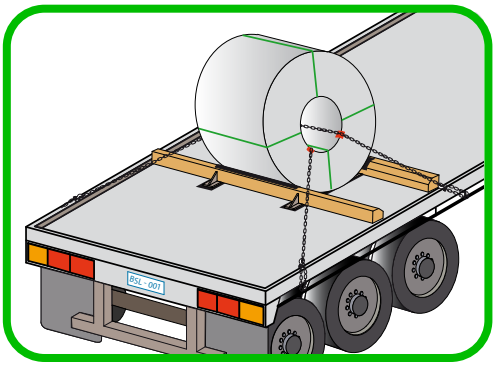
Load Restraint System
Bore Horizontal Coil in Coil Racks

BH

1. This System applies for:



- Transporting bore horizontal coils with the following minimum outside diameters:
  - 650mm for 610mm Racks;
  - 950mm for 710mm Racks;
  - 1280mm for 810mm Racks. (Fig.1.1)
- Coils configured **single file or two abreast** excluding checker plate coils. **Refer to LRG123-BH for load restraint requirements for checker plate coils.**

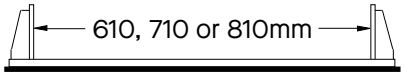


Fig.1.1: Always round intermediate coil rack sizes down to 610, 710 or 810mm.

2. Certification

- This load restraint system has been certified as meeting the Performance Standards in the NTC's Load Restraint Guide 2018 by the Senior Risk Engineer, RPEng (0845).

3. Essential Requirements

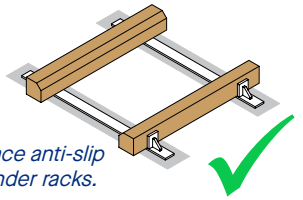


Fig.3.1: Place anti-slip material under racks.

- **All restraints MUST be 8mm transport chain with a Lashing Capacity of 4.0 tonnes or higher and comply with AS/NZS4344. (See LRG17-EQ for further details).**
- **Chain numbers and configurations MUST comply with Section 4.** Drivers may add additional chains if desired.
- Use anti-slip matting or strips of anti-slip material to cover a minimum of 90% of the underside of every coil rack. **No Steel on Steel contact.** (Fig.3.1)
- Coil racks **MUST** be placed under each coil and, where possible, above the vehicle's chassis rails. ***Place a third coil rack for narrow coils to stop the coil or timbers from touching the deck.***

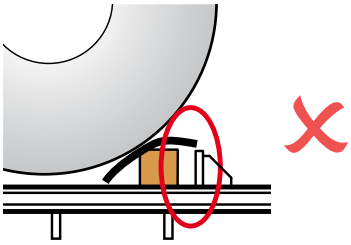
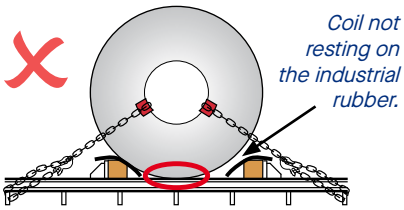


Fig.3.2: A gap between the timber and the coil rack can allow chains to loosen during transport.

- Use only **100mm x 100mm nominal**, full trailer width, hardwood dunnage with a 30mm chamfer. (See LRG18-EQ for further details).
- Place hardwood dunnage up against vertical upright of the coil racks, **NO** gaps allowed. (Fig.3.2)
- Place coils on the centre line of the vehicle.
- Place industrial rubber between the full width of the coil and the racked dunnage. Unglued strips must be at least 250mm wide.



Coil not resting on the industrial rubber.

*Fig.3.3: Coils must **NOT** touch the vehicle's deck or the steel coil rack.*

- Place polyurethane corner protectors or other approved edge protectors, beneath each chain to protect the coil bore.
- **DO NOT** allow coils to touch the vehicle's deck or the steel coil rack. (Fig.3.3)
- **DO NOT** load coils if the coil banding has visible faults or damage. The steel bands should be under tension. Contact your Supervisor if in doubt.
- Notching of dunnage is NOT recommended. If notched, the timber **MUST NOT** sit on the trailer deck as this will reduce the effectiveness of the anti-slip material.

DO NOT use thin or short pieces if doubling up dunnage in coil racks to reduce the rack size. Use only full width 100 × 100mm dunnage. Chamfered dunnage can be used. (Fig.3.4)

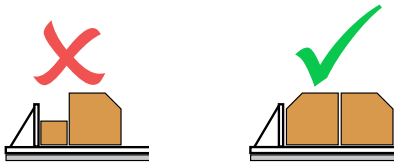


Fig.3.4: Use 100 × 100mm hardwood dunnage as a spacer to reduce rack size, i.e. 810mm down to 710mm. Chamfered dunnage is acceptable.

