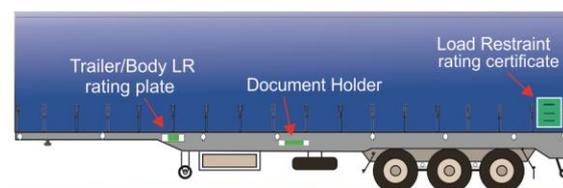


Certified load restraint curtain systems



Technical Advisory Procedure



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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 understanding industry best practice when using Certified Load Restraint Curtain (CLRC) systems.

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

This 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 Technical Advisory Procedure.

This TAP is not legal advice and does not take your specific legal circumstances into account. Any references to legislation are for general information only. If necessary you should consult a legal practitioner for specific advice.

Operators must comply with the Australian Design Rules (ADRs), the National Heavy Vehicle Law and supporting regulations (where applicable).

Operators in Western Australia and the Northern Territory must follow their equivalent legislative instruments governing heavy vehicles.

All operators should follow any specific information and instructions provided by manufacturers in relation to the vehicle systems and components.

This TAP does not endorse any products or services. Brand names, where used in this TAP, are for illustrative purposes only.

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

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1. Introduction

The ATA Industry Technical Council (ITC) produced this Technical Advisory Procedure (TAP) to provide operators with a better understanding of how to use Certified Load Restraint Curtain (CLRC) systems.

The main purpose of this TAP is to provide operators with guidance material on the selection and safe use of LRC systems that assist in complying with relevant loading and load restraint requirements. It is not intended to be a comprehensive guide for restraining loads. This TAP also provides some basic information to manufacturers of CLRC systems on certification, modification, retrofitting and repairs.

2. Loading requirements

Load Restraint (LR) systems must ensure that the vehicle and its load meet the legal obligations stated in the Heavy Vehicle National Law (HVNL) in participating states and territories:

- A load on a heavy vehicle must not be placed in a way that makes the vehicle unstable or unsafe.
- A load on a heavy vehicle must be secured so it is unlikely to fall or be dislodged from the vehicle.
- An appropriate method must be used to restrain the load on a heavy vehicle.

Under the HVNL, a load is considered to be effectively restrained if its LR system ensures that the vehicle and its load meet or exceed the performance standards in the Load Restraint Guide (LRG).

In non-HVNL participating jurisdictions of Western Australia and Northern Territory, LR systems must meet local legislative requirements.

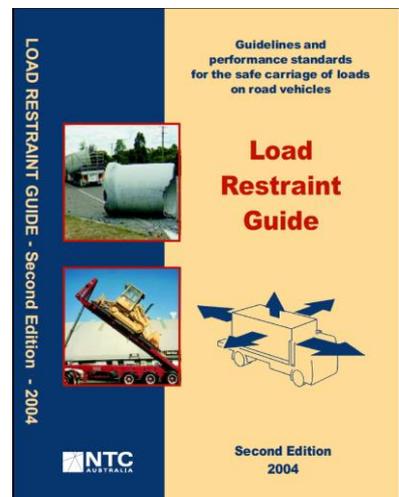


Figure 1: Current edition - load restraint guide¹

2.1 Performance standards, page 186 of the 2nd edition of the LRG

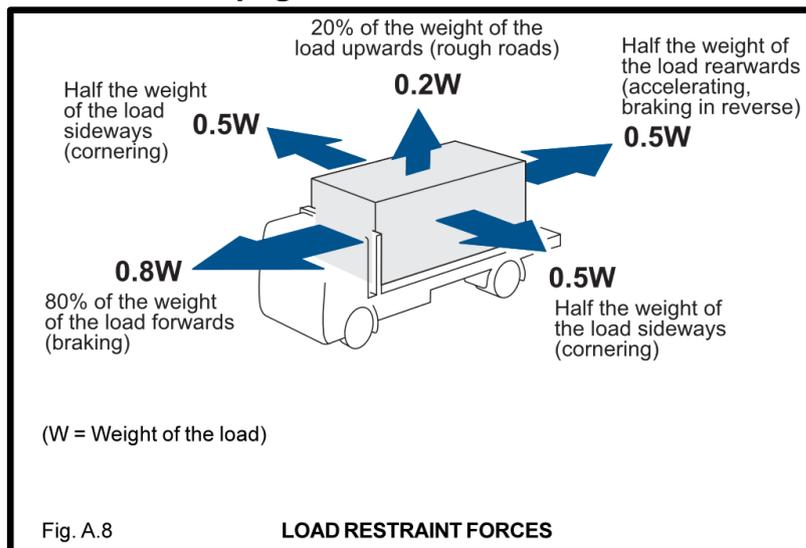


Figure 2: Graphic representation of the load restraint performance standard

¹ The NTC is currently reviewing the 2nd edition of the LRG. The performance standard will not change, but will become part of the HVNL – [\[LINK\]](#).

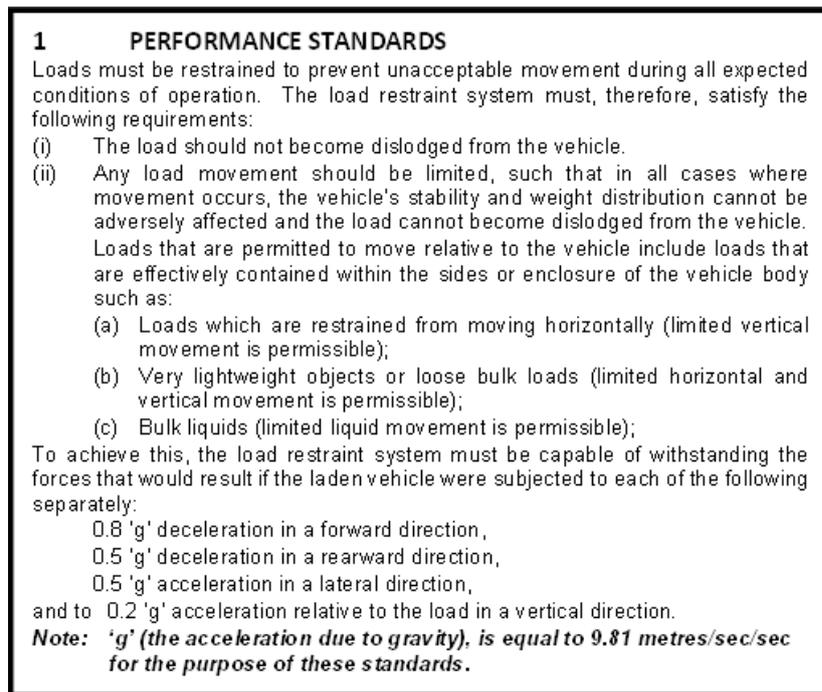


Figure 3: Performance standard, page 186 of the LRG, 2nd edition

The LRG includes guidance material on how a LR system may meet the performance standards. The guidance material provides examples and possible methods to restrain different types of loads. This material is not a legal requirement.²

The guidance material found in the LRG is not prescriptive. It is a suggestion as to how a load may be restrained to assist in meeting the LRG performance standards.

