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# **RAIL**INFRASTRUCTURE CORPORATION

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**Rolling Stock Engineering Standard**

Category  
**Maintenance**

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**Bogie DI**

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## About This Standard

This standard is based on the following TRS Standards:

- TRS 0153 Freight Package Unit Bearing In Service Inspection
- TRS 1032 Due Inspection for Three Piece Freight Bogies
- TRS 1091 Side Bearer Clearance (Radial Clearance) on Freight Vehicles
- TRS 1471 In Service Bearing Adaptor Inspection
- TRS 1590 Checking Bearing Retention Devices
- TRS 1641 Spring Friction Wedge Data Table for Freight Bogies
- TRS 1716 Friction Wedge Snubber Ride Control Type Preventative Maintenance Inspection for Freight Bogies
- TRS 1719 Bolster Preventative Maintenance Inspection for Freight Bogies
- TRS 1720 DI Gauge 110-380 Use Of
- TRS 1721 Friction Wedge Frame Mounted Preventative Maintenance Inspection for Freight Bogies
- TRS 1722 Gib Clearance Measurement on Three Piece Bogies
- TRS 1727 Brake Beam Preventative Maintenance for Freight Bogies
- TRS 1728 Side Frame Preventative Maintenance Inspection for Three Piece Freight Bogies
- TRS 1729 Spring Preventative Maintenance of Springs for Freight Bogies
- TRS 1738 Adaptor Identification for Freight Vehicles
- TRS 1757 Bogie Installation Under Freight Vehicles

## Version History

### Version 1.0

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## **Version 1.1 July 2004**

Sections 4.2.2.1 to 4.2.2.3 “In-service side bearer clearances” amended to “Workshop side bearer clearances.” Content modified. YM type bogie deleted. Stucki and Minor constant contact side bearer deleted.

Sections 4.2.1.3 & 4.4.1 Metric diameter of centre castings added.

Section 4.2.3 Limits from ROA Manual Clause 24.2.2.6. for wear or bending of king pin inserted.

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## 1 Scope

This standard covers DI Inspection of bogies.

It is the RIC practice to regularly inspect bogies by returning them to repair depots for a thorough inspection to certify them fit for service for a specific time period.

## 2 DI due

**Note: The DI date is no longer stencilled on the bogie.**

A bogie DI is due at each DWI, R2 or R3 maintenance.

A bogie DI is to be carried out when the bogie due workshop date has expired

## 3 Records

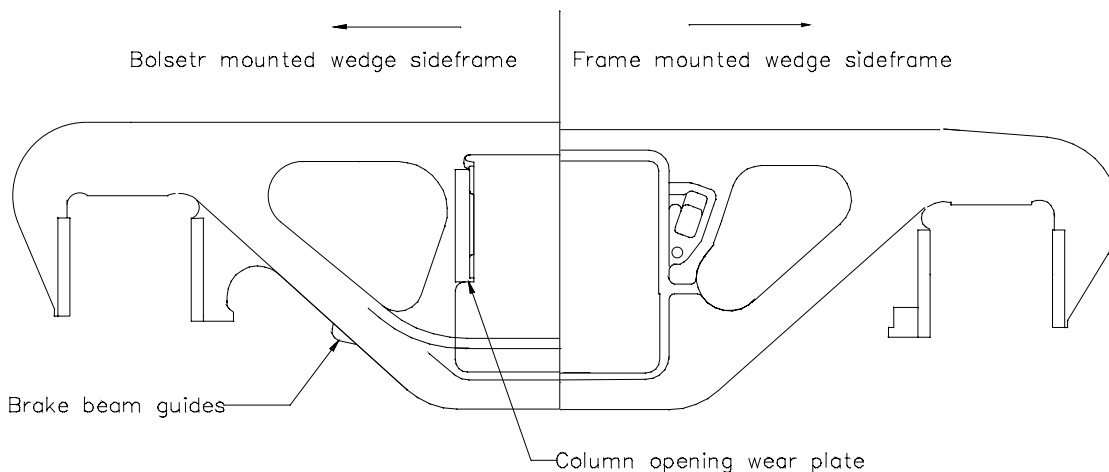
The DI record sheets shall be completed.

## 4 Inspection requirements

### 4.1 Frame Inspection

#### 4.1.1 Side Frame

This specification details the requirements for preventative maintenance inspection of sideframes for three piece freight bogies.



**Figure 1**

Brake beam guides are of two designs. Some have welded wear plates whereas others have liners that are held in place by a self locking spring loaded action. Both plastic and metal type liners are used.

Some pedestals have a metallic roof liner fitted which clip in place to reduce wear.

Some column opening wear plates may be fastened by locking bolts.

#### **4.1.1.1 Frame inspection**

Bogie sideframes shall be visually inspected for cracks. Suspect cracking shall be MPI tested. If any cracks are found the sideframe shall be replaced or overhauled.

If the sideframe is obviously bent the sideframe shall be replaced or overhauled.

All wear plate liner welds shall be inspected. If any of the welds are cracked they shall be repaired. Cracked welds shall be removed and the correct weld preparation used.

If any wear plate is cracked or a piece broken out the wear plate shall be replaced.

For wear plates fastened by bolts or fasteners, all loose or missing fasteners shall be replaced.

#### **4.1.1.2 Brake beam guides**

If the brake beam guides are missing, broken, loose or worn less than 1.5 mm thick, the brake beam guide shall be replaced or the wear plate replaced.

#### **4.1.1.3 Pedestal Roof Liners**

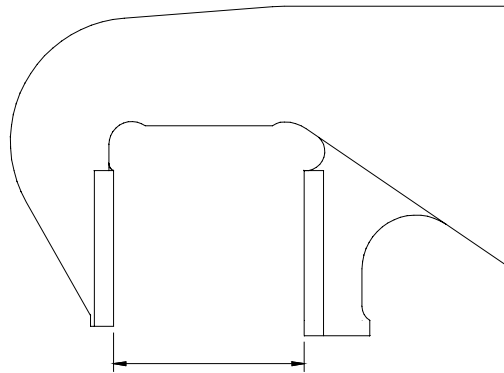
Some bogies are fitted with a clip on pedestal. If the liner is cracked or broken the liner shall be replaced.

Where fitted bogies must be fitted with all four liners. There must be four liners fitted or none.

#### **4.1.1.4 Pedestal opening**

Pedestal openings, shown in Figure 2 shall be measured and the maximum dimension shall not exceed that shown in Table 1. Sideframes exceeding these dimensions shall be replaced.





**Figure 2**

The use of the gauge as detailed in Section 5 is recommended for this purpose.

<b>Bogie</b>	<b>Maximum Pedestal dimension mm</b>
A and B type axle bogie except bogies listed in this table	228
C type axle bogie except bogies listed in this table	254
D type axle bogie except bogies listed in this table	276
AFT,CFB,CFC,CFD,XFA	219

**Table 1**

#### **4.1.1.5 Repair**

Welding shall be carried out in accordance with AS 1554 and be to the original design.

#### **4.1.2 Bearing retention devices**

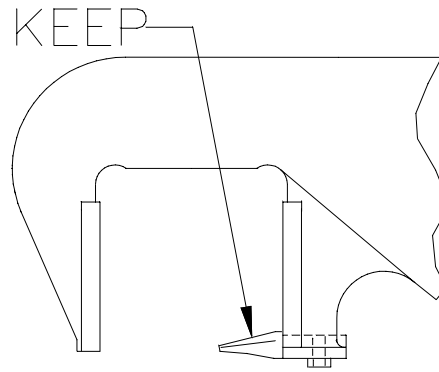
The purpose of these devices is to ensure that the wheelsets will remain in the bogies when lifted and in some cases to prevent spreading of the pedestal openings.

##### **4.1.2.1 Inspection**

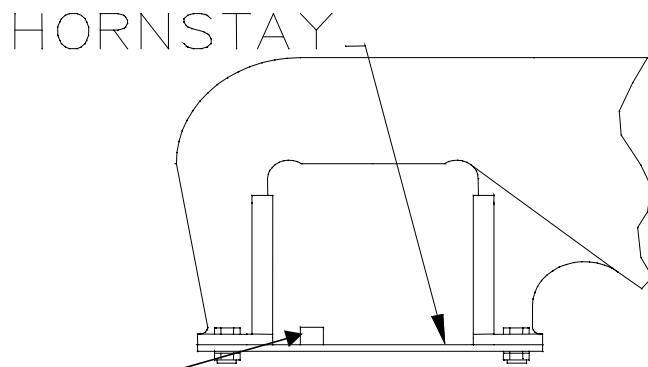
Ensure that keeps, hornstays and stopblocks as shown in Figures 3, 4 & 5 are intact.

Hornstays with stop blocks are to be fitted with the stopblocks uppermost as shown in Figure 3.

