AUSTRALIAN TRUCKING ASSOCIATION

INDUSTRY TECHNICAL COUNCIL

# TECHNICAL ADVISORY PROCEDURE

## CONSPICUITY MARKING

EDITION 3 / September 2024

# ATA ITC Technical Advisory Procedure

# Conspicuity Marking

# Edition 3

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**About this Technical Advisory Procedure (TAP):**

This Technical Advisory Procedure (TAP) is published by the Australian Trucking Association Ltd (ATA) to assist the road transport industry in improving the visibility of heavy commercial trucks and trailers.

This TAP is not, nor is it intended to be, complete or without exception.

The TAP is a guide only and its use is entirely voluntary. Recommendations or procedures may not be suitable for, or applicable to all operators. Operators should consider their own circumstances, practices and procedures when using this TAP.

Operators must comply with the Australian Design Rules (ADRs), the Australian Vehicle Standards Regulations, the Roadworthiness Guidelines and any specific information and instructions provided by manufacturers in relation to the vehicle's systems and components.

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Suggestions or comments about this TAP are welcome. Please write to the Industry Technical Council, Australian Trucking Association, 25 National Circuit, Forrest ACT 2603.

**About the ATA Industry Technical Council (ITC):**

The Industry Technical Council (ITC) is a standing committee of the Australian Trucking Association (ATA). The ITC's mission is to improve trucking equipment, its maintenance and maintenance management. The ITC was established in 1995.

As a group, the ITC provides the ATA with robust professional advice on technical matters to help underpin the ATA's evidence-based policymaking. It is concerned with lifting technical and maintenance standards, improving the operational safety of the heavy vehicle sector, and the development of guidelines and standards for technical matters.

ITC performs a unique service in the Australian trucking industry by bringing operators, suppliers, engineers and other specialists together in a long-term discussion forum. Its members provide expert and independent advice in the field to inform the work of the ITC. The outcomes from ITC benefit all ITC stakeholders and the heavy vehicle industry at large.

The ITC operates under the Australian Trucking Association's Council, which formulates industry policy for implementation by the organisation.

We welcome applications to join the ITC. For further information, please call the ATA on (02) 6253 6900 or email ata@truck.net.au or download information from the ATA website www.truck.net.au, follow the links under the members tab to join.

**Acknowledgement**

The ATA appreciates the support of the NHVR in updating this TAP and for providing the truck drawings.

The cover page was generously provided by Volvo Trucks Australia.

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# Introduction

This Technical Advisory Procedure (TAP) is published by the Australian Trucking Association Ltd (ATA) to assist the road transport industry in improving the technical understanding of Conspicuity Markings and the application of Conspicuity Markings to heavy duty vehicles. This TAP has been drafted to apply to a generalised range of typical Australian transport industry trucks and trailers and provides guidance for 'deemed' compliance in accordance with the requirements set out in UN Regulation R104.

It is not, nor is it intended to be, complete or without exceptions.

The focus of this TAP is to support the fitment of Conspicuity Marking required for compliance under the Safer Freight Vehicle and CLOCS-A.

**About the Safer Freight Vehicles package**

The Australian Government revised the national road vehicle standards effective from 1 October 2023, introducing new regulations to increase the safety of trucks on Australian roads. The Safer Freight Vehicles (SFV) package includes a range of new safety features such as electronic stability control, advanced emergency braking, devices to reduce blind spots, and lane departure warning systems. Additionally, the overall width limit for new SFV compliant trucks (rigids and prime movers) can be increased from 2.50m to 2.55m, allowing more space for the installation of these safety features and potentially productivity benefits. Trailers must continue to have an overall width of 2.5m (or 2.55 with load restraint equipment). These changes are expected to save lives, prevent serious injuries to road users and pedestrians while boosting freight productivity. It is estimated that the SFV package will provide a net benefit of $500+ million to the Australian economy. Details and further background of SFV package can be found the Department of Infrastructure website [LINK][1]

The new regulations include provisions for fitting safety devices and sensors to trucks without contributing to the vehicle's overall width and length measurements. This includes front and kerb view mirrors, camera monitor systems, blind spot sensors, and cross-view mirrors. While the width limit for buses and trailers will not change, they will benefit from these safety devices being excluded from width and length measurements.

This TAP has been updated to support the fitment of conspicuity markings which forms one of seven new or updated ADR requirements in the SFV package. These markings are mandated via Australian Design Rule (ADR) 43/04 *Vehicle Configuration and Dimensions* for trucks with a width greater than 2.5m. ADR 43/04 applies the conspicuity markings requirements of ADR 13/00 *Installation of Lighting and Light Signalling Devices on other than L-Group Vehicles* or for the complete listing of the ADR [LINK][2].

ADR 13/00, Appendix A, Section 6.21 provides the installation requirements for conspicuity markings. Alternatively they are fully detailed in UN R104. UN R104 is to be read with its component documents. ADR 13/00 which includes UN R48 states these markings are optional for vehicles not exceeding 2.5m in overall width.

[1] Guide to Safer Freight Vehicles | Department of Infrastructure, Transport, Regional Development, Communications and the Arts

[2] Current Australian Design Rules | Department of Infrastructure, Transport, Regional Development, Communications and the Arts

Conspicuity markings are usually not fitted by truck OEMs as vehicles may be exempt from meeting certain ADRs before first registration. Although these vehicles are ADR certified, they are not road ready, and are considered *partially completed vehicles*[3]. Dealers are required to complete the vehicle's ADR compliance before first registration.

Conspicuity markings are also beneficial for vehicles operating in remote, poorly lit areas or parked or stored in poorly lit areas. Additionally, if complying conspicuity markings are fitted, vehicles are not required to have rear marker plates as per VSB12 [Link]. Additional background information can be found in VSG11 [Link] Fitting of additional reflectors and conspicuity markings.

This TAP has been designed to provide simplified instructions for the application of conspicuity markings for ADR compliance.

[3] A vehicle which has been manufactured to a stage where, although it may be entered on the *'Register of Approved Vehicles'* or is otherwise registrable, additional work will be necessary to complete the vehicle and put it into service (e.g. a *'Chassis-cab'*). Depending on the vehicle design and the stage it is manufactured to, there may be some national road vehicle standards (or requirements of these standards) that do not apply, but will otherwise become applicable when the vehicle is completed.

# 1. Definitions

This Technical Advisory Procedure makes use of the terms 'must', 'shall' and 'should' when prescribing particular requirements.

- The term 'must' identifies a mandatory requirement under law in Australia which is required for compliance.
- The term 'shall' prescribes a requirement which, it is intended, will be complied with in full and without deviation to achieve best practice.
- The term 'should' prescribes a requirement which is recommended to achieve best practice unless, after prior consideration, deviation is considered to be necessary and acceptable.

