

CHAPTER 10

ROLLING GEAR

1001 WHEEL AND AXLE

1001a Introduction

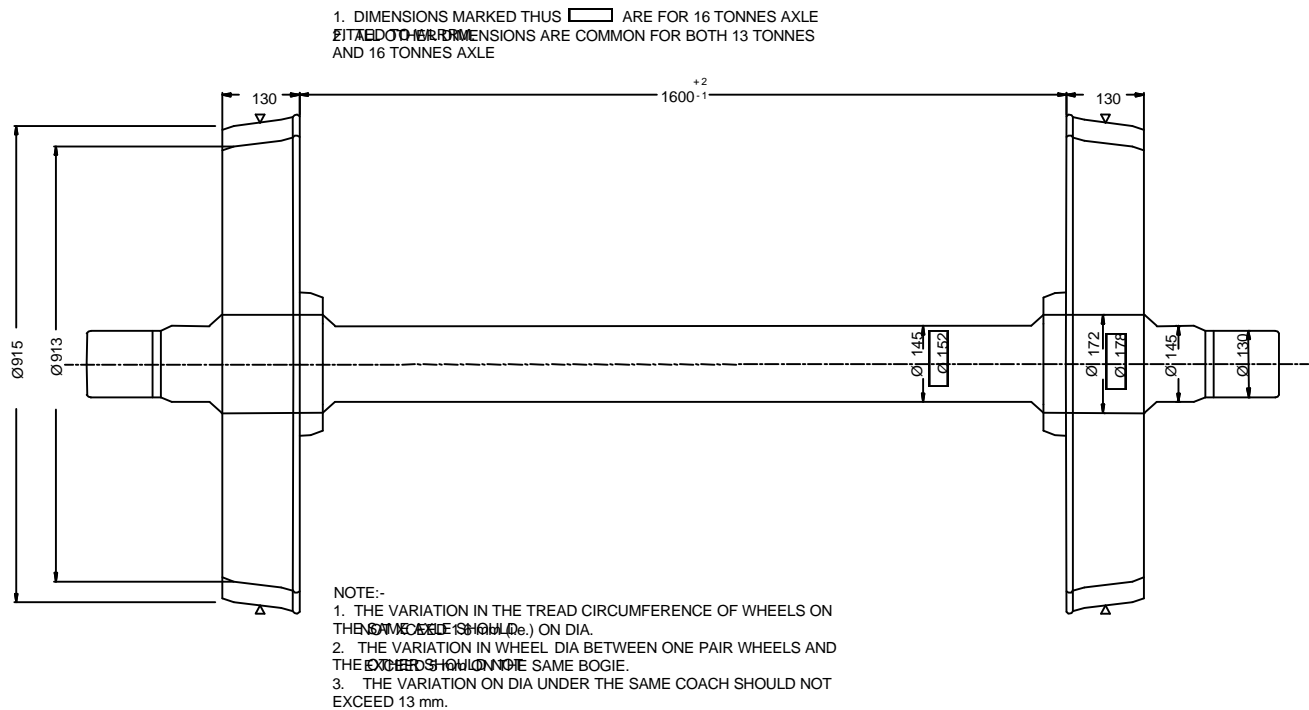
The movement of rolling stock on the track is possible only with the help of wheels. The complete wheel set is shown in the **figure 10.1** with the assembly components. These assembly components are described in detail in the following pages.

i) Wheel disc solid

The solid wheel disc is manufactured as per IRS Specification No. R - 19/ 93 Pt. II and drawing No. W/WL/1660 (see **figure 10.2**).

ii) Axles

An axle is a component of a wheel set to hold the wheel discs in position. The axle box is also mounted on the journal of the axle (See **figure 10.3** for Axle)