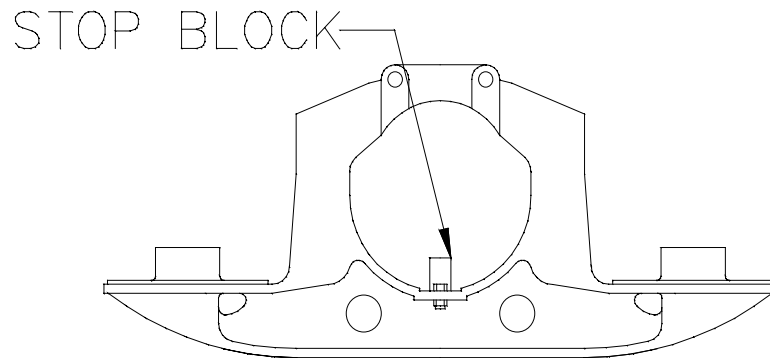
If any of these are missing or loose, tighten or replace on site if possible, otherwise green card to the nearest repair facility for repairs.



**Figure 3**



**Figure 4**



**Figure 5**

## 4.2 Bolster Inspection

### 4.2.1 Bogie Bolster

Bolsters are fitted to two and three piece type bogies. Inspection of the bolster is necessary as it is a critical load bearing member of the bogie. Wear plates are also attached that may dislodge and cause the bolster to jam in the frame.

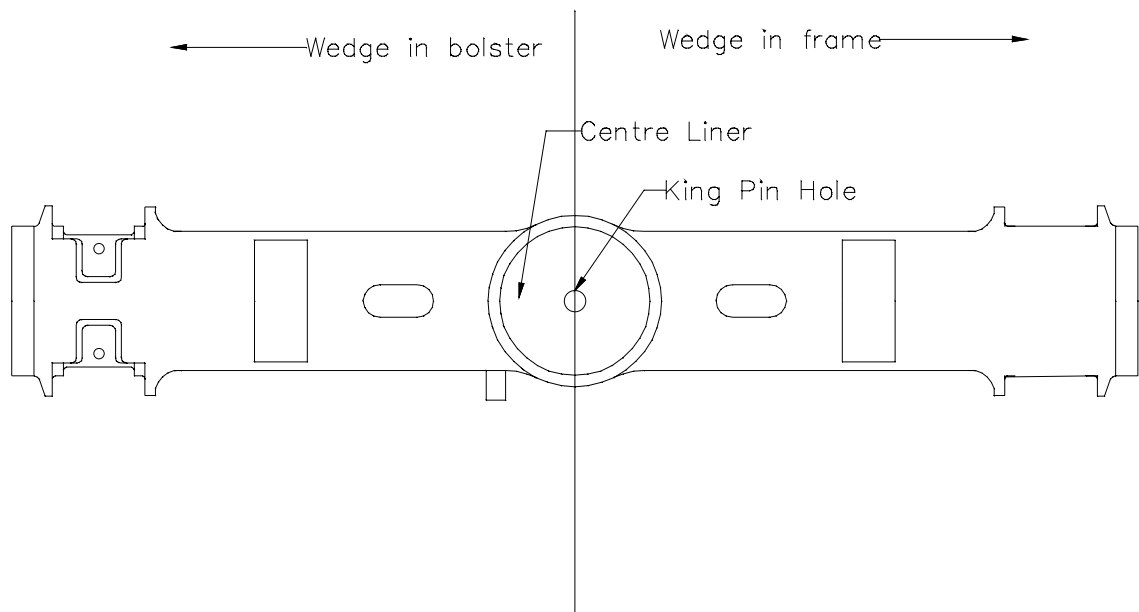


Figure 6

#### 4.2.1.1 Bolster Casting

Bolsters shall be visually inspected for cracks. Suspect cracking shall be MPI tested. If any cracks are found the bolster shall be replaced or overhauled.

If the bolster is obviously bent the bolster shall be replaced or overhauled.

#### 4.2.1.2 Wear Plates (Not including Centre Liner)

Wear plates welded to bolsters shall be checked for cracked welds. If any of the welds are cracked they shall be repaired. Cracked welds shall be removed and the correct weld preparation used.

If wear plates are cracked or pieces broken out, the wear plate shall be replaced.

For wear plates fastened by bolts or fasteners, if any of the bolts or fasteners are loose or missing they shall be replaced.

#### 4.2.1.3 Cupped Centre Liner

The liner shall not protrude above the casting more than 6mm.

If the centre liner has more than 1 piece broken out from the liner, the liner shall be replaced.

If centre liners have more than two cracks in the vertical portion of a cupped wear liner, the liner shall be replaced.

Cracked liners with two or less cracks shall have the cracks repaired.

If cracks extend into the base of a cupped liner the liner shall be replaced.

The minimum thickness of the liner base shall be 6 mm.

Any fractured welds shall be repaired.

Fractured welds shall be ground out. The correct weld preparation and weld, not less than 6 mm shall be used for repair.

The liner diameter shall be measured and shall not exceed the values shown in Table2.

The use of the gauge shown in Section 5 is recommended.

Centre liner type	Limit mm
300 mm (12") nominal cupped	310
355 mm (14") nominal cupped	360
406 mm (16") nominal cupped plastic	Replace liner

**Table 2 WN Bogies**

WN centre liner thickness shall be examined. If less than 15 mm thick the centre liner shall be replaced.

The WN centre pivot diameter shall not exceed 288 mm.

#### **4.2.1.4 Repair**

Welding shall be in accordance with AS 1554 and be to the original design.

#### **4.2.2 Bogie Sidebearer set-up**

At every bogie change, side bearers are to be checked using the gauges provided for this purpose and adjusted as described in drawing 203-953 latest issue.

The use of shims at the centre casting is not permitted except in the emergency circumstances stated below.

#### 4.2.2.1 Workshop side bearer clearances

Side bearer clearance to be shimmed to 10 – 14 mm.

#### 4.2.2.2 Side bearer setting gauges

The following list describes correct drawing numbers and drawing issue for wagon and bogie side bearer adjustment gauges.

<b>Bogie Code</b>	<b>Side Bearer Clearance Gauge Drawing No.</b>	<b>Centre Bearing Diameter (mm)</b>
AQA,ARA,ASA	306-395-D	305 nom.
CEA	306-395-D	305 nom.
CFB,CFC,CFD	306-395-D	305 nom.
CQA,CQB	306-395-D	305 nom.
XBA,XFA	306-395-D	305 nom.
XGA,XGB,XGC	306-395-D	305 nom.
XHA,XHB,XHC,XHD	306-395-D	305 nom.
XLA,XLB,XLC,XLD	306-395-D	305 nom.

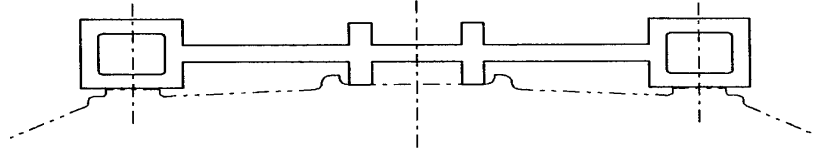
Side bearer clearances shall be set as per drawing number 203-953 latest issue.

#### 4.2.2.3 Application of Gauges

Note: Face designations A1, B1, C2 etc. are stamped on the gauges.

#### 4.2.2.3.1 Bogies with Spring Loaded Side Bearers

Side bearer clearance should preferably be set at or towards the bottom of the allowable range to accommodate wear at the side bearer plunger pads.



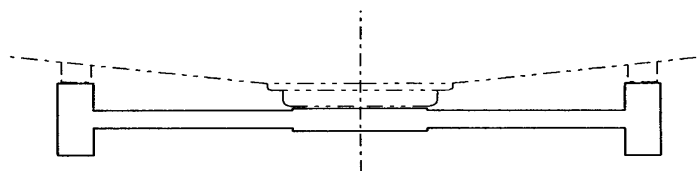
**Figure 7 Application of Bogie Gauge to Bogie Bolster  
 (Item 1 Drawing 307-015)**

Using bogie gauge Datum A in contact with the bogie bolster to set the Maximum Clearance:

Faces in contact	Faces not in contact	Clearance Status
A1, A2, A3, A4		PASS
A1, A4	A2, A3	PASS
A2, A3	A1, A4	FAIL

Using bogie gauge Datum B in contact with the bogie bolster to set the Minimum Clearance:

Faces in contact	Faces not in contact	Clearance Status
B1, B2, B3, B4		PASS
B2, B3	B1, B4	PASS
B1, B4	B2, B3	FAIL



**Figure 8 Application of Wagon Gauge to Wagon Bolster  
 (Item 2 Drawing 307-015)**

Using wagon gauge Datum C in contact with the wagon bolster to set the Maximum Clearance:

Faces in contact	Faces not in contact	Clearance Status
C1, C2, C3		PASS
C1, C3	C2	PASS
C2	C1, C3	FAIL

Using wagon gauge Datum D in contact with the wagon bolster to set the Minimum Clearance:

Faces in contact	Faces not in contact	Clearance Status
D1, D2, D3		PASS
D2	D1, D3	PASS
D1, D3	D2	FAIL

### 4.2.3 King Pin

The king pin shall be inspected and replaced if worn more than 10 mm less than the original diameter at any location, or bent more than 25 mm from the straight position over the full length of the pin.