Such terms may have different meanings when used in legislation, regulation, Codes of Practice or guidance and reference needs to be made to such legislation or official guidance for information on legal obligations.

The source for definitions is the ADR Definitions and Vehicle Categories.

| | |
|---|---|
| ADR | Australian Design Rules 3rd Edition. |
| ATM | Aggregate Trailer Mass (ATM) - the total mass of the laden trailer when carrying the maximum load recommended by the '*Manufacturer*'. This will include any mass imposed onto the drawing vehicle when the '*Combination Vehicle*' is resting on a horizontal supporting plane. |
| UN | United Nations. The ADRs rely on the UN Regulations as a set of accepted international vehicle standards. https://unece.org/transport |
| GTM | Gross Trailer Mass (GTM) - the mass transmitted to the ground by the '*Axle*' or '*Axles*' of the trailer when coupled to a drawing vehicle and carrying its maximum load approximately uniformly distributed over the load bearing area, and at which compliance with the appropriate Australian Design Rules has been or can be established. |
| GVM | Gross Vehicle Mass (GVM) - the maximum laden mass of a motor vehicle as specified by the '*Manufacturer*'. |
| Manufacturer | The person/organisation who holds a road vehicle type approval or a road vehicle component type approval, granted under the Road Vehicle Standards Act 2018, which covers the vehicle or component (as applicable). |
| NB2/NC | ADR categories for goods vehicles with GVM greater than 4.5 tonne. |
| OEM | Original Equipment Manufacturer. |
| RAV | Register of Approved Vehicles. Refer to Section 8 for further details. |
| Retroreflective | A surface that reflects light back to its source. See appendix 4 for illustration. |

For further terms refer to ATA's ITC dictionary [LINK]

# 2. Safer Freight Vehicles (SFV) ADR package

2.1 The following table shows the ADRs that the Safer Freight Vehicles must comply with.

| Safer Freight Vehicles | ADRs |
|---|---|
| a) SFV must comply with these ADRs (or a later version). | • ADR 14/03 – Devices for Indirect Vision<br>• ADR 35/07 – Commercial Vehicles Brake Systems. |
| b) SFV except vehicles with 4 or more axles and vehicles designed for off-road use. | • ADR 97/00 – Advanced Emergency Braking for Omnibuses, and Medium and Heavy Goods Vehicles, or a later version;<br>• ADR 99/00 – Lane Departure Warning Systems, or a later version. |
| c) SFV except partially completed vehicles and prime movers. | • Comply with ADR 106/00 – Side Underrun Protection, or a later version<br>• Be fitted with conspicuity marking to the rear, in accordance with ADR43/04 Vehicle Configuration and Dimensions and ADR 13/00 – Installation of Lighting and Light Signalling Devices on other than L-Group Vehicles, or a later version, and<br>• If more than 6,000mm in total length, be fitted with conspicuity markings to both sides, in accordance with ADR 13/00 – Installation of Light and Light Signalling Devices on other than L-group Vehicles, or a later version. |
| d) SFV with a gross vehicle mass over 8 tonnes. | • ADR 105/00 – Blind Spot Information Systems, or a later version, from 1 November 2025 for **new** model vehicles, and 1 February 2027 for **all** vehicles. |

*Table 1: SFV ADR listing*

2.2 ADRs 14/03, 35/07, 97/00, 99/00 noted above are considered mandatory for the vehicle to be identified on the Register of Approved Vehicles (RAV) as a SFV.

2.3 ADR 105/00 noted above, will be considered mandatory for the vehicle to be identified on the RAV as a SFV when the ADR105/00 applicability dates apply to the vehicle, starting from 1 November 2025.

2.4 While ADRs 106/00, ADR43/04 and 13/00 noted above can be applied at a range of times and alternative means of identifying the vehicle's compliance will be required – see Section 8 below for details.

2.5 UN R150 regulation combines the provisions of individual UN Regulations Nos. 3, 27, 69, 70 and 104 into a single UN Regulation for retro-reflective devices and markings, and is the outcome of the World Forum for Harmonization of Vehicle Regulations (WP.29) decision to simplify the lighting and light-signalling Regulations. UN R150 applies for tape marking on vehicles approved to the most recent series of amendments to UN R48, and it is anticipated that UN R150 will be further recognised in the future through updates to ADR13.

# 3. CLOCS-A and Conspicuity Markings

CLOCS-A or Construction Logistics and Community Safety – Australia [LINK] is a national voluntary standard developed with the primary aim of managing the risks and impacts associated with a construction project's on-road transport and logistics activities to improve community road safety. CLOCS-A is based on the highly successful London based CLOCS scheme, where it has achieved a "47% reduction in casualty rate when implementing CLOCS"[4].

As a direct result of an increase in construction activity, the number of heavy vehicle movements related to and around construction project locations has increased significantly. Recognising that the movement of construction heavy vehicles in populated areas can present hazards for the community, particularly Vulnerable Road Users, both State and Commonwealth governments seek to prioritise and promote the use of safer heavy vehicles, improved driver standards, more effective logistics planning and greater engagement with the community on road safety initiatives[5].

The CLOCS-A Standard is the result of the collective effort of industry champions involved in construction projects and the supply chain.

Through the wider adoption of the CLOCS-A Standard across Australian construction projects and supply chains, it is expected that the risk of road trauma involving construction vehicles will be reduced and the efficiency of construction project logistics improved.

Conspicuity Markings forms part of the Bronze Level [LINK], the Minimum Mandatory Standard for all heavy vehicles, for both trucks and trailers, complying with CLOCS-A technical requirements. Measures and technologies for the Bronze Level are relatively low cost and easy to implement.

[4] https://www.clocs.org.uk/page/Why%20CLOCS

[5] Commonwealth of Australia (2023) National Road Safety Action Plan 2023 – 2025: https://www.roadsafety.gov.au/sites/default/files/documents/National%20Road%20Safety%20Action%20Plan%202023-25_0.pdf

# 4. Conspicuity Markings Compliance Standards

4.1 Safer Freight Vehicles via ADR 43/04 Vehicle Configuration and Dimensions, mandates Conspicuity Marking to be fitted to:

- NB2 and category NC vehicles with an *Overall Width* exceeding 2,500mm must also, except for *'Partially Completed Vehicles'*[6] and *'Prime Movers'*:
  - be fitted with conspicuity markings to the rear, in accordance with the Australian Design Rule 13/00 – Installation of Lighting and Light Signalling Devices on other than L-Group Vehicles, or a later version; and
  - if more than 6,000 mm in *'Total Length'*, be fitted with conspicuity markings to both sides, in accordance with ADR 13/00 – Installation of Lighting and Light Signalling Devices on other than L-Group Vehicles, or a later version.