3.1 Two Abreast Coils

Combine the individual coil weights and widths in a row when calculating the load restraint for that row.

Use two coil racks aligned with the centre of each coil, extra coil racks can be used for extra support, if required. (Fig.3.5)

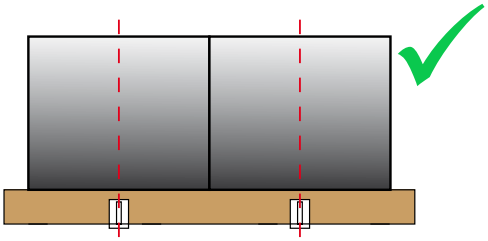


*Fig.3.5: Coil racks **MUST** be aligned with the centre of each coil when loaded two abreast.*

DO NOT leave a gap between the coils (Fig.3.6). If a gap is required for unloading purposes, use 100 × 100mm hardwood dunnage between the coils, spanning the full width of the coil racks. The dunnage **MUST** not come loose during transit.

DO NOT load coils with bore height differences of more than 100mm or weight differences of more than 0.5 tonnes. (Fig.3.6)

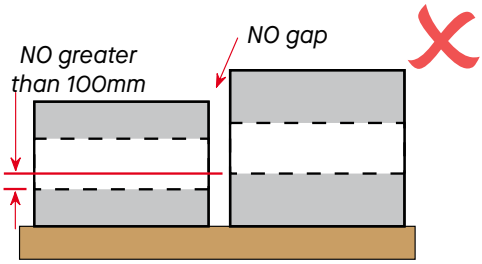
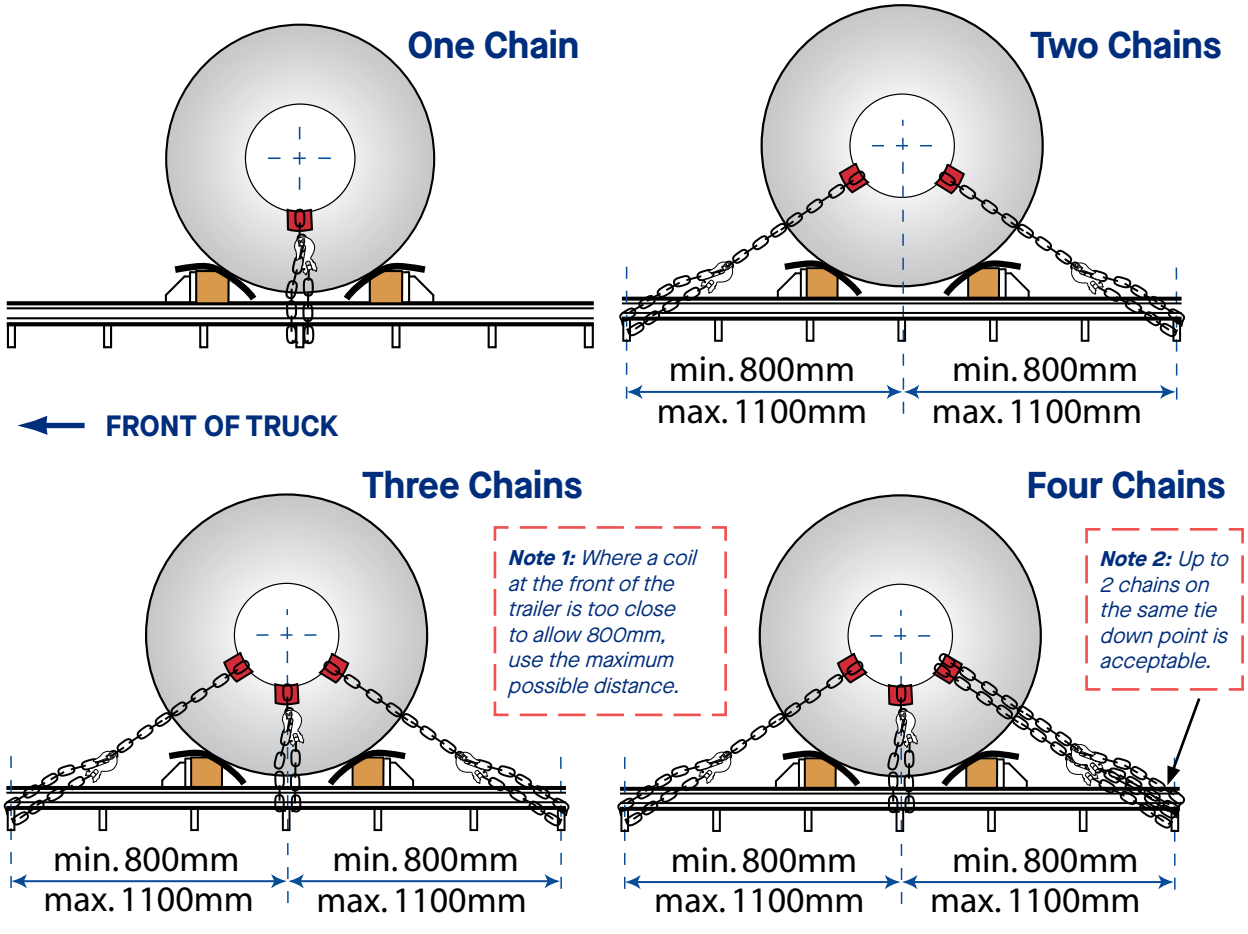