Note: Limited vertical or horizontal movement is explained in greater detail in section 4 of this TAP.

3. Legal requirements

The HVNL and other State/Territory law require loads to be restrained on heavy vehicles so as to safeguard public safety and minimise any adverse impact on road infrastructure or public amenity.

Failure to comply with load restraint requirements may result in penalty notices, offence reports, directions and prosecution.

The driver or operator of a vehicle and potentially other parties in the supply chain (specified under Chain of Responsibility legislation) may be held liable for breaches of the LR performance standards.

3.1 Penalties for load restraint breaches

The penalties are contained within the Heavy Vehicle National Law (HVNL), part 4.4 loading requirements, division 1, section 110 – 115 for all states and territories excluding Western Australian and Northern Territory. For non-HVNL jurisdictions, please refer to the relevant authorities.

² In Victoria and Western Australia, the 2nd edition of the LRG is called up in legislation, while in the NT it is the performance standards and principles in the LRG called up in their traffic regulations.

Penalties vary depending on the severity of the breach and can exceed \$10,000 per breach.

Additional penalties and a general safety duty will come into force in the first part of 2018. Reckless breaches of the general duty could attract penalties of up to \$3 million for companies or \$300,000 for individuals or imprisonment for up to 5 years or both.

These penalties are indexed annually in accordance with the law.

3.2 Chain of Responsibility (CoR) and load restraint – [\[LINK to NHVR\]](#)

One of the goals of the HVNL is to protect public safety and road infrastructure from unsafe heavy vehicles and unsecured loads. HVNL sections 110 and 111 describe the loading that apply to all heavy vehicles (GVM and ATM above 4.5 tonne) in participating states (Qld, Vic, NSW, TAS, SA) and territories (ACT).

These loading requirements are extended to parties in the transport supply chain by the HVNL section 183 (extended liability). This provision encompasses the Chain of Responsibility.

Parties in the supply chain must take all reasonable steps to ensure that loads are safely and legally restrained before they are transported on a road by a heavy vehicle. The person must:

- prove that they did not know, and could not reasonably be expected to have known, of the contravention concerned; and
- that they took all reasonable steps to prevent the contravention; or
- there were no steps they reasonably be expected to have taken to prevent the contravention. [HVNL, s618].

In the event of a failure to meet the HVNL loading and load restraint requirements, any party in a position to control or influence the loading and load restraint of the heavy vehicle may be held responsible.

From 2018, business in the chain of responsibility will be subject to a general duty to ensure safety so far as is reasonably practicable.

3.3 Who is a party in the transport supply chain?

For the purposes of the above, the NHVR³ has stated that the parties may include:

- a) corporations, partnerships, unincorporated associations or other bodies corporate
- b) employers and company directors
- c) consignors/senders and consignees/receivers of the goods for transport
- d) exporters and importers
- e) primary producers
- f) drivers (including a bus driver and an owner-driver)
- g) prime contractors of drivers
- h) operators of a transport company
- i) schedulers of goods or passengers for transport, and the schedulers or allocators of drivers
- j) loaders and unloaders of goods
- k) loading managers (loading/unloading supervisors, or managers of the premises where this occurs) and an employer of the vehicle's driver, if the driver is an employed driver

³ NHVR Chain of Responsibility – [\[LINK\]](#).

4. General load restraint guidance

4.1 What is permissible movement?

The performance standards listed in the LRG state that loads can have some limited movement. Loads that are permitted to move relative to the vehicle include loads effectively contained within the sides or enclosure of the vehicle body such as:

- Loads restrained from moving horizontally (limited vertical movement is permissible)
- Very lightweight objects or loose bulk loads (limited horizontal and vertical movement is permissible)

In cases where movement of the load occurs, the vehicle's stability, handling, dimensions and weight distribution must not be adversely affected and the load must not become dislodged from the vehicle.

4.2 Limited vertical movement

A load is allowed limited upwards movement and shall be deemed adequately contained/restrained in compliance with the LRG performance standards if:

- The load is contained and no part of the load can become dislodged from the load compartment of the vehicle.
- The load is restrained or blocked in a way that prevents it from moving horizontally.
- The load's movement does not affect the vehicle handling/stability or mass (weight) distribution.

Notes:

- This does not necessarily mean the load has to be tied down but it must be restrained or contained horizontally. This may be achieved by some form of blocking.
- Some vertical movement of the load is permitted provided that the load is restrained horizontally.
- Loads should be unitised where possible with plastic stretch wrap, pallet strapping or similar in order to minimise any potential movement.
- It is recommended loads should, where possible, be transported in a vehicle that provides containment. Such a vehicle may have a plate or label certifying that the vehicle's structure has been assessed as capable of providing part or all of the LR requirements to meet the performance standards.

4.3 What is a direct restraint system (attachment, blocking and containment)?

A direct restraint system is a cost effective means of complying with the LRG performance standards without necessarily tying down the load into place to prevent movement – forward, aft, left or right.

In the case of full load (global) blocking (over the full width or full length of the load compartment), void spaces should be filled with appropriate dunnage or air bags (for example, empty pallets inserted vertically or horizontally and tightened by additional timber battens as necessary). Material that may deform or shrink permanently such as solid foam of limited strength should not be used. Small gaps between the unit loads and similar cargo items that cannot be avoided and are necessary for the smooth packing and unpacking of the goods are acceptable and need not to be filled.

As a guide, it is recommended that they do not individually exceed 50 mm. In the case of full load (global) blocking, the sum of void spaces in any horizontal direction should not exceed 150 mm.⁴ However, between dense and rigid load items, such as steel, concrete or stone, void spaces should be minimised, as much as possible.

The height of blocking components needs to suit the load and the integrity of its packaging. If the load cannot be unitised with adequate packaging integrity, then the blocking at least needs to match the height and width of the load. The strength of headboards and tailboards are critical to an overall certified load restraint system when used for the purpose of blocking.

During delivery, loading and unloading the load, the remaining payload must maintain legal weight distribution and must not adversely affect the vehicle's stability.

