
AUSTRALIAN ASSOCIATION OF
LIVE STEAMERS**S**

CODE OF PRACTICE
STANDARDS FOR INTEROPERABILITY AND SAFETY OF
MINIATURE RAILWAYS, ROAD VEHICLES AND PLANT



STANDARDS

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About this code

This Code of Practice has been compiled by the Australian Association of Live Steamers for use by Member Societies so that a minimum standard of competency can be achieved by their Society Members.

By adopting the requirements and procedures outlined in this code the Association and its Member Societies recognise their obligation to provide a safe environment for visiting public and members alike which will be engendered at the many operating locations throughout Australia.

This Code of Practice for the Standards for Interoperability and Safety of Miniature Railways, Road Vehicles and Plant was revised and re-formatted in 2009 as part of the general revision of the Code of Practice, to reflect changes made at the April 2009 convention and suggestions made through a formal process of consultation to make the document more user-friendly and comprehensive.

Amendments are listed in section 12.

Distribution and change

The AALS maintains the master for this document and publishes the current version on the AALS website www.aals.asn.au

Any changes to the content of this publication will also update this control page. The control page defines the current version of this document. Changes to this document are approved by vote by the member Societies of the Association in accordance with the Association's Constitution and Standing Orders.

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Contents

1.	DEFINITIONS.....	4
2.	GENERAL.....	4
3.	CONTEXT.....	4
4.	MINIMUM BRAKING REQUIREMENTS FOR MINIATURE PASSENGER CARRYING RAILWAYS.....	5
5.	LOCOMOTIVES.....	6
6.	PUBLIC PASSENGER CARRYING AND DRIVING CARRIAGES.....	7
7.	SCALE TYPE ROLLING STOCK (NON RIDING).....	10
8.	INFRASTRUCTURE.....	10
9.	RECOMMENDED TRACK AND WHEEL PROFILE STANDARDS.....	12
10.	COUPLINGS AND INTER-VEHICLE CONNECTIONS.....	17
11.	ALTERNATIVE COUPLINGS.....	23
12.	AMENDMENTS TO THIS CODE.....	30

1. DEFINITIONS

- 1.1. For definitions see the AALS Code of Practice:- Operation of Miniature Railways, Road Vehicles and Plant.

2. GENERAL

- 2.1. This Code of Practice is intended to cover minimum safe operating requirements of affiliated societies operating miniature railways of gauges between 32mm (1¼") and 204mm (8"), operating at a speed not exceeding 20 km/h, road vehicles and plant, as non-commercial hobby operations.
- 2.2. This code is in accordance with the Aims and Objects as detailed in the Australian Association of Live Steamers Constitution.
- 2.3. With changes to Amusement Device Legislation in various States of the Commonwealth and the trend for self regulation by industry and business in general the need for a high standard of competency in operators is required.

3. CONTEXT

- 3.1. This Code of Practice for Standards for Interoperability and Safety of Miniature Railways, Road Vehicles and Plant should be read in conjunction with:
 - 3.1.1. AALS Code of Practice:- Operation of Miniature Railways, Road Vehicles and Plant;
 - 3.1.2. AALS Code of Practice:- Training of Operators and Attendants of Miniature Railways, Road Vehicles and Plant; and
 - 3.1.3. AS 3533 - 2009 Amusement Rides and Devices.
 - 3.1.4. AALS Constitution.
 - 3.1.5. AALS Standing Orders.

4. MINIMUM BRAKING REQUIREMENTS FOR MINIATURE PASSENGER CARRYING RAILWAYS

- 4.1. A Society shall have a braking policy in accordance with the AALS Code of Practice "OPERATION OF MINIATURE RAILWAYS, ROAD VEHICLES AND PLANT" 2013 clause 5.1.1.2.
- 4.2. A light engine shall be fitted with a braking system capable of stopping the engine in compliance with the Society's braking policy.
- 4.3. All trains running on a track open for public passenger carrying shall be fitted with a braking system capable of stopping the train in compliance with the Society's braking policy.
- 4.4. A train must be able to be secured indefinitely on the ruling grade of a track, in the tare condition. If chocks or other devices are required, these must be readily available.
- 4.5. Minimum requirements for a train are specified in the table below.

Train category	Small	Small-Medium	Medium	Heavy
Typical loco	non ride-on. 2.5", 3.5" and small 5"g	5"g and small 7.25"g	Large 5"g, most 7.25"g	Large 7.25"g
Typical loco mass (excl tender) (5)	Up to 35 kg approx.	Over 35kg up to 150kg	Over 150kg up to 400kg	Over 400 kg
Typical max passenger capacity	Up to 4	Up to 12	Up to 35	Over 35
Typical max train mass (excl loco+tender)	400 kg	1100 kg	3000 kg	Over 3000 kg
Loco mechanical parking brake (retentive)	Not required(1)	Recommended(1)	Recommended(1)	Mandatory
Loco brake, power-operated	Not required	Recommended	Recommended	Mandatory
Driver's vehicle brake (2)	Mandatory	Mandatory		
Train brake control automatically applies loco brake	Not required	Not required	Recommended (7)	Recommended (7)
Proportion of braked wheelsets on train(3)	33% minimum (6)	33% minimum	50% minimum	50% minimum
Guard able to apply braking (4)	Not required	Not required	Recommended	Mandatory

Notes to table:

1. Parked locomotives and trains to be secured, e.g. by retentive brake or spragging wheels.
2. Includes ride-in locomotive, ride-on locomotive tender, driver's truck or passenger car used for driving. For a ride-on tender or driver's truck this requirement is deemed fulfilled if the locomotive brake is used.
3. Percentage calculation based on payload carriages only. Train brakes are optional if the locomotive is braked and its mass exceeds the gross mass of the trailing load.
4. Requirement for a guard is specified in the Operations Code of Practice section 5.
5. With multiple locomotive units the masses should be summed to establish the train category.
6. In the Small category the driver's truck can be counted as payload.
7. A failsafe train brake system requires energy to hold the brakes off. If the train brake is not failsafe, an independent brake should also be provided (e.g. locomotive, tender, guard).

5. LOCOMOTIVES

5.1. General

- 5.1.1. Couplings between engine and Driving truck or carriage for both ground level and elevated operations shall be a solid bar type attached to a fork or clevis with a positive locked or screwed pin as defined in this Code of Practice.
- 5.1.2. Couplings between engine and tender shall:
 - 5.1.2.1. Be at least equal in strength to the coupling between engine and driving truck.
 - 5.1.2.2. Be safety checked, such period not to exceed two (2) years.
- 5.1.3. Automatic couplings shall not be used between the locomotive and the train unless the driver rides on or in the Locomotive.
- 5.1.4. Every locomotive shall be fitted with an audible warning device.

5.2. Steam

- 5.2.1. Every steam locomotive shall:
 - 5.2.1.1. Have a current boiler certificate issued under the relevant AMBSC Code or State Statutory Authority requirements before operating.
 - 5.2.1.2. Be operated in a manner so as not to emit sparks that cause damage or personal injury.
 - 5.2.1.3. Discharge steam or condensate from blow down, steam traps or any other source to a place where there is no risk of injury to persons.
 - 5.2.1.4. In the case of liquid fuel fired or gas fired boilers, have adequate safeguards to deflect fuel spillage away from dangerous areas.

5.3. Non-Steam

- 5.3.1. Every non-steam Locomotive shall:
 - 5.3.1.1. Have a cut out device, which when operated, will render the Locomotive inoperable when unattended.
 - 5.3.1.2. Have exhaust fumes directed away from the Operator and persons riding on the Train.
 - 5.3.1.3. Have hot exhaust pipes or other areas likely to cause burns to persons adequately protected by lagging or shielding.
 - 5.3.1.4. In the case of liquid fuelled internal combustion engines, have adequate precautions to deflect spillage away from dangerous areas.

6. PUBLIC PASSENGER CARRYING AND DRIVING CARRIAGES

6.1. General

- 6.1.1. Attention should be paid in the design stage to the centre of gravity of carriages and the centre of gravity shall be kept as low as possible.
- 6.1.2. Carriages shall be enclosed where necessary to prevent passengers contacting dangerous parts of the mechanism.

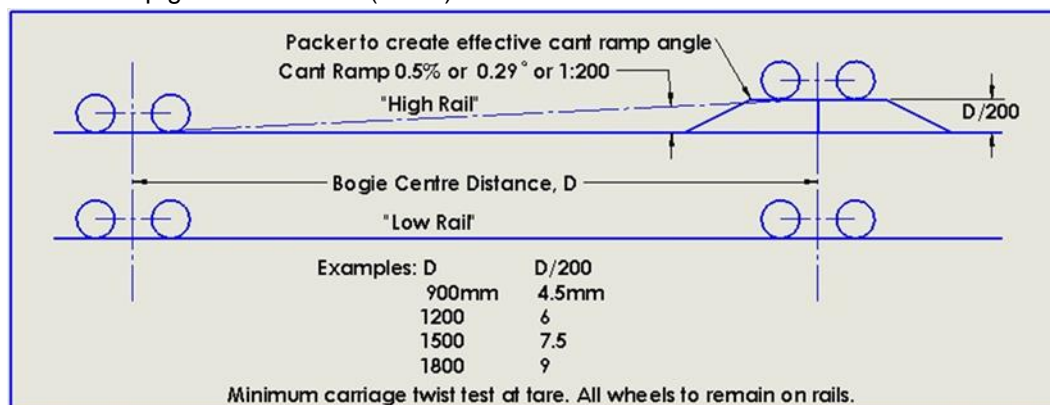
6.2. Couplings

- 6.2.1. Carriages utilised for public passenger carrying shall:
 - 6.2.1.1. Be fitted with adequate strength couplings.
 - 6.2.1.2. Be fitted with a backup arrangement. Acceptable backup arrangements include
 - (a) adequate safety chains
 - (b) link pins fitted with R clips or equivalent means of positive retention.
 - 6.2.1.3. Be coupled together using a solid bar type coupling where sprung draw gear is utilised.
- 6.2.2. Screw link couplings, correctly buffered, shall be permitted but loose link couplings shall not be used.
- 6.2.3. Automatic type couplings shall be permitted on ground level tracks only. Safety chains must be fitted where couplings are not positively locked or there is any possibility of couplings disengaging.
- 6.2.4. Couplers are not to be mounted on bogie frames.