WHEEL AND AXLE COMPLETE

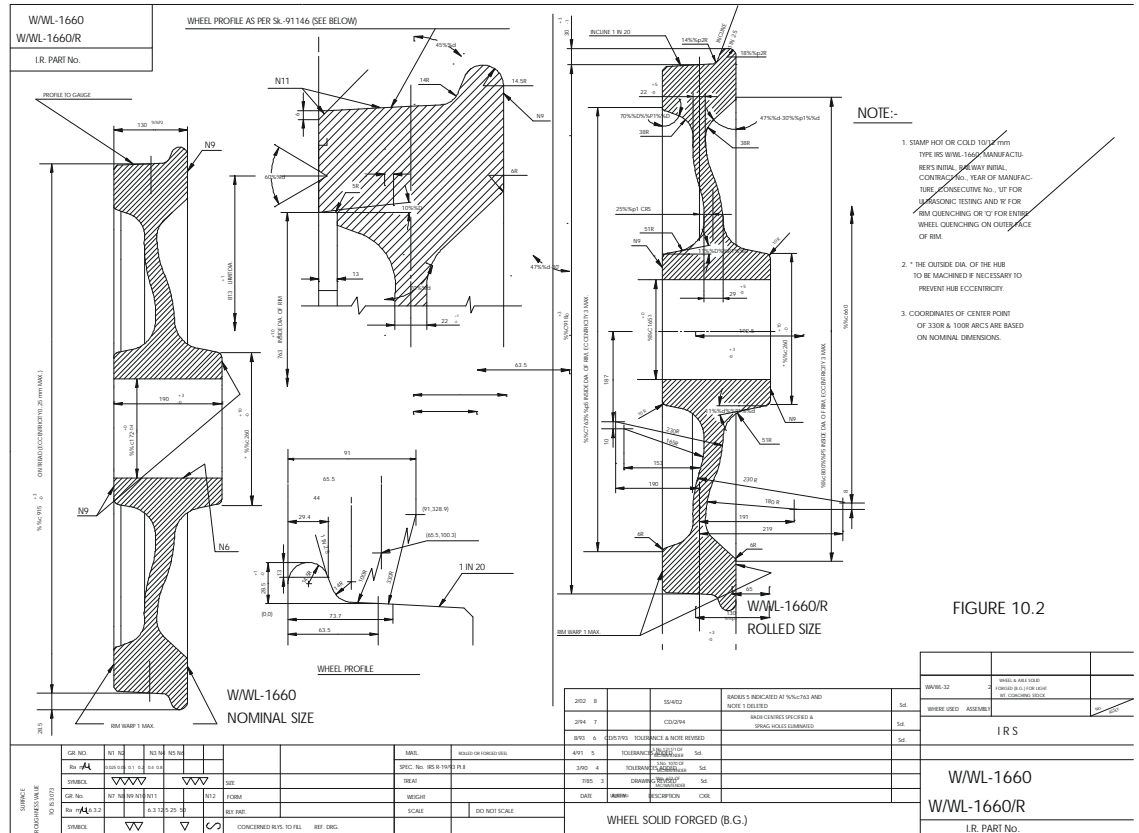
Figure 10.1

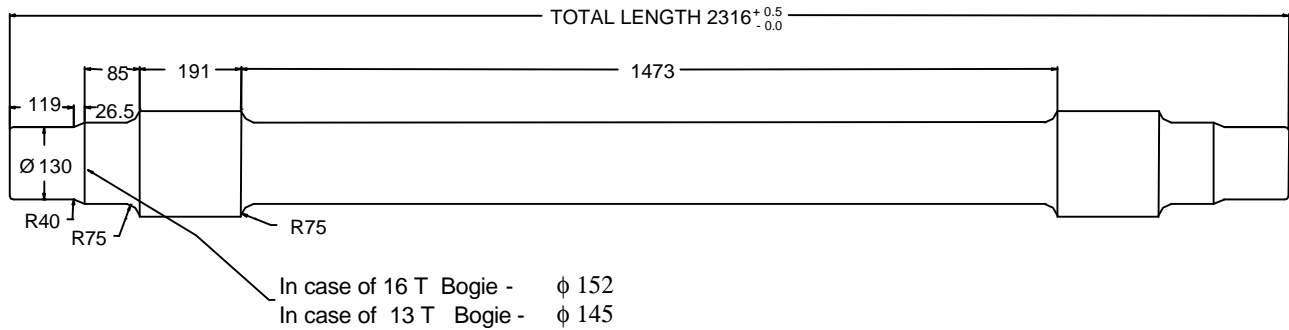
1001b Components of a wheel set

A wheel set is an assembly mainly of two components:

- Wheel discs(solid) on both sides of the axle
- An axle to hold these wheel discs in position

Note:- Rly. Bd. vide their letter no. 98/RSF/874/1/SAIL (Pp) dt. 8/10/1998 has decided that only 16.25t axles would be used for wheel set under 13t bogie also for new wheel sets. The existing wheel set in service may however continue till they are required to be changed.





AXLE
Figure 10.3

iii) Axle boxes with roller bearings

The axle boxes used on ICF coaches are with under mentioned spherical roller bearings

Spherical Roller Bearings No. 22326/C3

These roller bearings are with **130 mm** parallel bore on the inner ring and are directly shrunk on the axle journals.

1001c Maintenance Procedure in the Workshop

i) Pre-inspection of wheels in the workshop

During pre-inspection of incoming wheels, the wheel-set is inspected for assessing the condition of the components. Following measurements are carried out on all the wheels, received in shop for repairs.

a) Measurement of a wheel gauge (distance between two wheels flanges on the same axle)

The distance between two wheel flanges on the same axle should be **1600 mm + 2/-1 mm**. This measurement should be taken at three locations apart with the help of an adjustable pi gauge. If wheel gauge is not within permissible limits, then the wheel disc (s) have to be pressed off and then pressed on.

b) Measurement of Wheel Diameter (Tread Diameter)/Wheel Flanges

The wheel diameter is measured with the help of a trammel gauge with a least count of **0.5 mm**. on both sides. However, a gauge with a least count of **0.1 mm**. is recommended as the measurement of a diameter would be more accurate with this gauge.