4.2 The Australian Trucking Association recommends conspicuity markings should be fitted to:

- All trucks, both rigids and prime movers, over 6m in length.
- All trailers with an ATM greater than 3.5 tonnes.
- Any other heavy vehicles stored, parked or used in low light locations.

4.3 UN R104 requires Conspicuity Marking to be fitted to:

- Trucks with a GVM exceeding 7.5 tonnes.
- Trailers with an ATM exceeding 3.5 tonnes.

4.4 UN R104 Exemptions:

- A vehicle which is not a goods vehicle.
- Goods vehicles not exceeding 7.5 tonnes GVM.
- Trailers not exceeding 3.5 tonnes ATM.
- An incomplete vehicle which is proceeding to a works for completion, storage location, or place to be displayed for sale.
- Tractor units (prime movers).
- Vehicles/trailers with overall width not exceeding 2.1m do not require rear markings.
- Vehicles/trailers with overall length not exceeding 6.0m do not require side markings.

[6] A vehicle which has been manufactured to a stage where, although it may be entered on the *'Register of Approved Vehicles'* or is otherwise registrable, additional work will be necessary to complete the vehicle and put it into service (e.g. a *'Chassis-cab'*). Depending on the vehicle design and the stage it is manufactured to, there may be some national road vehicle standards (or requirements of these standards) that do not apply, but will otherwise become applicable when the vehicle is completed.

# 5. Tape Requirements and Identification

5.1 There are a range of marking tape suppliers and importers offering a wide range of tape options.

| Location on vehicle | Recommended colours | Other allowable colours |
|---|---|---|
| Front (trailers only) | **White** | None |
| Side | **Yellow** | White |
| Rear | **Red** | Yellow |

*Table 2: Permissible colours on each vehicle side*

*Figure 1: Sample colour swatch*

5.2 The recommended colours, listed in table 2 above, align with the typical ADR lights used in the equivalent directions:

- White (head lights) to the front;
- Yellow (side marker lights) lights to the side;
- Red (brake and parking lights) to the rear.

5.3 All tapes must be compliant to UN R104.

- Tape width is 50 $^{+10}_{-0}$ mm.
- Select the colour of the tape appropriate to the location and surface type.
- Select tape, which has been E Marked for quality purposes.

5.4 Retro-reflective material used for Contour Markings and its colour must be appropriate to the location, complying with the requirements of Class C material as specified in the UN R104 regulation.

5.5 All tape must incorporate the E marking (see figure 2), in accordance with Clause 5 of UN R104, easily identifying that it is suitable for this application.

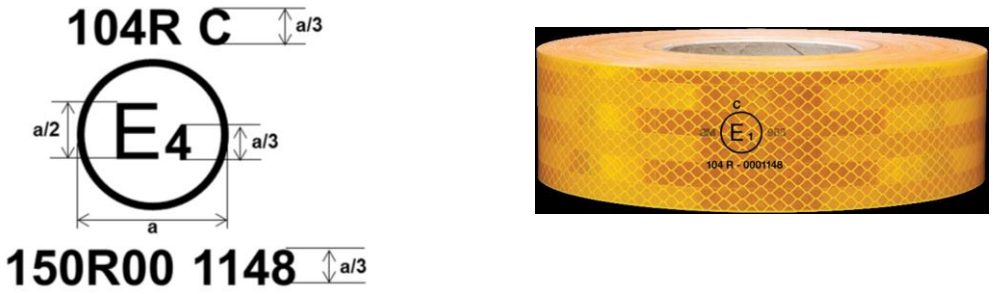



*Figure 2: Example of UN R104 compliant E-mark displayed on tapes*

For UN R104 material a = 12

Note

- Refer to ADR 13/00 *Installation of Lighting and Light Signalling Devices*, ADR 47/00 Retroreflectors and Heavy Vehicle (Vehicle Standards) National Regulation for additional guidance. If inconsistent with the ADR, the National Heavy Vehicle Law (NHVL) for vehicle standards defers to the ADR regardless of whether the vehicle is required to comply with the requirement.
- Exempt vehicles, such as emergency and police vehicles, are not required to comply with this standard.

# 6. Tape Maintenance

6.1 Conspicuity markings require maintenance. Maintenance issues fall into two broad areas – faded and damaged. Enforcement agencies may issue notices and fines if they believe the conspicuity markings no longer comply with ADR requirements or UN R104.

6.2 If the conspicuity markings are damaged, that section no long functions as a contour marking. The section must be excluded from the strip contour coverage calculation.

6.3 The amber and red markings will fade over time and gradually lighten and approach white. White is more reflective than amber or red and as they fade, as a result they will become brighter and more visible. However, they should be replaced before the red markings fade to pink and amber fades to light yellow to keep visibility levels as high as practicable.

6.4 When the manufacturer's instructions are followed, the tape's adhesion to the surface will allow a reasonable amount of power or pressure washing.[7] The following provides the test standard to which the tape must pass as a guide for cleaning.

6.5 When subjected to continuous spraying for 60 seconds on a test component in its normal mounting conditions, and under the following set-up parameters, a test sample shall show no damage to the retro-reflective surface, no delamination from the substrate or separation from the sample mounting surface:

- Water/wash solution pressure 8 ± 0.2 MPa;
- Water/wash solution temperature 60° - 5 °C;
- Water/wash solution flow rate 7 ± 1 l/min;
- The tip of the cleaning wand to be positioned at distance of 600 ± 20 mm away from the retro-reflective surface;
- Cleaning wand to be held at no greater angle than 45 degrees from perpendicular to the retro-reflective surface;
- 40-degree angle nozzle creating wide fan pattern.

6.6 The life of the tape will be reduced if the above parameters are exceeded.

[7] E/ECE/324. Reg No 104, p 26, Annex 8.

# 7. Contour Markings Layouts

7.1 Contour markings on a heavy vehicle outline the shape of the vehicle with retroreflective tape to be more visible for other road users. This allows other road users to better judge distance and closing rate. A full contour of the vehicle makes this visual perception easier.

