



Load Restraints Toolbox Talk Part 2

SUBJECT	LOAD RESTRAINTS FOR HEAVY VEHICLES – PART 2
RESOURCES	PowerPoint Presentation Load Restraint Fact Sheet Loading Guide Performance Standards

LOAD RESTRAINTS HEAVY VEHICLES

Facilitator

Explain to trainees:

In Part 1 toolbox you covered load restraints and why a load needs to be restrained and legal obligations.

This toolbox talk - Part 2 toolbox will go into more detail on how Pantechnicon and Containers are loaded correctly.

Note: Performances standards will be covered again as a refresher.

TERMINOLOGY:

Dunnage (Trucking) is the cushion or barrier used to prevent cargo slides, protect goods and ensure that items are securely stowed. Common materials used for dunnage include wood, metal and plastic.

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The following guidelines outline how to comply with Performance Standards for securing contained loads. These guidelines serve as a reference and alternative methods for load restraint are permissible. It is advisable to have an engineer certify any alternative methods used.

What are performance standards?

Performance standards when applied in regulations, they offer a flexible approach. By specifying the minimum standards that need to be met, there is room for flexibility in achieving the desired outcome, if the chosen method meets or surpasses the performance criteria. This allows individuals or businesses to select an approach that aligns with their specific requirements that best meets their needs. For example, braking performance is determined by the stopping distance or the rate at which the vehicle must be slowed, rather than by the size, type, or design of the brakes

Why are performance standards important?

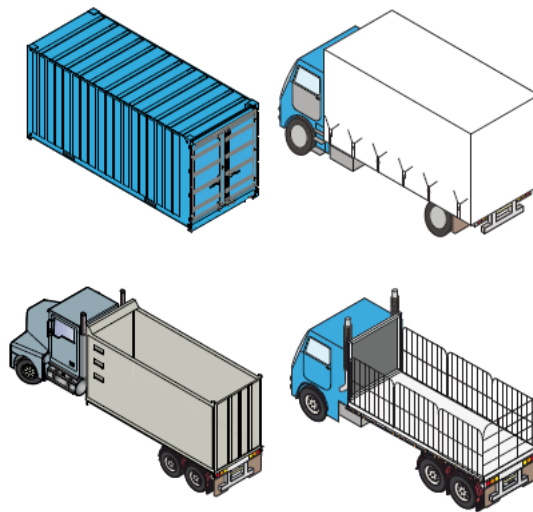
Performance standards provide a flexible approach to your specific requirements, allowing you to tailor a load restraint system that best meets your business needs. The performance standards offer industry and regulators clear guidelines on what is deemed safe and compliant.

Contained loads cover loads transported in various types of vehicles such as containers, tippers, drop-sided vehicles, panttechnicon, curtain-sided vehicles, flattop vehicles with gates, and tankers.

The following will describe the methods used for loading a panttechnicon and container. Large, heavy items are loaded towards the back, forming a bottom tier with lighter items filling in any gaps. Items are squared off in the same manner as the panttechnicon. Any small gaps are filled to prevent any movement.

Samples of vehicles:

Figure 177 Container, curtain-sided, tipper truck and flat top with gates



Panttechnicon (Pantech)



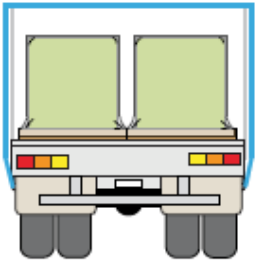

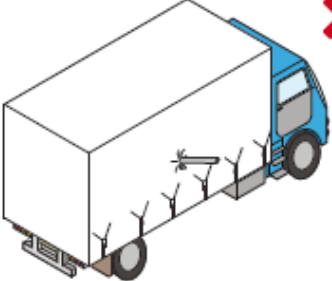
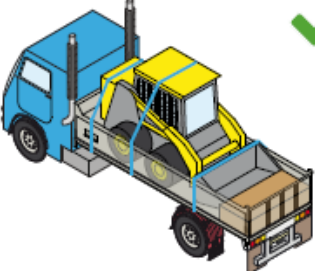
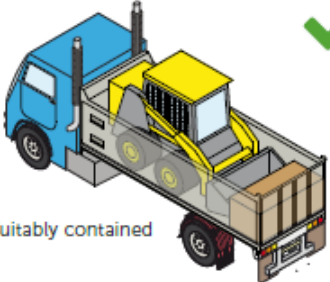
GENERAL TIPS