## 4.3 Springs

This section details the requirements for the preventative maintenance inspection of helical springs on freight vehicles. A helical spring is shown in Figure 9.

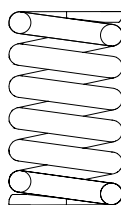


Figure 9

### 4.3.1 Inspection

#### 4.3.1.1 Broken

Springs shall be checked to see if any are broken or missing. Any broken or missing springs shall be replaced.

#### **4.3.1.2 Type**

Springs shall be checked to see that they are of the correct type and number.

For correct type and number see RSS 0043.

#### **4.3.1.3 Seated**

Springs shall be checked to see that they are correctly seated.

Springs shall sit with full contact on the top and bottom seat.

Dislodged or cocked springs shall be resealed with the vehicle unloaded, preferably with as little weight on the bogies as possible.

Care shall be taken to ensure that the springs are not damaged whilst reseating.

After reseating the springs shall be checked for surface damage.

#### **4.3.1.4 Damage**

Springs shall be inspected for surface damage. Prior to inspection all excessive dirt shall be removed from the springs by washing or wire brushing.

Coil pitch variation. The variation between any two adjacent coils shall not exceed 25% of the average free coil spacing.

Free of nicks grooves any sharp edges or abrupt depression.

Free of corrosion. Single pits shall be less than 1 mm in diameter or the major axis of any general pitted area shall be less than 20% of the coil bar diameter.

Free of cracks. No cracks or fissures are allowed.

Free of excessive wear. Any wear flat width must be less than 20% of the coil bar diameter.

Smooth edged depressions are allowed providing there are no sharp edges and that the reduction in bar cross section dimension is less than 5% of the coil bar diameter.

Lack of identification. All springs must show a drawing number, year of manufacture, manufacturers initials and material.

Excessive flattening of dead coils shall not exceed 25% of the forged bar width.

#### **4.3.1.5 Free height**

Any springs removed from a bogie or where there is any doubt the free height shall be measured to the limits shown in RSS 0043.



## 4.4 Side Frame Bolster Interface

This section outlines the details for inspection and measurement of the areas at the bolster gib and sideframe interface. This clearance is the gib clearance.

### 4.4.1 Method

The gib clearance between the bolster gibs and sideframe is taken by adding dimensions "A" and "B" as shown in Figure 10, with the limits shown in Table 3

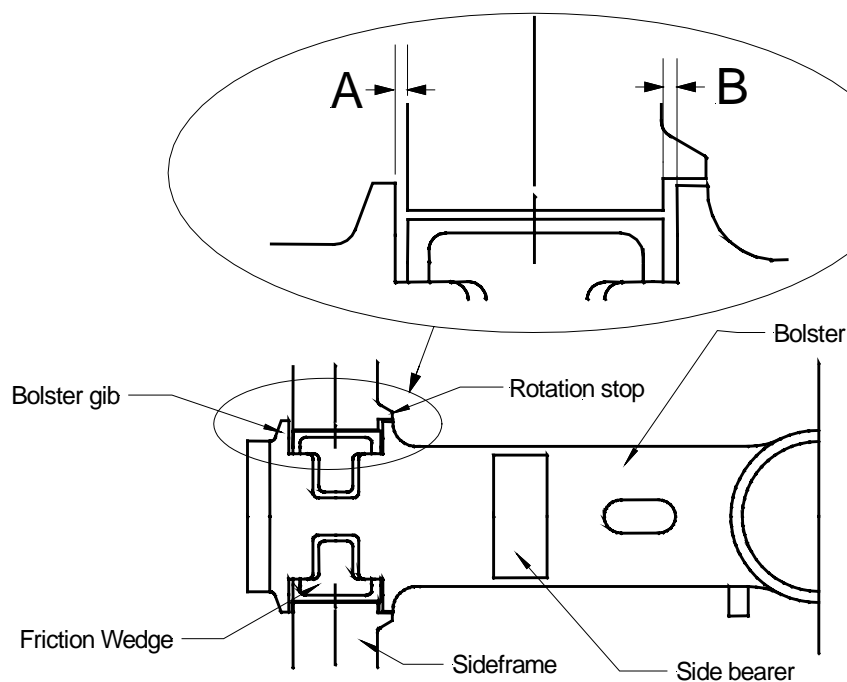


Figure 10

It is recommended to utilise gauge 110-380 or 406-916 for taking such measurements.

Centre Casting Diameter	Gib Clearance A + B not to be greater than	Action
300 mm (12")	30 mm	Sideframe &/or bolster require repair.
355 mm (14")	38 mm	Sideframe &/or bolster require repair.
406 mm (16")	38 mm	Sideframe &/or bolster require repair.

Table 3

Along with measuring the gib clearance the condition and the wear pattern on the gib and rotation stop faces shall be as shown in Table 4

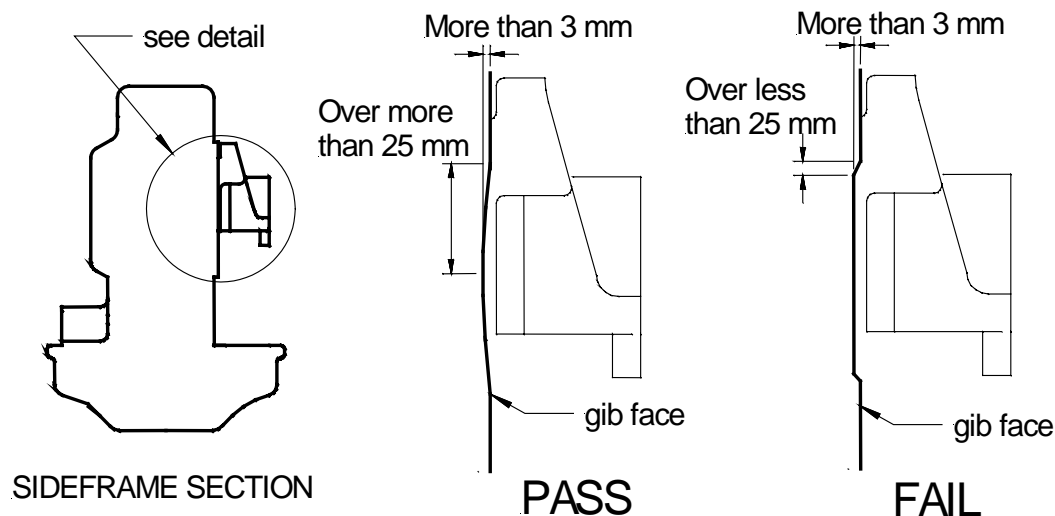


Figure 11

Condition	Action	Comments
Pronounced step evident on the gib face or rotation stop which is greater than 3mm depth over less than 25mm length. See Figure .	Sideframe &/or bolster require repair.	Step may inhibit bolster movement.
Any of the rotation stops worn to be less than 10mm thick.	Sideframe &/or bolster require repair.	
Damaged or bent gib and/or rotation stop which would hinder the safe and effective travel of the mating components.	Sideframe &/or bolster require repair.	May be indication of derailment damage.

Table 4

## 4.5 Bearing Adaptors

### 4.5.1 Axlebox bearing assemblies

Axlebox bearings shall be inspected in vehicles in service, on wheelsets before being installed in bogies and at wheel turning.

### 4.5.1.1 Marking

#### 4.5.1.1.1 Wagons

Suitably marked for wagons shall mean sufficient detail on the Green or Red card for identification of the fault by the next repairer.

#### 4.5.1.1.2 Wheelsets

Suitably marked for wheelsets shall mean attaching the tag to the component with details of the defect.