*Fig.3.6: Two abreast coils are to have similar heights with **NO gaps** between them.*

4. Restraint Systems

4.1 Load Restraint Chain Configurations



4.2 Coil Mass Limits and Chain Requirements - 4 Tonne Chain System

610mm Coil Racks

Single File Coil Mass Limits				
Sheet width (mm)	**1 Chain** (Tonne)	**2 Chains** (Tonne)	**3 Chains** (Tonne)	**4 Chains** (Tonne)
600 to 699	2.6	6.1	6.1	6.1
700 to 799	2.8	7.1	10.7	10.7
800 to 899	3.0	7.3	11.6	13.9
900 to 999	3.1	7.5	11.8	14.0
1000 to 1099	3.3	7.7	12.0	14.2
1100 to 1199	3.5	7.9	12.3	14.5
1200 or greater	3.8	8.1	12.6	**15.7** / 14.7

(see Note 3)

Two Abreast Combined Coil Mass Limits		
Sheet width (mm)	**1 Chain** (Tonne)	**2 Chains** (Tonne)
1200 to 1399	3.8	8.1
1400 to 1599	4.4	8.6
1600 to 1799	5.2	9.1
1800 to 1999	6.4	9.6
2000 to 2199	7.8	10.0
2200 to 2440	9.3	10.4

710mm Coil Racks

Single File Coil Mass Limits				
Sheet width (mm)	**1 Chain** (Tonne)	**2 Chains** (Tonne)	**3 Chains** (Tonne)	**4 Chains** (Tonne)
600 to 699	3.8	6.1	6.1	6.1
700 to 799	4.1	8.2	10.7	10.7
800 to 899	4.4	8.5	13.0	**16.1** / 14.7
900 to 999	4.7	8.9	13.3	**16.5** / 14.7
1000 to 1099	5.0	9.2	13.7	**16.5** / 14.7
1100 to 1199	5.4	9.6	14.1	**16.5** / 14.7
1200 or greater	5.8	9.9	14.6	**16.5** / 14.7

(see Note 3)

Two Abreast Combined Coil Mass Limits		
Sheet width (mm)	**1 Chain** (Tonne)	**2 Chains** (Tonne)
1200 to 1399	5.8	9.9
1400 to 1599	6.7	10.7
1600 to 1799	7.8	11.4
1800 to 1999	9.2	12.2
2000 to 2199	10.8	12.9
2200 to 2440	12.4	13.5

810mm Coil Racks

Single File Coil Mass Limits				
Sheet width (mm)	**1 Chain** (Tonne)	**2 Chains** (Tonne)	**3 Chains** (Tonne)	**4 Chains** (Tonne)
600 to 699	–	6.1	6.1	6.1
700 to 799	–	9.7	10.7	10.7
800 to 899	–	10.1	**15.7** / 14.7	**16.5** / 14.7
900 to 999	–	10.6	**16.3** / 14.7	**16.5** / 14.7
1000 to 1099	–	11.2	**16.5** / 14.7	**16.5** / 14.7
1100 to 1199	–	11.7	**16.5** / 14.7	**16.5** / 14.7
1200 or greater	–	12.3	**16.5** / 14.7	**16.5** / 14.7

(see Note 3)