More information is available at: [LINK](#) or

<https://www.gov.uk/government/publications/load-securing-vehicle-operator-guidance/load-securing-vehicle-operator-guidance>

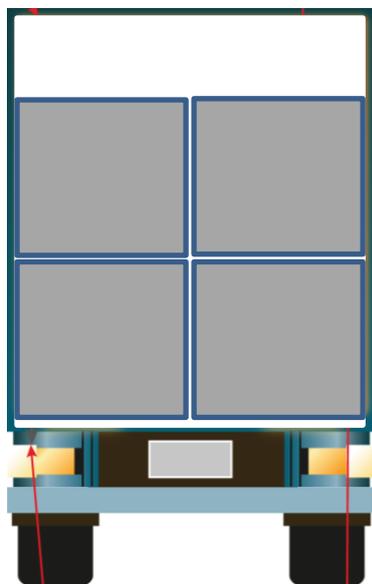


Figure 4: Block load from rear

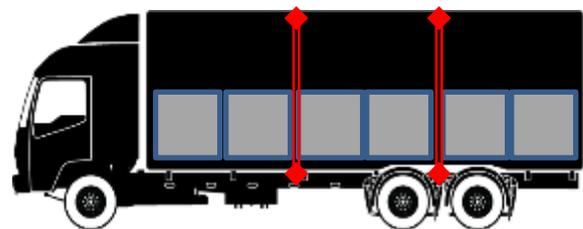


Figure 5: Blocked load from side

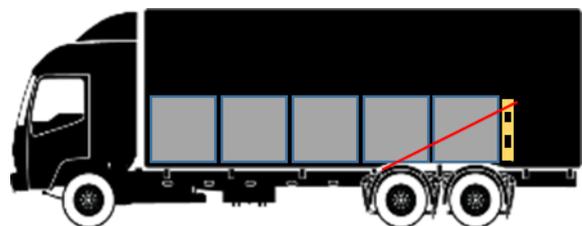


Figure 6: Partially blocked load

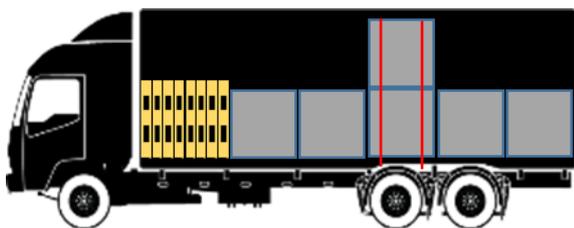


Figure 7: Partially blocked load

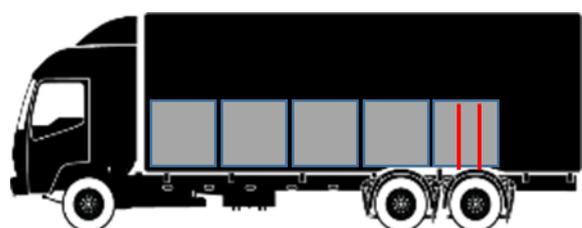


Figure 8: Partially blocked load

Part or partial loads

Even when they are contained by the body and curtain, part or partial loads are the most troublesome areas discussed at the roadside between truck drivers and the enforcement authorities. From section 4.1 of this TAP, in all cases where movement of the load occurs, the vehicle's stability, handling, dimensions and weight distribution must not be adversely affected and the load must not become dislodged from the vehicle.

All partial loads must be adequately restrained. Further guidance for allowable gaps and voids is detailed earlier in this section.

⁴ Refer to [European guidelines for load restraint 2014 – Section 5.4, full load \(globe\) blocking.](https://www.transportinfo.org/wp-content/uploads/2016/05/cargo_securing_guidelines_2014.pdf)
https://www.transportinfo.org/wp-content/uploads/2016/05/cargo_securing_guidelines_2014.pdf

4.4 Pallet packaging and its integrity

The integrity of the LR system is critical. However, palletised cargo is often not recognised as being a critical component of compliance and is not the responsibility of the CLRC system manufacturer or necessarily the driver.

Pallet integrity should be tested to meet the LRG performance standards. The failure of pallet wrapping can result in the failure of a LR system. See examples below of poor pallet integrity.



Figure 9: Example of poor pallet load integrity.

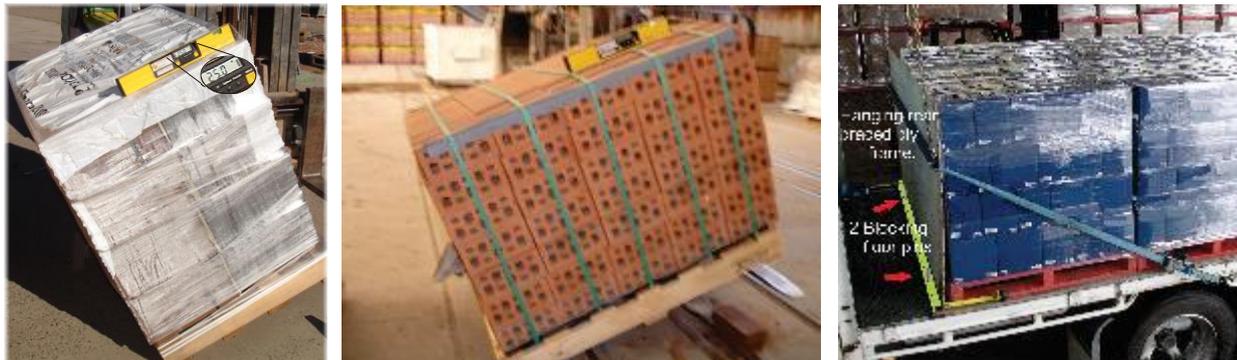


Figure 10: Examples of testing pallet packaging integrity

4.5 Load restraint equipment and acceptable levels of damage/wear

Where the supplier of LR equipment does not provide guidance for fair wear and tear of LR equipment, the following may assist in assessing if the equipment is compliant:

- a) The LRG provides guidance as to acceptable wear and tear limits in Part 2: Section H – Load-Restraint Equipment.
- b) The LRG recommends LR equipment must be replaced when weakened by 10 per cent or more of their original minimum breaking strength. The LRG also lists other criteria for assessing the serviceability of LR equipment and recommends replacement of LR equipment if these criteria are present or are not met.
- c) LR equipment that does not meet the serviceability criteria detailed in the LRG should not be used for the purpose of restraining loads on a heavy vehicle.

The following are examples of wear and tear that is unacceptable:

Physical damage that is greater than either:

- 10% cut to the webbing, rope or chain threads, or
- 10% weakened by any other form of damage.