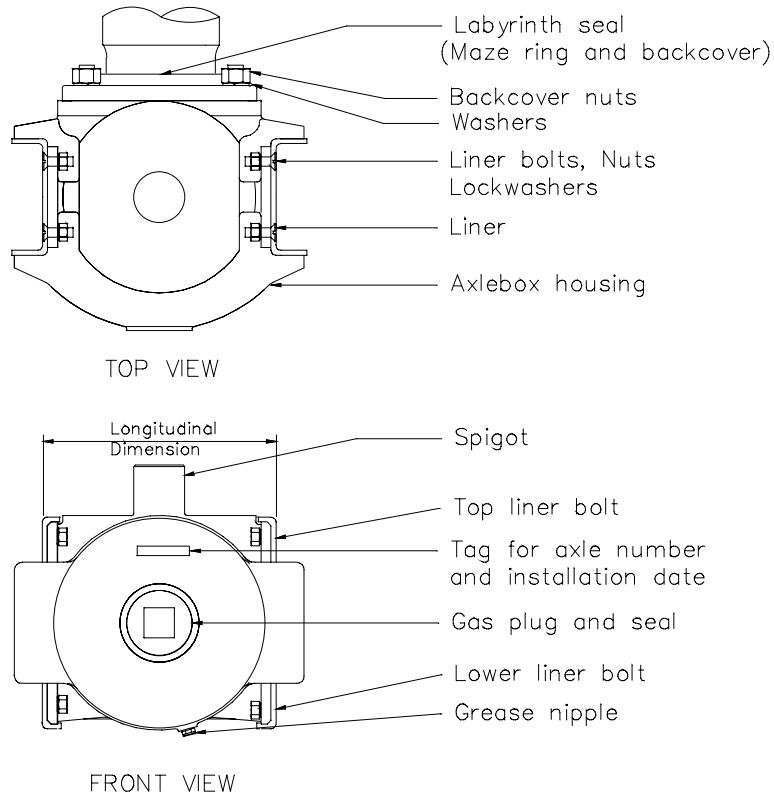
### 4.5.1.2 Axlebox Components

There are two types of axleboxes.

#### 4.5.1.2.1 Primary Sprung Axlebox

This type has primary springs that sit on top of the axlebox allowing vertical movement relative to the pedestal opening. Liners are attached to the side of the axlebox (e.g 18R).

The components that are to be examined for this type of axlebox are shown in Figure 12.

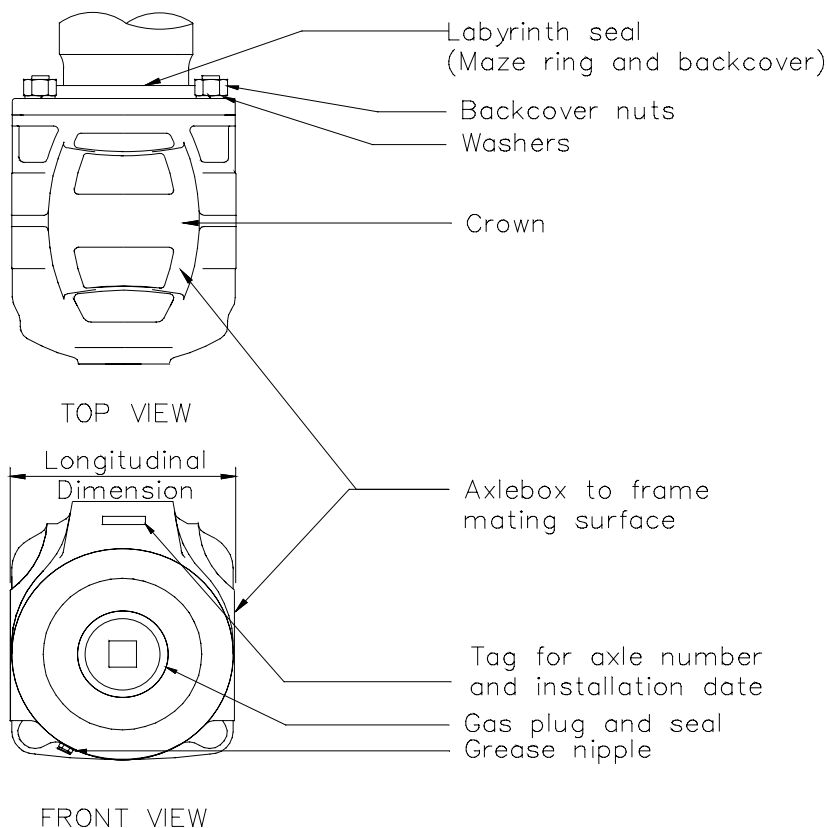


**Figure 12**

### 4.5.1.2.2 Unsprung Type Axlebox

This type of axlebox is used in three piece bogies with direct contact between the crown of the axlebox and the pedestal roof of the bogie sideframe (e.g 9R and 15R).

The components that are to be examined for this type of axlebox are shown in Figure 13.



**Figure 13**

### 4.5.1.3 Inspection Of Axleboxes

#### 4.5.1.3.1 Axlebox Housing

Visually inspect the axlebox housing and note any signs of cracking or extensive physical damage that is likely to effect the safe operation of the bearing.

Any vehicles found to have fractured or extensively damaged axleboxes must be Red Carded. The wheelset must be replaced.

Wheelsets with fractured or extensively damaged axleboxes must be removed and the bearings replaced.

On unsprung axleboxes check the axlebox to frame mating surface for signs of excessive wear. A 3 mm step is considered excessive.

The overall pedestal clearance on sprung type axleboxes shall be less than 5 mm.

For axleboxes under vehicles found to have excessive wear must be Green Carded for replacement of the wheelset.

Freestanding wheelsets with axleboxes with excessive wear must have the axlebox or axlebox wearliners replaced For replacement of wearliners see RSS 0052.

#### **4.5.1.3.2 Grease Leakage**

Visually inspect the rear labyrinth seal area of each bearing for signs of grease leakage.

It is not unusual for grease leakage to be present, but the grease is usually old.

If excessive grease leakage is detected check if the grease is fresh.

If the wheelset is in a vehicle check also surrounding parts of the bogie for signs of grease flung from the bearing.

If the bearing was installed more than 6 months prior to this inspection, and more than half a cup of fresh grease leakage is present, there is excessive grease leakage.

For axlebox bearings the grease date can be gauged from the Bearing Inspection (BI) date on the axle barrel, axlebox tag if the bearings are recently installed.

Bearings on wheelsets under vehicles with excessive grease leakage are to be Green Carded to the nearest facility, where the wheelset is to be removed and suitably marked.

Axleboxes on freestanding wheelsets that have excessive grease leakage shall have the axlebox removed and the cause of the grease leakage determined. Replace any defective components.

#### **4.5.1.3.3 Backcover Nuts**

Visually check the backcover nuts for tightness and ensure that all nuts are applied. Tighten or replace if necessary on site, otherwise Green Card for repairs.

#### **4.5.1.3.4 Grease Nipple and Gas Plug**

Ensure that the grease nipple and gas plugs are in position and correctly installed. If missing, check for any obvious defects through the gas plug. If satisfactory, replace the missing component and regrease according to RSS 0032.

#### 4.5.1.3.5 Loose Wear Liners

Visually check for the correct application of the wear liners and ensure that all bolts are tight.

For wheelsets under vehicles if any of the bottom nuts are missing or loose, Green Card the vehicle for repairs for replacement of the liner bolts.

For wheelsets under vehicles if any of the top nuts are missing the vehicle is to be Red Carded for a wheelset change or replacement of the liner bolts.

For wheelsets under vehicles, if any of the top nuts are loose, Green Card the vehicle for repairs for replacement of the liner bolts.

For freestanding wheelsets, replace the bolts or wearliners according to RSS 0032.

Wheelsets not installed in bogies

In addition, wheelsets that are not installed into bogies must also undergo the following tests.

#### 4.5.1.3.6 Axlebox Longitudinal Clearance

Check the longitudinal clearance. It shall be greater than that specified in Table 5. Overhauled or returned wheelsets received from workshops will not need to be measured.

Axlebox type	Longitudinal over box
9R	241 mm
15R	265 mm
18R	290.5 mm

**Table 5**

#### 4.5.1.3.7 Rumble test

Perform a bearing rumble test as detailed in RSS 0032.

#### 4.5.1.3.8 Lateral play

Check the bearing lateral play as detailed in RSS 0032.

## 4.6 Package Unit Bearings

### 4.6.1 Components

The package unit bearing is made up of the components shown in Figure 14.

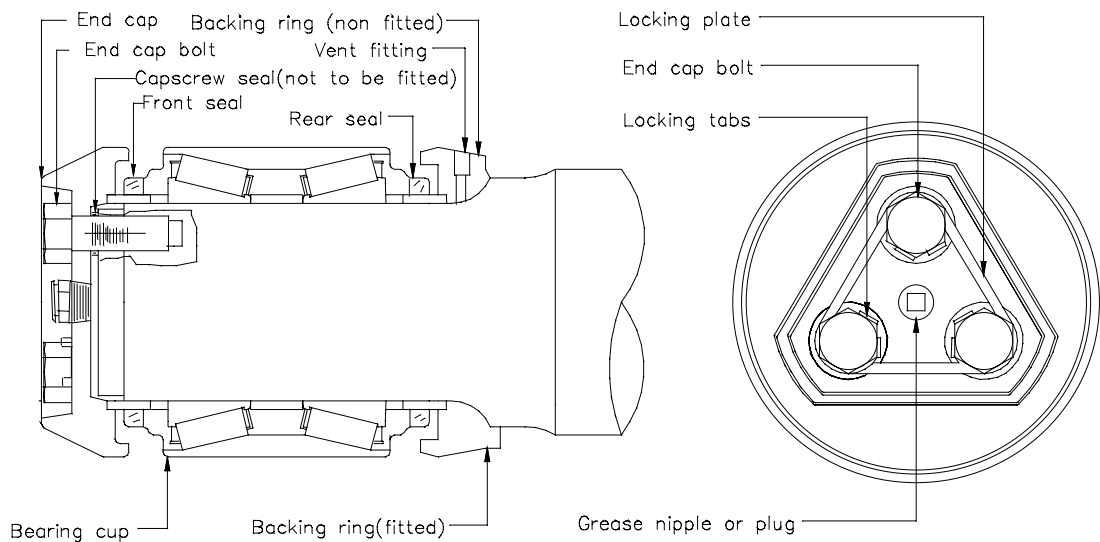
### 4.6.2 Marking

### 4.6.3 Wagons

Suitably marked for wagons shall mean sufficient detail on the Green or Red card for identification of the fault by the next repairer.