The difference in tread diameter of the two wheels on the same axle should not exceed **0.5 mm** after tyre turning. There is no 'In service' limit for this variation and rejection shall be decided by tyre defect gauge

During last shop issue the wheel is to be turned to RDSO SK-91146. The profile is to be turned **1 mm** above the condemning limit groove. The maximum diameter and last shop issue size for ICF type wheels is given below:

Table 10.1

Type of wheel	New	Min. Shop issue
ICF solid	915	836

c) Inspection of wheel disc as per CMI-K003

The wheel should be inspected for rejectable defects in accordance with RDSO's instructions CMI-K003

d) Inspection of Wheel Flanges

The flanges on both sides of a wheel set are checked with the help of a profile gauge to measure the height and thickness of flanges. Accurate measurement of flange height and flange thickness is not possible with the profile gauge. It is, therefore, recommended to use a wheel profile gauge with which accurate measurement of flange height and flange thickness to the extent of **0.1 mm** can be made.

After recording the diameters of wheels and wheel flange measurements, the wheel set is nominated for necessary repairs.

e) **Inspection of axle**

Axle journals should be thoroughly cleaned for inspection to detect flaws, pitting, ovality, taper, ridges etc. Each axle should be ultrasonically tested for detecting internal flaws and defects as per the code of procedure issued by RDSO (**Annexure 10.1**). Axles found flawed, pitted or with under size journals should be replaced.

On ICF axle journal

- A taper should not exceed 0.015 / 0.010 mm.
- Out of roundness (ovality) must not exceed **0.015 / 0.020 mm**.

1002 **CATEGORY OF WHEELS**

The wheels are categorised after pre-inspection as below:

1002a **Normal repair wheels**

If all the components are within the acceptable range of limits, these are taken directly for wheel profiling and servicing of roller bearings.