Types of physical damage and serviceability include but are not limited to:

- Chain that contains nicks, gouges, abrasions or broken, cracked, twisted, bent, knotted or stretched links. Chain that has been damaged as a result of missing edge protection.
- Wire rope that contains kinks, bird caging, popped core or knots in the working section of the wire rope. Discolouration from excessive heat or electric arc in the eye or main body of the rope. Corrosion with pitting of external or internal wires. More than 3 broken wires in any one stand or 2 broken wires at the end connection or fitting (or 10% of the rope's wire strands, whichever is the lessor). Wire rope that has been damaged as a result of missing edge protection.
- Webbing that contains separation of its load carrying stitch pattern(s) in excess of 10% of the total stitch area. Contains a knot, repair, splice or any other apparent defect. It contains cuts, burns and/or holes through the webbing. Wear, mechanical damage, exposure to chemicals, high temperatures, prolonged exposure to sunlight or ultraviolet light. Webbing that has been damaged as a result of missing edge protection.
- Anchor points that are broken or cracked side or pocket rails, supports or welds. Rails bent or distorted where hooks or fittings are attached. Floor rings nicked, gouged, worn, twisted bent, stretched or with broken welds. Replacing higher Load Certified (LC) straps without checking that under floor slide tracks can hold the higher LC tensions, if tensioner to the higher limit eg; changing from 2,500 kg LC straps to 5,000 kg LC straps.
- Heat effected areas are assumed to be the area directly affected plus an additional 25% zone for the heat affected zone.
- Ensuring LR equipment remains within Australian Standards limits. It is best practice to carry out a regular sample test of components via an approved facility such as NATA Laboratory. Tests should confirm the wear and tear of the old / used equipment is still within 10% of its new performance requirement.

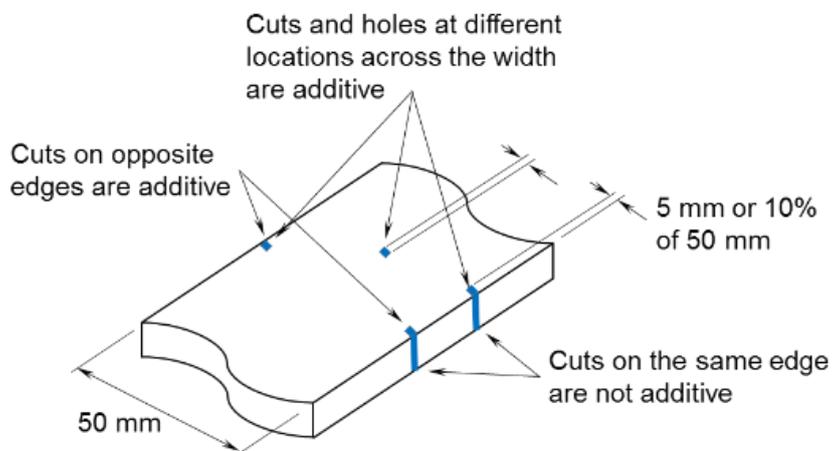


Figure 11: Illustration of the allowable levels of damage to webbing

4.6 Use of fibre rope as part of the load restraint system

Only fibre ropes that comply with the *Australian Standard AS/NZS 4345 Motor vehicles – Cargo Restraint Systems - Transport Fibre Rope*, or an equivalent international standard should be used. Sisal and manila ropes do not comply with the above standard and should not be used for restraining loads.

Additionally, the ATA recommends that synthetic rope should also not be used for the restraint of the load and alternative methods of restraint be investigated as best practice. It may be used to restrain light cubic loads and/or for restraining other load elements in position for that component to carry the load, such as dunnage and gates. In most cases, it is difficult to define a ropes rating and it is difficult to consistently achieve a known clamping force or lashing capacity (LC).

All fibre ropes of a size of 12 mm or greater can be identified by a single coloured yarn of polypropylene or multi-filament inserted in the centre of one of the strands.

Type of Rope Fibre	Colour of Identifying Yarn
Polyester	Blue
Polyethylene staple	Orange
Polypropylene	Brown

Figure 12: The colour of the identifying standard rope yarns used is set out below.

Lashing Capacity (LC kgs)	Colour of Identifying Strands
100 kg	Black
300 kg	Yellow
500 kg	Green
700 kg	Light Blue

Figure 13: Rope 12mm + Lashing Capacity Identification colour Chart – AS/NZS 4345

All transport fibre rope with a diameter of at least 12mm or more is colour coded for its lashing capacity as per the above table. For example, rope with black marker yarns has a lashing capacity of 100 kg, yellow yarn 300 kg, green yarn 500 kg, and light blue yarn has 700 kg (LC) Lashing Capacity. The Australian Standard sets the lashing capacity as the maximum force (kg) for use in a straight pull that a rope is designed to sustain. A complying fibre rope (LC) must attain 25% of the minimum breaking strength.

5. Certified load restraint systems

Use of a certified load restraint system which details how a load is to be restrained or contained is one method an operator can ensure compliance with LR requirements.

The purpose of certifying a LR system is to ensure that it meets the LR Performance Standards. The certified system describes how a LR system complies with the LR Performance Standards.

The LRG recommends that only a person with appropriate skills and experience should assess and certify a LR system. Normally, a mechanical engineer with full membership of the Institute of Engineering Australia is considered an appropriate person. States or territories may impose further qualification requirements such as being a registered engineer in Queensland.

A load restraint curtain may form part of or be a certified LR system. The load restraint curtain may be certified to meet all or some of the LR performance standard requirements.

6. Certified Load Restraint Curtain (CLRC) systems

A CLRC system usually includes:-

- The body of the trailer/truck
- Webbing, buckles, hooks, rollers and webbing loop connections
- Internal vehicle blocking structures (support posts and roof structure)
- May include gates, doors, hinges and other types of LR equipment plus mezzanine floors and supporting posts/panels/gates.

A LRC system must restrain a load so that it meets the LR performance standards.

A LR curtain alone may provide for restraint in the sideways direction and may be used in combination with blocking restraint. The restraint provided must be adequate so that the load does not shift when a force of 0.5g is applied to the vehicle in the sideways direction. This force can be generated by tilting the loaded vehicle by 30 degrees as described in the LRG Part 2 Section F- 5 test criteria.

The headboard and rear gate/door/vehicle structure may restrain the load in the fore and aft directions and may be used in combination with blocking restraint. These items will need to be rated and certified when used as part of the complete LR system. The restraint provided must be adequate so that the load does not shift when a force of 0.8g is applied to the vehicle in the forward direction or 0.5g is applied to the vehicle in the aft direction.