### 4.6.4 Wheelsets

Suitably marked for wheelsets shall mean attaching the tag to the component with all details of the defect.



**Figure 14**

### 4.6.5 Inspection of Package Units

#### 4.6.5.1 Axle End Cap

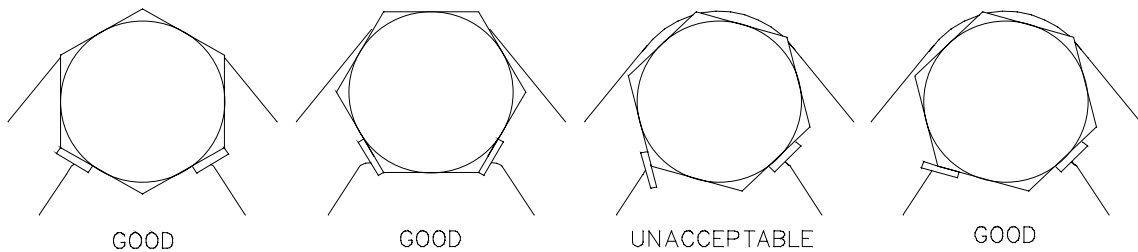
Visually check the axle end cap for signs of cracking.

Any vehicles found to have cracked end caps must be Red Carded. The wheelset must be changed out. The wheelset shall be suitably marked.

Bearings on freestanding wheelsets with cracked end caps shall be replaced.

#### 4.6.5.2 Locking Plate

Check that the locking plate is in place with its tabs bent up to prevent the capscrews from becoming loose as shown in Figure 15.



**Figure 15**

For wheelsets under vehicles, where tabs are found either broken or not bent against capscrew heads, those cap screws must be checked for correct torque and the vehicle Green Carded for checking of the bearings with the wheelset removed from the vehicle. The bearing must be fully inspected according to this instruction.

For freestanding wheelsets, where tabs are found not bent against capscrew heads or broken must have the locking plate replaced and the bearing must be fully inspected according to this instruction.

In all cases when fitting new locking plates stamp the axle number and bearing date from the existing locking plate, onto the new locking plate being fitted.

#### 4.6.5.3 Capscrews

Visually check to see that all cap screws appear secure.

For bearings on wheelsets under vehicles, if any capscrew is loose so that it can be rotated by hand or missing, the vehicle is to be Red Carded and the wheelset replaced.

Bearings on freestanding wheelsets, with finger tight or missing capscrews, shall be replaced.

#### 4.6.5.4 Bearing Cup

Visually inspect the exposed part of the bearing cup.

Note any chips, dents or cracks, particularly at the outer edges of the cup, near the seal.

Bearings on wheelsets under vehicles with chips, dents or cracks in the bearings must be Red Carded. The wheelset must be replaced. Wheelsets are to be suitably marked.

Bearings on freestanding wheelsets with chips, dents or cracks must be replaced.



#### **4.6.5.5 Grease Leakage at Front Seal**

Visually inspect the seal area of each bearing for signs of grease leakage.

If signs of grease are detected, wipe the seal in the area of the leak with a blunt instrument, and check if the grease is fresh.

If in a vehicle check also the surrounding parts of the bogie, such as the frame adaptor, for signs of grease flung from a rotating bearing.

If the bearing was installed more than 6 months prior to this inspection, and more than one tablespoon of fresh grease leakage is present, there is excessive grease leakage.

The bearing installation date is located on the locking plate on the bearing end cap.

Bearings on wheelsets under vehicles with excessive grease leakage are to be Green Carded to the nearest facility, where the wheelset is to be removed and suitably marked.

Bearings on freestanding wheelsets with excessive grease leakage must be replaced.

#### **4.6.5.6 Grease Leakage at Rear Seal**

Behind the bogie frame, visually inspect the rear seal for signs of grease leakage.

On bogies with wing type adaptors, the rear seal can be inspected by reaching up from beneath the frame adaptor and moving fingers around the rear seal from one side of the adaptor to the other.

If in a vehicle check also the frame adaptor in the region of the rear seal, and the wheel for signs of grease flung from a rotating bearing.

If the bearing was installed more than 6 months prior to this inspection, and more than one tablespoon of fresh grease leakage is present, there is excessive grease leakage.

The bearing installation date is located on the locking plate on the bearing end cap.

Bearings on wheelsets under vehicles with excessive grease leakage are to be Green Carded to the nearest facility, where the wheelset is to be removed and suitably marked.

Bearings on freestanding wheelsets with excessive grease leakage must be replaced.

#### 4.6.5.7 Dented Seals

Visually inspect the full circumference of all seals for dents causing the seals to become out of round where the seal meets the bearing cup.

Bearings on wheelsets under vehicles detected with seals damaged in this way must be Red Carded. The wheelset concerned is to be replaced and suitably marked.

Bearings on freestanding wheelsets with dented seals must be replaced

#### 4.6.5.8 Seals Out of Position

Visually inspect all seals to ensure that they are seated squarely to the end of the bearing cup as shown in Figure 16.

Bearings on wheelsets under vehicles detected with seals out of position must be Red Carded. The wheelset must be replaced and suitably marked.

Bearings on freestanding wheelsets with out of position seals must be replaced.

On bogies with wing type adaptors, the rear seal can be inspected by reaching up from beneath the frame adaptor and moving fingers around the rear seal from one side of the adaptor to the other.

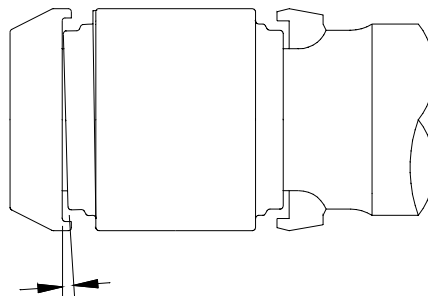


Figure 16

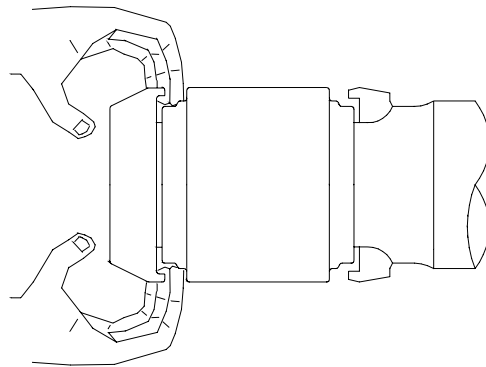
#### 4.6.5.9 Lateral Movement of Seals

Using the thumb and index finger of each hand, or a suitable probe that will not damage the seal, check if the seal can be moved laterally, (in a direction parallel to the axle). as shown in Figure 17.

Bearings on wheelsets under vehicles found to have loose seals must be Red Carded. The wheelset is to be replaced and is suitably marked.

Bearings on freestanding wheelsets found to have loose seals must be replaced.

On bogies with wing type adaptors the rear seals can be most easily inspected by reaching under the frame adaptor and feeling the bearing seal from beneath.



**Figure 17**

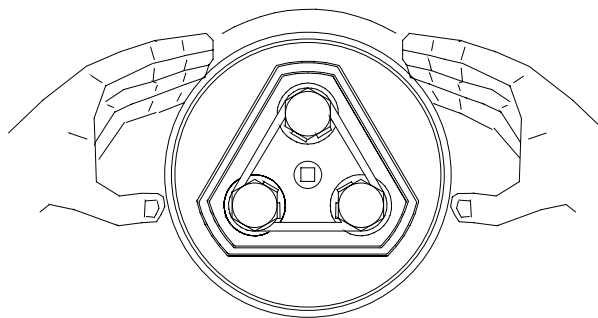
#### **4.6.5.10 Rotation of Seals**

Using the thumb and index finger of each hand, or a suitable probe that will not damage the seal, check if the seal can be rotated as shown in Figure 18.

Bearings on wheelsets under vehicles found to have loose seals must be Red Carded to the nearest depot, where the wheelset is to be removed and suitably marked.

Bearings on freestanding wheelsets with loose seals must be replaced.