✓	Always pack contained loads tightly to minimise movement horizontally
✓	Fill gaps with empty pallets, dunnage, foam or other suitable materials.
✗	Do not leave gaps unblocked in contained loads as freight can move during transport.

PANTECHNICON, CURTAIN-SIDED & FLAT TOP

<p>✓</p>	<p>Pack loads tightly within the vehicle body and sides to prevent the load from moving sideways or forwards or backwards – Figure 178.</p>	<p><i>Figure 178 Contained load tightly packed</i></p>
<p>✓</p>	<p>Where freight is wrapped onto a pallet, make sure sufficient packaging is applied to prevent freight movement on the pallet.</p>	
<p>✓</p>	<p>Fill gaps with empty pallets, dunnage, Figure 179 Contained load – gaps filled foam or other suitable materials – Figure 179.</p>	<p><i>Figure 179 Contained load – gaps filled</i></p>

<p>✗</p>	<p>Do not leave gaps unblocked in contained Figure 180 Gaps in contained load loads as freight may move during transport and impact the containment body – Figure 180.</p>	<p>Figure 180 Gaps in contained load</p>
<p>✓</p>	<p>Where tight packing is not possible, the total of all gap widths in any direction must be less than 200 mm front to back and 100 mm side to side – Figure 181.</p>	<p>Figure 181 Maximum gap width</p> <p>A + B less than 100 mm</p>
<p>✓</p>	<p>If freight is unable to be packed tightly, and there are cumulative gaps of more than 200 mm front to back or 100 mm side to side, use extra restraint on freight (for example, use lashings).</p>	
<p>✓</p>	<p>Make sure gates are high enough to prevent the load from bouncing out – Figure 182.</p>	<p>Figure 182 Containment by gates</p> <p>Insufficient containment height on mezzanine deck</p> <p>Insufficient containment height for stacked pallets</p>
<p>✓</p>	<p>Lash gates to provide additional strength and prevent the load from bouncing out over the gates – Figure 183.</p>	

	<p><i>Figure 183 Lashed gates</i></p>  <p>Flat top – gates lashed</p>  <p>Curtain-sided vehicle – gates lashed</p>	
<p>✓</p>	<p>Use side curtains to contain loads only if the vehicle and curtain system are certified for the particular application.</p>	
<p>✗</p>	<p>Do not use side curtains to restrain any load that may damage the curtains, such as sharp objects – Figure 184.</p> <p><i>Figure 184 Damaged side curtain</i></p> 	
<p>✓</p>	<p>Restrain all loads supported on springs and/or pneumatic tyres that can bounce out of their containment – Figure 185.</p> <p><i>Figure 185 Suspended load</i></p>  <p>Limited restraint from short containment walls – lashed for extra restraint</p>  <p>Suitably contained</p> <p><i>Figure 186 Unbalanced load</i></p>	

LOADING A CONTAINER

Figure 186 Unbalanced load



✓ When loading freight into containers, make sure there is even weight distribution both across the width and preferably along the length of the container.

⚠ Uneven weight distribution may affect the stability of the carrying vehicle – Figure 186.

⚠ Consignors should advise drivers how a containerised load is packed so that they can understand the impact of the load on the vehicle's stability and drive accordingly.

⚠ Consignors should mark the centre of gravity on the container if it is more than 10% of the container length away from the container centre – Figure 187.

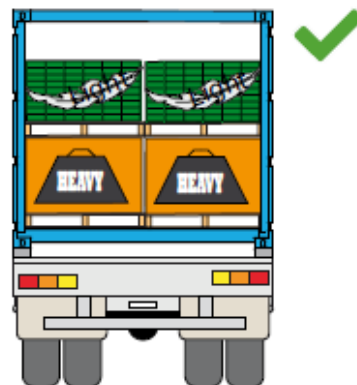
⚠ Drivers should request information on the packing of the container from the consignor.