6.3. Common requirements for carriages that are used for the carrying of public passengers

6.3.1. Carriages that are used for the carrying of public passengers shall:

- 6.3.1.1. Be a bogie type.
- 6.3.1.2. Incorporate end boards to prevent passengers riding across two carriages or slipping endways off the car.
- 6.3.1.3. Incorporate full length footboards on straddle type cars. Such footboards must not be of a width which may increase the risk of overturning or provide some other hazard, and if such footboards incorporate up-turned edges, such up-turned edges must not exceed 100mm in height.
- 6.3.1.4. Have full length guards provided to prevent passenger contact with track or running equipment.
- 6.3.1.5. Have a place at each end on to which a passenger can hold.
- 6.3.1.6. Incorporate a suspension arrangement that ensures the vertical forces act within the wheel gauge. Specifically, bogie sidebearers must lie within the wheel gauge. The recommended sidebearing spacing is between 0.8 and 0.93 of track gauge.
- 6.3.1.7. Have a minimum gauge of 127mm (5 inch).
- 6.3.1.8. Recognise and allow for the potential for overturning given the gauge, mass and width of the vehicle.
- 6.3.1.9. Be consistent with the track structure (including loading) and structure gauge of the railway.
- 6.3.1.10. Incorporate buffers or other protection to prevent the potential jamming of passengers' hands in the event of a derailment.
- 6.3.1.11. Have no places which could cause the trapping of a passenger's hands or limbs.
- 6.3.1.12. Be capable of negotiating, at tare and without lifting a wheel off the rails, the worst case twist in the track being used for passenger hauling. All newly-built carriages shall be capable of negotiating, at tare and without lifting a wheel off the rails, a minimum cant ramp gradient of 0.5% (1:200).



- 6.3.1.13. Where plain gap-type side bearers are fitted, the weight of the carriage when centralised must be carried on the centre plate such that there is a finite gap at each sidebearer. Gaps of approximately 1mm are appropriate.

- 6.4. 127mm (5") Gauge Straddle Type Public Passenger Carriages
- 6.4.1. Straddle type Carriages that are used for the carrying of public passengers utilised on 127mm (5") gauge railways should have the following characteristics:
- 6.4.1.1. Length 1520-1830mm (5' - 6') long,
 - 6.4.1.2. Seat boards 250-300mm (10"-12") wide
 - 6.4.1.3. Seat Height 180-250mm (7"-10") above footboards (ground level rolling stock)
 - 6.4.1.4. Foot boards 100 -115mm (4" - 4½") wide, seat 5 adults maximum
 - 6.4.1.5. End boards 100mm (4") high minimum above the seat
 - 6.4.1.6. Hand holds approximately 50-150mm (2"-6") above the seat
- 6.5. 184mm (7¼") Gauge Carriages that are used for the carrying of public passengers
- 6.5.1. Carriages that are used for the carrying of public passengers whether straddle type or sit-in type, utilised on 184mm (7¼") gauge railways should have the following characteristics:
- 6.5.1.1. Length 1830mm-2500mm (6'-8') long bogie type to seat 4 to 7 Adults.
 - 6.5.1.1.1. Notwithstanding the provisions of clause 6.5.1.1 the length of 7¼" gauge carriages may be extended beyond the 2.5m to 4.5m when the design provides adequately for such length and additional loading and includes design features which ensure a low centre of gravity. Such features may include but not be limited to drop centres, underfloor location of air tanks, and suitably weighted and strengthened bogies.
 - 6.5.1.2. Seat boards 250 - 300mm (10" - 12")
 - 6.5.1.3. Seat Height 250-300mm (10"-12") above foot boards.
 - 6.5.1.4. Foot board width 100 - 150mm (4" - 6")
 - 6.5.1.5. End Boards 100mm (4") high above the seat
 - 6.5.1.6. Hand holds approx 50mm -150mm (2"-6") above the seat
- 6.6. Driving Trucks
- 6.6.1. Driving trucks shall be fitted with effective couplings.
 - 6.6.2. The locomotive and/or driving truck shall be fitted with an effective brake.

7. SCALE TYPE ROLLING STOCK (NON RIDING)

- 7.1. Scale type rolling stock (non-riding) of 7¼ inch gauge or larger and of significant mass and used concurrently on the same track as public running shall:
 - 7.1.1. Be fitted with effective brakes.
 - 7.1.2. Comply with the same requirements as if the vehicles were passenger carrying rolling stock.
- 7.2. Prototypical couplings may be used on scale type (non-riding) rolling stock.

8. INFRASTRUCTURE

- 8.1. Minimum Track Gauge
 - 8.1.1. The minimum rail gauge for Public passenger carrying operations should be 127mm (5") gauge for elevated and ground level railways, excepting Driving trucks.
 - 8.1.2. Where elevated or ground level tracks of a smaller gauge than 127mm (5") gauge only are installed they should operate at an appropriate speed as required by the Code of Practice: - Operation of Miniature Railways, Road Vehicles and Plant.
- 8.2. Portable Miniature Railways
 - 8.2.1. Prior to operation on each day, the portable miniature railway shall be inspected for compliance with this Code and the Code of Practice: - Operation of Miniature Railways, Road Vehicles and Plant.
 - 8.2.2. Adequate precautions shall be taken to ensure the safety of the public.
 - 8.2.3. Where a portable miniature railway, on being set up requires to be levelled, suitable stable packing shall be used.

