TECHNICAL ADVISORY PROCEDURE

SIDE UNDERRUN PROTECTION

EDITION 3 / September 2024

ATA Technical Advisory Procedure

Side Underrun Protection

Edition 3

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DISCLAIMER

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About this Technical Advisory Procedure (TAP):

This Technical Advisory Procedure is published by the Australian Trucking Association Ltd (ATA) to assist the road transport industry in improving Vulnerable Road User safety around heavy vehicles.

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, roadworthiness guidelines and any specific information and instructions provided by manufacturers in relation to the vehicle's systems and components.

No endorsement of products or services is made or intended. Brand names, where used in this Technical Advisory Procedure, are for illustrative purposes only.

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 cover page was generously provided by Volvo Trucks Australia.

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Introduction

This Technical Advisory Procedure has been published by the Australian Trucking Association Ltd (ATA) to assist the road transport industry in improving Vulnerable Road User safety around heavy vehicles. The TAP has been drafted to apply to a generalised range of typical Australian transport industry heavy vehicles and provides guidance for 'deemed' compliance in accordance with the requirements set out in ADR106/00 Side Underrun Protection.

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

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, which incorporate devices to reduce blind spots, electronic stability control, advanced emergency braking, and lane departure warning systems. Additionally, the overall width limit for rigid trucks and prime movers that comply with these new SFV safety features can be increased from no more than 2.50 to 2.55 metres, allowing space for the installation of these safety features and potentially productivity benefits. Trailers must continue to have an overall width no more than 2.50m, or 2.55m with load restraint equipment. These changes are expected to save lives, prevent serious injuries to vehicle occupants, cyclists, and pedestrians, and ultimately reduce road trauma while boosting freight productivity. It is estimated that the SFV package will provide the Australian economy a net benefit of over $500 million. Details and further background can be found here.

The new regulations also 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, external parts of 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.

About this Technical Advisory Procedure (TAP)

This TAP has been updated to support the fitment of SUP devices which form one of seven new or updated ADR requirements of the SFV package. The detail requirements for SUPs are contained within ADR106/00 which in turn is based on UN R73 Lateral Protection Devices (LPD).

The TAP's clause references this version of Australian Design Rule 106/00 – Side Underrun Protection) 2023 dated 28th September 2023[1].

[1] The latest version of ADR106 refer to https://www.legislation.gov.au/F2023L01317/latest/text

The purpose of the SUP is to help protect Vulnerable Road Users (VRUs) such as pedestrians and cyclists from being caught under the wheels of a heavy vehicle. The Lateral Protection Device (LPD) is intended to deflect pedestrians and cyclists, but not other vehicles on the road. As such, the strength requirements are appropriate, but the system should minimise the likelihood that VRUs are caught and dragged under the wheels.

Although these requirements are being mandated for SFVs, SUPs are beneficial for vehicles operating in built up areas and around construction projects where there is significant number of pedestrians and/or cyclists.

Due to their nature, SUPs are usually not fitted by truck manufacturer before delivery to the selling dealer. Vehicles can be exempt from meeting certain ADRs before first registration.

In some cases, vehicles which are a ***partially completed vehicle*** may not need to comply with an ADR (or a particular requirement within an ADR) while its stage of manufacture remains incomplete. Although such a ***partially completed vehicle*** may be presented for registration (for example a ***chassis-cab*** vehicle without side underrun protection and without conspicuity markings), it would not be able to perform useful work in service until it is a completed vehicle with body fitted, at which point it must comply to the relevant ADRs for these safety features.

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 under this TAP.
- 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.

Note

"*"	The source for the definitions is the ADR Definitions and Vehicle Categories.
ADR	Australian Design Rules 3rd Edition
Chassis-cab *	a '*Partially Completed Vehicle*' with a completed occupant compartment, that requires only the addition of cargo-carrying or load-bearing components to perform its intended work-performing functions.
UN	United Nations (UN). The ADRs rely on the UN Regulations as a set of accepted international vehicle standards. Refer to www.UNECE.org
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*'.
LPD	Lateral Protection Device (LPD) - consist of longitudinal member(s) and link(s) (fixing elements) to the chassis side members or other structural parts of the vehicle, designed to offer effective protection to unprotected road users against the risk of falling under the sides of the vehicle and being caught under the wheels. Parts of the vehicle can also be used as LPD.
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 *	ADR sub-category for goods vehicles with GVM greater than 4.5 tonnes, up to 12.0 tonnes GVM. Refer to Appendix C for further details.
NC *	ADR category for goods vehicles with GVM greater than 12.0 tonnes. Refer to Aappendix C for further details.

OEM — Original Equipment Manufacturer (OEM).

OAW * — Overall Width - subject to the additional requirements below, the maximum distance measured across the vehicle body including wheel guards, but excluding:

(a) rear vision mirrors (also referred to in the ADRs as rear-view mirrors);
(b) *'Prescribed Devices for Indirect Vision'*;
(c) any other devices to enable the driver to see objects in an area adjacent to the vehicle, including *'Cross-View Mirrors'*;
(d) monitoring devices fitted as part of an *'Automated Driving System* and/or a *'Close-Proximity Information System'*;
(e) signalling devices and side-mounted lamps and reflectors;
(f) permanently fixed webbing-assembly-type devices such as curtain-side devices, provided the maximum distance across the body of the vehicle, including any part of the devices, is not more than 2.55m;
(g) central tyre inflation systems;
(h) tyre pressure gauges;
(i) anti-skid devices mounted on wheels; and
(j) the deflected part of the tyre sidewalls, including any elevations due to labelling/marking, decoration and protective bands or ribs, between the lowest point of each tyre rim and the ground (i.e. load induced tyre bulge).

The total lateral protrusion beyond the *'Overall Width'* of the devices excluded under parts (c), (d), (f), (h) and (i) above (or the excluded parts thereof), must not exceed 100mm. The total lateral protrusion is the sum of the maximum lateral protrusion on the left side of the vehicle and the maximum lateral protrusion on the right side of the vehicle. The maximum lateral protrusion on a given side of the vehicle (i.e. left or right side), is the maximum lateral protrusion of any of the excluded devices beyond the extreme outer point from which the *'Overall Width'* is measured on that side of the vehicle.

The protrusion of central tyre inflation systems (or the excluded parts thereof) beyond the *'Overall Width'*, must not exceed 100mm on each side of the vehicle.

The protrusion of rear vision mirrors, *'Prescribed Devices for Indirect Vision',* signalling devices, and side-mounted lamps and reflectors, must be in conformity with the applicable Australian Design Rules for these devices.

Partially Completed Vehicle*

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 particular requirement of these standards) that do not apply, but will otherwise become applicable when the vehicle is completed.