A combination of restraint systems may constitute a complete LR systems package and be documented in a Certified LRC system.

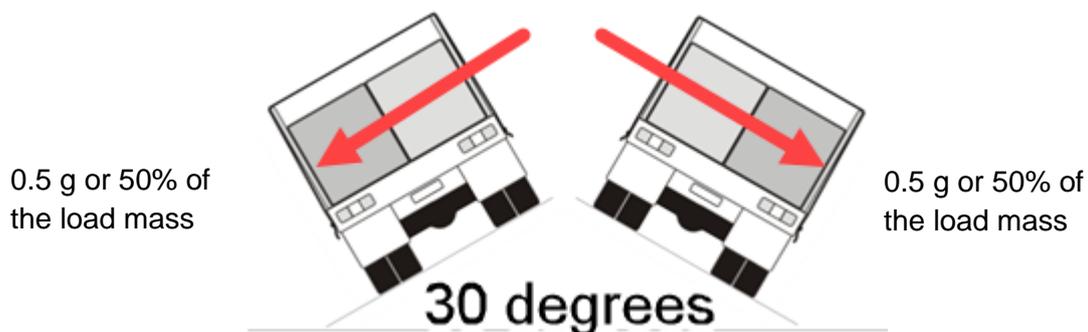


Figure 14: Illustration of the forces that the side restraint needs to contain or block the load

6.1 Supporting information

The manufacturer of a Certified LRC system should provide operators with the following documented information:

- The rating of the CLRC system, setting out the mass or weight per pallet footprint including double stacking.
- Use of gates (if required).
- Load placement including mezzanine floors or other load configurations.
- Care and maintenance including replacement of components.
- The details of any blocking required particularly when partial loads are certified.
- Any other requirements specific to the certification of the CLRC system.

6.2 Rating of the LRC system

Ratings are stated as either:

- Allowable mass (weight) per pallet width (mass of pallet A + pallet B or (2) across the floor must be less than rating) (see figure 15) or
- Allowable mass (weight) per pallet space (mass of pallet C or D must be less than rating) (see figure 15) or
- Total payload of evenly distributed pallets over entire cargo deck space including the pallets on mezzanine level.

Mezz Deck; example with solid ply across floor between posts, front & rear.

Also ply or fixed gate lengthwise on Mezz deck and trailer floor. This reduces total pallet load weight against curtains.

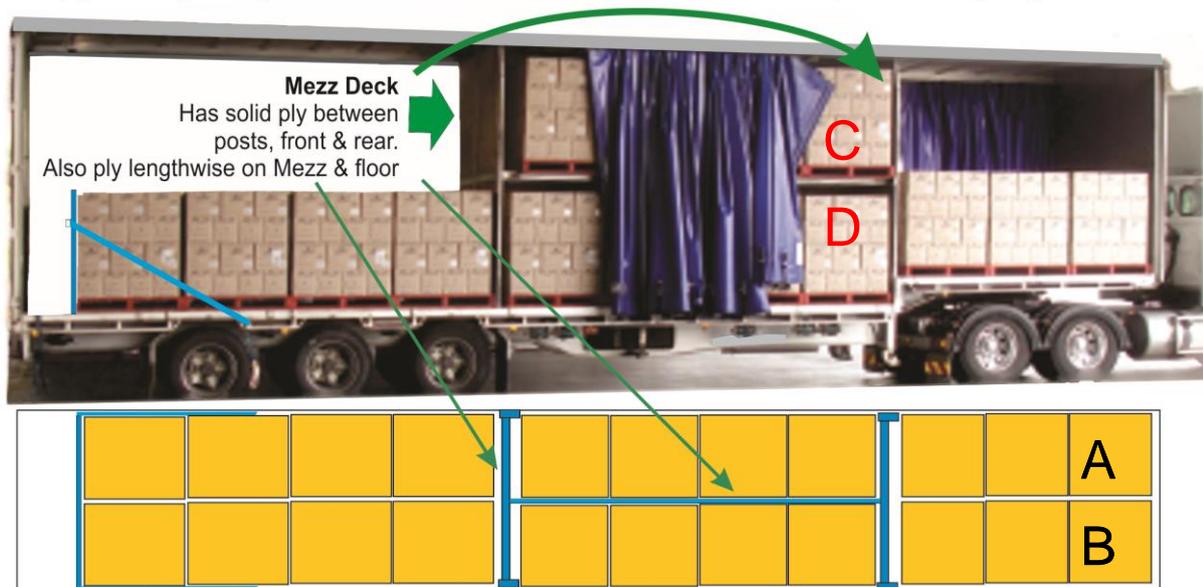


Figure 15: Mezzanine loading

6.3 Use of gates

The CLRC manufacturer should specify if gates are required. This could include a braced longitudinal gate (pallet height or to the roof).

The manufacturer should provide:

- the rating of the gates,
- installation/fitting requirements, and
- labelled as a load restraint system element

6.4 Australian Dangerous Goods Code (ADGC) and gates

Any DG load must be restrained to meet the LRG performance standards under the HVNL at a minimum. The ADGC may impose further requirements.

The ADGC specifies the use of gates on packaged dangerous goods loads. These requirements also mention how much the items or packs should extend above the gates as no more than a third of the overall height of the package or carton.⁵

⁵ Australian Dangerous Good Code Edition 7.4. National Transport Commission. 2016. Section 8.1.3 "Open and non-rig sided vehicles and containers"

These requirements were put in place before load restraint curtain systems became widely available. The ADGC does not define a rating or performance requirement for the gate. All loads must be safely restrained regardless and comply with the LR performance standards.

It should be noted that the gates referred to within the ADGC could be mounted/attached to either the body or be part of the transport stillage.

It is strongly recommended that operators seek advice from regulatory agencies on the transport of dangerous goods loads.

6.5 Examples of load placement including mezzanine floors

Stacked loads

As an example, a CLRC system may define the maximum mass (weight) per pallet or $1,165 \pm 3$ mm square pallet footprint as 1,850 kg with post centres up to 2,800 mm apart. The load may be a “stable single level load” or “stacked load” such as cartons on pallets. The load height of adjacent pallets may be of similar height so as to be a block for each other. The load per pallet space usually includes double stacked or second deck pallets.

Note:- with stacked pallets, the integrity of the double stacked pallet should be tested separately.