Figure 187 Offset centre of gravity



✓ Load light freight on top of heavy freight to lower the centre of gravity and increase vehicle stability – Figure 188.

Figure 188 Light on heavy load



✓ Make sure blocked loads do not exceed the allowable wall or floor loads for all modes of transport in the supply chain.



For maximum wall and floor loads in general purpose containers refer to Australian Standard AS 3711.4 Freight containers Part 4: General purpose containers.

Figure 189 Manufacturer-specified capacity

✗ Do not exceed the manufacturer-specified maximum allowable load mass of the container or vehicle – Figure 189.

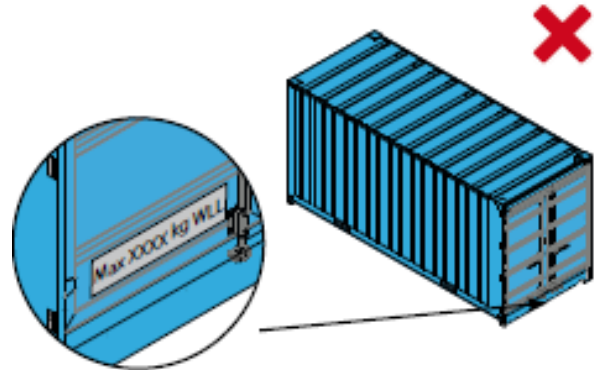


Figure 190 Maximum allowable axle masses

✗ Do not exceed the maximum allowable axle masses of the carrying vehicle – Figure 190.

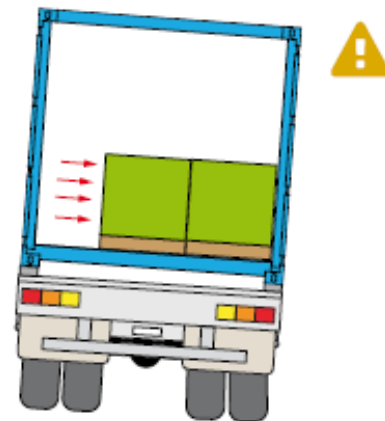


Figure 191 Containerised load – tightly packed

✓ Pack loads tightly within containers – tightly packed loads prevent the load from moving sideways or horizontally – Figure 191 & 192,



Figure 192 Sideways movement



Sideways gaps in load

Figure 193 Containerised load – gaps filled

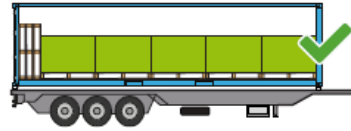
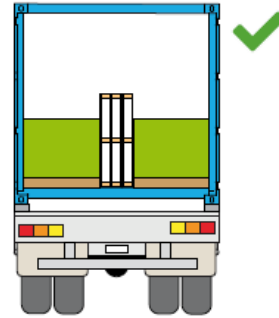


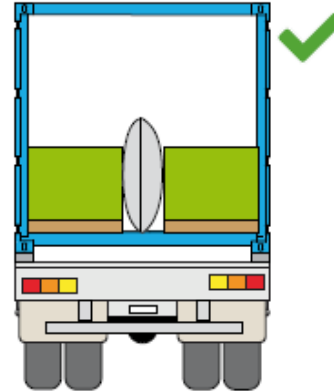
Figure 194 Sideways movement



Gap filled with pallets

✓ Fill gaps with empty pallets Figure 193 and Figure 194, dunnage, foam, custom framing or other suitable materials.

Figure 195 Load packed with air bags



✓ Use rated inflatable dunnage as part of restraint systems within containers – Figure 195.