7.2 Reflective tape is applied as close as possible to the edge of the vehicle to form a continuous outline of the vehicle. This best practice provides maximum visibility to other road users. This method must also be chosen if there are retro-reflective graphics on the side of the vehicle. Three levels of contour markings are acceptable:

7.3 Full contour marking means a contour marking that indicates the outline of the vehicle by a continuous line.

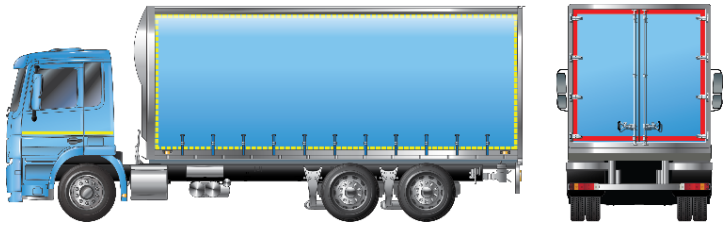


*Figure 3: Full contour marking for a curtain sided van*

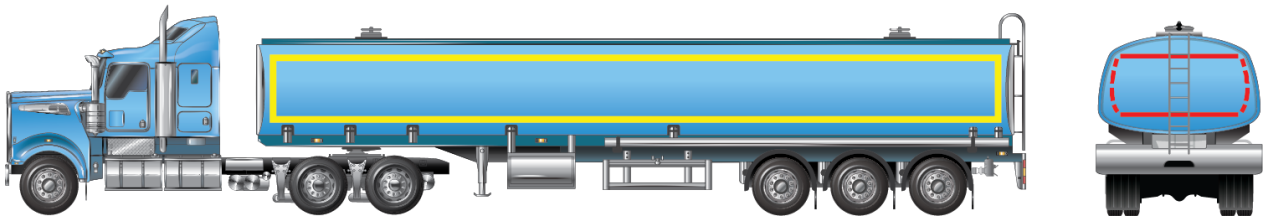


*Figure 4: Full contour marking for tanker trailer*

*Note broken lines on the rear side edges are specifically to account for the curved profile*

7.4 Partial contour marking means a contour marking that indicates the horizontal dimension of the vehicle by a continuous line, and the vertical dimension by marking the upper corners. A single stripe of retro-reflective tape is applied along each side and rear of the body or trailer, with 'L' shape sections 0.5 m long in each corner.

*Figure 5: Partial contour marking*

7.5 Line marking is a conspicuity marking intended to indicate the horizontal dimensions (length and width) of a vehicle by a continuous line. A single stripe of retro-reflective tape is applied along each side of the vehicle and body or trailer side, and a strip across the rear. This basic layout shall only apply to those vehicles that do not utilise retro-reflective graphics or logos or have limited structure onto which tape can be applied on the upper sections of the trailer.

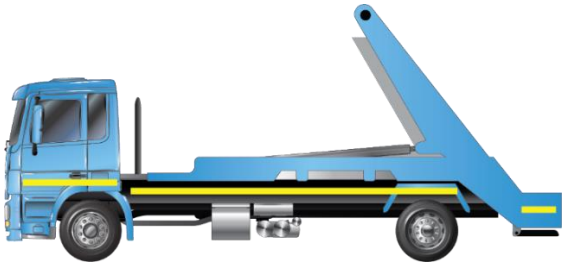


*Figure 6: Line marking*

*Note: Where the shape, structure, design, or operational requirements make it impossible to install the mandatory full or partial contour marking, a line marking is acceptable.*

7.6 ADR13/01 and UN R48 notes full or partial contour markings need not be applied to the front face of a trailer. However, this is taken to mean that a single white horizontal stripe line marking is required. This is thought line marking is visible when the trailer is parked, but not seen by drivers coming the other way when the trailer is towed by a truck.

*Figure 7: Full/partial contour marking is optional, but line/stripe marking is required*

7.7 For curtain sided trailers or curved shapes/surfaces, specific retroreflective tapes must be selected. These tapes are either flexible or segmented so that they can flex as the curtain is retracted. These conspicuity markings should (as a minimum) be applied to the lower section of the curtain, underneath the line of the straps. The placement of stripe should follow one of the three options detailed above.

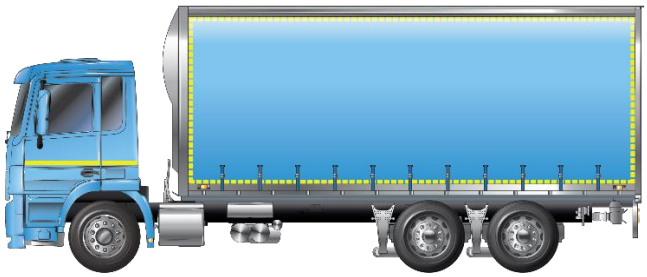


*Figure 8: Example of segmented tape options for curtain sided units*

7.8 Truck and dog draw bars. In some circumstances the drawbar may need to be marked. The tape should cover 70% of the overall length of the combination.

*Figure 9: Truck, dog trailer and draw bar*

# 8. Key Dimensional Requirements for Tape

8.1 The total minimum length of the retro-reflective markings shall be at least 70 per cent of the combined bumper to bumper length of the vehicle (including the prime mover), and 70 per cent of the width of the vehicle.

8.2 Where non-continuous stripes are used, the distance between single elements shall be as small as possible and should not exceed 50 per cent of the length of the shortest element. Such segments shall be evenly distributed.

8.3 The stripes shall be installed as close to parallel to the ground as possible, at a minimum height of 250mm and a maximum height of 1.5m from the ground. Where vehicle designs do not allow conformity with the 1.5m maximum height, a 2.1m maximum height is acceptable.

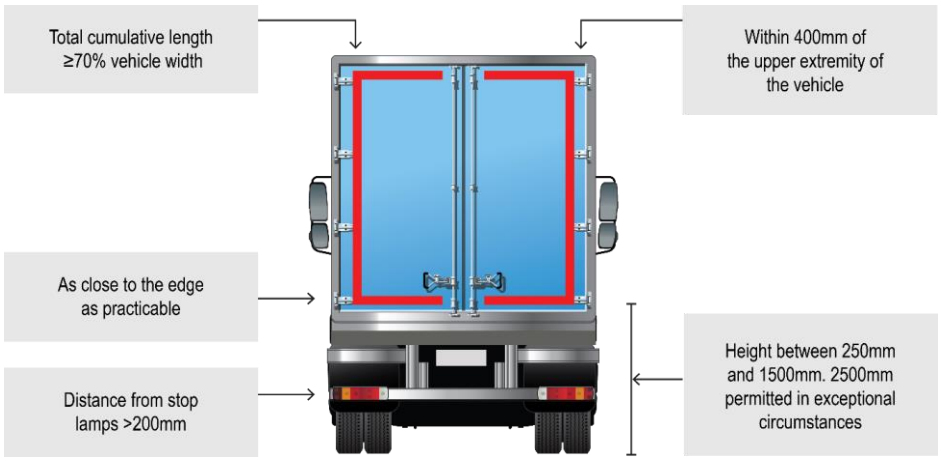
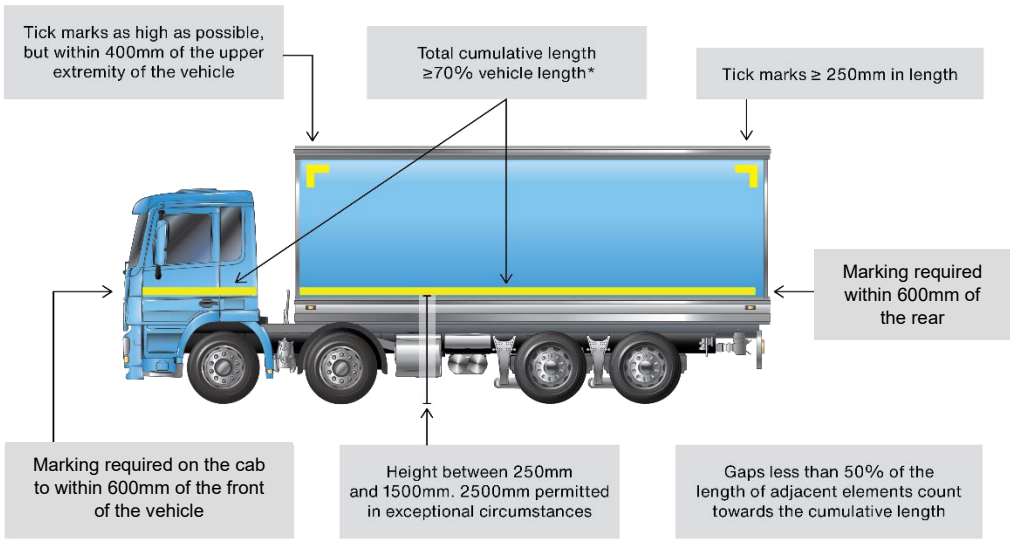