Off-road use	Refer to ADR97/00 Appendix B **Clause 2. Omnibuses with a *'Gross Vehicle Mass* exceeding 12.0 tonnes and heavy goods vehicles** 2.1. Category ME vehicles with a *'Gross Vehicle Mass'* exceeding 12.0 tonnes and category NC vehicles are considered to be 'designed for off-road use' if all of the following criteria are satisfied: (a) All wheels are driven, except where applicable, when the drive to one *'Axle'* is disengaged; and (b) There is at least one differential locking mechanism or at least one mechanism having a similar effect; and (c) They can climb a 25 per cent gradient calculated for a solo vehicle; and (d) At least four of the following six criteria are satisfied: (i) The *'Approach Angle'* is at least 25°; (ii) The *'Departure Angle'* is at least 25°; (iii) The *'Breakover Angle'* is at least 25°; (iv) The *'Ground Clearance'* under the front axle is at least 250mm; (v) The *'Ground Clearance'* between the axles is at least 300mm; (vi) The *'Ground Clearance'* under the rear axle is at least 250mm.
R73	UN Regulation R73 "Uniform provisions concerning the approval of: (I) Vehicles with regard to their lateral protection devices (LPD) (II) Lateral protection devices (LPD) (III) Vehicles with regard to the installation of LPD of an approved type according to part II of this regulation".
RAV	Register of Approved Vehicles. Refer to Section 11 for further details.
TC/TD *	ADR categories for trailers with a Gross Trailer Mass greater than 3.5 tonnes. Refer to Appendix C for further details.
VRU	Vulnerable Road User (VRU) – within this TAP are define as being either a pedestrian or cyclist.

For further definitions and terms refer to ATA's ITC Dictionary [LINK]

2. Safer Freight Vehicles (SFV) ADR package

2.1 A Safer Freight Vehicle is a sub-category NB2 or category NC vehicle that meets all the ADR requirements necessary for the vehicle to exceed an *Overall Width* of 2.50m. The additional mandatory requirements in the SFV package are the ADRs shown in the Table 1 below. Although some of these ADRs may be optional or mandatory for vehicles with an *Overall Width* no greater than 2.50m, they are all mandatory as indicated in the table to allow the vehicle *Overall Width* to exceed 2.50m (up to the limit of 2.55m prescribed by ADR 43/04).

Safer Freight Vehicles	ADRs
a) SFV must comply with these ADRs (or a later version).	• ADR 14/03 – Devices for Indirect Vision • ADR 35/07 – Commercial Vehicles Brake Systems.
b) SFV except vehicles with 4 or more axles and vehicles designed **off-road use** as defined by the ADR.	• ADR 97/00 – Advanced Emergency Braking for Omnibuses, and Medium and Heavy Goods Vehicles, or a later version; • 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 • Be fitted with conspicuity marking to the rear, in accordance with ADR 13/00 – Installation of Lighting and Light Signalling Devices on other than L-Group Vehicles, or a later version, and • If more than 6.0m 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 As noted in the Introduction and in Table 1, compliance to ADR106/00 and to the conspicuity marking requirements of ADR 13/00 is not required for partially completed vehicles or for prime movers. However, where a vehicle is not a partially completed vehicle or a prime mover at the time of RAV entry, and the RAV identifies the vehicle as a SFV, this indicates that the vehicle is compliant to ADR 106/00 and the conspicuity marking requirements of ADR 13/00. See also Section 11.

3. CLOCS-A and Side Underrun Protection

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"[2].

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 heavy vehicles in populated areas can present hazards for the community, particularly VRUs, 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[3].

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.

Side Underrun Protection forms part of the Silver Level [LINK], the second tier of CLOCS-A for all heavy vehicles, both trucks and trailers. A higher standard of equipment than bronze and is preferred for heavy vehicles complying with CLOCS-A technical requirements. The Silver level is similar to UK CLOCS and broadly aligned to current NSW and Victorian government major project requirements.

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

[3] 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. Side Underrun Protection Compliance Standards

4.1 Safer Freight Vehicles via ADR 106/00 SUP, mandates LPD to be fitted to:

- NB2 and NC category vehicles with an *Overall Width* greater than 2.50 up to 2.55m, except for 'Partially Completed Vehicles' and 'Prime Movers'.
- ADR106/00 does not exempt off road vehicles.

4.2 The ATA recommends side underrun protection devices should be fitted to:

- All trucks, both rigids and prime movers with a GVM greater than 4.5 tonnes.
- All trailers with GTM greater than 4.5 tonnes.
- Any other heavy vehicles used in or around VRUs.
- The LPD be full face to minimise VRU catch points and for improved aerodynamics.

4.3 UN R73 Lateral Protection Devices requires Side Underrun Protection to be fitted to:

- Trucks with a GVM exceeding 3.5 tonnes.
- Trailers with an GTM exceeding 3.5 tonnes.

UN R73 Exemptions:

- Tractors (prime movers) for semi- trailers
- A motor vehicle which is not a goods vehicle.
- Goods vehicles not exceeding 3.5 tonnes GVM.
- Trailers not exceeding 3.5 tonnes GTM.

5. Compliant Side Underrun Protection Overview

This TAP relies on ADR106/00 for direction which in turn relies on UN R73 as adapted and modified by ADR106/00. The area of intended protection is primarily the side of a vehicle where intrusion by a pedestrian or a cyclist could result in injury. The aim of the LPD is to limit the potential for VRUs to be run over by the rear wheels of either a truck or a trailer.

Warning

- Any gap between a truck and dog trailer is without a SUP system and will remain a risk to VRUs.
- The gap between a truck or dolly, and semi-trailer is equally problematic as it is necessary to allow for clearance between the two vehicles when manoeuvring.

Note
The ADR sets a series of exclusions from the vehicle width for determining the outermost planes and the vehicle's OAW. Refer to Section 1 Definitions for details.

5.1 The LPD has a maximum inboard dimension of 150mm from the outermost plane, except that immediately forward of the tyres. Any supplementary installed SUP must not be more than 30mm inboard of the outer edge of the tyres.

5.2 Wheel enclosing mudguards over rear tyres may form part of the SUP immediately ahead of the tyres where dimensional requirements are met.

5.3 The upper edge of the LPD shall be either; no more than 350mm below the vehicle structure immediately above and overhanging the outside surface of the tyres (up to 950mm above ground level), or where the load carrying platform does not overhang the outside surface of the tyres, then level with the top of that platform where it is lower than 950mm above ground level, otherwise no less than 950mm above ground level.

5.4 The longitudinal section to be protected is typically rearward of the front steer axle including fuel tank(s) and battery box, to in front of the drive axle group; and,

5.5 For trucks and trailer with low chassis heights, the coaming and rope rail assembly in its normal position may form part of SUP system, subject to meeting the dimensional requirements of the ADR for horizontal rails. However, additional SUP protection at a lower level will usually be needed.

5.6 If “rails” are used for the SUP, the lower rail should be no more than 300mm below the bottom of the rope rail and not more than 550mm above the ground.

5.7 Equipment such as fuel, oil or diesel exhaust fluid tanks provided within the dimensional scope of SUP may be accepted as forming part of the SUP.

5.8 Equipment such as toolboxes, air tanks or battery boxes provided they are within the dimensional scope of SUP may be accepted as forming part of the SUP.

5.9 Protruding steps should have a vertical depth of at least 42mm.

5.10 The outer surface of the LPD shall be smooth, and so far as possible continuous from front to rear. Adjacent parts may however overlap provided that the overlapping edge faces rearwards or downwards, or a gap of not more than 25 mm measured longitudinally may be left, provided that the rearward part does not protrude outboard of the forward part. Domed heads of bolts or rivets may protrude beyond the surface to a distance not exceeding 10 mm and other parts may protrude to the same extent provided that they are smooth and similarly rounded. All external edges and corners that may be contacted by a sphere of 100 mm diameter shall be rounded with a radius not less than 2.5 mm. Those protruding less than 5 mm shall have blunted outward facing edges.