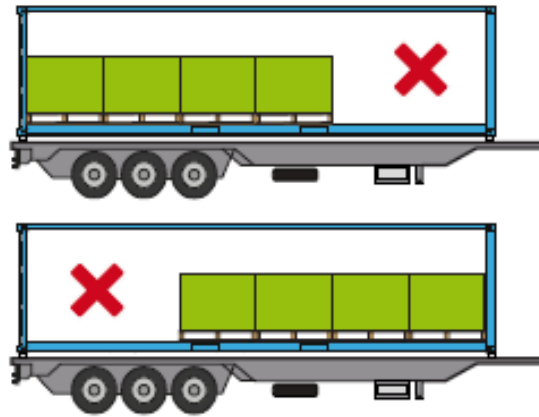
Figure 196 Air bags with sharp load



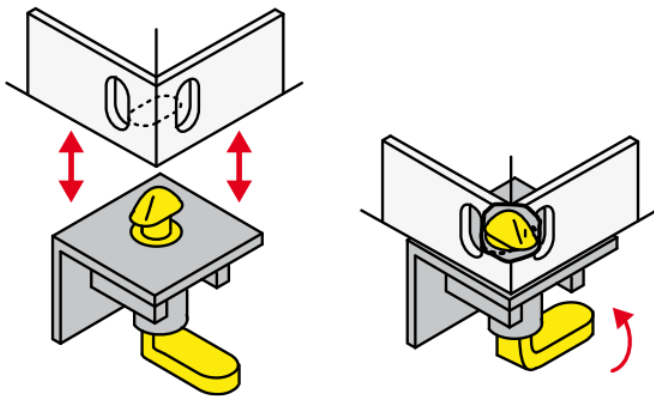
✗ Do not use inflatable dunnage to restrain sharp objects – Figure 196.

Figure 197 Gaps in containerised load

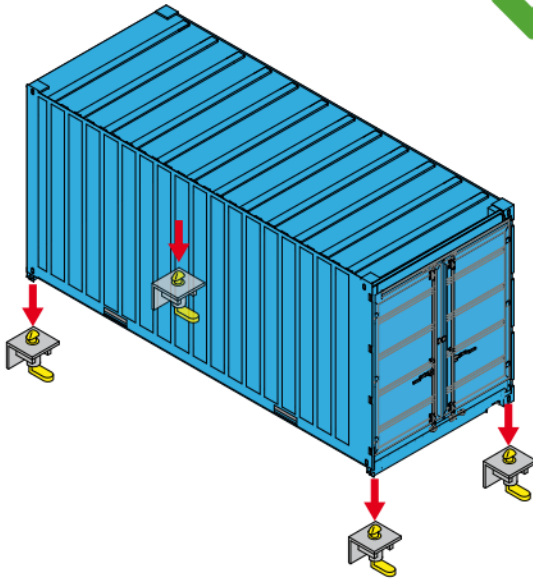
✘ Do not leave gaps unblocked in containerised loads because freight may move during transport and impact the container walls – Figure 197.



RESTRAINING CONTAINERS



All ISO and most other shipping containers and flat platforms are equipped with corner castings designed to interlock with mating “twist locks” for lifting or restraint.



Container restrained by twist locks

✓ Restrain shipping containers with four twist locks.



Direct restraint tie rail

✓ Make sure direct restraint of loaded shipping containers is part of an engineered load restraint system.

✗ Do not lash shipping containers if they are carrying any load.

⚠ Tie rail anchor points are not strong enough to restrain laden shipping containers.



Empty container tied down



Empty container cross-chained

✓ If containers are empty and twist locks are not fitted, restrain them using tie downs or crossed chains.

✓ Place empty containers on rough sawn timber, anti-slip rubber matting or other high-friction material if restraining them by tie-downs or cross chains.

⚠ Timber or anti-slip matting placed under the container must be strong enough to withstand high pressures without disintegrating.

✗ Do not restrain empty containers with cross chains or tie-down on low-friction surfaces (i.e. steel on steel).