*Figure 10: Rear positional requirements*
*Note VSB11 Rear Marker Plates count towards the cumulative total width.*




**Vehicle length excludes the cab, however the cab area must be marked to comply with the requirement to extend to within 600mm of the front of the vehicle.*

*Figure 11: Side positional requirements*

8.4 Tape orientation is critical to its reflective performance and must be positioned as reasonably practicable as vertical and parallel to the direction of travel.

8.5 It is recommended conspicuity marking tape should be applied to surfaces at no more than 30 degrees to the vertical, if possible, to ensure acceptable levels of reflective light. This maintains around 45 per cent of the light being reflected. Refer to Appendix 3 Table 4.

8.6 Appendix 1 contains a page handout for easy reference.

# 9. Register of Approved Vehicles (RAV)

9.1 The RAV will detail the unit's SFV status. Enter the 17-character VIN (Vehicle Identification Number) into the new RAV via [LINK][8]. If SFV code is noted against the VIN, it is considered a SFV complying with ADRs (refer to section 2 – table 1) a., and b., with d. starting from 1 November 2025.

9.2 RAV output sample. SFV highlight with red bubble.

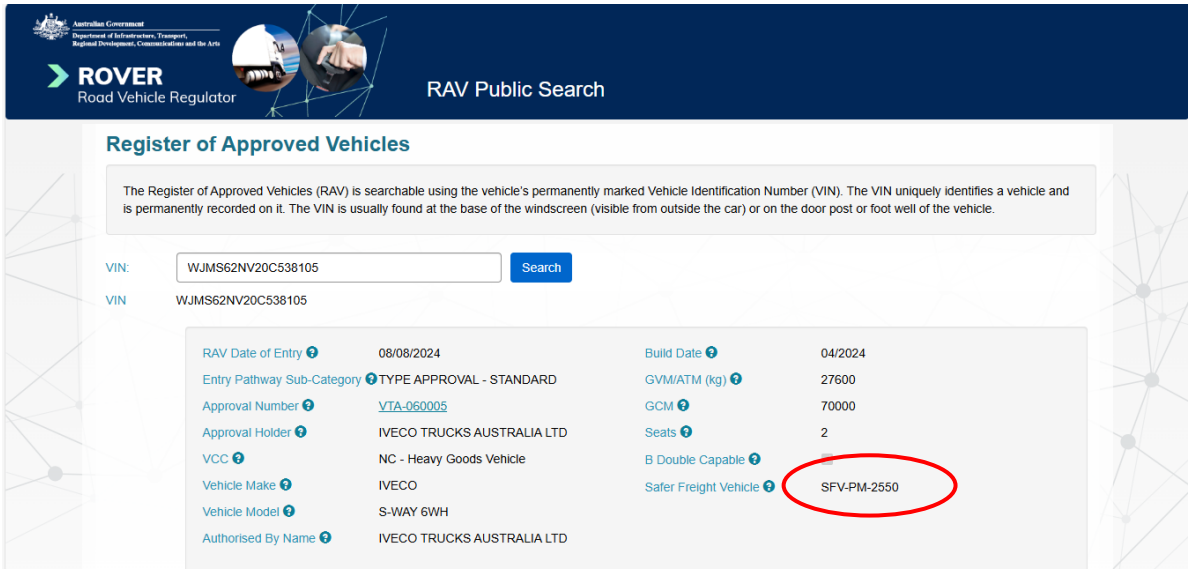



*Figure 12: RAV output web page*

9.3 Understanding the SFV code "SFV-XX-Y1Y1Y1Y1-Y2Y2Y2Y2"
The code 'XX' descriptor is used as follows: -
– PM for a prime mover vehicle.
– CC for a chassis-cab vehicle.
– IO for a partially completed vehicle other than chassis-cab.
– For other vehicle types comprising completed ADR sub-category NB2 and ADR category NC vehicles, the 'XX' descriptor is not used (eg SFV-Y1Y1Y1Y1-Y2Y2Y2Y2 or SFV-Y1Y1Y1Y1).

9.3.1 The code 'Y1Y1Y1Y1' descriptor is the maximum overall width (in mm) of the vehicle at the time of RAV entry. This is the manufacturer's nominal value plus upper (positive) manufacturing tolerance for the design variant and is required for both complete and incomplete vehicles.

9.3.2 The code 'Y2Y2Y2Y2' descriptor is the maximum permissible overall width (in mm) of the vehicle in accordance with the approval for its entry pathway under s15(2) of the Road Vehicle Standards Act 2018, at the time of RAV entry. Where this value does not differ from the 'Y1Y1Y1Y1', it is not entered.

9.4 ADRs (refer to Section 2, table 1 (c)) including Conspicuity Markings will be identified separately. Refer to Section 10 below for details.

[8] If link fails, follow steps via the old RAV lookup https://rav.infrastructure.gov.au/

# 10. Identifying Conspicuity Markings Compliance for SFV

10.1 There are a range of options to identify conspicuity markings ADR compliance for SFV:

a) Second Stage Manufacture (SSM).
Will be visible as an additional line enter on the RAV.

b) An AVE (Approved Vehicle Examiner) can plate the vehicle via VSB6 plate.
At the time of this document's publication, there no specific VSB6 codes for conspicuity markings. A "J1" AVE may include a comment on the modification certificate stating it meets conspicuity markings.

c) Dealer declaration.
An appropriate person within the dealership may 'sign-off' the installation via a declaration. Details must be retained for the life of the vehicle and be available to authorities on request. An appropriate person is one who is technically experienced with a suitable level of approval from the dealership to sign-off installations. This may include but is not limited to Service Managers and authorised Roadworthy signatures.

d) TIC Manufacturers Plate can be fitted acknowledging the OEM has certified the noted item(s).


