in ADR 38/06

**Pass:** The trailer was sold new after 1 November 2019, or

The owner of the vehicle can produce readily verifiable documentation from the manufacturer, distributor or Approved Vehicle Examiner (authorised by the NHVR) stating that the trailer is fitted with a Roll Stability Control system.

**Fail:** The trailer is not fitted with a Roll Stability Control system, or

If a system is fitted to a vehicle sold prior to 1 November 2019, the owner of the vehicle is unable to produce readily verifiable documentation from the manufacturer, distributor or Approved Vehicle Examiner (authorised by the NHVR) stating that the truck is fitted with RSC.

Figure 3.3 RSC system testing and calibration being carried out on a specially equipped trailer in a controlled environment.





# ITEM 3.4

## ADVANCED EMERGENCY BRAKING SYSTEM - AEB

### CLOCS-A Standard

Have trucks fitted with an Advanced Emergency Braking System - AEBS

### Reference Standards

ADR 97/00 – Advanced Emergency Braking for Omnibuses, and Medium and Heavy Goods Vehicles 2022

**Fail:** The truck is not fitted with an Advanced Emergency Braking System, or if a system is fitted:

- The owner of the vehicle is not able to produce readily verifiable documentation from the manufacturer, distributor or Approved Vehicle Examiner (authorised by the NHVR) stating that the truck is fitted with the system, or
- the system is not operational.

### Objective

To reduce the likelihood of heavy vehicles being involved in incidents via advanced electronic driving aids.

### Rationale

A significant amount of incidents involving heavy vehicles are rear-end collisions.

AEB uses radar and camera imaging to identify a frontal hazard. If the system detects a likely collision ahead, it gives the vehicle's driver a warning. If the driver does not respond, the brakes are automatically applied in an attempt to bring the truck to rest before impacting the object.

Some advanced systems are also capable of detecting and protecting vulnerable road users such as pedestrians and cyclists.

### Criteria

The fitment of AEB is not yet mandatory on new heavy vehicles sold in Australia, although the technology is now defined in ADR 97/00 for 2 and 3 axle trucks with the following planned implementation dates:

- 1 November 2023 for all new model vehicles.
- 1 November 2024 for all category MD and ME vehicles.
- 1 February 2025 for all category NB and NC vehicles.

**Note:** AEB cannot be retrofitted to an existing vehicle. It may however be ordered as an option or come as part of a standard suite of electronic aides on some new vehicles.

**Pass:** The owner of the vehicle is able to produce readily verifiable documentation from the manufacturer, distributor or Approved Vehicle Examiner (authorised by the NHVR) stating that the truck is fitted with an Advanced Emergency Braking System, and the system is operational.

Figure 3.4 Depiction a truck fitted with AEBS and automatically being brought to a halt before impacting a car in front.





# ITEM 3.5

## AUTONOMOUS REVERSE BRAKING - ARB

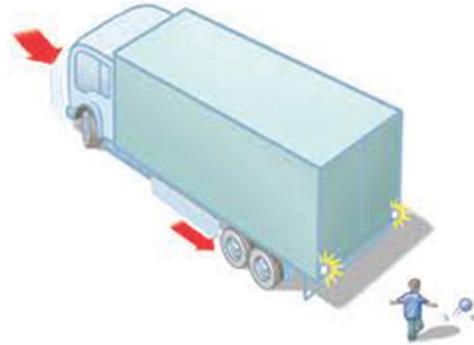
### CLOCS-A Standard

Have trucks fitted with an Autonomous Reverse Braking system - ARB

### Reference Standards

UN Regulation No. R 158 – Devices for means of rear visibility or detection.

Figure 3.5 An Autonomous Reverse Braking System can detect an object or person behind the vehicle when in reverse and automatically bring the vehicle to a stop prior to a collision.



### Objective

To reduce the likelihood of heavy vehicles being involved in incidents via advanced electronic driving aids.