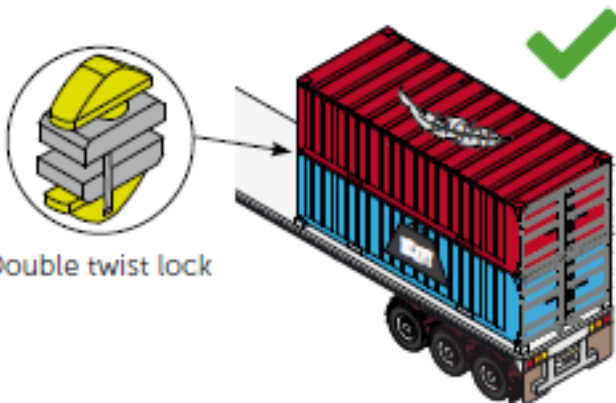
Loaded container with doors to the rear

✓ Load containers with doors to the rear of the carrying vehicle at all times.



Loaded container with doors to the front

⚠ If doors are towards the front of the carrying vehicle, the forward restraint may not be adequate for heavy loads.



Double twist lock

Stacked low-height containers

✓ Stack low-height containers and flat Stacked low-height containers platforms (where required) with double twist lock fittings

✓ Keep the heavier container at the bottom to lower the centre of gravity and maximise vehicle stability.

IMPORTANT THINGS TO CHECK:

Check the container before use for leaks/damage.

All pads and felts must be kept in neat piles when not in use.

- Articles are prepared and stowed in the same manner used when loading a pantehnicon.
- Fragile items must be well padded and lightweight goods because they form the top tier of a stack.
- Any goods that will be needed first are loaded into the container last, or in accessible positions.
- **Stow goods to ensure an even weight distribution inside the container.**
- **Check for any gaps or unused space, once stowing has been completed. Fill these with unused hessian, bags of paper, etc., to ensure the load is firmly fixed.**
- **Once loading has been completed, check all locks are firmly in position. This includes the twist locks securing the container to the vehicle, as well as door locks.**

Note: Before leaving the residence, check with the client or agent that all items in the consignment have been removed from the house (and the outhouses) and have been loaded securely.

RESOURCES:

Load Restraint Guide: www.nhvr.gov.au/files/202112-1285-load-restraint-guide-2018.pdf

Extracts from Load Restraint Guide

- Pages 81-88
- Pages 97-99

NHVR:

Loading Guide Performance Standards

NHVR - Loading Guide Performance Standards

LOADING PERFORMANCE STANDARDS

(1) A load on a heavy vehicle must be restrained by a load restraint system that:

(a) prevents the load from moving in relation to the heavy vehicle (other than movement allowed under subsection

(2)) in the circumstances mentioned in subsection (3); and (b) at a minimum, is capable of withstanding the forces that would result in the circumstances mentioned in subsection (3).

(2) A load may move in relation to a heavy vehicle if:

(a) the vehicle's stability and weight distribution are not adversely affected by the movement; and

(b) the load does not become dislodged from the vehicle.

Examples of load movement that may be permitted under (2)

1. load contained within the sides or enclosure of the heavy vehicle that is restrained from moving horizontally may be able to move vertically;

2. a load of very light objects, or a loose bulk load, that is contained within the sides or enclosure of the heavy vehicle may be able to move horizontally and vertically;

3. a bulk liquid load contained within the sides or enclosure of the heavy vehicle.

(3) For subsection (1), the circumstances are that the loaded vehicle is subjected to:

(a) any of the following, separately:

(i) 0.8 g deceleration in a forward direction;

(ii) 0.5 g deceleration in a rearward direction;

(iii) 0.5 g acceleration in a lateral direction; and

(b) if friction or limited vertical displacement is relied on to comply with (a), 0.2 g acceleration in a vertical direction relative to the load.