Two Abreast Combined Coil Mass Limits		
Sheet width (mm)	**1 Chain** (Tonne)	**2 Chains** (Tonne)
1200 to 1399	–	12.3
1400 to 1599	–	13.4
1600 to 1799	–	14.5
1800 to 1999	–	**16.5** / 14.7
2000 to 2199	–	**16.5** / 14.7
2200 to 2440	–	**16.5** / 14.7

(see Note 3)

Note 3: *The maximum coil size restrained by these methods is limited to the* ***bold typed numbers*** *for coils with 508mm internal bore, (eg. coated coils), or all other numbers for larger bore coils, hot rolled coils (760mm bore) and pickled oiled coils (610mm bore).*

Note 4: *Coils heavier than the weights shown in this table may* ***not*** *be moved safely using this restraint system. It is recommended an alternate Bore Horizontal System or method be used. Contact BlueScope Health & Safety - Risk Engineering on (02) 4275 7522 for advice if unsure.*

Note 5: *Coils with a 760mm bore greater than 14.7 tonnes can be carried as per the guidance stipulated in TAL441 Issue 2.*

Restraint System - Coil Cradle on Vehicle Deck - Forwards and Rearwards - Direct & Indirect Restraint, Sideways - Indirect;
- Coil in Cradle - Forwards and Rearwards - Direct Restraint, Sideways - Indirect Restraint & "Cradle Wedge" Effect.

4.3 Coil Mass Limits and Chain Requirements

- Where a **3 tonne chain system** is to be used, apply the 4 tonne chain system requirements as per Section 4.2 **plus 1 extra chain** up to a maximum total of 4 chains.
- Claw Hooks and Winged Grab Hooks provide a 4.0 tonne chain system. (Fig.4.1)
- Standard Grab Hooks generate a bending effect in the chain that de-rates the chain capacity by 25% to a 3.0 tonne chain system. (Fig.4.1)
- The chain should be hooked to the chain back **above** the coaming rail where possible. If the chain is hooked back onto itself **below** the coaming rail it is de-rated to 3 tonnes. (Fig.4.2)

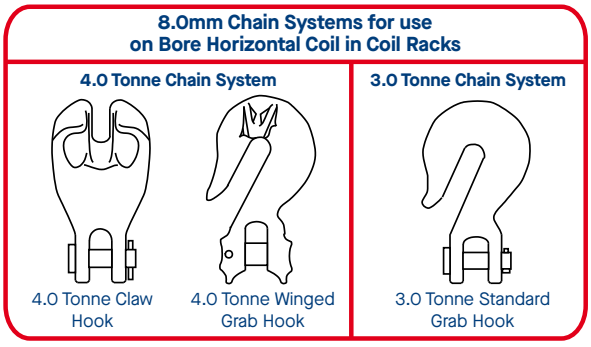


Fig.4.1: Lashing Capacities of Chain Systems

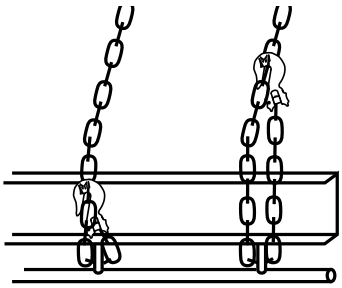


*Fig.4.2: Hooking the chain back on itself **above** the coaming rail maintains a 4 tonne system.*

4.4 Material Specifications for Rubber in Coil Racks

Minimum specification for the Anti-Slip Material:

- Dynamic coefficient of friction with smooth steel (μ_d) ≥ 0.6.
- Recommended minimum thickness is 8mm for durability.

DO NOT use Insertion rubber or Rubber conveyor belt.

Minimum specification for the Industrial Rubber:

- Static coefficient of friction with smooth steel (μ_s) ≥ 0.4.
- At least 6mm in thickness and 250mm width (unless glued).

DO NOT use Rigid core conveyor belt, Age hardened/cracked rubber or Split belt with soft rubber face (unless the fabric side is glued to the chamfered face of the dunnage).

5. Maintenance/Safety/Retensioning Requirements

Visually inspect all equipment for damage prior to use.

Maintain load binders as per manufacturer's recommendations.

Retension binders periodically for linehaul transport or long trips and following emergency braking.

Ensure Anti-Slip Material is used on the underside of the coil racks and is in good conditon. Anti-Slip Material MUST cover a **minimum of 90%** of the underside of the racks. **NO Steel on Steel Contact.**

DO NOT use racks where the Anti-Slip material is worn or missing at the ends or racks are visibly bent. Refer to LRG16-EQ for condition requirements on coil racks.