### Rationale

Collisions involving a reversing vehicle and a site worker, pedestrian or another vulnerable road user (such as a cyclist or motorcyclist) result in significant trauma and associated costs.

An Autonomous Reverse Braking System can use technology to provide a level of protection by autonomously applying the brakes if an object (including a person) or crash threat is detected.

After several seconds the brakes are released again so the final distance to a dock or similar can be achieved.

### Criteria

There is no current legislation in Australia requiring ARB to be fitted to heavy vehicles.

Systems can be retrofitted and may be applied to both rigid vehicles and combinations.

**Pass:** The owner of the vehicle is able to produce readily verifiable documentation from the manufacturer, distributor, product supplier or Approved Vehicle Examiner (authorised by the NHVR) stating that the truck is fitted with an Autonomous Reverse Braking System, and the system is operational.

**Fail:** The truck is not fitted with an Autonomous Reverse Braking System, or if a system is fitted:

- The owner of the vehicle is not able to produce readily verifiable documentation from the manufacturer, distributor, product supplier or Approved Vehicle Examiner (authorised by the NHVR) stating that the truck is fitted with the system, or
- the system is not operational.



# ITEM 3.6

## ADR 80/04 EMISSION STANDARDS (Euro VI and Alternatives and Technical Equivalents)

### CLOCS-A Standard

The use of trucks with engines that comply with ADR 80/04 (Euro VI) emission standards.

### Reference Standards

ADR 80/04 – Emission Control for Heavy Vehicles 2023

Euro VI

US EPA 2010

Japanese “Post New Long-Term Emissions Standards”

### Objective

To reduce the impact of heavy vehicle exhaust emissions on the Australian public by the adoption of vehicles that comply with more stringent regulations.

### Rationale

Noxious emissions from road vehicles reduce urban air quality, leading to illness and premature deaths among Australians.

Current noxious emissions standards in Australia are set out in ADR80/03 (Euro V).

The more stringent ADR80/04 emission standards for heavy vehicles have been approved by Parliament & posted on the Federal Register of Legislation. This will require new models to comply with the standard from 1 Nov 2024 and all new vehicles sold from 1 Nov 2025.

The new standard lists alternate or technically equivalent Japanese MLIT, UN or US EPA regulations.

Purchasing and using new vehicles complying with ADR 80/04 emission standards will contribute to a reduced incident of disease and premature deaths attributable to air pollution.

### Criteria

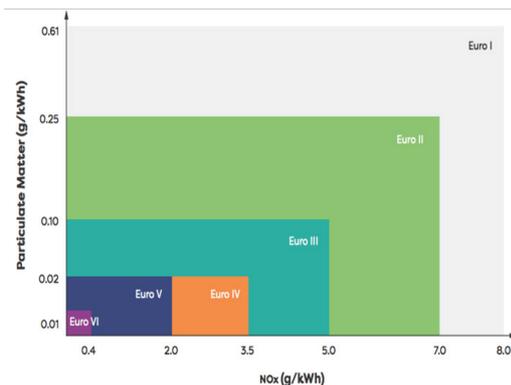
Some, but not all truck suppliers and brands in Australia can offer vehicles fitted with engines that comply with the new ADR80/04 standard prior to it becoming mandatory 2024/2025.

**Pass:** The vehicle is fitted with an engine that complies with ADR80/04 emission standards (or the alternate regulations outlined within the standard), and where the owner of the vehicle can produce readily verifiable documentation from the manufacturer, distributor or Approved Vehicle Examiner (authorised by the NHVR) stating that it does so.

**Fail:** The owner of the vehicle is unable to produce readily verifiable documentation from the manufacturer

or distributor stating that it complies with ADR80/04 (or the alternate regulations outlined within the standard).

Figure 3.6 The change in particulate and Nitrous Oxide emissions from diesel engines in line with the change in European standards





# ITEM 3.7 ZERO EMISSION VEHICLES

### CLOCS-A Standard

The use of trucks with a zero-emission drive train.