5.11 LPD may consist of a continuous flat surface, or of one or more horizontal rails, or a combination of surface and rails; when rails are used they shall be not more than 300 mm apart and not less than:

(a) 50mm high in the case of vehicles of categories NB2 and TC;

(b) 100mm high and essentially flat in the case of vehicles of categories NC and TD.

Combinations of surfaces and rails shall form a practically continuous LPD subject, however, to the provisions of paragraph 5.10 above.

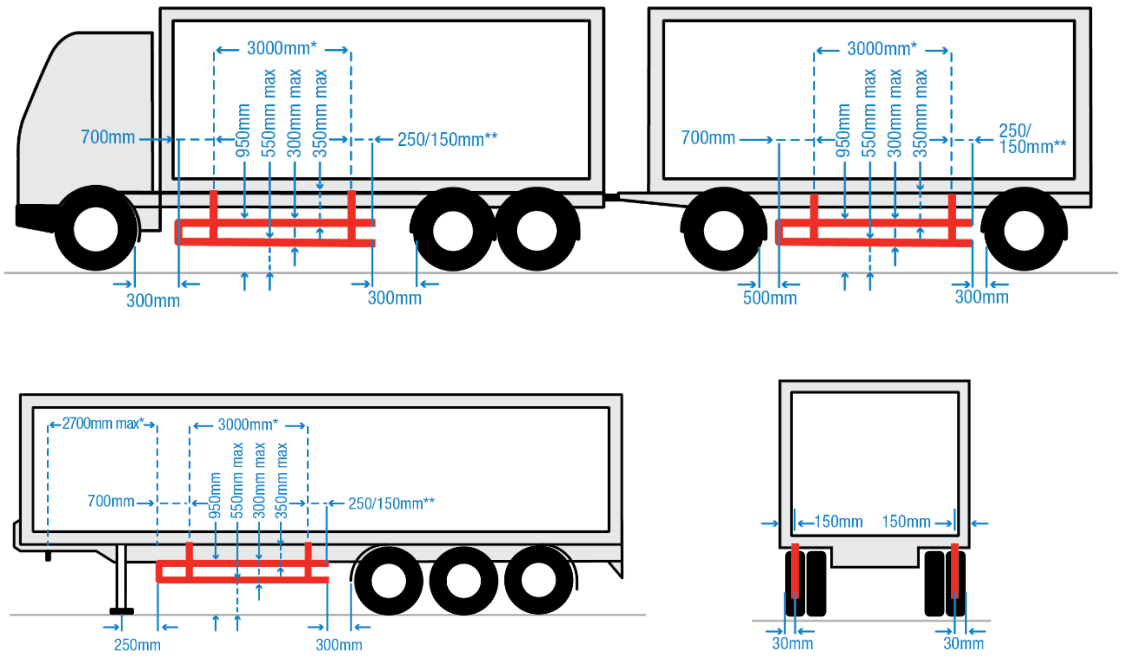

Figure 1: Dimensional requirements

Note

- Dimensions detailed in figure 1 should be assumed to the maximum unless otherwise noted.

"*" A minimum of three legs will be required if the overall length of the LPD is greater than 3,950mm.

"**" Where the overall length of the LPD exceeds 735mm, the rear most overhang must be reduced from 250mm to 150mm.

6. ADR106/00 Relaxation for Steps

Where access steps are used as a horizontal rail in the LPD, they must meet all the applicable requirements, except where relaxations are permitted. Refer to clauses 6.9 to 6.13 of **Australian Design Rule 106/00 – Side Underrun Protection) 2023**, or later versions, for the relaxations.

Selected clauses from ADR106/00 : -

6.10.1. To be counted as a horizontal rail in an LPD, access steps which have an outer face less than 50mm in height for a sub-category NB2 vehicle or less than100 mm in height for a category NC vehicle, must be designed and positioned, including in combination with at least one handhold point (e.g. using a dedicated handrail, a suitable side section of a truck headboard etc.), to allow an operator to climb and descend the vehicle, while keeping at least three of four limbs in contact with the vehicle at all times.

6.11. Where access steps to the vehicle cab and/or a 'Sleeper Berth' are used as horizontal rails in a required (i.e. mandatory) LPD, the outermost edge of the highest step in the LPD may be up to 50mm inboard of:

(a) the outermost edge of the lowest step in the LPD; and

(b) the outermost edge of the tyre(s) on the wheel immediately to the rear of the LPD, excluding any bulging of the tyre(s) close to the ground.

For full details, refer to ADR106/00.

7. Technical Specifications for Lateral Protection Devices

Refer to **Australian Design Rule 106/00 – Side Underrun Protection) 2023** Appendix A Section 12 requirements as amended by clauses 6.3 and 6.4.

Note

- Checker plate used for the covers of battery or toolboxes shall be deemed to be "smooth" in this context only.
- Combinations of surfaces and rails shall form a practically continuous LPD, to the provisions of ADR106/00 Appendix A clause 12.3.

Clauses from ADR106/00 Appendix A

"12.8" *The lower edge of LPD shall at no point be more than 550mm above the ground.*
Interpretation: The 550mm is the maximum gap to the ground from the lower side of the lower "conforming" SUP rail.

"12.9" *The upper edge of LPD shall not be more than 350mm below that part of the structure of the vehicle, cut or contacted by a vertical plane tangential to the outer surface of the tyres, excluding any bulging close to the ground, except in the following cases:*
Interpretation: 350mm is the maximum gap from coaming rail or body structure to the top side of the upper "conforming" SUP rail.

"12.9.1" *Where the plane in paragraph 12.9 does not cut the structure of the vehicle, then the upper edge shall be level with the surface of the load-carrying platform, or 950mm* from the ground, whichever is the less;
Interpretation: For special application trailers (eg: drop and double drop deck) where the frame or combing rail is below 950mm, the intent is to provide within the structure limitations Side Underrun Protection to an extent as far as is practical, within the structure limitation of the vehicle.

"12.9.3" *On a vehicle specially designed and constructed, and not merely adapted, for the carriage of a container or demountable body, the upper edge of the device may be determined in accordance with paragraphs 6.12(a) and 6.12(b), the container or body* being considered as part of the vehicle;
Interpretation: Skeletal (container) Trailers: SUP design should consider the fitment of a continuous side rail in accordance with the recommendations of this Technical Advisory Procedure.

8. Differences Between ADR106/00 and UN R73

The ADR's are generally prescriptive. They define a test to which compliance is measured as a pass or fail. The UN Regulations are frequently included in the ADR as either an alternative compliance standard via an E-mark approval or used as the technical compliance standard within the ADR with amendments. The UN Regulations can allow for some interpretations of the regulation. The UN Type Approval Authority assesses the item holistically against the regulation to ensure there must be an overall improvement in the safety outcomes. This is the case with UN R73 with the following clause from Appendix A : -

> *13.3 Vehicles where any LPD (e.g. fixed, removable, foldable, adjustable, etc.) is incompatible with their on-road use may be partly or fully exempted from this Regulation, subject to the decision of the Type Approval Authority."*

ADR106/00 includes UN R73 (as Appendix A of ADR106/00) for the ADR's technical requirements with a series of amendments. Appendix A (UN R73) when use as the ADR's technical standard is amended via the following clause: -

> *6.8. The derogations in paragraphs 13 and 16 of Appendix A shall not apply – instead refer to clauses 6.9 to 6.13 below.*

ADR106/00 provides prescriptive requirements that must be complied with, whereas UN R73 is less stringent in allowing a balance between achieving the safety outcome that is the function of the regulation, and not detracting from the scope of operational function needed from the vehicle (subject to the decision of the relevant UN Type Approval Authority).