*Figure 13: Sample of the TIC manufacturers plate*[1]

e) UN R104 type approval. The OEM for a complete vehicle or type approval holder, could provide type approval for the feature, but it is recommended that would still need to be identified by one of the other means noted above.

f) An appropriate person with suitable understanding of the conspicuity marking requirements of either the ADRs or this TAP can provide via a declaration that the unit is UN R104 compliant. This declaration must be retained for the life of the vehicle and be available to authorities on request.

Note
The NHVR and roadside enforcement agents, are not expecting that, for this SFV feature only, to have the unit identified with a conspicuity marking compliance feature. They do expect, if requested, that evidence can be provided within a reasonable time frame that the unit was UN R104 complaint.

[1] Will be located near the vehicle's ADR compliance plate.

# Appendix 1 - Conspicuity Marking Installation Guide / Handout.

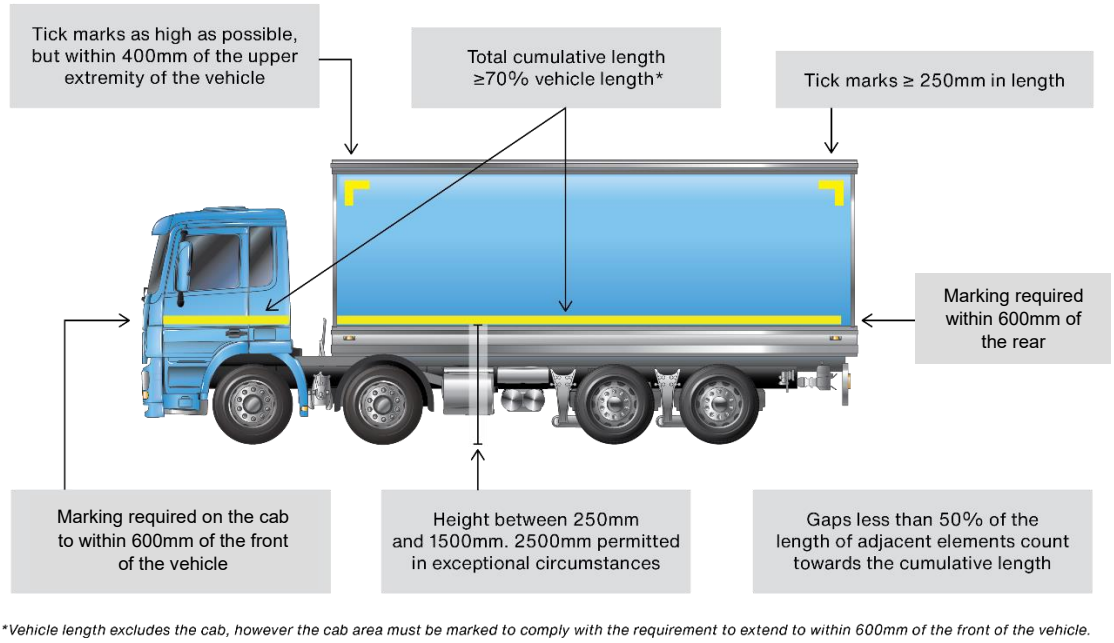



*Figure 14: Side positional requirements*

Note
"*" Vehicle length excludes the cab, however the cab area must be marked to comply with the requirement to extend to within 600mm of the front of the vehicle. Additionally, the total cumulative length may be reduced to ≥70% of vehicle length. See below.

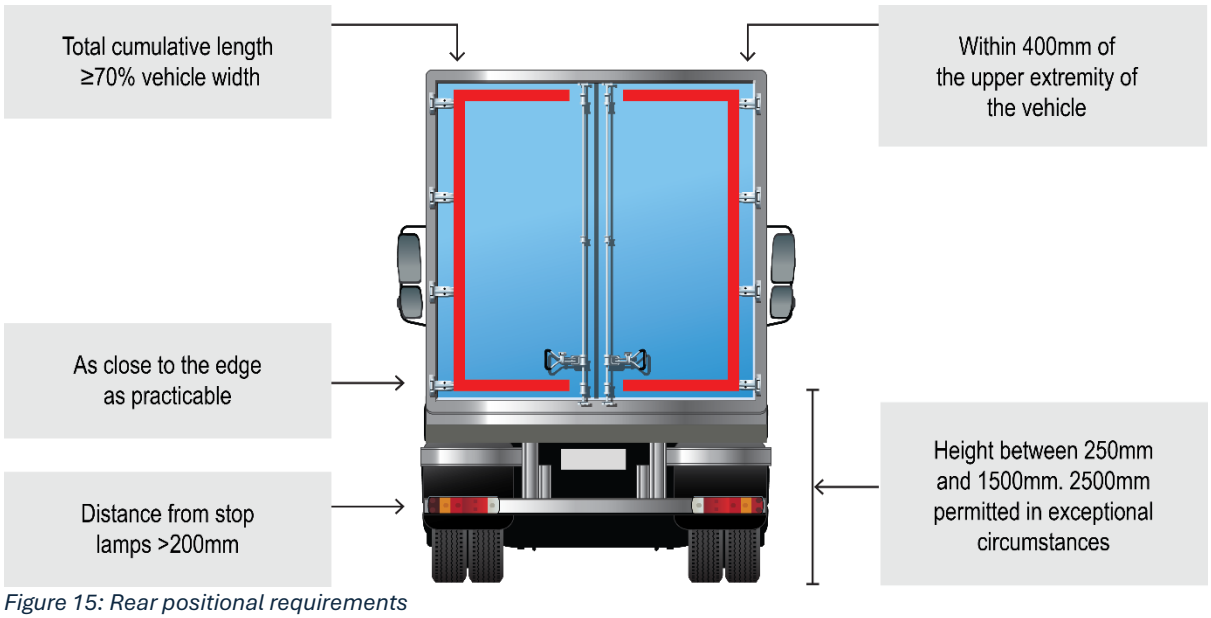



*Figure 15: Rear positional requirements*

Note
Rear marker plate as detailed in VSB11 count towards to the cumulative total width.

## UN Regulation 48

UN Regulation 48 on the approval of vehicles about the installation of lighting and light-signalling devices amend the requirements for conspicuity markings. These amendments are only applicable for new lighting or vehicle type approvals carried out from the entry into force date of 15 July 2013. The main change is that the length of the vehicle cab is considered in calculating the cumulative horizontal length of the conspicuity markings, a minimum 70% cumulative marking requirement for the vehicle length and width and an alternative marking option for the front of vehicles.