1002b **Wheels requiring replacement of an axle (RA wheels)**

The wheel is taken for replacement of an axle for the following :

- A bent axle,
- Dimensional deviations on a journal / wheel seat
- Axle having groove marks in the middle due to rubbing of a pull rod,
- Dents, corrosion, pitting marks on the surface of the axle
- Axles found flawed in the ultrasonic flaw detection test

1002c **Wheels requiring replacement of solid discs (RD wheels)**

The wheel is taken for replacement of discs if found

- It is not possible to turn the wheel to the last shop issue size
- There is a rejectable defect as per CMI-K003.

1003 **REPAIR PROCEDURES FOR DIFFERENT CATEGORIES OF WHEELS**

Detailed procedure for carrying out repairs to different categories of wheel sets is described below:

1003a **Normal Repair of Wheel sets**

Normal repair wheels are of two categories.

- a. With roller bearings mounted
- b. With roller bearings removed

The activities involved in Normal Repair Wheels are as follows:

- Pre-inspection of incoming wheels.
- Drop axle boxes, clean and inspect axle boxes. If required, repair them.
- Carry out Ultrasonic Flaw detection test of axle.
- If required, dismount roller bearings from journals. (In any case dismount roller bearings in alternate POH)
- If the wheels are sent for re-profiling without dismounting roller bearings from the journals, special protective covers should be fitted on the bearings on either side of a wheel to avoid entry of chips / dust or damage to the bearing during machining.
- Machine wheel profiles to the prescribed dimensions. The wheel tread should be checked and machined to the worn wheel profile and machining standard N11 to IS: 3073. (see **figure 10.4** for worn wheel profile)
- Clean roller bearing and assemble components in position, if not dismounted.
- Inspect roller bearing and assembly in position.
- Check radial clearance and confirm it to be within permissible limits.
- Pack fresh grease
- Mount cleaned and inspected axle boxes.
- Fit front cover with new sealing ring.

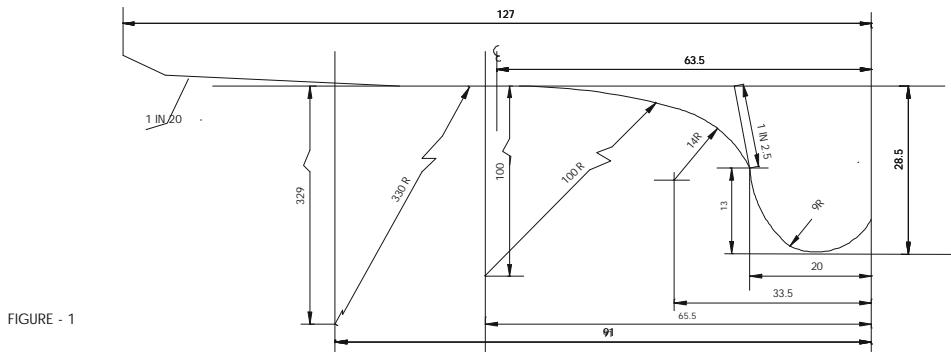


FIGURE - 1

(20 MM THICK FLANGE)

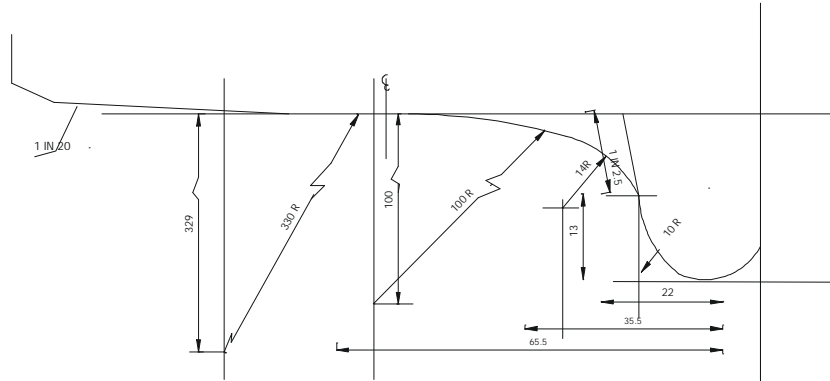


FIGURE - 2

(22 MM THICK FLANGE)