It is not the intention of the ADR to restrict the functional design of a vehicle; where necessary for the safe and practical operation of a vehicle, the Department[1] may approve a vehicle to be fitted with a non-compliant SUP, in particular where compliant SUP would be incompatible with the operational purpose of the vehicle. The extent of the non-compliance, and therefore the nature of the approval issued, will be a decision for the Department after undertaking assessment of the application.

[1] The Department of Infrastructure, Transport, Regional Development, Communications and the Arts.

9. Designing or Fitting Your Own SUP

9.1 Appendix A of this TAP, provides details for four LPD rail types with their supported and unsupported spans that complies with the strength requirements of ADR106/00.

9.2 SUP kits can be purchased from third parties. These SUP kits are available to support both the aftermarket and OEM areas. The SUP supplier needs to provide a set of detailed fitment instructions and compliance/certification support material. Typically, the fitment would require sign-off via an AVE and VSB6 plated accordingly, to ensure the installation complies to the fitment instructions and ADR106/00.

9.3 Either approach needs to signed off and identified as noted in Section 12.

10. Conformance and Maintenance

10.1 Conformance: This TAP provides for the application of Side Underrun Protection to a generalised range of typical Australian transport industry trucks and trailers and guidance for ADR106/00 compliance. The fitment of Side Underrun Protection is typically voluntary, except for SFV certified units.

10.2 Maintenance: For vehicles to be able to demonstrate continued conformance to ADR106/00 and this TAP, the vehicle SUP installation needs to be maintained in accordance with the ADR and/or the SUP Installer's design.

10.3 The NHVR's National Heavy Vehicle Inspection Manual (NHVIM)[4] at the time of writing, does not detail requirements for Side Underrun Protection. However, Section 6 Body and Structure provides general guidance regarding roadworthiness and ongoing ADR106/00 compliance.

[4] Refer to https://www.nhvr.gov.au/safety-accreditation-compliance/vehicle-standards-and-modifications/national-heavy-vehicle-inspection-manual

11. Register of Approved Vehicles (RAV)

11.1 The RAV will detail the unit's SFV status. Enter the 17-character VIN (Vehicle Identification Number) into the new RAV via [LINK][5]. If SFV code is noted against the VIN, it is considered a SFV complying with ADRs (refer to Section 2, Table 1).

11.2 RAV output sample. SFV highlight with red bubble.

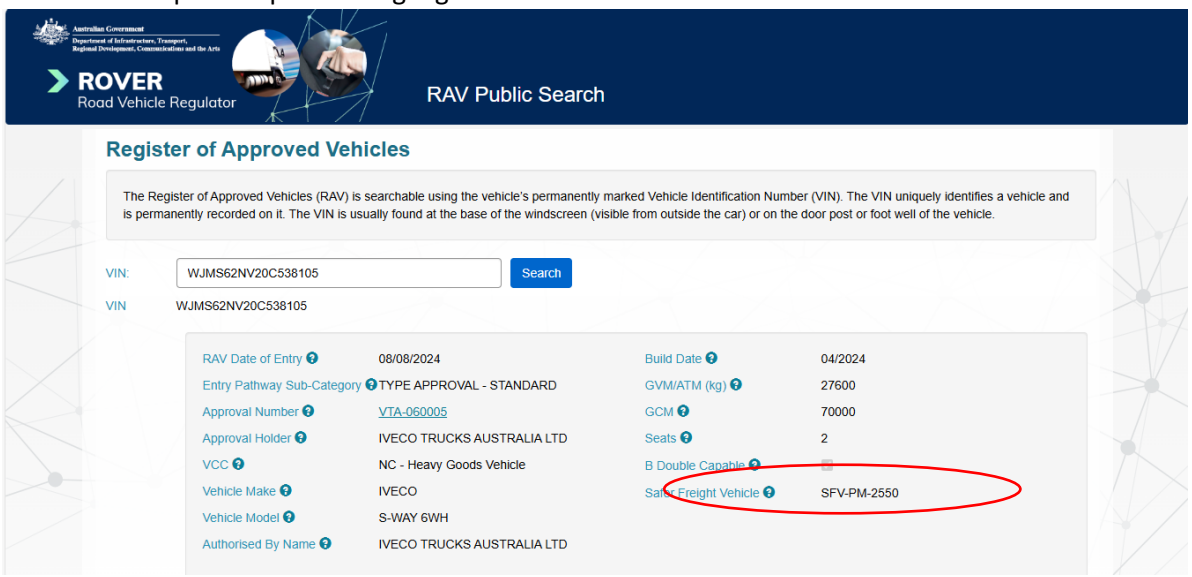

Figure 2: RAV output web page

11.3 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).

11.4 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.

11.5 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.

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

12. Identifying SUP Compliance for SFV

12.1 There are a range of options to identify ADR106 SUP compliance for SFV:

a) Second Stage Manufacture (SSM).
Will be visible as an additional line enter on the RAV against the unit's VIN.

b) An AVE (Approved Vehicle Examiner) can plate the vehicle via VSB6 plate.

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

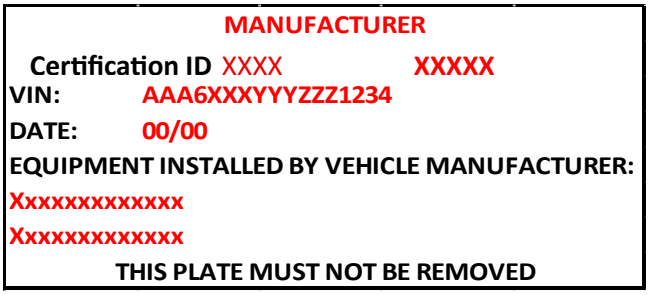


Figure 3: Sample of TIC manufacturers plate

Appendix A - Material Selection

Materials used in SUPs must be able to withstand the relatively low design load of 1kN (102 kgf) applied over a 220mm diameter contact area. The options considered below have been conservatively validated : -

I. Steel Purlins
   Selected sections - C10015 & C15012.
II. Aluminium Channel
   Selected sections - UA2464 (100x50) & UA5058 (125x50) and are nominally 2.6 to 3.9 kg/metre.

LPD Sections	Maximum Span – Supported (mm)	Maximum Overhang (mm)
Steel - C10015	2,400	600
Steel - C15012	3,000	700
Aluminium - UA2464	1,900	400
Aluminium - UA5058	2,150	450

Table 2: Maximum recommended section spans

Your manufacturer/supplier or SUP installer will be able to calculate alternatives for material options and installation.

Additionally, the support and mounting brackets must also comply with the required loads as prescribed in ADR106/00.

Appendix B - Impact of Different Tyre Sizes

Vehicle modification, such as a change in tyres, undertaken after ADR compliance may require modification of the SUP to ensure its continued compliance. The following table provides typical tyres and the difference in their height to adjust the SUP heights which should be cover by VSB6.