***Length***

The side markings are required to extend to within 600mm of each end of the vehicle (including the cab). The cumulative horizontal length of the conspicuity elements must cover at least 70% of the overall length of the vehicle (including the cab), or for trailers the overall length of the trailer (excluding the drawbar).

***Width***

The cumulative horizontal length of the conspicuity elements must cover at least 70% of the overall width of the vehicle.

***Alternative marking option for vehicle length***

The amendment introduced an alternative marking option for vehicle length which allows a series of retro-reflectors to be mounted within 2.4 metres from the front of the motor vehicle followed by the required conspicuity marking to the rear. The requirements of this alternative marking are as follows.

The retro-reflectors must be of Class IVA of UN Regulation No 3 or Class C of UN R104.

The retro-reflector size must be a minimum of 25cm$^{2.}$

One retro-reflector mounted not more than 600mm from the front end of the vehicle.

Additional retro-reflectors spaced not more than 600mm apart.

The distance between the last retro-reflector and the start of the conspicuity marking must not exceed 600mm.

If this alterative marking is applied, the minimum cumulative 70% marking requirement applies to the length of vehicle from 2.4 metres from the front of the vehicle to the rear end of the vehicle.

# Appendix 2 - Application Examples

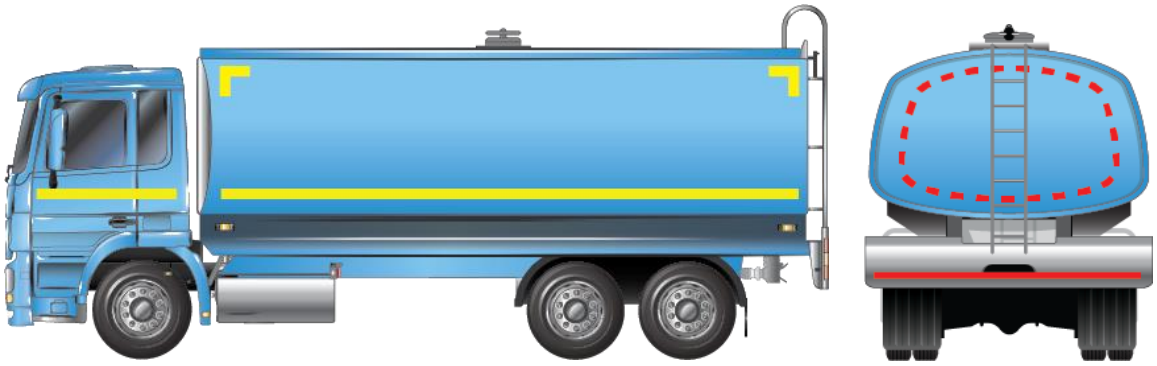


*Figure 16: Tanker with partial contour markings*

*Note for tankers and similar units with round shell type bodies, it is recommended the tape by applied on a vertical surface. This may not be possible within the maximum height requirement of 1,500mm, however it is allowed to move the tape up to a maximum of 2,500mm under exception circumstances such as these.*