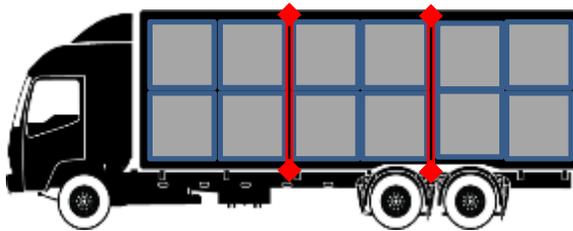


Figure 16: Stacked pallet configurations

Figure 16 illustrates a double stacked load. Figure 17 below illustrates two single stacked levels with a mezzanine level (red) – total load per pallet space = 1,850kg, red posts shown at every second pallet, about 2,400 mm apart.

Mezzanine configurations

For mezzanine loads (figure 17), if the load rated curtains used in a CLRC system are capable of managing stacked and mezzanine/floor level loads, add weights of both layers when checking curtain capacity.

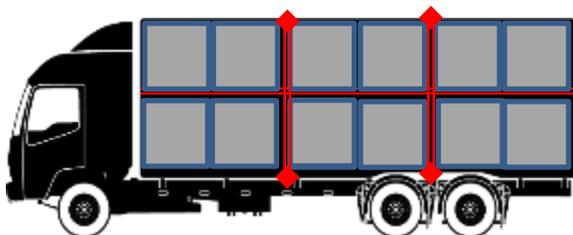


Figure 17: Use of a mezzanine floors

6.6 Mixed or partial loads – refer to section 4.3 of this TAP

Manufacturers of LRC systems must specify if their equipment can handle mixed loads. The information provided must also include how to restrain partial loads.

7. Certified Load Restraint Curtain (CLRC) system documentation

A CLRC system should be supplied with documentation that includes the following information.

7.1 Certificate of assessment

A certificate of assessment should include details of the LR equipment that make up the system, how the LR equipment should be used and what loads can be restrained using the LRC system. The certificate of assessment should detail the testing of the CLRC system and list who completed the testing and their qualifications. This is typically held by the CLRC manufacturer and LR certifying person/company. The level of detail in the CLRC system certificate can vary significantly, depending on the complexity of the system itself.

7.2 CLRC system usage instructions

The CLRC system certificate should be carried in the vehicle or on the trailer/body, and should be readily available for review. The certificate should provide clear instruction to the operator and any other relevant party on how to use the CLRC system in the form of work instructions or standard operating procedures, to ensure the CLRC system is correctly applied to a load to ensure compliance with LR performance standards.

The level of detail in the certificate can vary significantly depending on the complexity of the requirements. It is recommended that it should be pictorial with enough information to clearly define the load that can be restrained and how it is contained.

It is strongly recommended to obtain certification from the LRC system manufacturer stating explicitly under what conditions vertical and horizontal movement is allowed while still complying with the LR performance standards.

7.3 Identification of load restraint elements

Labels or plates should be fixed to the different components that form part of the CLRC system including curtains and gates. Load restraint equipment part numbers could also be used to identify equipment in the CLRC system which could be referenced by the CLRC system certification report/assessment. Labels are typically affixed to the curtain and should include at least a reference number and company identification linking it back to the specific CLRC system certification report/assessment.

LOAD RESTRAINT CERTIFICATE		<insert your company logo here>		
<insert your company name>		FOR	<insert name of owner>	
This certificate has been issued in line with the performance based standard detailed in the Load Restraint Guide, second edition 2004 for the vehicle or trailer, load type and procedure detailed below				
Vehicle:		<insert vehicle/trailer details>		
VIN:		<insert VIN number>		
Modification Plate Reference:		<insert modification plate reference>		
Load: <insert load details>				
Load Restraint Procedure (if required): <insert restraint procedure details>				
Maintenance Requirements: <insert maintenance requirement details>				
Test or Calculation Report to Support the Procedure:		<insert test or calculation report number>		
Certificate No: <insert certificate number>		Date: <insert date certificate issued>		
Name: <insert name of person issuing certificate>	OF	<insert company name> ABN: <insert ABN> <insert street address> <insert suburb state postcode>		
All calculations and a typical vehicle have been checked by <insert name of person issuing certificate> <insert position title> at<insert name of company>, a qualified Mechanical Engineer with in excess of 10 years' experience in the design and manufacture of road transport equipment and with full membership of the Institute of Engineers.				
Signed:		Institute of Engineers Membership No: <insert member no>		

Figure 18: Example of a load restraint system certificate – illustrative only.

LOAD RESTRAINT RATING

This curtain has been designed for use with *MANUFACTURER MODEL* load restraint Trailer/Body system. The requirements for side post spacing and loading in accordance with the Load Restraint Certificate must be observed.

Load Restraint Certificate No:
XXXXXXXXXXXX

Company ID

Load:
<insert load details>

Test or Calculation Report to Support the Procedure:
<insert test or calculation report number>

Figure 19: Sample Load Restraint Rating label – illustrative only. Applicable to a trailer or truck.

7.4 Load restraint rating plate

Vehicle Standards Bulletin number 6 (VSB#6) requires all heavy vehicle modifications to be approved by an Authorised Vehicle Examiner (AVE) and a modification plate fitted, for modifications such as the fitment of the body and the initial fitment of the fifth wheel.

All vehicle modifications must be performed by an appropriately accredited person and certified by a person accredited to certify that type of modification.

Similarly, an appropriate person must certify load restraint systems including all body modifications and certification of the system.

This TAP recommends that for load rated curtain systems affecting the vehicle structure (body or chassis, or both), a plate similar to that illustrated in figure 20 is used to certify the load restraint system.



Figure 20: Sample LRR plate. Applicable to a trailer or truck.

7.5 Suggested document and labelling/plating location

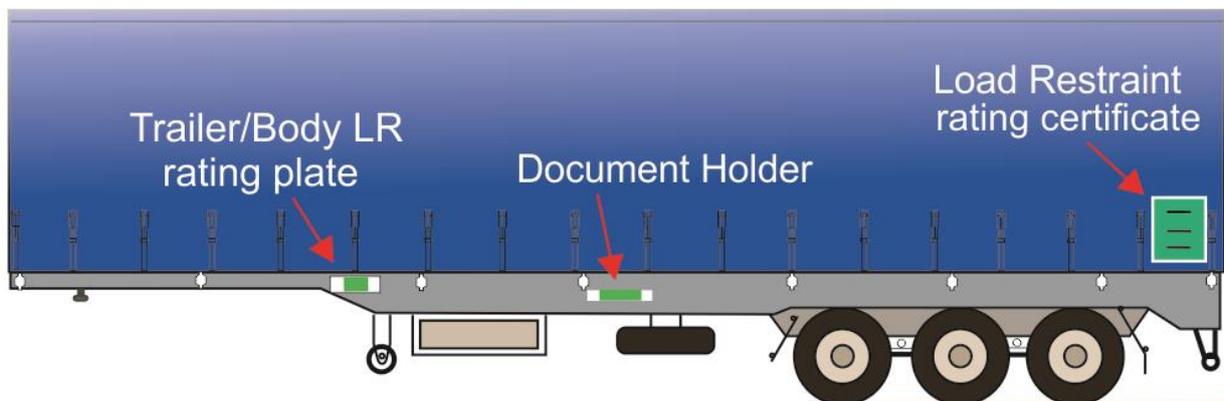


Figure 21: suggested document location and labelling/plating requirements

8. Maintenance of a CLRC system

As with other parts of the trucks and trailers, all LR equipment requires regular and thorough servicing and maintenance. Manufacturers' guidelines must be followed.