On bogies with wing type adaptors, the rear seals can be most easily inspected by reaching under the frame adaptor and feeling the bearing from beneath.



**Figure 18**

#### **4.6.5.11 Bearings out of date**

It will not be required for examiners to specifically look for out of date bearings.

At repair locations determine the latest Bearing Inspection (BI) or installation date from the locking plate.

From this date determine how many years the wheelset has been in service. If it exceeds the period stated in RSS 0032 the wheelset shall be replaced and sent for workshop attention. The wheelset should be suitably marked.

Freestanding wheelsets with out of date bearings shall have the bearings replaced.

Wheelsets with no installation dates are to be treated the same as for bearings that are out of date.

## **4.6.6 Wheelsets not installed in bogies**

In addition, wheelsets to be installed into bogies must also undergo the following tests.

### **4.6.6.1 Rumble test**

Perform a bearing rumble test as detailed in RSS 0032.

Lateral Play

Check the bearing lateral play as detailed in RSS 0032.

### **4.6.6.2 Fitted and non fitted backing rings**

Check the backing ring to see if it will rotate by hand.

If the backing ring can be rotated the bearing must be replaced.

### **4.6.6.3 Non fitted backing ring**

For bearings fitted with non fitted backing rings (see Figure 16 for detail) attempt to insert a 0.05 mm (0.002") feeler gauge between the bearing backing ring and the axle fillet.

If the feeler gauge can be inserted more than 3 mm the bearing must be replaced.

## **4.6.7 Repair procedure**

When fitting new locking plates, replacing end caps, replacing capscrews or replacing bearings, the requirements of RSS 0032 shall be met.

## 4.7 Grease Dates and Colours

### 4.7.1 Axlebox bearings

Vehicles shall be Green Carded for greasing attention if either, it is three years since the last grease date (RH pedestal see 2.1.4), or the axlebox colour is as indicated in Table 6.

If a bearing is more than 3 months overdue for greasing (ie from April in the year overdue) the vehicle shall be Red Carded. Greasing shall only be carried out by facilities that comply with RSS 0032.

Bearing is <b>overdue</b> for greasing in January of this year	Colour to be identified and carded for attention - All freight
2004	Purple
2005	Green
2006	Yellow or Silver
2007	Pink
2008	Orange
2009	White
2010	Blue
2011	Purple
2012	Green
2013	Yellow or Silver
2014	Pink
2015	Orange

**Table 6**

### 4.7.2 Package Unit Bearings

Bogies containing Package Unit type bearings do not require regreasing, and thus are not to be marked off for due greasing dates. These bogies will eventually carry no grease dates.

One piece bogies coded DCA have 'E' class package units and will be colour coded the same as axlebox type bearings when the bearings are installed. On these bogies the colour indicates when the bearings are overdue for removal. These bogies shall be Green carded for attention in the same colour year as for axleboxes as indicated in Table 6.

### 4.7.3 Greasing of Bearings

Bearings requiring greasing are to be greased in accordance with RSS 0032 Axle Bearing Reference Manual.

#### 4.7.4 Bearing Adaptors

Bearing adaptors are to be inspected in accordance with RSS 0032 Axle Bearing Reference Manual.

#### 4.7.5 Compatibility of Bearing Adaptors

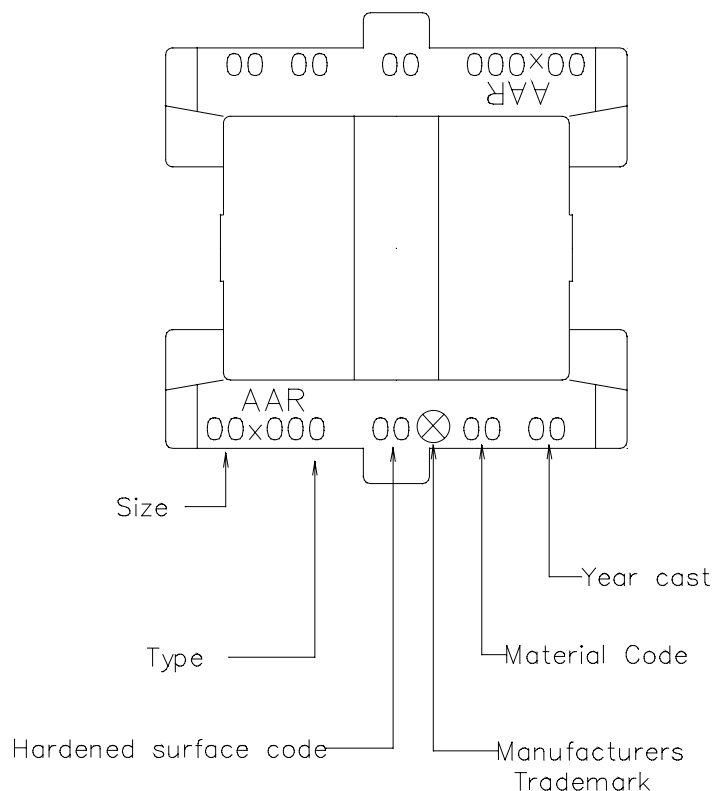
Adaptor need to be correctly identified so that when they are installed with the bearing, the correct adaptor is used. If the wrong adaptor is used the bearing may fail in service.

Refer to with RSS 0032 Axle Bearing Reference Manual for identification of package unit bearings.

#### 4.7.6 Identification of Bearing Adaptors

This section details how to identify wide and narrow adaptors fitted to freight bogies.

Wide and narrow adaptors are identified by the markings shown on the top of the adaptor as shown in Figure 19. Not all markings may be on the adaptor.



**Figure 19**

#### 4.7.6.1 Size

RIC code	AAR class	Size
BPU	B	4 1/2" x 8"
CPU	C	5"x9"
DPU	D	5 1/2" x 10"
EPU	E	6"x 11"
FPU	F	6 1/2" x 12"
GPU	G	7"x12"

**Table 7**

#### 4.7.6.2 Type

W	Wide
N	Narrow

**Table 8**

#### 4.7.6.3 Hardened surface code

C	Crown
T	Thrust shoulder
CT	Crown and thrust shoulder

**Table 9**

#### 4.7.6.4 Material Code

PM	Pearlitic malleable
S	Cast steel
F	Forging
D	Ductile Iron

**Table 10**

## 4.8 Brakegear

### 4.8.1 Brake Block Alignment

Brake blocks must be centred on the wheel tread. Refer to RSS 0030 Wheel Defect Manual.

### 4.8.2 Brakegear Security

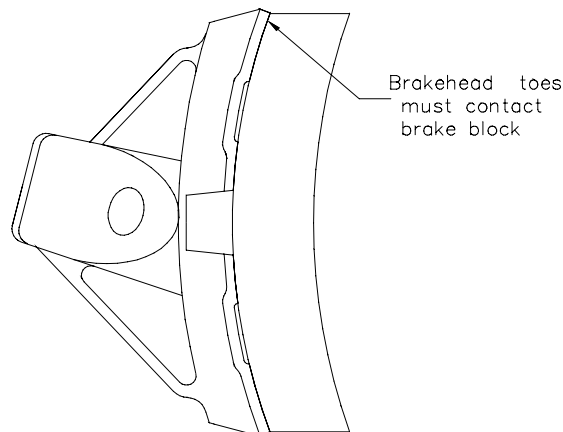
Refer to RSS 0063 Security of Brakegear.

### 4.8.3 Brakebeams

#### 4.8.3.1 Inspection

If one or more of the toes on the brake head are worn or broken to the extent that no portion will contact the back of the brake shoe, the brakebeam shall be replaced. See Figure 20.

Brake beams are considered bent when there is a deviation of more than 3 mm when compared to a 300mm straight edge centred as closely as possible against the bend or indentation. Bent brake beams shall be replaced, except where the bend is by design.



**Figure 20**

Loose brake head fasteners shall be replaced with rivets, bolts or two piece rivets of proper size, machine driven. Where fastener holes are worn more than 1.5 mm larger than the fastener diameter the brakebeam shall be replaced.



### 4.8.3.2 Compression Members

Compression members may be repaired by blending any gouges, wear areas, etc. which are less than 4 mm deep. Total blend length should be 4 times the depth; no sharp corners or fillets are allowed.

Brakebeams shall be replaced when discontinuity's on compression members such as gouges, wear areas, etc. are deeper than 12 mm or more than 75% of the original material thickness.

Compression members may be repaired by welding to fill any gouges or wear areas, etc., which are 4 mm to 12 mm deep or 75% of the original material thickness, so that the surface is within 1 mm of original. Total blend length should be 4 times the depth; no sharp corners or fillets are allowed.