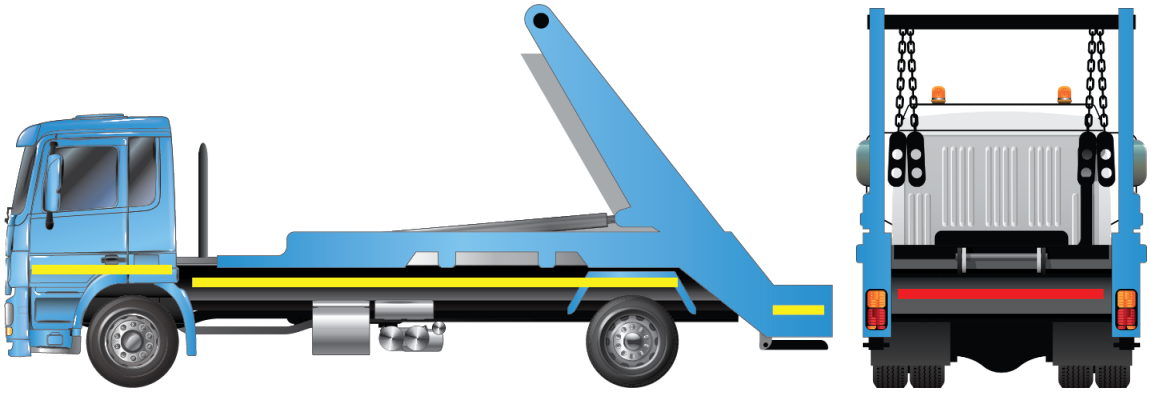


*Figure 17: Skip loader with line markings*

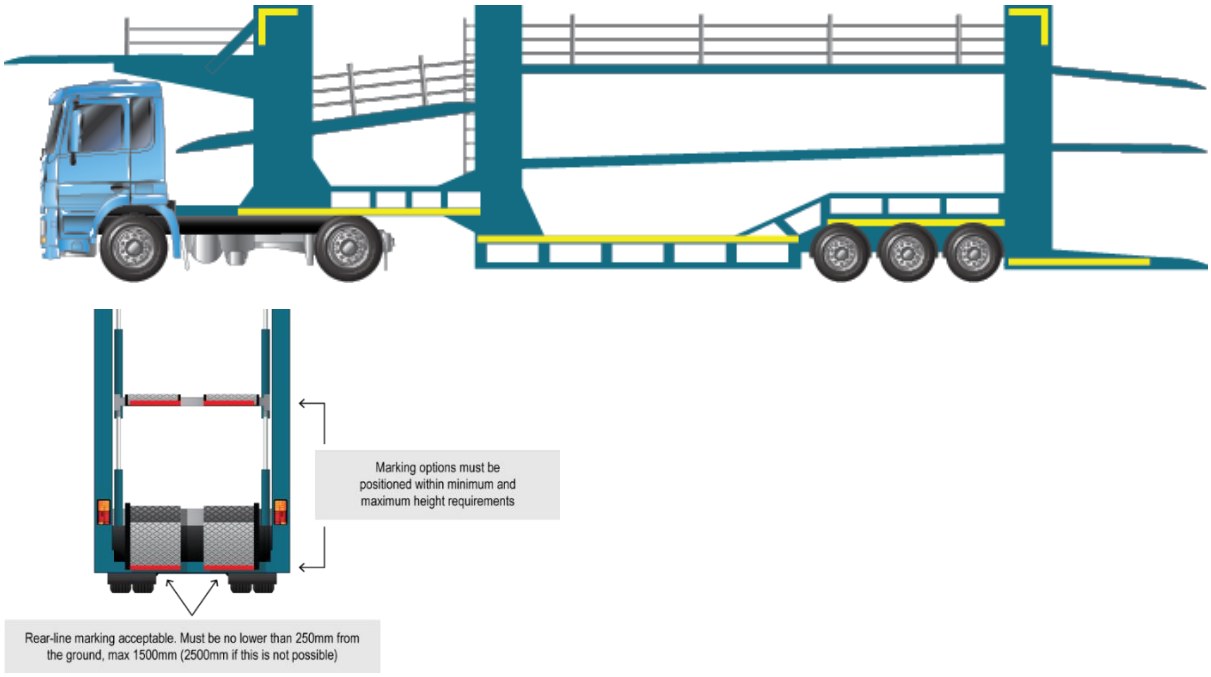



*Figure 18: Car carrier with partial contour markings*

## Application examples – continued

*Figure 19: Semi-trailer with tray and line markings*

*Figure 20: Concrete mixer/agitator with line markings*

*Figure 21: Rubbish truck with partial contour markings*

Many rubbish trucks will not be able to take a full line or contour marking due to the equipment being fitted. In these cases, it is acceptable to retain rear marker plates with conspicuity markings fitted to the fullest extent practicable.

## Application examples – continued

*Figure 22: Rigid with tray and line markings*

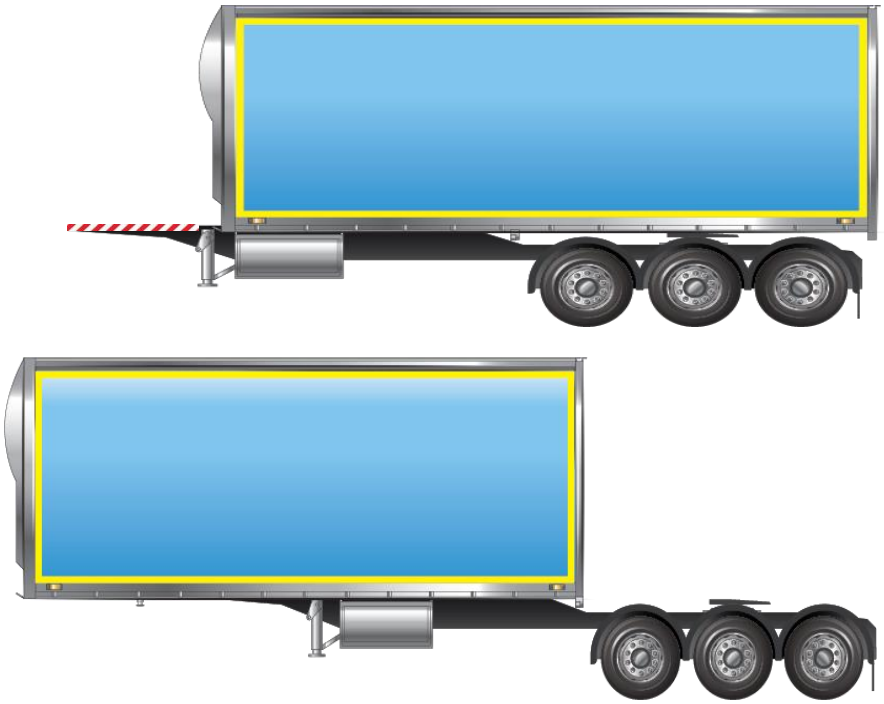


*Figure 23: A-Trailer shown with its body set for loading/unloading and in its transport position*

Note
The red / white chevrons, used in the US as conspicuity markings, are not allowed under the ADR. The above shows the red / white pattern on an A-Trailer to highlight the exposed section of the trailer chassis with the body rolled back for loading/unloading to assist forklift operators and worksite staff see the protrusion. The body of the A-trailer should be locked into its forward position when on-road.

*Figure 24: Bus*

# Appendix 3 - Minimum Values for Retro-Reflection at Various Angles

Minimum values for the Coefficient of Retro-reflection R' [cd.m-2.lx-1]

| | Light incidence to the vertical | ⇨ └ | ⇨ ∠ | ⇨ ∠ | ⇨ ∠ | ⇨ ∠ |
|---|---|---|---|---|---|---|
| | Angle **(degrees)** | 5° | 20° | 30° | 40° | 60° |
| Colour | White | 450 | - | 200 | 90 | 16 |
| | Yellow | 300 | - | 130 | 75 | 10 |
| | Red | 120 | 60 | 30 | 10 | - |

*Table 3: Minimum values for the coefficient of retro-reflection*

*Source UN R104*

| | Light incidence to the vertical | ⇨ └ | ⇨ ∠ | ⇨ ∠ | ⇨ ∠ | ⇨ ∠ |
|---|---|---|---|---|---|---|
| | Angle **(degrees)** | 5° | 20° | 30° | 40° | 60° |
| Colour | White | Base | - | 44% | 20% | 3.6% |
| | Yellow | Base | - | 43% | 25% | 3.3% |
| | Red | Base | 50% | 25% | 8.3% | - |

*Table 4: Comparison of retro-reflection from vertical to inclined*

# Appendix 4 - Understanding Retroreflective Material

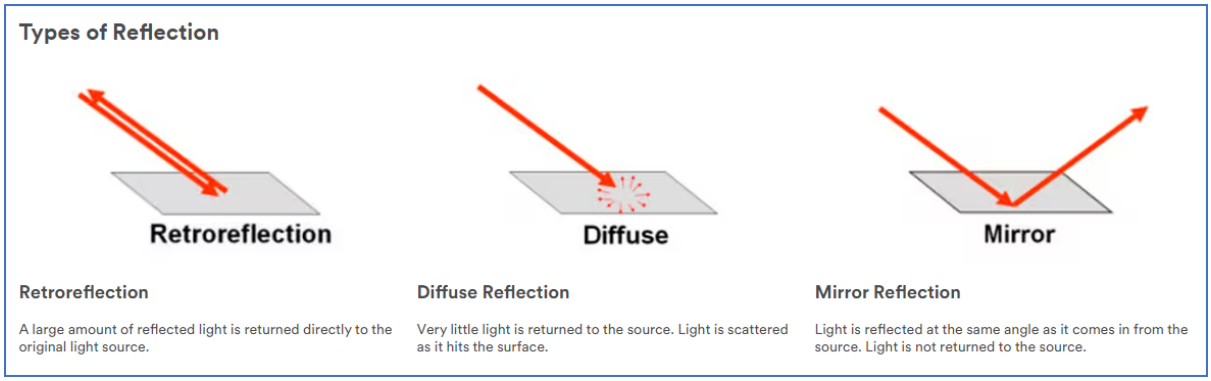



*Figure 25: Retroreflective tape function*

*Source 3M*

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