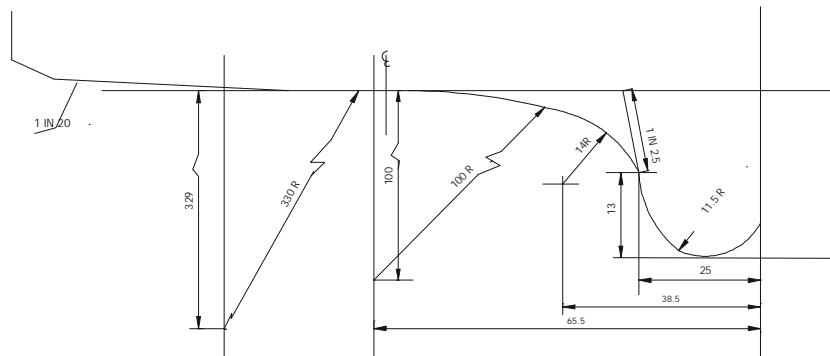


FIGURE - 3

(25 MM THICK FLANGE)

1. FIG. 3 SHOULD BE THE LAST PINTERMEDIATE WHEEL PROFILE FOR THE WHEELS MEANT FOR PIHE COACHES TO RUN AT MAX PKMPH AND ABOVE.P2. ALL THE THREE INTERMEDIATE WORN WHEEL PROFILE (FIG.1,2&3) CAN BE USED FOR THE WHEELS FOR POTHER TYPES OF COACHES.

DEVELOPED BY:		INTERMEDIATE WORN WHEEL PROFILE FOR COACHING STOCK
SUPERSEDES:		
SCALE	P	
	C	
	D PAINT 9/92	
1:1	I	
	B	
B.G. RDSO[C]		SKETCH-92082

FIGURE 10.4

1003b **RA (Replacement of Axles) Wheels**

The activities involved in replacement of an axle are as follows:

- **Pressing off a rejected axle from a wheel**

The wheel is taken on the wheel press for separating the rejected axle from the wheels.

- **Machining of new axles**

New axles should be machined to the correct drawing dimensions. Journal, journal fillets and shoulders should be finished smooth, concentric and without ridges, burrs or chatter marks.

- **Inspection of machined axles**

Dimensional checks

A machined axle should be inspected for dimensional accuracy with the help of a micrometer with least count of **0.01 mm**. Journal diameters should be measured at three points along the length of journals both on the vertical and horizontal axis. The ovality and taper must not exceed the limits prescribed in the drawing..

Surface finish checks

Surface finish of the axle on journals, wheel seat and middle portions should be checked with the help of a surface finish tester and the prescribed limits are as below: -

Table 10.2

Axle portions	Prescribed (RA) value for Surface finish in microns
Journal portion	0.8
Wheel seat portion	1.6
Middle portion	3.2

Ultrasonic flaw detection checks

Ultrasonic flaw detection test is carried out as per **annexure 10.1**.

- **Machining of serviceable wheel disc**

The serviceable wheel discs are re-bored on the vertical boring machine. Care should be taken that the finished bore is straight, concentric to the tread of the wheel and has a smooth surface free from ridges, scores and chatter marks. A radius of **2.5 mm** is provided on the hub to facilitate mounting. It must be made after the finishing cut.

- **Inspection of re-bored wheel disc**

The rebored wheel disc should be inspected with the help of an inside micrometer to ensure consistent results. Each wheel bore must be checked at not less than three points in its length and on the different diameters at each of these points to ensure roundness and absence of tapers. The variation for any of these measurements must not exceed **0.05 mm**.