	265/70R19.5	275/70R22.5	295/80R22.5	11R22.5	445/50R22.5	385/65R22.5	315/70R22.5
Free Radius (Half Unloaded Diameter)	434	479	522	525	504	536	507
Laden Radius (Static Loaded Radius)	401	445	487	489	464	496	468
Tyre Height (Static Loaded Diameter)	835	924	1009	1014	968	1032	975
Overall Diameter (Free)	867	958	1044	1050		1072	1014

Table 3: Selected tyre height details.

Source ETRTO.

Appendix C - Comparison of ADR and UN Vehicle Categories

Vehicle Category	ADR Category Code	UN Category Code
Medium Goods Vehicle Over 3.5tonnes up to 12.0tonnes GVM Over 4.5tonnes up to 12.0tonnes GVM	NB NB2	N2
Heavy Goods Vehicle A goods vehicle with a '*Gross Vehicle Mass*' exceeding 12.0tonnes.	NC	N3
Medium Trailer A trailer with a '*Gross Trailer Mass*' exceeding 3.5tonnes but not exceeding 10.0tonnes	TC	O3
Heavy Trailer A trailer with a '*Gross Trailer Mas*' exceeding 10.0tonnes	TD	O4

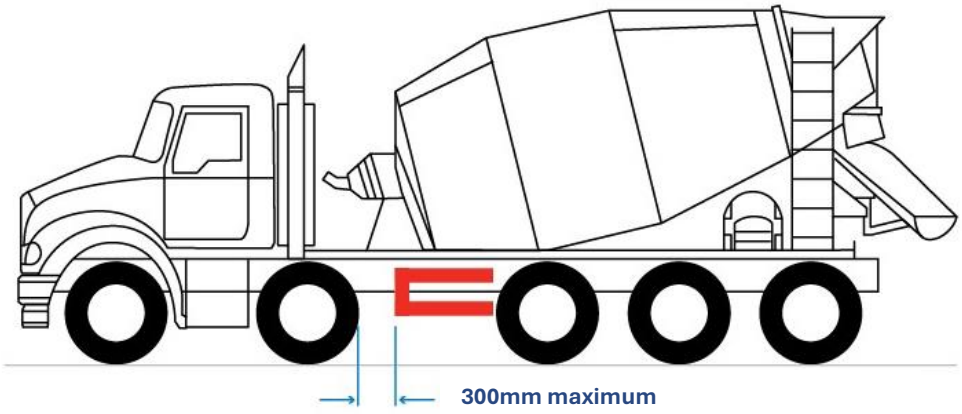
Table 4: Vehicle certification categories

For further details, refer to ADR Definitions and Vehicle Categories.

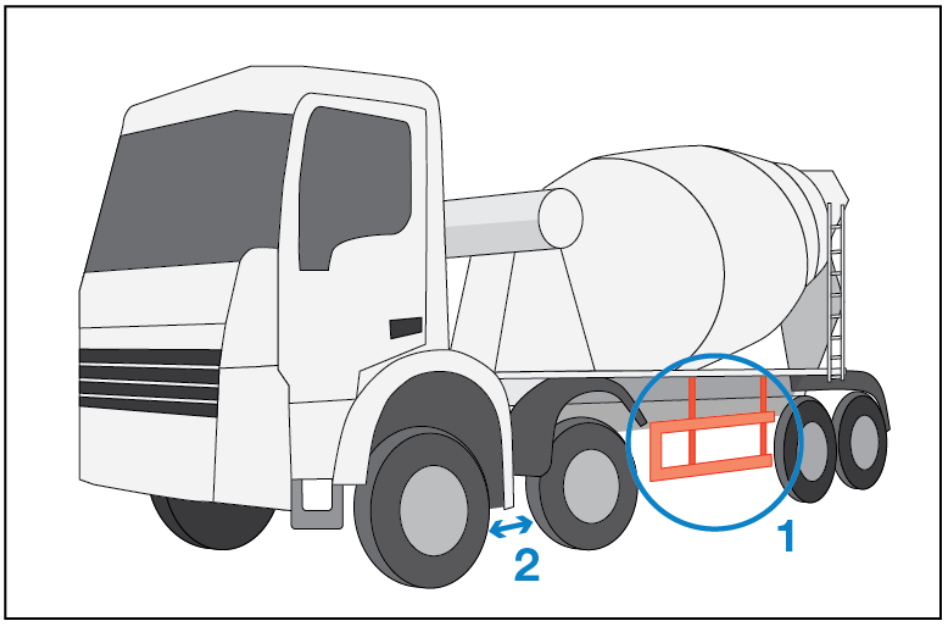
Appendix D - Graphical SUP Installations

These interpretations and advisories have been included as guidance in response to queries raised by users of this Technical Advisory Procedure. They are intended to assist users referencing this document to achieve consistent outcomes.

Example 1



Example 2



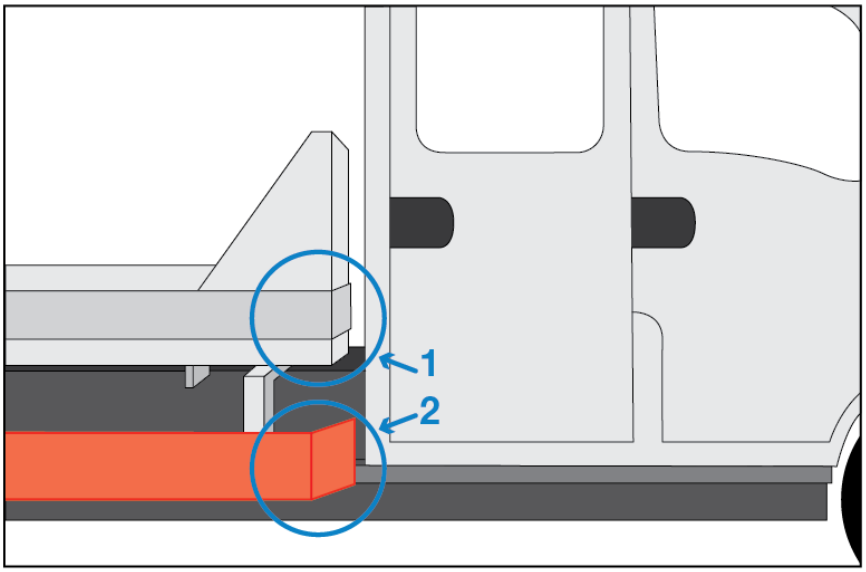
The image above shows that:

(1) LPD is required here and may comprise of rails and/or solid panels

(2) No LPD where the distance between centre of consecutive axles is less than 2.1m

This example meets the required standard, if the centre distance of the two steer axles is less than 2.1m.