8.3. Tracks, Rails and Lineside Fixtures

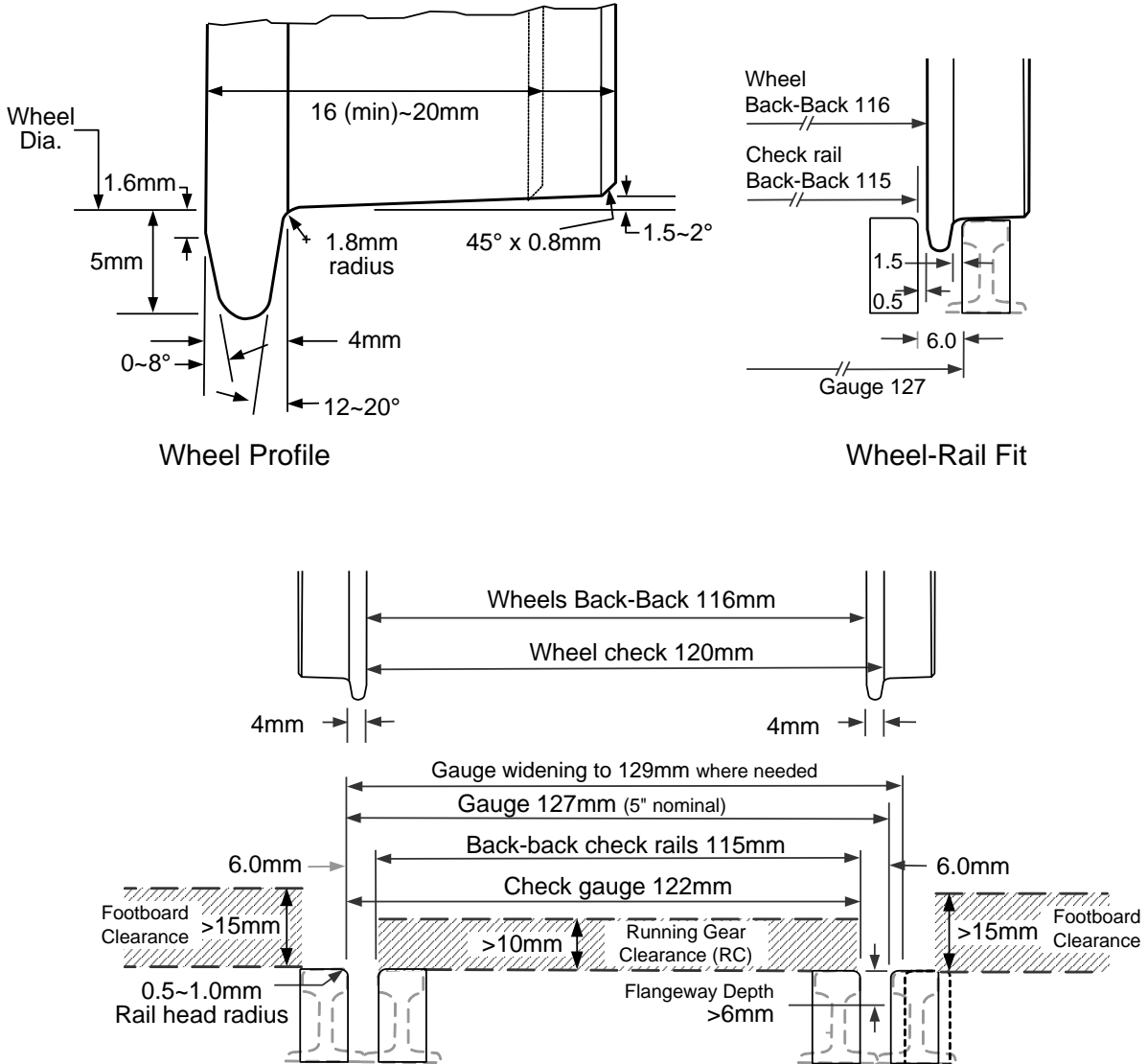
- 8.3.1. Railways of 184mm (7¼"), 127mm (5"), 89mm (3½"), and 63.5mm (2½") gauge shall conform to the relevant A.A.L.S. Standards as defined in this Code of Practice.
- 8.3.2. The track layout and all associated equipment and facilities shall be designed and engineered to provide safety in operation of the system.
- 8.3.3. Consideration shall be given in the design of the system to maximum speed, maximum loadings and where applicable, bridges and their approaches, crossings, stations or disembarkation areas, and communications for multi-train operations.
- 8.3.4. Tracks shall be constructed to provide a firm base to support and steer the train.
- 8.3.5. Ground level tracks shall be so constructed and ballasted as to maintain accuracy of gauge, alignment and superelevation.
- 8.3.6. Elevated tracks shall be secured to supports so as to maintain accuracy of gauge and alignment.
- 8.3.7. Rails shall be laid on and secured to sleepers or firm structural systems mounted on ballast or engineered foundations.
- 8.3.8. Rails shall be joined at their ends by welding, or by fishplates or by other acceptable bolting methods.
- 8.3.9. Sleepers, where used, shall be laid on flat surfaces capable of providing adequate bearing capacities for the imposed loading and to achieve rail height and alignment on permanent installations.
- 8.3.10. A change of direction in the track shall not impede positive traction for the train.
 - 8.3.10.1. A transition curve of adequate radius leading into and out of such change of direction may be necessary.
- 8.3.11. The design of rail points should consider the following features:
 - 8.3.11.1. The moving rail components to be securely supported.
 - 8.3.11.2. The moving point tips or rails to be connected by a system to maintain gauge.
 - 8.3.11.3. The switch stand or actuating mechanism to be fixed in relation to the main rail.
 - 8.3.11.4. An actuating mechanism, other than that for catch points, to hold the points as set.
 - 8.3.11.5. Provision for locking the actuating mechanism.
- 8.3.12. Where rail tracks cross bridges, a check rail or other positive means to prevent derailment of the train shall be provided both during the approach to and on the bridge.
- 8.3.13. The length of the check rail or other derailment prevention means shall be related to the operating speed and the potential of the train to overturn should derailment occur.
- 8.3.14. Line side fixtures, fencing, electrical wiring, water services, buildings and fittings shall comply with relevant Federal, State or Local ordinances.

8.4. Compressed Air Services.

- 8.4.1. Fittings for compressed air to provide assisted draft for steaming up should be Ryco style 200 / Jamec 900 ¼ inch series with the female coupling provided as part of the fixtures.
- 8.4.2. Compressed air hoses should be fitted with the nipples, and where necessary utilise ¼ inch BSP unions.

9. RECOMMENDED TRACK AND WHEEL PROFILE STANDARDS.

9.1. AALS 5" (127mm) Gauge



Coupler height above rail 82.5mm
 Coupler pin 6.35mm dia (min)
 Drawbar cross-section 16 x 5 mm (min)
 Running gear clearance >10mm above rail

5" GAUGE

Standard Track Dimensions:		
	Imperial (inches)	Metric (mm)
Track Gauge (Nominal) (G)	5	127
Track Gauge (Actual)	5	127
Check Gauge (CG) <i>Note 1</i>	4.937	122
Track Gauge Widening (GW) (maximum, where needed)	5.094	129
Check Rail Spacing (CR)	4.531	115
Width of Flangeway (W)	0.235	6.0
Gauge Clearance (G-BB-2*FT)	0.125	3.0
Railhead Edge Radius	0.02~0.04	0.5~1.0
Depth of Flangeway (minimum)	0.25	6.0

Standard Wheel Dimensions:		
	Imperial (inches)	Metric (mm)
Back to Back (BB)	4.563	116.0
Flange Depth	0.187	5.0
Flange Thickness (FT) <i>Notes 2,3</i>	0.156	4.0
Flange Angle - Front	12~20°	12~20°
Flange Angle - Rear	0~8°	0~8°
Wheel Check (BB+FT)	4.718	120.0
Wheel Root Radius	0.07	1.8
Wheel Tyre Taper	1.5~2°	1.5~2°
Wheel Tyre Width (minimum)	Fine scale	0.55
	Normal (Preferred)	0.63
Flange Tip Profile	Half round	

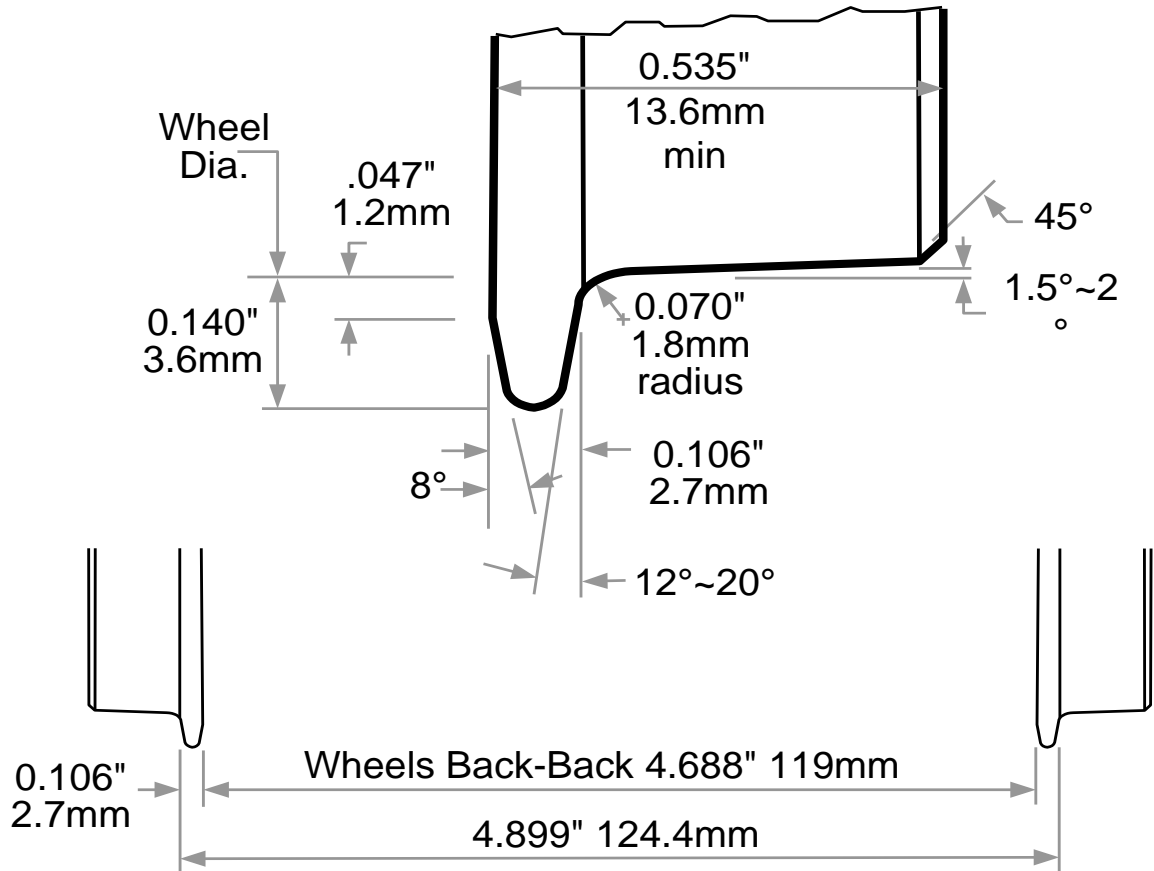
Rolling Stock Dimensions:		
	Imperial (inches)	Metric (mm)
Coupler Height (above rail)	3 ¹ / ₄	82.5
Drawbar X-section (minimum)	5 ⁵ / ₈ x 3 ³ / ₁₆	16 x 5
Coupler Pin Diameter (minimum)	0.25 (1 ¹ / ₄)	6.35
Running Gauge Clearance (RC) (minimum)	3 ³ / ₈	10
Footboard Clearance (minimum)	5 ⁵ / ₈	15

Note 1: Care should be taken where gauge widening is used with checkrails. Where there is gauge widening, the term CR is reduced. CR=CG-W-GW. Irrespective of GW, CG (Check Gauge) is always 4¹³/₁₆ inch (122.4mm)

Note 2: For intermediate driving wheels requiring thin flanges, the width shall be 1¹/₈ inch (3.2mm). The reduction of 1¹/₃₂ inch (0.8mm) to be effected from the front of the flange.