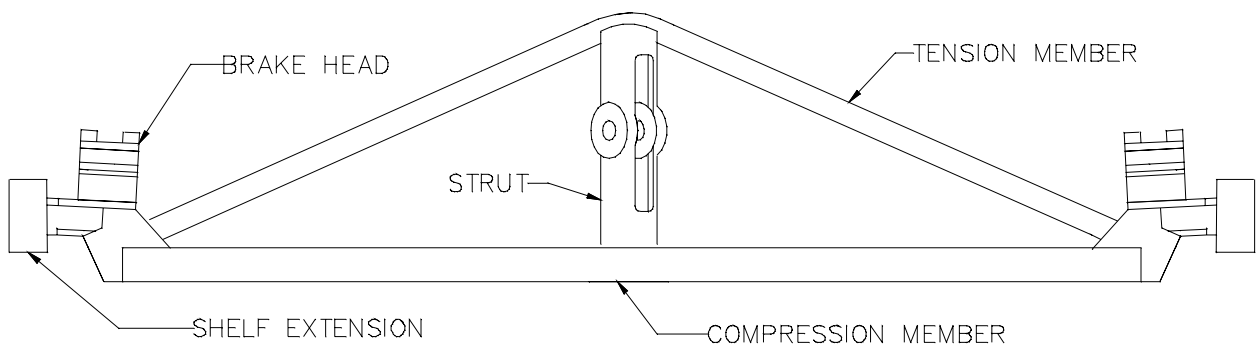


Figure 21

### 4.8.3.3 Tension Members

Repair welding is prohibited on all tension members except by design in the brake head or strut area.

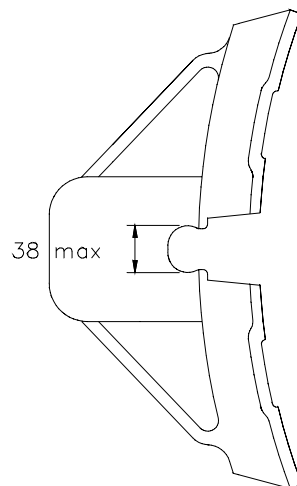
Brakebeams shall be scrapped when tension member diameter or thickness in any direction reduced by wear or corrosion by more than 4 mm.

Tension members may be repaired by blending any gouges, wear areas, etc. which are less than 4 mm deep. Total blend length should be 4 times the depth; no sharp corners or fillets are allowed.

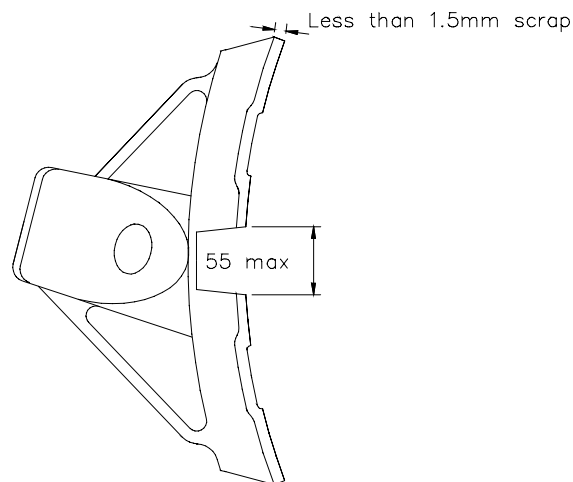
### 4.8.3.4 Brake heads

Brake-heads where the thickness of any of the four brake shoe contact areas or material surrounding the lug pocket area is worn to 1.5 mm or less shall be scrapped.

Brakebeams supported by brake hangers shall be replaced when the hanger bearing openings in the brakehead is greater than 38 mm as shown in Figure 22.



**Figure 22**



**Figure 23**

Brakebeams shall be replaced when the measurement between the upper and lower brake shoe lug is greater than 55 mm as shown in Figure 23.

#### **4.8.3.5 Strut**

Brake beams shall be replaced when struts are cracked, bent or twisted.

#### **4.8.3.6 Brake Beam End Extensions**

Brakebeams shall be replaced when end extensions are cracked, broken, bent or twisted.

### 4.8.3.7 Welding

Inspect all welds for signs of cracking. Repair any cracks where necessary. Welding shall not be across any tension member.

All weld repairs shall comply with AS 1554.

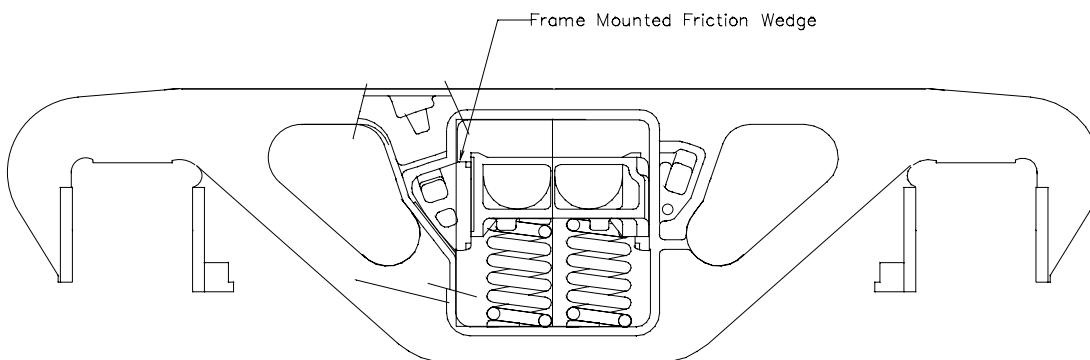
## 4.9 Friction Wedges

### 4.9.1 Frame Mounted Friction Wedges

This inspection requalifies the friction assembly for a further period in service.

In service limits are shown in RSS 0040.

Frame mounted friction wedges are fitted to two piece and National type three piece bogies.



**Figure 24**

#### 4.9.1.1 Inspection

Wedge heights are required to be visually checked for correct height.

Wedges shall be inspected for wear notches.

If there is any doubt to the suitability for service, measurements shall be taken.

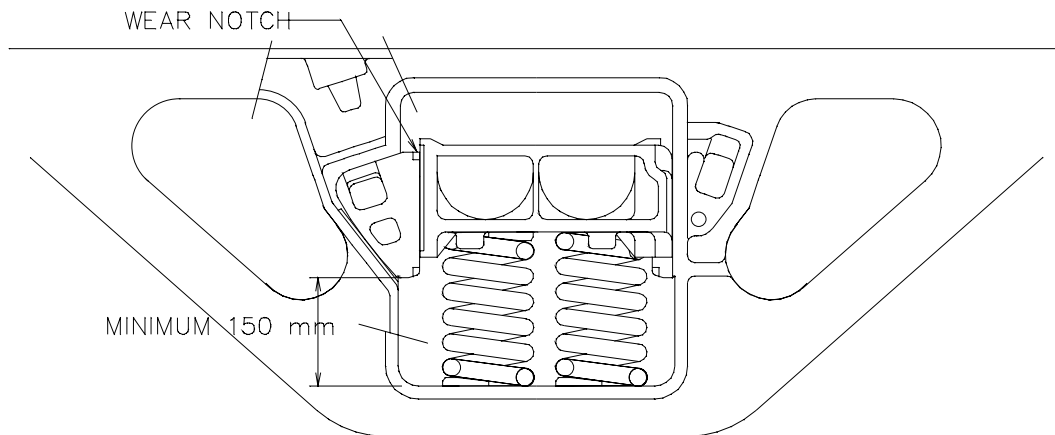
#### 4.9.1.2 Limits

The bottom of the wedge to spring base shall be greater than 150 mm.

The wedge wear notch shall be greater than 3 mm.

#### 4.9.1.3 Measurement With Ruler

The distance from the bottom of the spring seat to the bottom of the friction wedge can be measured as shown in Figure 25



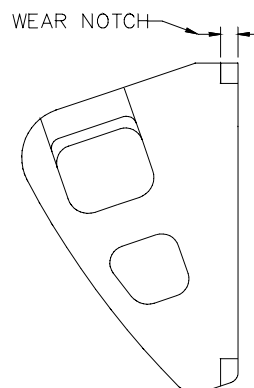
**Figure 25**

#### 4.9.1.4 Wear notch

Snubbers have a wear notch cast into the side friction face positioned as shown in Figure 5 and shown in more detail on the wedge in Figure 26.

This notch is an indication of the wear on the friction wedge casting working face.

The wear notch can be measured with the aid of a ruler.



**Figure 268**

#### 4.9.2 Friction Wedge Spring Data Table

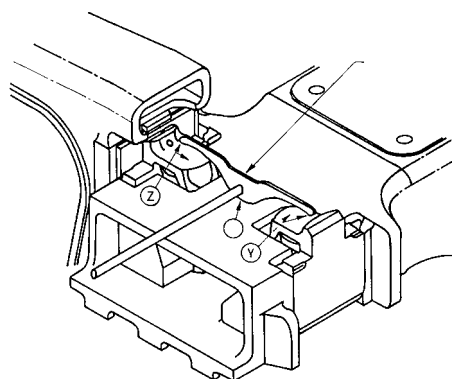
This specification details the free height limits for the requalification of freight friction wedge springs.