Example 3

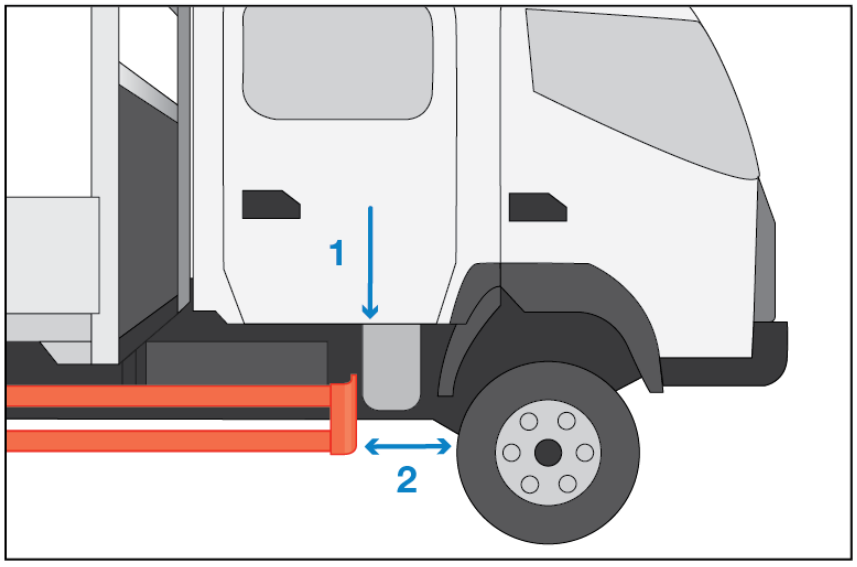


At the manufacturer's option, for NB2 and NC ADR categories, the leading edge of the LPD may be within 100mm of the cab. The LPD may be angled "in" towards the cab by no more than 45 degrees to meet the required standard. There is no requirement for the body itself to be angled "in". Note the body is considered to meet the requirements as a LPD, if it meets the height requirements. As shown in the image above:

(1) no requirement for the body to be angled " in"

(2) lateral protection may be angled "in"

Example 4

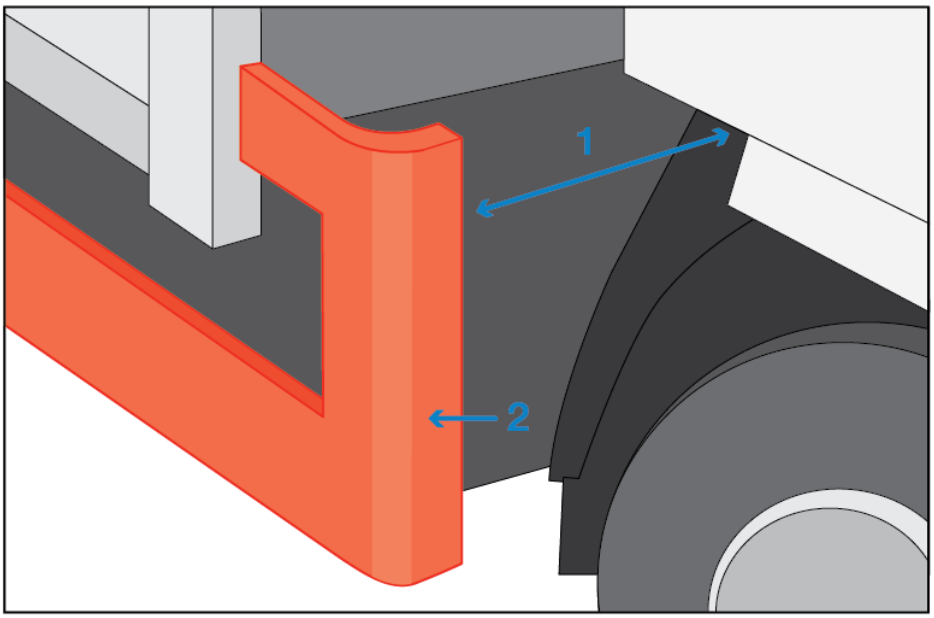


As shown above

(1) the cab ends above the area required to be protected by the LPD
(2) The LPD must start within the 0.3m dimension - as above the steps are considered part of the cab, however, it is expected the lower LPD rail to meet the 0.3m dimension

This example meets the required standard, if (2) is under 0.3m.

Example 5

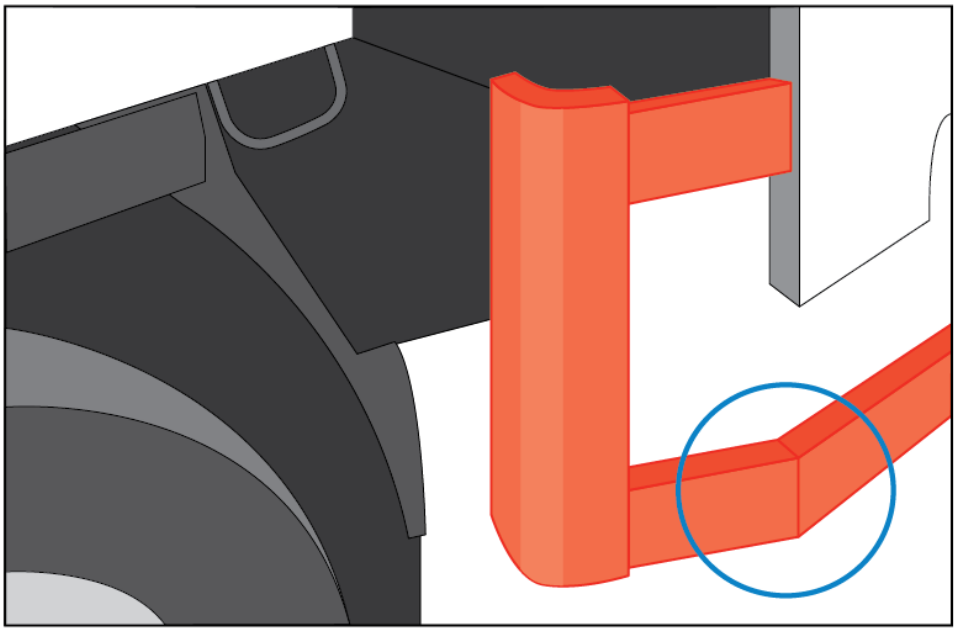


As shown above: -

(1) The body is wider than the cab

(2) The LPD does not have to be angled “in” towards the cab, however the gap between LPD and cab may be no more than 100mm in any direction. Where necessary the LPD may be angled in if it needs to meet the 100mm gap.

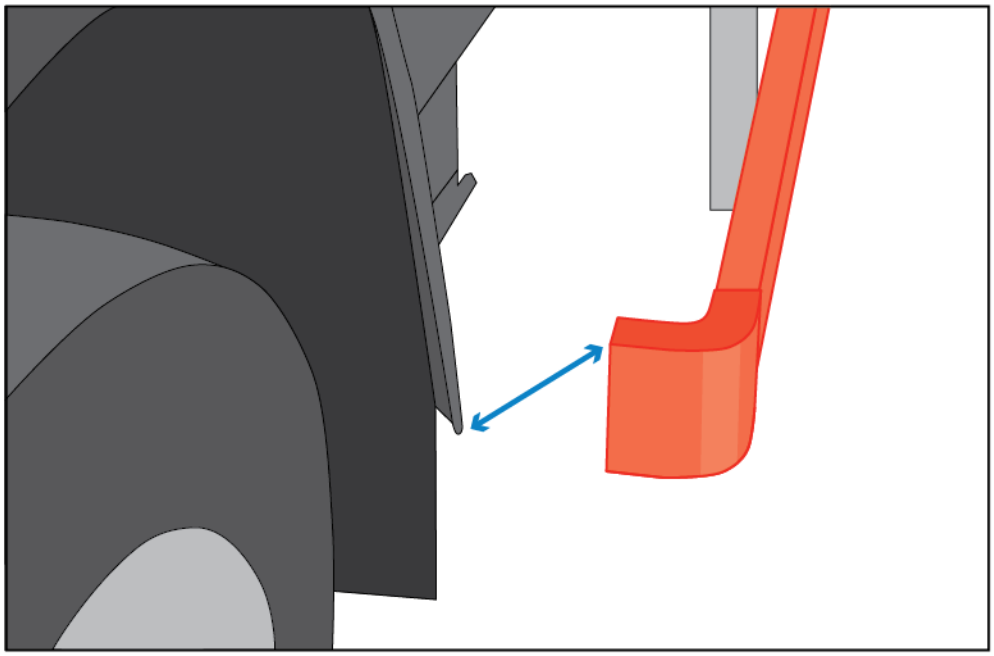
Example 6



In the image above, on the passenger side of the vehicle, the gap is more than 100mm. The LPD is angled “in” towards the cab to meet the 100mm dimension, less chance of injury to VRUs, more likely to deflect and glance off. Where the LPD is angled in towards the cab, an upright is still required, but no longer needs to meet the 100mm turn-in criteria. Refer to example 7 for dimensional illustration