Note 3: For intermediate driving wheels where flanges are not required the tread diameter shall be machined parallel for the total width of the flange and flange to tread radius viz. 5⁵/₃₂" + 1¹/₁₆" = 7⁷/₃₂" (4+1.6=5.6mm).

9.2. 5 Inch (127mm) Gauge Fine Scale

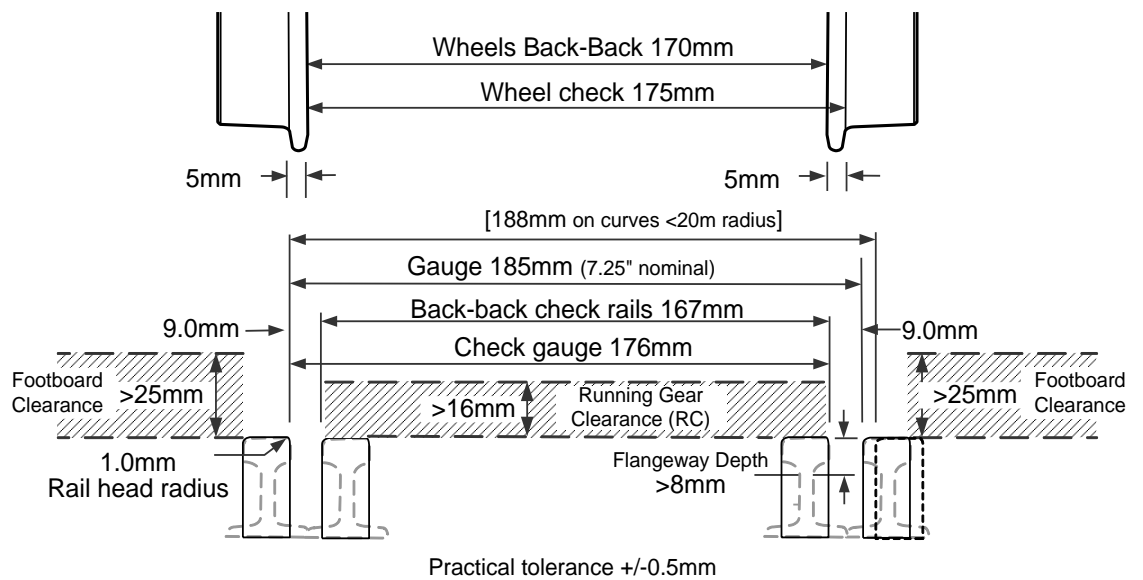
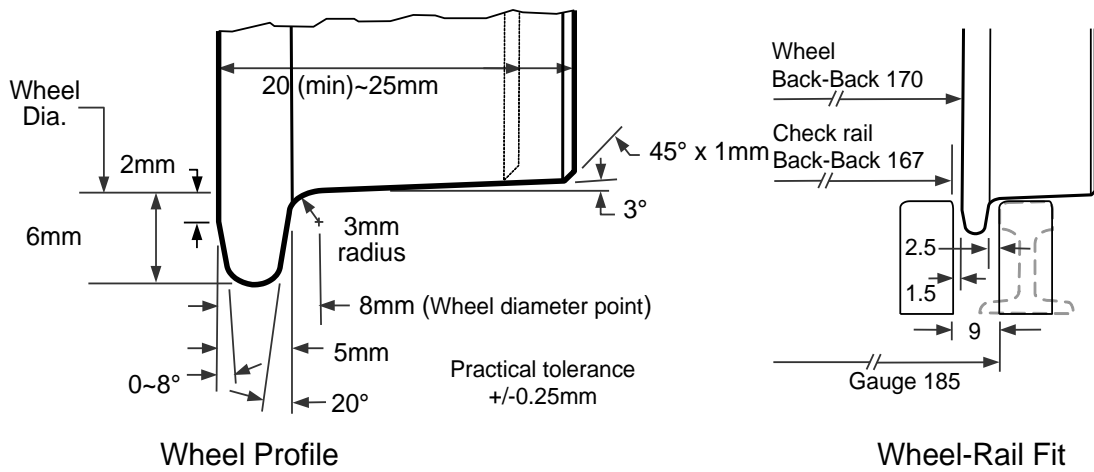


Coupler height above rail 3¼" 82.5mm

5" Fine Scale

Standard Wheel Dimensions:		
	Imperial (inches)	Metric (mm)
Back to Back (BB)	4.688	119.0
Flange Depth	0.140	3.6
Flange Thickness (FT)	0.106	2.7
Flange Angle - Front	12~20°	12~20°
Flange Angle - Rear	8°	8°
Wheel Check (BB+FT)	4.794	121.7
Wheel Root Radius	0.07	1.8
Wheel Tyre Taper	1.5~2°	1.5~2°
Wheel Tyre Width (minimum)	0.535	13.6
Flange Tip Profile	Half round	

9.3. AALS 7¼" (184.15mm) Gauge



- Coupler height above rail 125mm
- Coupler pin 10mm dia (min)
- Drawbar cross-section 25 x 8 mm (min)
- Running gear clearance >16mm above rail

7¼" GAUGE

Standard Track Dimensions:		
	Imperial (inches)	Metric (mm)
Track Gauge (G)(Nominal)	7.25"	184.15
Track Gauge (Actual)	7.28"	185.00
Check Gauge (CG)	6.83"	176.00
Check Rail Spacing (CR)	6.57"	167.00
Width of Flangeway (W)	0.35"	9.00
Gauge Clearance	0.20"	5.00
Gauge Widening (GW) (Curves<20m radius)	0.12"	3.00
Railhead Edge Radius	0.04"	1.00
Depth of Flangeway (minimum)	0.32"	8.00
Wheel Check Clearance to back of wheel	0.06"	1.50
	Practical tolerance: ±0.5mm	

Standard Wheel Dimensions:		
	Imperial	Metric (mm)
Back to Back (BB)	6.69"	170.00
Flange Depth	0.24"	6.00
Flange Thickness (FT)	0.20"	5.00
Flange Angle - Front	20°	20°
Flange Angle - Rear	0 - 8°	0 - 8°
Wheel Check (BB+FT)	6.89"	175.00
Wheel Root Radius	0.08" - 0.12"	2.00 - 3.00
Wheel Tyre Taper	3°	3°
Wheel Tyre Width (minimum)	Fine scale	0.80"
	Narrow gauge	0.98"
Flange Tip Profile	Half round	
	Practical tolerance: ±0.25mm	

Rolling Stock Dimensions:		
		Metric (mm)
Coupler Height (above rail)		125
Drawbar X-section (minimum)		25 x 8
Coupler Pin Diameter (minimum)		10
Running Gauge Clearance (RC) (minimum)		16
Footboard Clearance (minimum)		25

10. COUPLINGS AND INTER-VEHICLE CONNECTIONS

10.1. General

10.1.1. This Section describes the recommended Couplings for 63.5mm (2½"), 89mm (3½"), 127mm (5") and 184mm (7¼") gauge Locomotives.

10.1.2. It also provides recommended practice related to the location of Inter-Vehicle connections on Rolling Stock.

10.1.3. A selection of alternative Coupler types is contained in Section 11 of this Code of Practice.

10.2. Materials

10.2.1. Couplings shall be:

10.2.1.1. Manufactured from mild steel with a 250 MPa minimum yield strength.

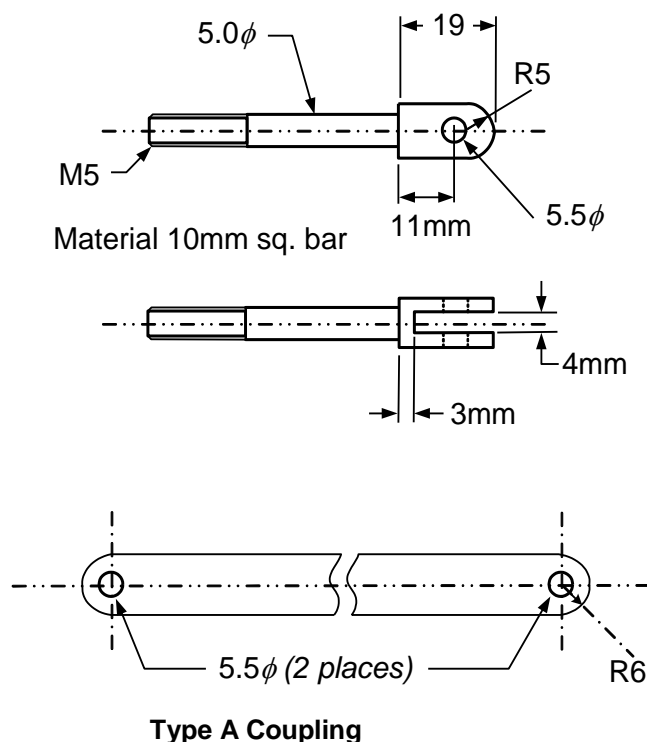
10.2.1.2. Loaded to a maximum working tensile stress of 130 MPa.