Source: *NTI – Load Restraint Guide 2018*



Items Raised/Corrective Action	Action By	Action completed	
		Sign off	Date

DATE:

FACILITATOR SIGNATURE



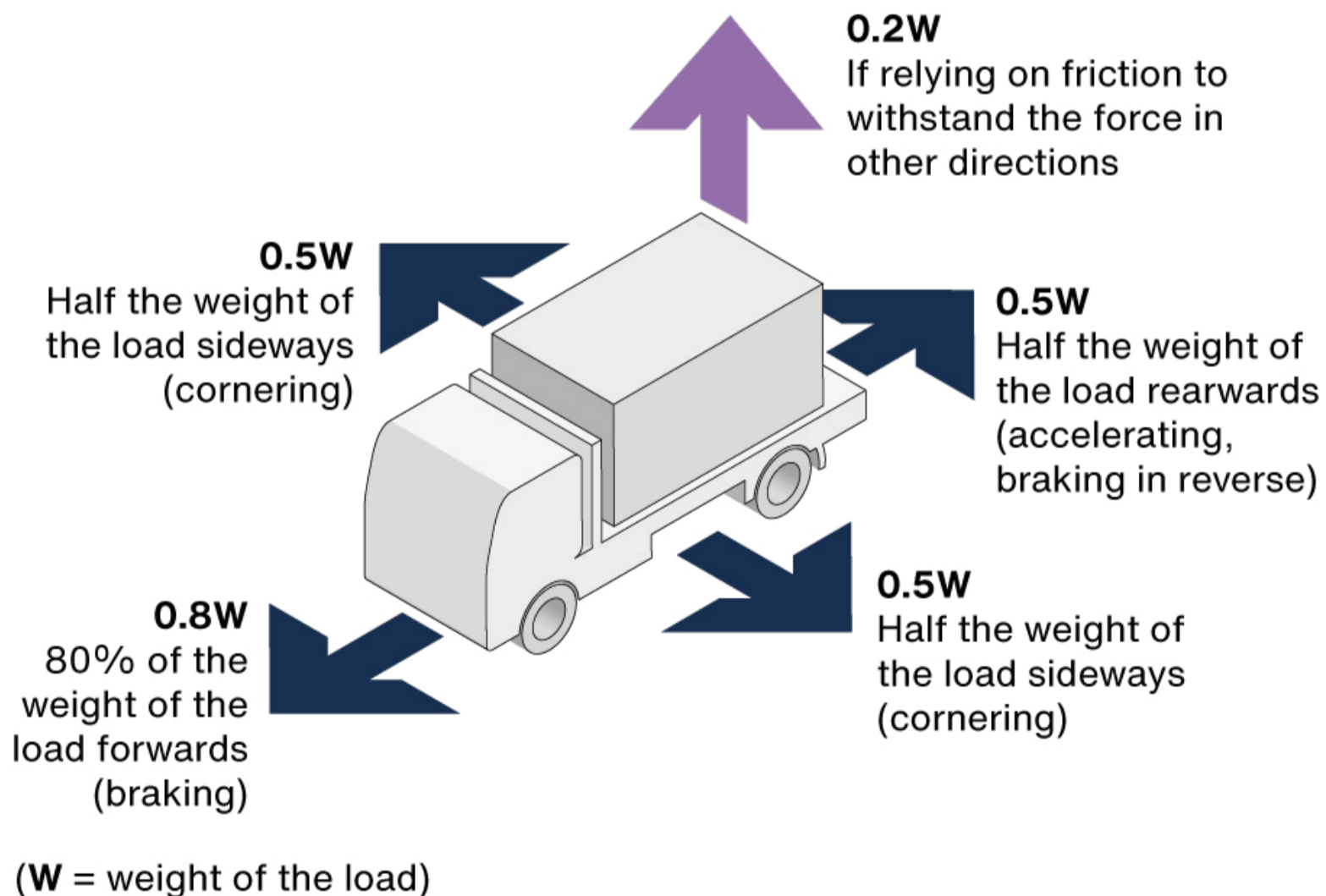
The Performance Standards set out the minimum amount of force a restraint system must be able to withstand in each direction.

The load on a heavy vehicle must:

- ✓ Be secured so it is unlikely to fall or be dislodged
- ✓ Be restrained using an appropriate method
- ✓ Be placed, secured or restrained in a way that meets the Performance Standards.



PERFORMANCE STANDARDS REQUIREMENTS



Under the Heavy Vehicle National Law, it is your duty to comply with the Loading Requirements. Learn more about the Performance Standards, load restraint and other useful information on our Loading page.