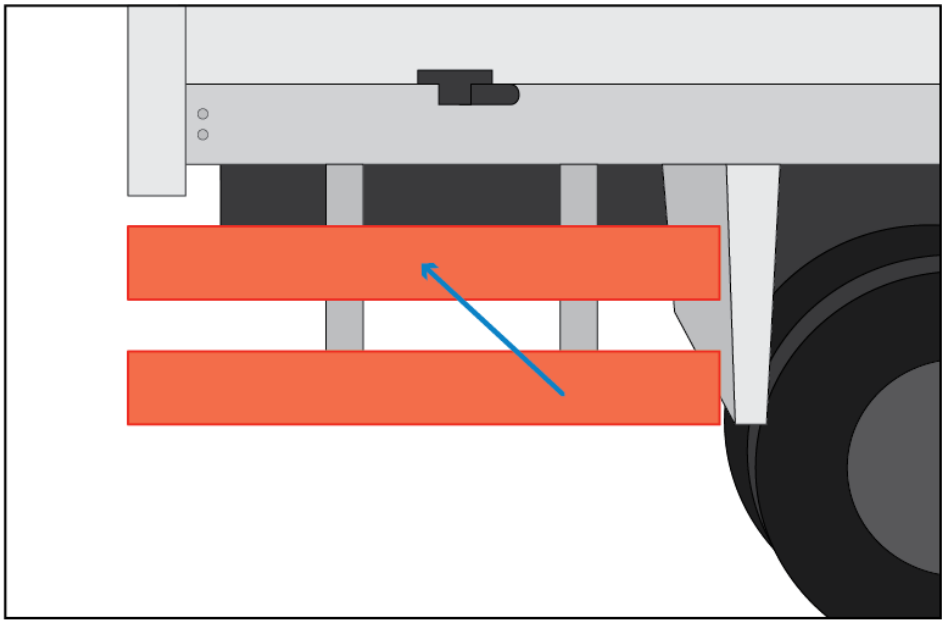
This meets the required standard.

Example 7



The 100mm gap can be diagonal as in this image or longitudinally or laterally.

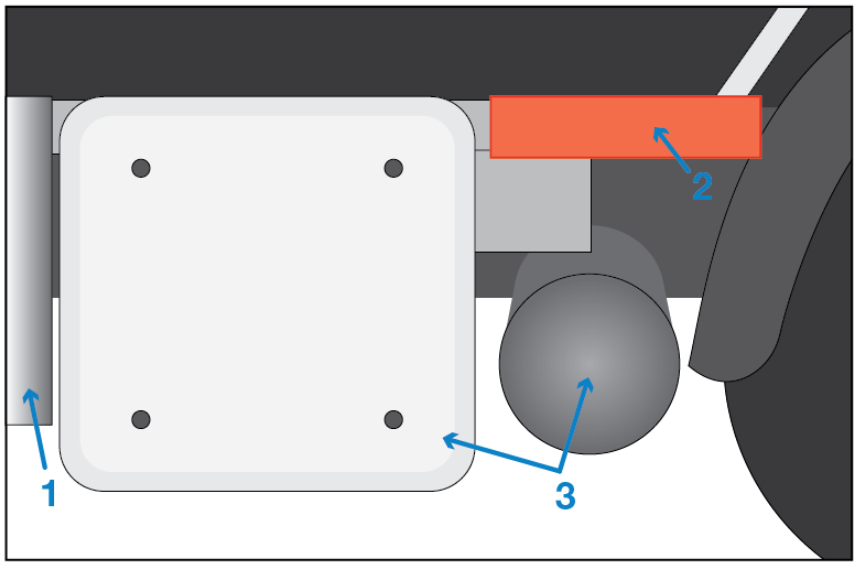
Example 8



LPD is not required behind the rear axle. As shown in the image above, it may be fitted for a specific operator's requirement.

Any LPD behind the rear wheels is not subject to ADR assessment, but is considered good practice.

Example 9



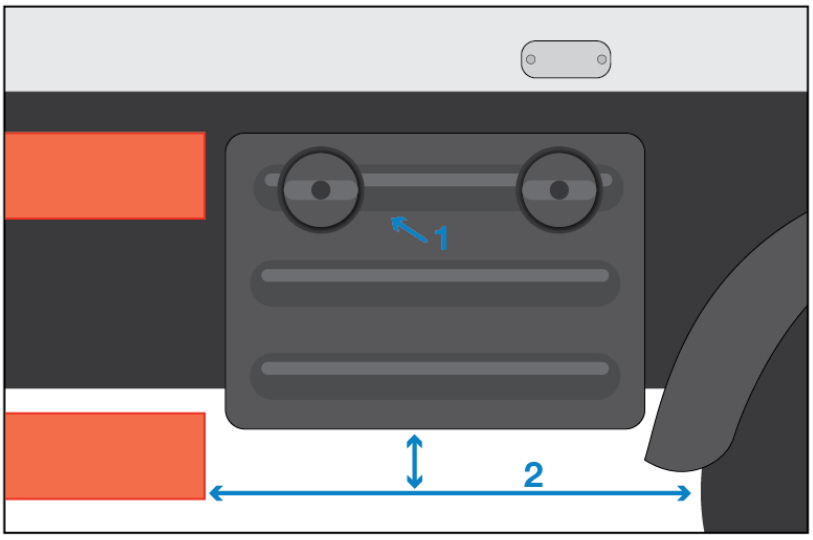
The image above shows that the:

(1) original LPD finishes here
(2) top rail fitted is required due to gap between cab and body rail
(3) Exhaust protection and air tank can be considered as part of the LPD

Between them, the original LPD (1), the rail (2), air tank and exhaust protection (3) will deflect unprotected road users away and they are unlikely to fall under the vehicle.

The above example meets the required standard.