10.3. Type A Coupling - For models to a total mass of 25kg (55 lbs)

10.3.1. Fitted between the locomotive and the driver.

10.3.2. Coupling Bar cross section: 12mm x 3mm.

10.3.3. Drawbar pin: 5mm (3/16") diameter.

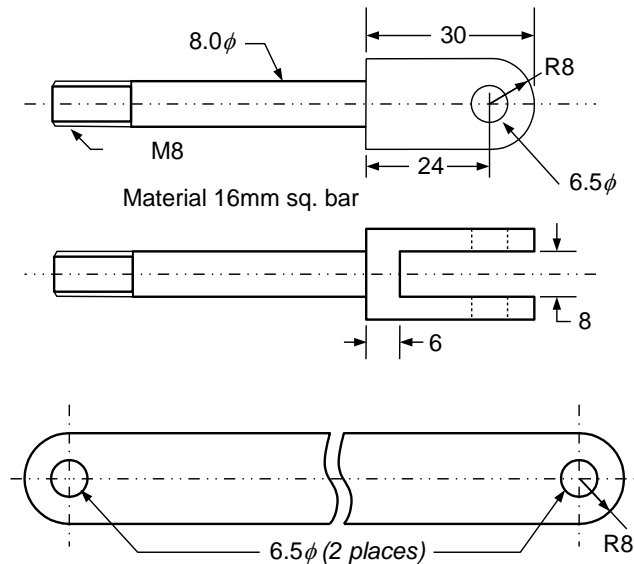


10.4. Type B Coupling - For models to a total mass of 120kg (264 lbs)

10.4.1. Fitted between the locomotive and the driver.

10.4.2. Coupling Bar cross section: 16mm x 5mm.

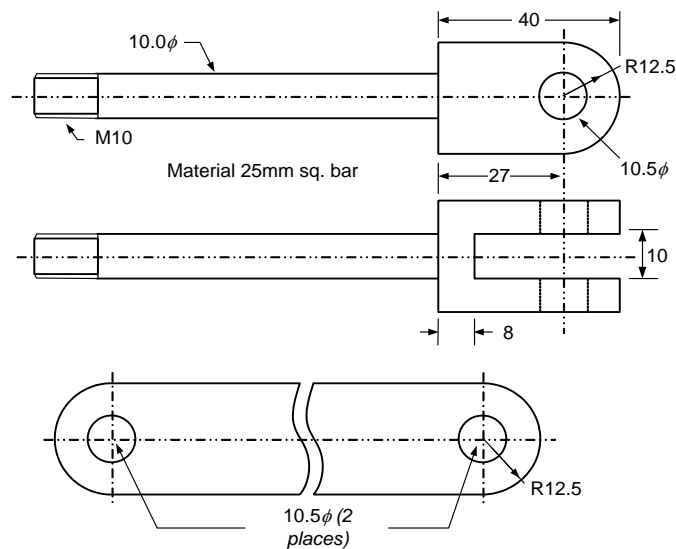
10.4.3. Drawbar pin: 6 mm (or ¼") diameter.



Type B Coupling

10.5. Type C Coupling - For models of total mass in excess of 120kg (264lb)

10.5.1. For models in excess of 120kg, these are to be as specified by the Society's Safety Committee or as for 184mm (7¼") gauge standards.



Type C Coupling

10.8. Coupling Height

10.8.1. Coupler height is to be measured from the top of the railhead to the centre of the coupler bar.

10.8.2. Coupler heights applicable to Gauge and Scale are listed in the following table:

Gauge	Scale	Coupler Height
5" (127mm)	1" and above	3¼" (+0" / -1/8 ") 82.5mm (+0mm / -3mm)
7¼" (184mm)	1½" to 2"	5" (+0" / - 3/16") 127mm (+0mm / -5mm)
7¼" (184mm)	2" and above	6" (+0" / - 3/16") 150mm (+0mm / -5mm)

10.9. Coupling Length

10.9.1. Coupler Bars shall be of sufficient length to allow a minimum of 50mm clearance between vehicle corners when negotiating a curve of 10m radius.

10.10. Inter-Vehicle Connections

10.10.1. This dimensions provided are for 7¼" gauge.

10.10.2. The principles can be applied to 3½" and 5" gauge using suitable scaling.

10.10.3. Coupler Bar retaining pins shall:

10.10.3.1. Preferably be secured to the coupler pocket, carriage buffer beam or carriage end using a suitable wire lanyard or small chain:

10.10.3.2. Be held in the coupler pocket using a suitable "R" Clip.

10.10.4. Alternatively, commercial "Wire Lock" or "Shaft Lock" Pins may be utilised as coupler bar retaining pins.

10.10.4.1. "Wire Lock" or "Shaft Lock" pins have a wire loop which is pulled over the pin end to lock it in place or to remove it.

10.10.5. Safety chains shall be long enough to be connected to an adjacent coupled carriage and shall preferably be welded to the coupler pocket.

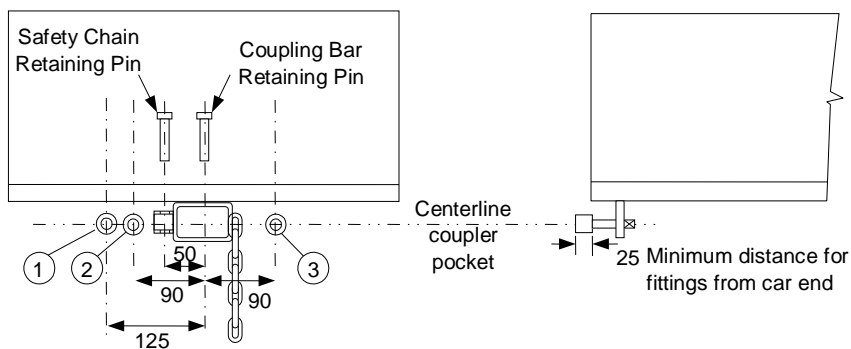
10.10.6. Safety chain and brake hose lengths shall be chosen to suit coupler bar length.

10.11. Brake fittings

10.11.1. Brake fittings shall comply with the following standards:

Item	Function	Specification
1	Stored Air	Ryco Part Number 201
2	Vacuum	Spigot 6mm diameter
3	Train Brake Air	JAMAC Part Number 310-M4 Barb 3ITS

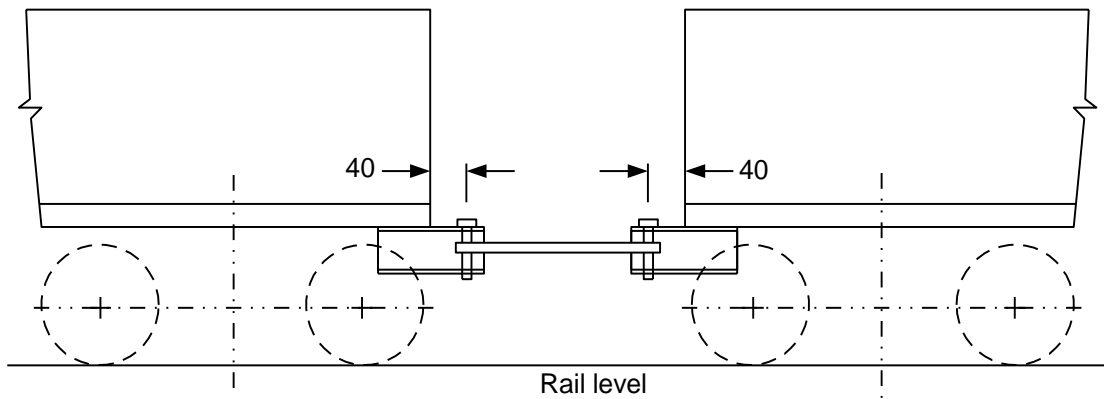
10.11.2. Brake fittings shall be installed at the locations indicated in the following diagram



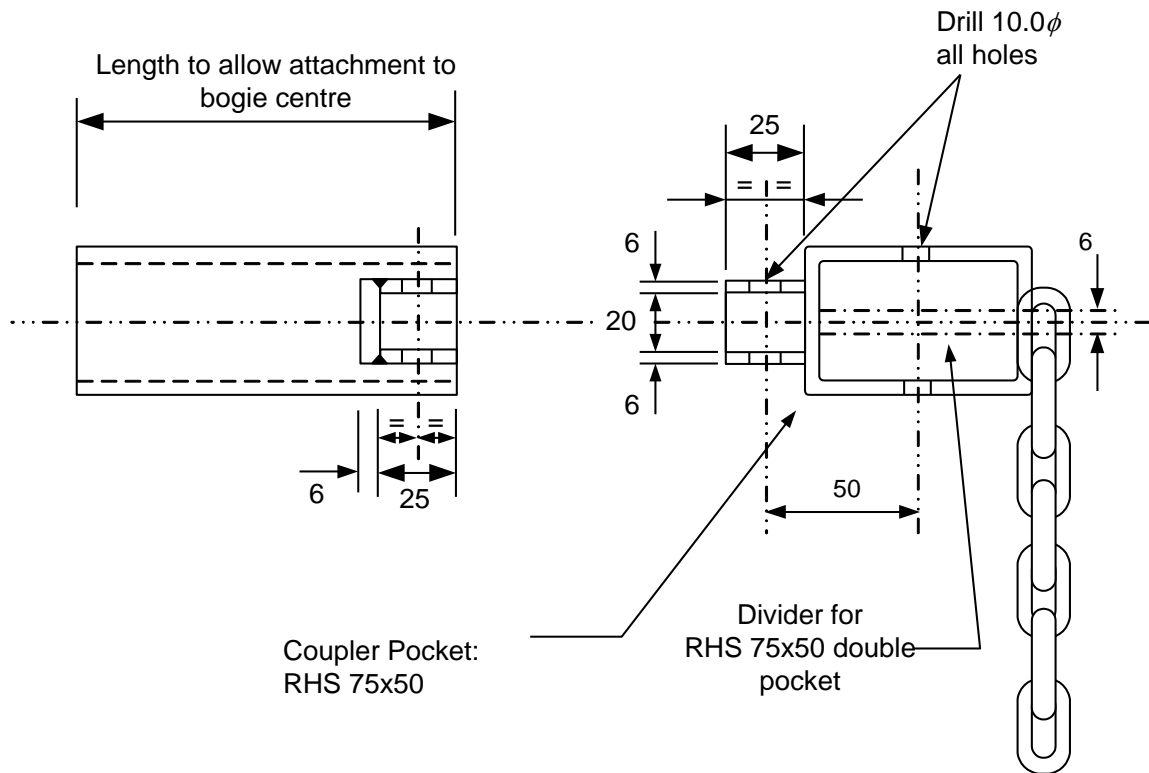
Position of Air and Vacuum Brake Fittings