### Reference Standards

ADR 109/00 – Electric Power Train Safety Requirements 2023

ADR 110/00 – Hydrogen-Fuelled Vehicle Safety Related Performance 2023

UN Regulation No. 138/01 – Acoustic Vehicle Alert Systems

### Objective

To reduce the impact of heavy vehicle exhaust emissions on the Australian public by the adoption of vehicles that comply with more stringent regulations.

### Rationale

Noxious emissions from road vehicles reduce urban air quality, leading to illness and premature deaths among Australians. Greenhouse gases from road vehicles are also a major contributor to global warming and climate change.

The potential benefits offered by zero emission vehicles represent a huge step forward. Current viable drivetrain options for this technology are either battery electric or hydrogen fuel cells.

Advantages offered by zero emission vehicles include better air quality, reduced noise pollution and the ability to deliver into the city and residential areas at night due to the silent engines.

Relevant in the context of CLOCS-A and its objective of reducing community road safety risks is the fact that it is harder to hear electric vehicles travelling at low speeds – especially in the lowest speed range beyond which the noise generated by rolling tires can be easily heard. Such vehicles may be travelling in front of schools, at pedestrian crossings, traffic lights or intersections and nearby pedestrians may include the visually impaired or those that rely on their hearing. In response to this concern, Acoustic Vehicle Alerting Systems (AVAS) have been developed to provide an artificial vehicle noise at lower speeds.

### Criteria

For CLOCS-A accreditation, Zero emission heavy vehicles require AVAS conforming to UN Regulation No. 138/01 – Acoustic Vehicle Alert Systems.

Heavy vehicles with a battery electric drive train in Australia must comply with (draft) ADR 109/00 – Electric

Power Train Safety Requirements 2023.

Heavy Vehicles with a hydrogen fuel cell drive train in Australia must comply with (draft) ADR 110/00 – Hydrogen-Fuelled Vehicle Safety Related Performance

**Pass:** The vehicle is fitted with an ADR compliant zero-emission drive train such as battery electric or hydrogen fuel cells and is fitted with a compliant effective Acoustic Vehicle Alerting Systems (AVAS).

**Fail:** The vehicle is not fitted with a zero- emission drive train or is fitted with a zero- emission drive train that is not ADR compliant or does not have a compliant Acoustic Vehicle Alerting Systems (AVAS).

Figure 3.7 Vehicles fitted with zero emission engines can reduce both air and noise pollution.



# Appendix - Conversion of ADR Levels to Euro Level Emissions

## Conversion of ADR Levels to Euro Level Emissions

Standard	Date Introduced	Source Standard	Alternative Standards
ADR 70/00	1995/1996	Euro I UN ECE Reg 49/02	US EPA 91 or Japan 94
ADR 80/00	2002/2003	Euro III Directive 1999/96/EC	US EPA 98 (model year 2000)
ADR 80/02	2007/2008	Euro IV Directive 2005/55/EC, 2005/78/EC & 2006/51/EC	US EPA 2004 and Japan JE05 Announcement 619 from amendment 872 16/08/2005
ADR 80/03	2010/2011	Euro V Directive 2005/55/EC, 2005/78/EC & 2006/51/EC	US EPA 2007g and Japan JE05 Announcement 619 from amendment 872 16/08/2005
ADR 80/04	2024/2025	Euro VI UN ECE 49/06 EU 595/2009 EU 582/2011	US EPA 2019g and Japan JE05 Announcement 619 from amendment 219 12/02/2019

# Change Control Log

Version	Change Description	Change Date	Comments
1.0	Inclusion of appendix - Conversion of ADR Levels to Euro Level Emissions on page 46.	12.11.2024	Requested by PC
1.0	Inclusion of "ATA Technical Advisory Procedure TAP - Conspicuity Marking" in pages 4 and 21 replacing "ATA Technical Advisory Procedure - Heavy Vehicle Visibility".	12.11.2024	Requested by CL