Approved service parts should always be used to maintain the accreditation or compliance of the load restraint system. Any replacement part, where it cannot be shown to be equivalent to the part it is replacing, will result in the LR system no longer being compliant. Even repairs to curtains need to be approached with caution, and the strength of the repaired part needs to be confirmed to ensure ongoing compliance to the load restraint performance standard.

8.1 Maintaining a compliant system

As with all certified LR systems, maintaining compliance with legal requirements is critical to achieving ongoing safety. Typically, the original supplier of the CLRC system will be able to supply replacement parts that will maintain the certification of the CLRC system. However if this not feasible or practical any alternative replacement part must be able to maintain the compliance of the original CLRC system. To achieve this it must be demonstrated that the new part is equivalent or superior to the original component. The new part should have a unique identifier referenced in supplementary documentation added to the CLRC system certification. A copy of the supplementary document should be carried with the vehicle.

If inferior parts are used for repair or replacement of a CLRC system, the CLRC certification may no longer be valid. Repairs to LR curtains also need to maintain the original strength and integrity of the LR curtain to ensure ongoing certification of the CLRC system.

Ensure LR equipment remains within Australian Standards limits. It is best practice to carry out a regular sample test of components via an approved facility such as NATA Laboratory. Tests should confirm the wear and tear of the old / used equipment is still within 10% of its new performance requirement.

8.2 Webbing – ensuring compliance of alternative components

The CLRC system certification report/assessment should provide additional information for the webbing of its test load, all strap components, design strength and % or mm/m of stretch at the test load. Any replacement strapping should match or exceed the strength requirements with matching or lowering of the stretch capabilities to be considered equivalent. Unless a part has direct equivalence (like for like) to the original, the load restraint system should be considered non compliant and expert assistance should be sort.

8.3 Curtain – ensuring compliance of alternative components

The CLRC system certification report/assessment should provide additional information for the curtain of its test load, design strength and % or mm/m of stretch at the test load in each direction. Any replacement curtain material, including all components, needs to match the strength requirements with a matching or lower stretch capabilities to be considered equivalent. Unless a part has direct equivalence (like for like) to the original, the load restraint system should be considered non compliant and expert assistance should be sought.

8.4 Retrofitting of load rated curtains

The fitment of load rated curtains to an existing vehicle cannot be considered part of a CLRC system, unless the whole system has been assessed as complying with the LR performance standards.

9. When are CLRC systems likely to become non-compliant?

9.1 Matters affecting the effectiveness of load restraint curtain systems

- Where there are heavy individual items with edges that may pierce the curtain.
- If any element of the LR system is not in good functioning condition.
- CLRC system does not cover all of the requirements of the LRG performance standards. The overall system usually includes a rated headboard and tailboard to account for the forward and aft requirements of the performance standards.
- If gates are part of the LR system and are not mounted correctly, the load is not compliant.
- In some cases additional lashings may be required to restrain heavy items of freight or to make up for gaps in the load. Refer to the LR system certifier for further information.
- The load being carried is specifically applicable to the certified LR system. The system for a different load top will need to be certified.
- When loaded pallets or packs have large gaps and spaces (refer to section 4 blocking) that will allow too much load-shift or movement during travel. Such loads should be fully assessed and tested as per the test methods listed in the LRG performance standard – see section F.

9.2 Deflection of LR curtains and vehicle widths

Heavy Vehicle National Law applies across Australia except in Western Australia and Northern Territory. The Heavy Vehicle (Mass, Dimension and Loading) National Regulation under the HVNL, defines the maximum width for a heavy vehicle as 2.5 metres.

The HVNL, when considering vehicle width, disregards the following:

(a) rear vision mirrors, signalling devices and side-mounted lamps and reflectors;

(b) anti-skid devices mounted on wheels, central tyre inflation systems, tyre pressure gauges;

(c) permanently fixed webbing assembly-type devices, including, for example, curtain-side devices, if the maximum distance across the body including any part of the devices does not exceed 2.55m.

The Australian Design Rules (ADR) defines the requirement for new vehicles via ADR 43/01 that the overall width must not exceed 2.5 m with the following definition as:

the maximum distance measured across the body including wheel guards, but excluding:

– rear vision mirrors, signalling devices and side-mounted lamps and reflectors;

– anti-skid devices mounted on wheels, central tyre inflation systems, tyre pressure gauges;

– permanently fixed webbing-assembly-type devices – such as curtain-side devices, provided that the maximum distance measured across the body including any part of the devices does not exceed 2.55 m.

Where there is a conflict between the ADR and HVNL or HVNL does not cover the area, the ADR's will take precedence over HVNL.

Deflection of curtains

A deflection in the certified load restraint curtain system should not increase the vehicle's width beyond 2.5 m. If it does, roadside enforcement may treat this as an offence against:-

(a) Width requirements - the vehicle together with its load is over 2.5 metres

(b) Load requirements - the load restraint system failed to restrain the load within the limits of the vehicle.

As a guide for vehicle stability, the deflection of the certified load restraint curtain system will limit the capacity for restraining many loads. In the absence of any test data or guidelines on allowable load shift for the different types of load, the maximum sideways deflection of the restraint system including side curtains should be limited to 100 mm.⁶

As a result, for a 2.5 m wide body with a CLRC system, the load is considered restrained up to an overall width of 2.6 m, but is over width. However, at a width greater than 2.6 m it will be considered both unrestrained and overall width.

9.3 Work health and safety

CLRC systems help reduce loading and unloading times, and improve safety by avoiding the need for an operator to climb on to the heavy vehicle's load deck. Always use caution when opening and closing curtains, even if they are not part of the load restraint system. If the curtain is bulging, the load has moved and the curtain should be opened with care after the stability of the load has been assessed.