10.12. Coupler Pockets and Safety Chains

10.12.1. Coupler pockets and safety chains shall be installed as indicated in the following diagrams:



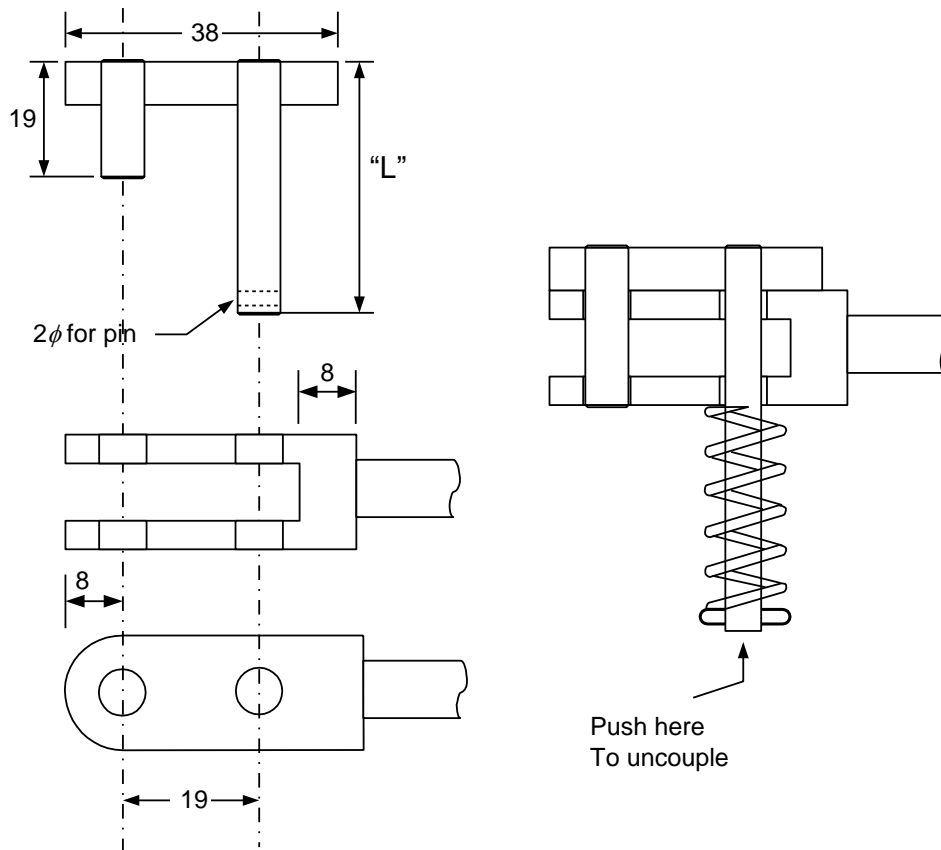
Coupler Pocket Location



Safety Chain and Coupler Pocket Details

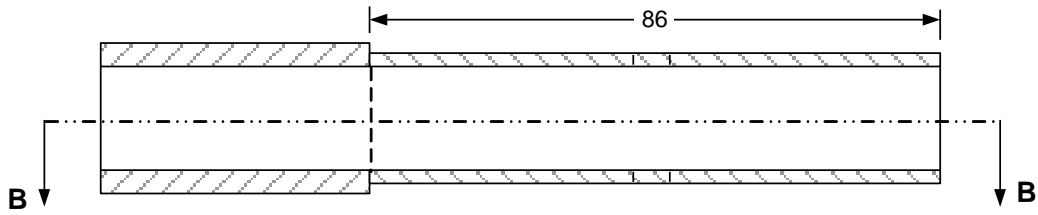
11. ALTERNATIVE COUPLINGS.

11.1. Alternative Type B Coupling - 1

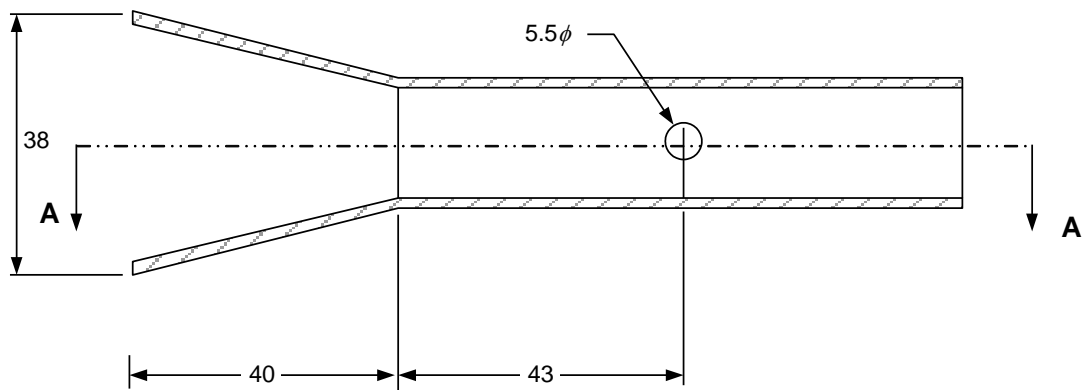


1. 6mm diameter pins to be shouldered down and either riveted, welded or silver soldered to 12mm x 6mm bar.
2. "L" sufficient for washer, compression spring and 12mm movement when pushed from underneath.