Spring	Min free height mm	Colour
303-194	240	Black
303-195	164	Black
303-196	136	Black
303-197	231	Black
303-198	185	Black
303-199	173	Black
RC274	177	Black
TC300	177	Black

**Table 11**

### 4.9.3 Ride Control Bogie Friction Wedges

This type of friction wedge arrangement is fitted to 3 piece freight bogies as shown in Figure 27. Ride Control bogies have the friction wedges housed in the bolster. The spring which forces the wedge out is separate for the wedge, and this spring does not carry any of the vehicle load.



**Figure 27**

#### 4.9.3.1 Inspection

Wedge heights are required to be checked for correct average height and variation.

Wedges shall be inspected for wear notches.

If there is any doubt to the suitability for service, measurements shall be taken.

### 4.9.3.2 Limits

Average wedge height shall be less than 35 mm.

The average wedge height shall be taken over each pair of wedges.

Any lip in the casting at the end of the bolster shall be disregarded.

The wedge height variation shall be less than 15 mm with the bolster centred. If the bolster is not centred then an additional variation of 2.5 mm per 1mm of the bolster being off centre will be allowed, up to a maximum variation of 20 mm.

Wear notch depth shall not be less than 3 mm.

Bogies exceeding these limits shall be overhauled.

### 4.9.3.3 Measurement with ruler

The individual height of each wedge can be measured and then averaged.

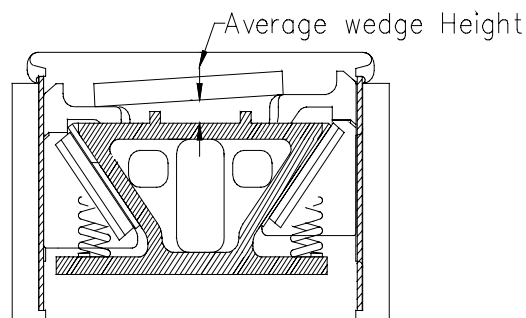


Figure 28

As an alternative, a straight edge can be put across the wedges and the height at the centre of the bolster measured. A radial gauge (406-916) can be used for this purpose.

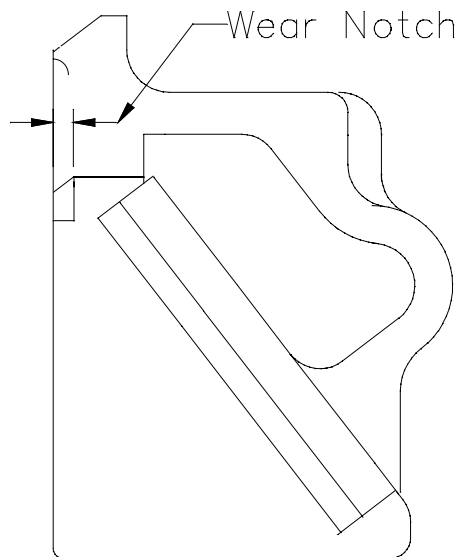
### 4.9.3.4 Wedge Height Variation

The wedge height variation can be measured by using a ruler or radial gauge (406-916).

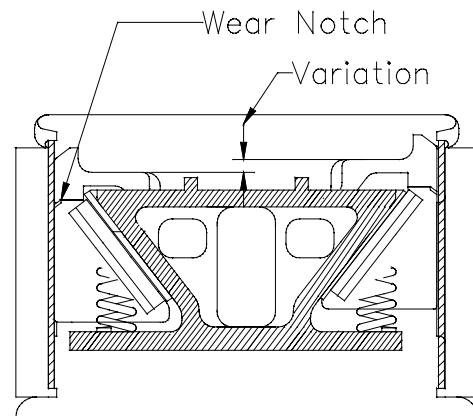
### 4.9.3.5 Wear notch

Wedges have a wear notch cast into the side friction face positioned as shown in Figure 29 and shown in more detail on the wedge in Figure 30.

This notch is an indication of the wear on the friction wedge casting working face.



**Figure 29**



**Figure 30**

## 4.10 Wheels

Wheels shall be examined for any defects in accordance with RSS 0030 Wheel Defect Manual.

Wheels shall be measured in accordance with RSS 0031 Wheel & Axle Reference Manual.

## 4.11 Axles

The Axle barrel shall be inspected in accordance with RSS 0031 Wheel & Axle Reference Manual.

Axles shall be checked for straightness in accordance with RSS 0031 Wheel & Axle Reference Manual.





## 5.3 Pedestal Opening

The DI gauge can be used to gauge the maximum pedestal opening dimension as shown in Figure 34.

Set the gauge to the required dimension on the gauge.

If the gauge can be inserted into the pedestal opening more than 25mm the pedestal opening is greater than the required dimension.

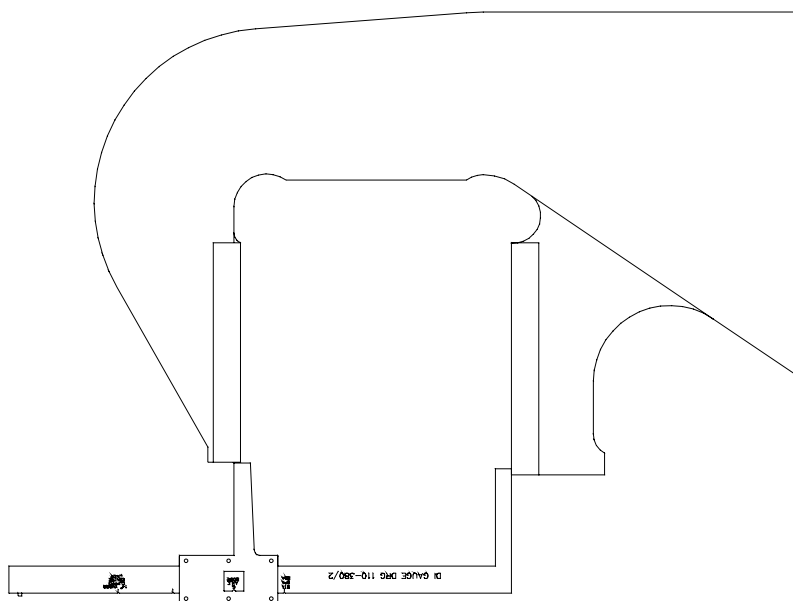
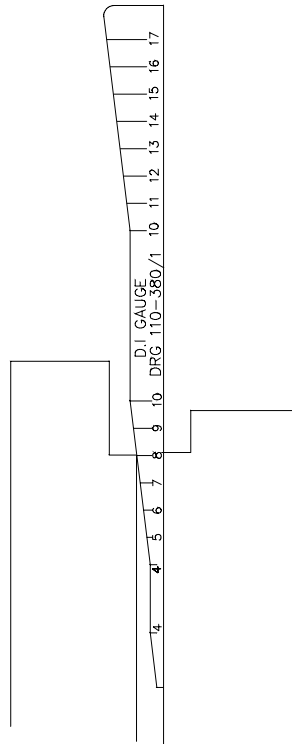


Figure 34

## 5.4 Clearances

The 110-380/1 can be used to measure any small clearances such as axlebox and gib clearances.

Insert the gauge into the opening to be measured as shown in Figure 35.



**Figure 35**

## 6 Stencilling

**Note:** *The DI date is no longer stencilled on the bogie. The DI is due at the next DWI, R2 or R3 maintenance.*

## 7 Reporting

The following reporting forms are to be completed and sent to the Train Operations Unit:

- Three Piece Bogie DI Report Sheet
- Out of Course Repair Report Sheet
- Wagon Release Data Sheet

The following form must be completed if required:

- Scheduled Maintenance & Component Change Out Sheet

## 8 Reference Documents

### 8.1 RIC Standards

RSS 0010	Ballast Wagon Maintenance Policy
RSS 0011	Wagon Maintenance Policy (1996)
RSS 0030	Wheel Defect Manual
RSS 0031	Wheel & Axle Reference Manual
RSS 0032	Axle Bearing Reference Manual
RSS 0040	Inspection of Freight Bogies
RSS 0043	Coils Spring Groups
RSS 0052	Welding of Wear Plates
RSS 0063	Security of Brakegear

### 8.2 RIC Drawings

110-380	Bogie DI Gauge
203-953	Side Bearing Clearances
303-194	Ride Control Bogies Friction Wedge Spring
303-195	Ride control bogies friction wedge outer spring
303-196	Ride control bogies friction wedge inner spring
303-197	Friction wedge spring
303-198	Ride control bogies friction wedge outer spring
303-199	Ride control bogies friction wedge inner spring
306-395	Gauges for adjustment of side bearers to centre bearer Ø350 mm (new and reconditioned vehicles)
307-015	YM Type Bogie Side Bearer to Centre Bearer Adjustment Gauges
406-916	Bogie side bearing clearance gauge
RC 274	
TC 300	

### **8.3 Australian Standards**

AS 1554      Structural Steel Welding Code