Example 10

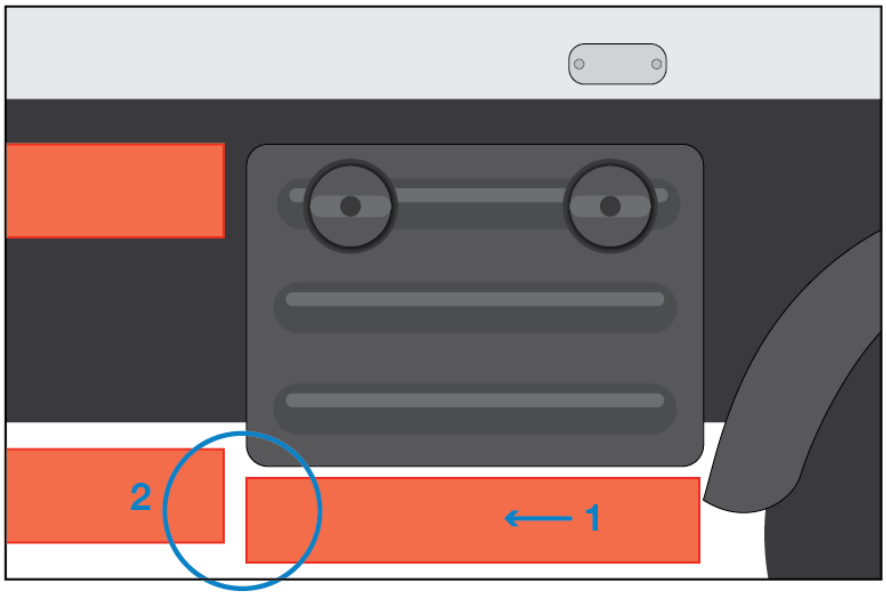


The above image shows that the tool box may be considered as part of the LPD (1) but the LPD:

(1) does not meet the height requirements.
(2) does not protect road users from being caught under the rear wheels.

This example does not meet the required standard.

Example 11

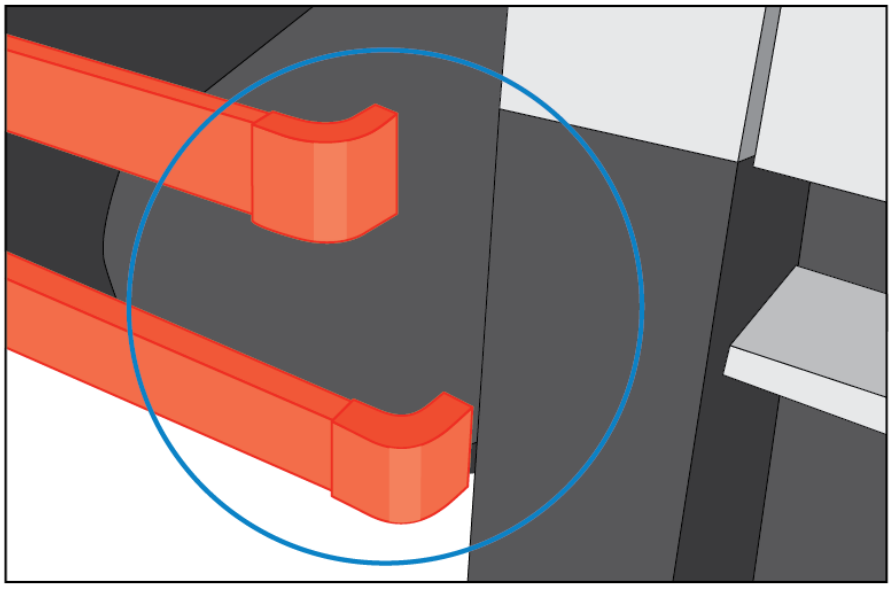


The image above shows that the addition of the LPD rail (1) starts to solve the problem, but the outer surface of the additional rail is not:

- in line, and
- does not overlap, front to rear, the original LPD (2)

This example still does not meet the required standard.

Example 12

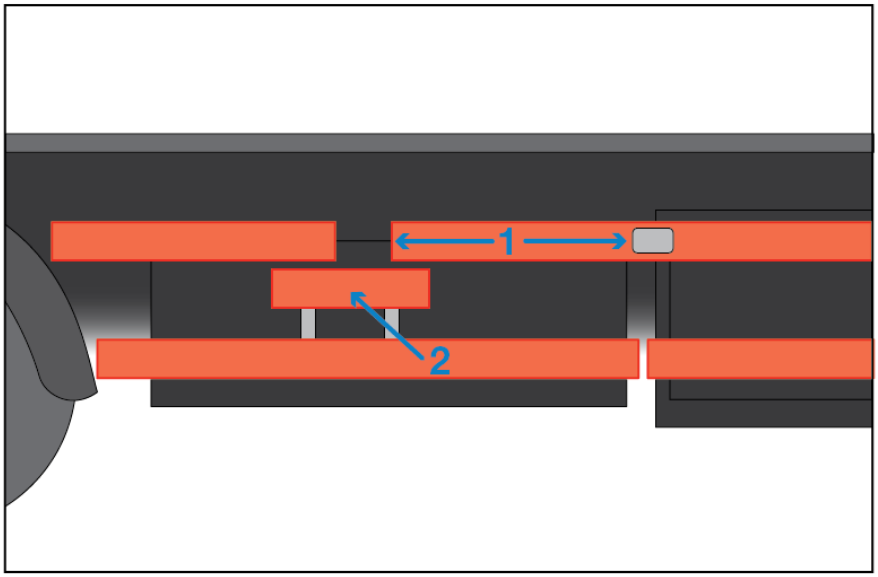


Where the forward edge of the LPD lies in open space there needs to be a continuous vertical member extending over the whole height of the device. The size depends on the vehicle type, for:

- ADR categories NB2 and TC the upright needs to be 50mm rearwards and 100mm inwards
- ADR categories NC and TD the upright needs to be 100mm rearwards and 100mm inwards.

This example does not meet the required standard.

Example 13



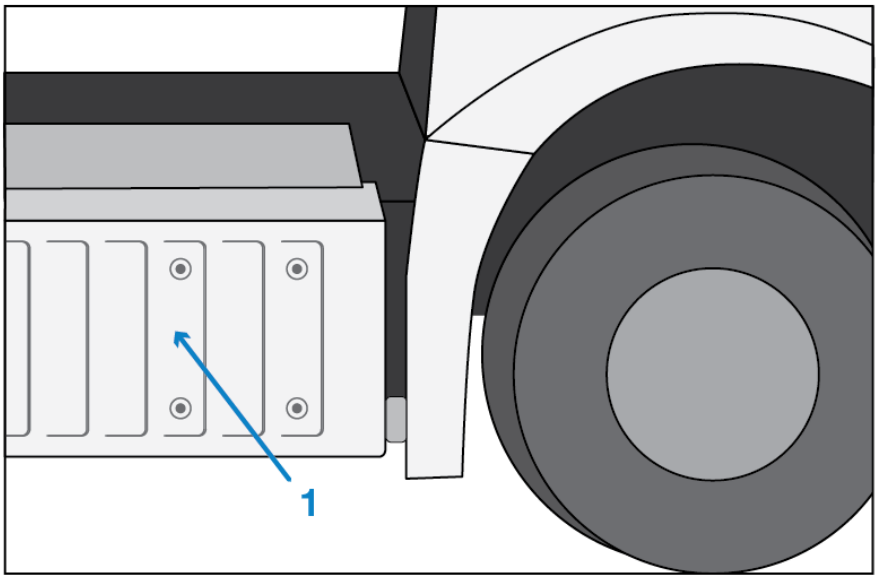
The image above shows that

(1) The LPD rails have been cut in numerous places, to accommodate a side reflector and fuel filler neck, this is unacceptable.

(2) A rail has been added around a filler neck and now isn't continuous.

This example does not meet the required standard.

Example 14



(1) In the image above, the original fitting on an exhaust shield is less than 25mm to the rear of a fixed component, it does not lie in open space and will be acceptable as part of the LPD. However, if the gap were to be more than 25mm, a vertical member of the required dimensions would be required.

This example does meet the required standard.

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