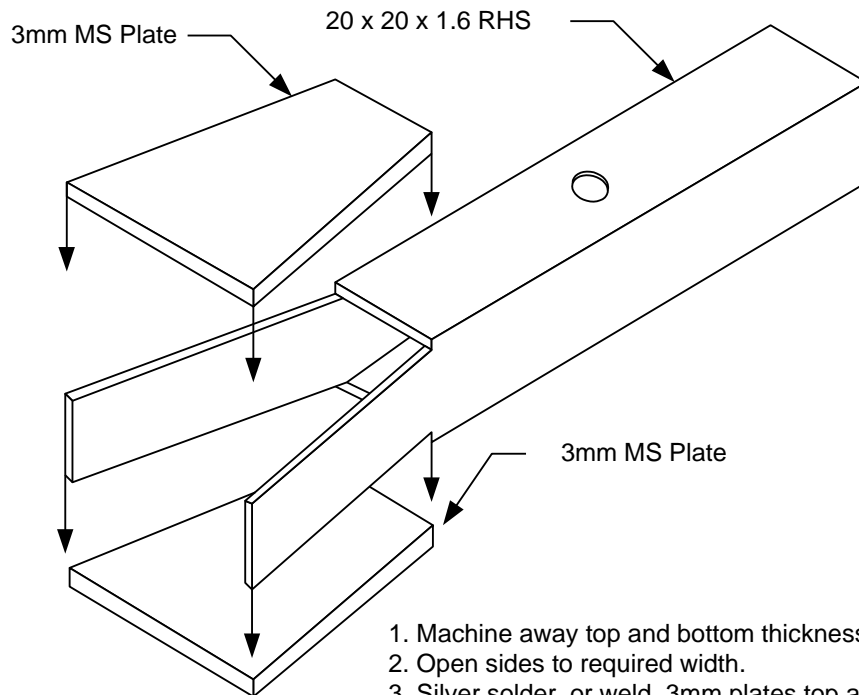
11.2. Alternative Type B Coupling - 2



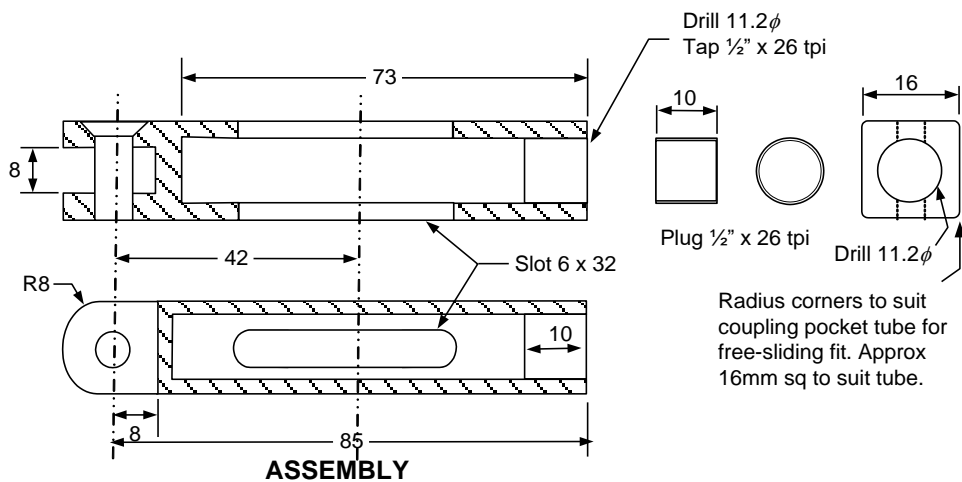
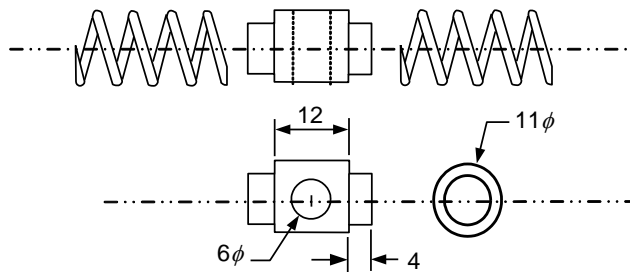
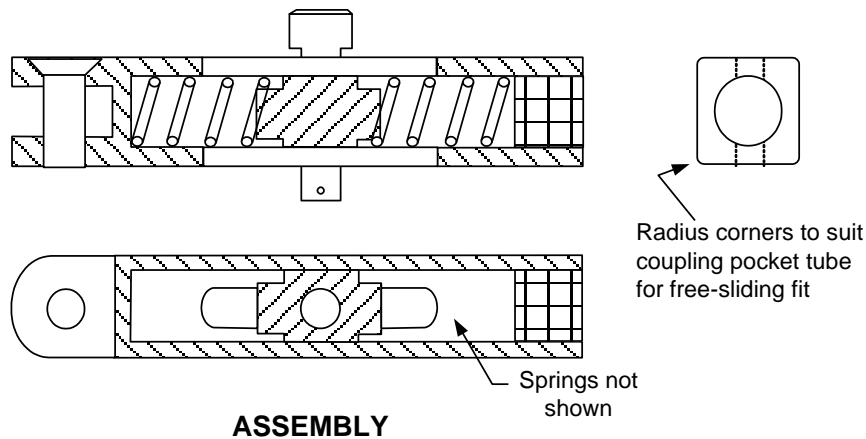
Elevation (Section A-A)



Plan (Section B-B)

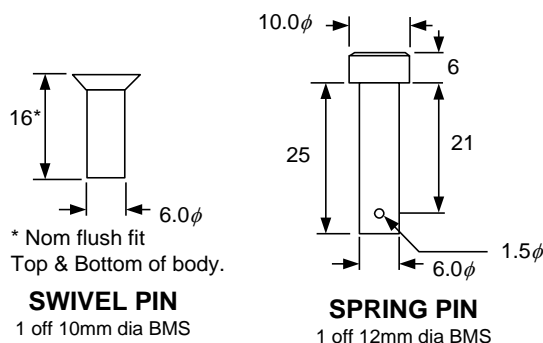


1. Machine away top and bottom thickness of tube.
2. Open sides to required width.
3. Silver solder, or weld, 3mm plates top and bottom



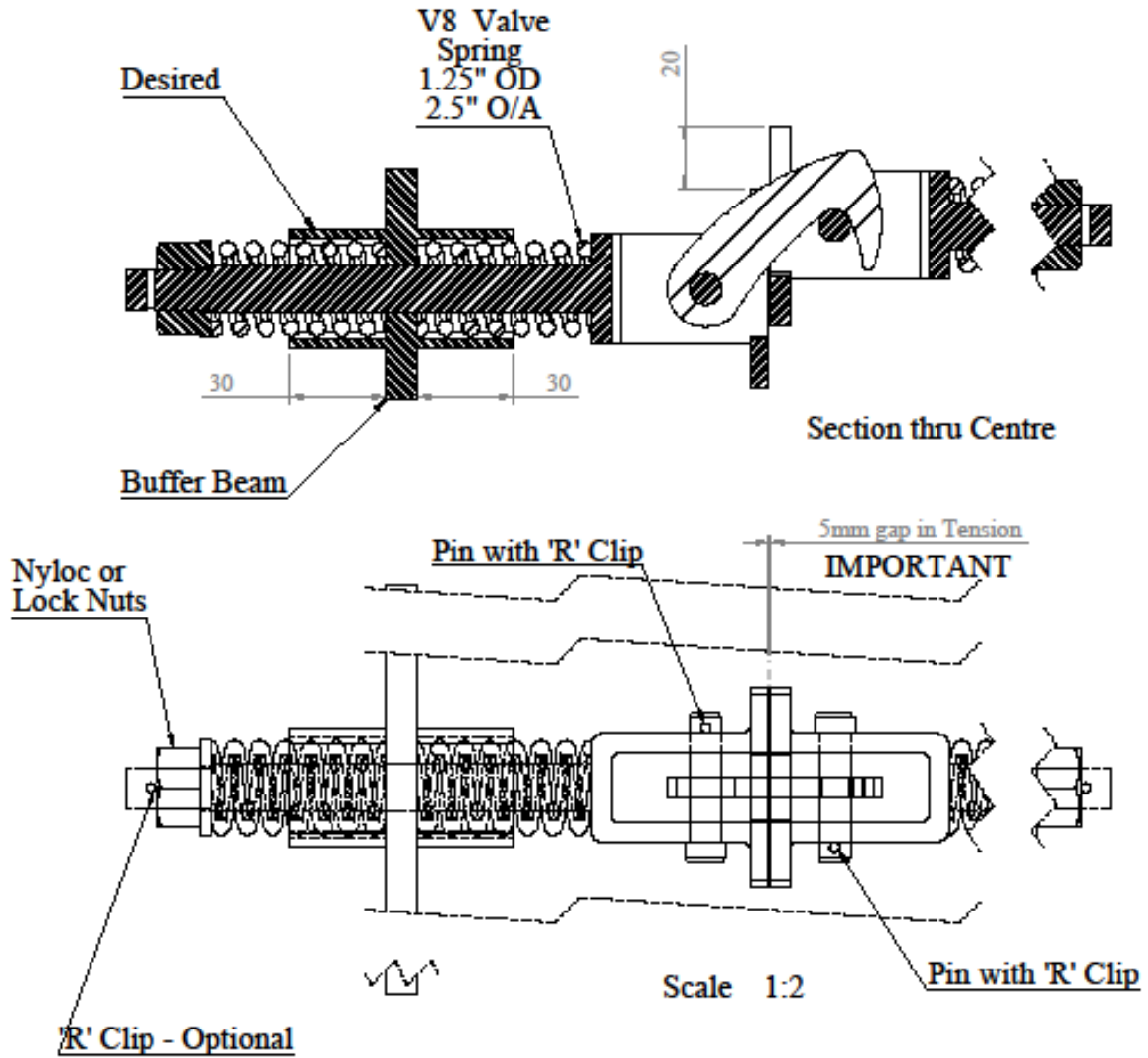
SPRING HOUSING

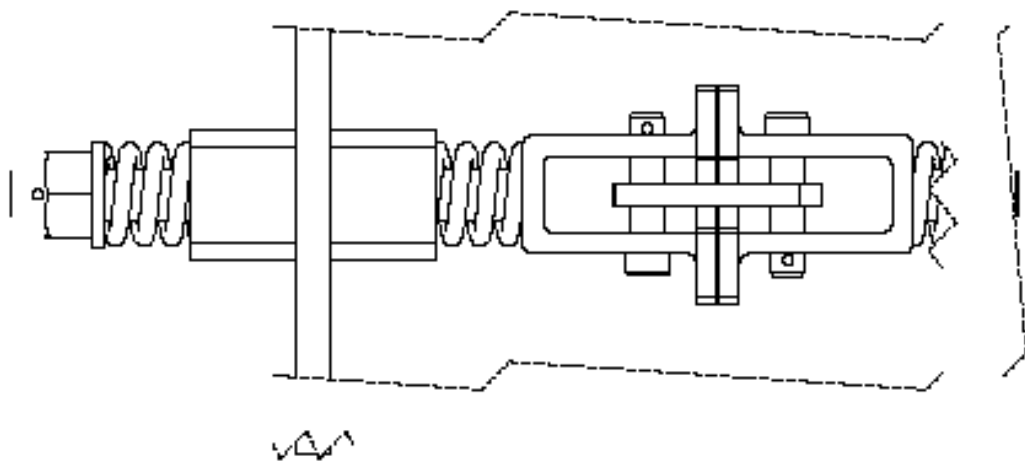
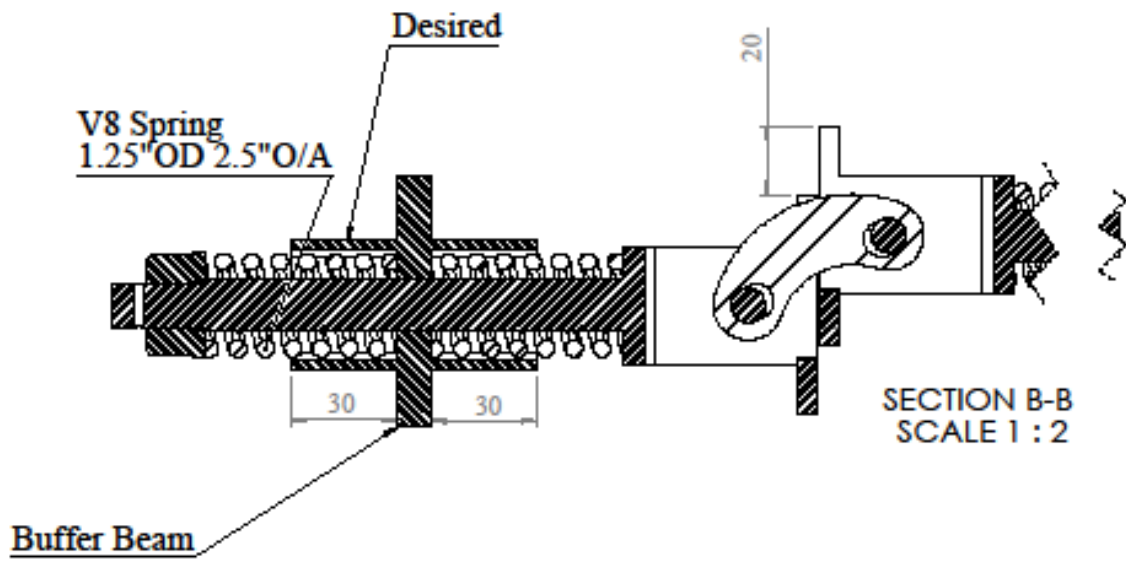
1 off 16mm sq. BMS