10. Common load restraint terms

Air bag	An inflatable barrier placed between sections of the load and/or the vehicle to stop any movement of load. It can be disposable or reusable.
Anchor point	Fitting or attachment on a vehicle's bodies or load to anchor lashings.
ATM (Aggregate Trailer Mass)	Of a heavy trailer, means the total maximum mass of the trailer, as stated by the manufacturer together with its load and the mass imposed on the towing vehicle by the trailer when the towing vehicle and trailer are on a horizontal surface. See also GTM.
Bolster	Rigid support base (or with a stanchion) commonly used to support logs on jinkers.
Blocking	Blocking is a load restraint method. Material used for blocking varies widely, from timber to air bag and placed between the load and the vehicle structure to prevent movement of the load (also see dunnage).
Centre of gravity	The centre of balance of a load or mass.
Cheater bar	Usually a length of pipe placed over the operating lever of a dog so as to extend its length. (The use of these extensions is not approved by any manufacturer and can be dangerous).
Chocks	Usually wedge shaped blocks used to prevent movement of the load (also see wedges).
Claw hook	A chain hook in the shape of a claw.
Coaming	A frame border around the outside of a vehicle's loading deck.
Contained load	Is a load prevented from dislodging from the vehicle by the vehicle structure, gates, sides, racks, headboards, stanchions etc or other parts of the load. Certified LR curtains are not listed in the LRG, but should be allowed as part of an overall certified LR system.
Containment restraints	Side curtains and gates may be used as containment restraints.
Corner protectors	Material used to protect lashings and the exposed edges of loads and vehicles, and to allow lashings to slide freely when being tensioned.
Cradle	A frame shaped to support a load.

⁶ Source LRG 2004 Section I, paragraph 2.2 – Direct Restraint Systems

Deck	The load carrying surface of a vehicle.
Dog	A chain tensioner incorporating an over-centre locking action with a fixed or pivoting lever.
Dunnage	Packing placed either between items of a load or between the base of a load and the surface of the vehicle's loading deck (also see blocking). The word 'dunnage' is derived from the era of sailing ships where wood packing was used to raise the cargo above the bilge water in the hold.)
Flush deck	A flat loading deck without a raised coaming rail.
Gates	Permanent or removable vertical frames used at the front, sides and rear of a vehicles loading deck to contain its load. The front gate is usually called a loading rack or load rack.
GCM (Gross Combination Mass)	The value specified by the manufacturer of a vehicle as being the sum of its gross vehicle mass plus the maximum loaded mass of any trailer or motor vehicle that it can tow in combination or limited by the road authorities.
GTM (gross trailer mass)	The maximum mass transmitted to the ground by the axles of the trailer when it is loaded to its GVM and connected to a towing vehicle.
GVM (Gross Vehicle Mass)	The maximum mass of a motor vehicle when loaded, as specified by its manufacturer or limited by the road authorities.
Headboard	Usually a permanent vertical frame used at the front of a vehicle's loading deck to contain its load (also known as a bulkhead).
Heavy vehicle	For the purposes of this document, a heavy vehicle is a load carrying goods vehicle weighing more than 4.5 tonnes.
Lashings	Fastening devices, chains, cables, ropes or webbing used to restrain loads.
Lashing capacity (LC)	The maximum force (in kilograms) that a lashing system is designed to use.
Load binding	A device used for tensioning a lashing (see dog or tensioner).
Load capacity	The difference between the GVM or GTM/ATM of a load carrying vehicle and its tare mass.
Load mat	A sheet of material used to increase friction and protect the load (also called anti-slip mat or friction mat).
Load restraints	Load restraints are classified as tie-down/friction restraints or direct restraints (containing, blocking and attaching) or a combination of the two. Commonly, webbing and chains are used for tie-downs and direct restraints.
Pallet	A portable wooden or plastic platform or tray onto which loads are placed for mechanical handling. Sizes vary around the world. The Australian pallet is 1,165 ±3 mm square. Refer to AS4068.
Pawl	A lever or lock which prevents reverse rotation on a winch.
Pockets	Housings or slots fixed to the vehicle to locate gates, stakes or loading pegs.
Shackle	A metal coupling link closed by a bolt, which can be used for attaching chain fittings.
Shoring bar/pogo stick	Adjustable metal beam used to restrain or segregate sections of load (also known as a staling pole).

Stanchion	A large upright support fixed to the side of a vehicle or bolster for sideways restraint, eg; logs, pipe, poles, steel.
Stillage	A metal structure for containing individual items of load.
Tare mass	The unladen mass of a motor vehicle or trailer, ready for service and if applicable less driver with only 10 litres.
Tensioner	A device used to tighten a lashing (winch, dog, hand ratchet etc).
Tie down method	A tie down method is when the load is prevented from moving by friction only.
Tie rail	A round rail which skirts the perimeter of the loading deck below the coaming rail.
Turnbuckle	A tensioner consisting of a threaded sleeve and two mating threaded ends.
Twist lock	A locking device with a rotating head or pin, which normally engages a corner casting on the load. Eg; containers.
Wedge	A piece of rigid material, thick at one end and tapering to a thinner edge at the other (also see chocks).

TAP development process, history and validation

The process

The ITC will approve the need for the creation of a new TAP or the triennial routine review of an existing TAP. The nominated editor(s), who are listed below, with support of the ITC and specialist industry technical members as required, will agree on the TAP content with approval by a majority vote of ITC members. A suitably qualified and experience ATA appointed peer reviewer will further review the publication and if necessary, recommended changes. These changes will then be reviewed and approved again by a majority vote of ITC members before the document is released.

Document version control

Edition	Date	Nature of change / comment	Editor(s)
First	March 2017	Initial release	Chris Loose, ATA, Senior Advisor Engineering

The next is expected on or before March 2022 or when the 3rd edition of the LRG is issued if required.

Drafting committee, first edition

Member	Organisation	Title	Qualification
Stuart Donaldson	Polyweld	Business manager	Tenacitex & Axitex Load Rated Systems, truck side curtain manufacturer
Greg Brown	MaxiTRANS	Engineering and design manager	Engineer
Ian Brownlee	Barker Trailers	Engineering and design manager	Engineer
Ian Wright	Ian Wright & Associates	Principal	Industry Consultant
Bernard Dalton	Toll Holdings	Fleet operations	Fleet manager

Peer review

Edition	Date	Peer Reviewer	Organisation/qualification
First	December 2016	Keith McKinley	Bistecniks



About the ATA Industry Technical Council:

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.

Joining ITC:

We welcome applications to join the ITC. For further information,

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