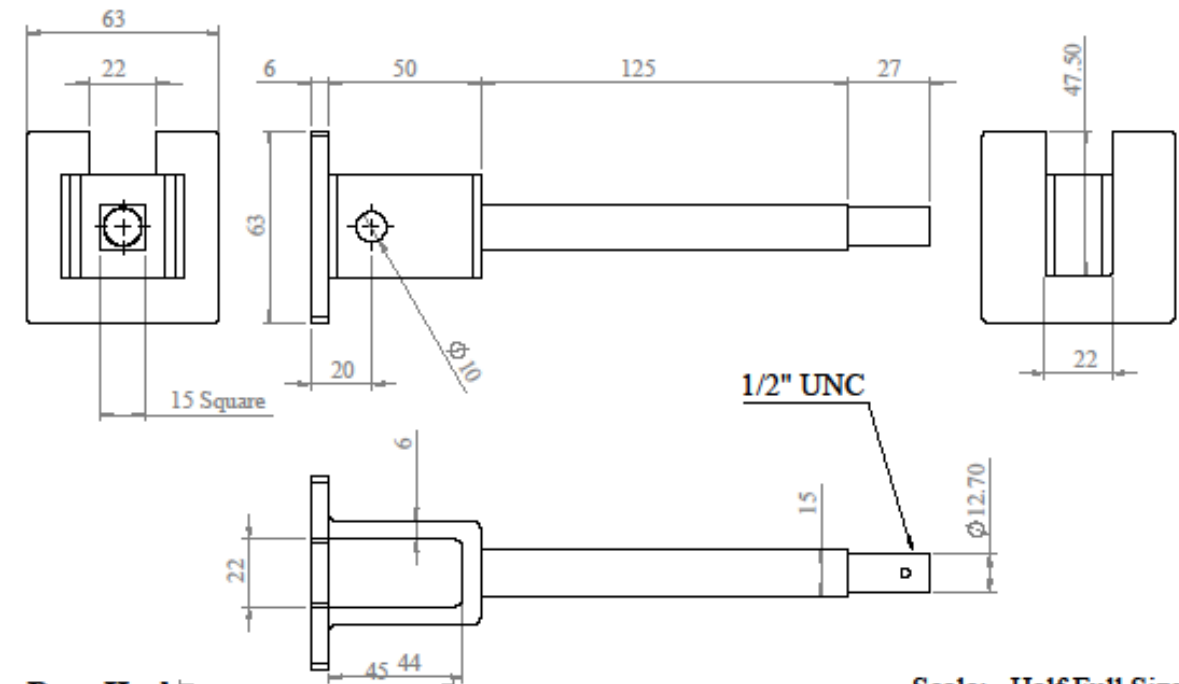
11.3. Chopper Coupling

The design shown in this section should be regarded as a recommended standardised arrangement.



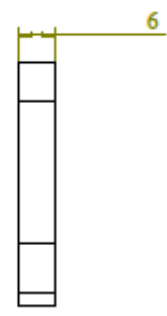
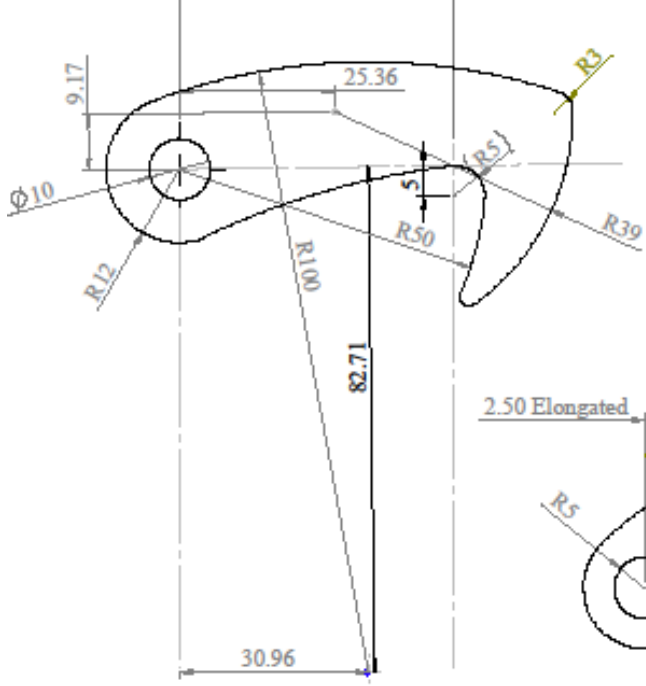


MUST BE USED IN PASSENGER SERVICE

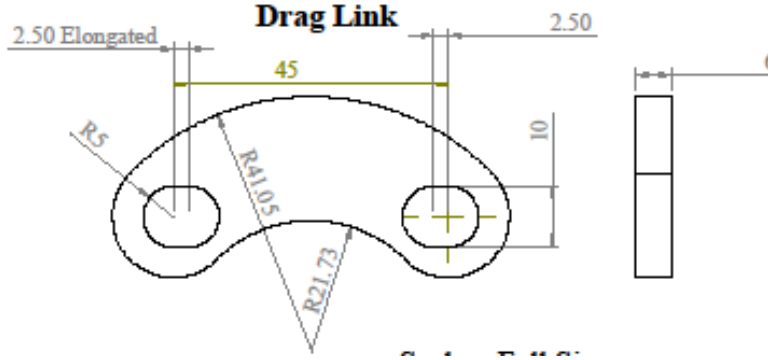


Drag Hook

Scale: Half Full Size



Drag Link



NOTES RE- NORWEGIAN/JONES YOKE BUFFERS

Couplers in buff are designed to push on the faces.

Yoke buffers are designed to have very minimal lateral or vertical movement.

The face gap is set at 5mm to allow 20mm vertical movement.

Wagon springs MUST be of 20mm maximum travel.

Tare to load 12mm deflection desired.

All buffers to be set to 123mm min to 127mm at tare.

Should wheels be reprofiled, packers of thickness equal to radius loss must be used to correct buffer height if necessary.

D-Link must be used in passenger service.

Efforts should be made to keep the coupler overhang to a minimum. Carriages new to a track should be checked that the couplers do not bind due to horizontal offset when negotiating the worst-case horizontal curvature, which will typically be when the couplers are near the point of inflection of an S curve, e.g. on a turnout.

Note that locomotives normally have much heavier capacity draft/buff 'springs'.

12. AMENDMENTS TO THIS CODE

- 12.1. 2010 – Original issue version dated 14 April 2010.
- 12.2. 2011 – As adopted at the 2011 AGM; Sections 4.2.1 word ‘train’ substituted for ‘carriage’. Sections 6.3 – 6.5 amended to remove 3½” gauge public passenger carriages; common design goals included and general and typical dimensions provided to avoid prejudicing any specific design.
- 12.3. 2012 – As adopted at the 2012 AGM; Section 6.5.1.1 amended and new section 6.5.1.1.1 added in regard to the length of passenger carriages.
- 12.4. 2013 – As adopted at the 2013 AGM section 8.4.1 clarified air fittings.
- 12.5. 2014 July – Wheel profiles in sections 9.1, 9.2 & 9.3 redrawn to scale. Typos corrected and missing dimension for rear flange taper reinstated. External footboard clearance labelled. No changes to dimensions.
- 12.6. 2017 April – As adopted at the 2017 AGM, relating to the following clauses: 6.2.3, 6.2.1.2, 6.2.4, 6.3.1.6, 6.3.1.12, 6.3.1.13, 11.3.
- 12.7. 2019 June – As adopted at 2019 AGM. Replacement of Section 4. Update typesetting.