If any taper does exist, the small diameter must be outside ends of the hub (a reverse taper is not allowed). The surface finish of the bore should be within the permissible limits.

- **Machining of wheel seats for matching of wheel disc bores**

The wheel seat of the axle to be used for re-axling is machined to suit the bore of the wheel disc keeping interference allowance as specified.

The bore of wheel disc and wheel seat on the axle should be maintained to the specified surface finish and diameters to achieve correct interference fit and pressing in pressure

- **Pressing on Wheel Discs on Axle**

- Before pressing on operation, wheel seats on the axle and bore of the wheel centres should be carefully cleaned to remove rust, grit, swarf, dirt etc.

- The wheel seat should be lubricated with a mixture of basic carbonate white lead and boiled linseed oil, in the proportion of **1.2 kg**, of white lead paste to **1 litre** of boiled linseed oil. The wheel and axle should be properly aligned on the wheel press.

- The wheel press should be equipped with a dial pressure gauge and pressure recording gauge with graphs to record mounting pressure diagrams for each assembly.
- Wheels should be mounted within the prescribed pressure limits.
- Wheels should be mounted (pressed in) carefully on the axle such that the wheel gauge distance is maintained.
- The axle end should be stamped with the shop code, date of mounting, pressing in pressure, axle no., cast no., cons. no. to enable identification of wheels. Care should be taken to ensure that wheel disc number is preserved (see figure 10.5)
- The wheel gauge should be checked by gauging at three or more equi-angular points around the circumference.

1003c **RD (Replacement of solid discs) Wheels**

During pre-inspection, if it is found that tread diameters of the solid disc wheels cannot be issued at the last shop issue, the wheel is taken for replacement of discs.

The activities involved in replacement of discs:

▪ **Dismounting of Axle boxes & Roller Bearings**

Axle boxes are dropped from the RD Wheel. The wheel is then taken for dismounting of roller bearings from journals.

▪ **Inspection of Axle journals/ Ultrasonic testing of the axle**

Journal diameters should be measured with an outside diameter to confirm to be within the permissible limits. The axle should be ultrasonically tested for flaw detection and should be flawless.

▪ **Pressing off rejected discs from a wheel**

The wheel is taken on the wheel press for separating the rejected discs from the wheels.

▪ **Boring (Machining) of new discs**

New discs are bored on the vertical boring machine. Care should be taken to ensure the finished bore is concentric to the tread of the wheel and has a smooth surface free from ridges, scores and chatter marks. The radius of **2.5 mm**, which is provided on the wheel bore to facilitate mounting, should be made after the finishing cut. An inside micrometer should be used for measuring wheel bores to ensure consistent results. Each wheel bore must be checked at not less than three points in its length and on the different diameters at each of these points to ensure roundness and absence of tapers. The variation among any of these measurements must not exceed **0.05 mm**. If any taper does exist, the small diameter must be at an outside end of the hub bore (reverse taper is not allowed)

▪ **Machining of wheel seats on an old axle for matching of wheel disc bores**

The wheel seats on the old axle (released from RD wheels) are machined to suit the bore of the wheel discs keeping interference allowance as prescribed.

The bore and the wheel seat should be machined to the specified surface finish to achieve correct interference fit and pressing in pressure.

▪ **Pressing on Wheel on Axle**

- Before pressing on operation, wheel seats on the axle and bore of the wheel should be carefully cleaned to remove rust, grit, swarf, dirt etc.
- The wheel seat should be lubricated with a mixture of basic carbonate white lead and boiled linseed oil, in the proportion of **1.2 kg.** of white lead paste to **1 litre** of boiled linseed oil. The wheel and axle should be properly aligned on the wheel press.
- The wheel press should be equipped with a dial pressure gauge and pressure recording gauge with graphs to record mounting pressure diagrams for each assembly.

- Wheels should be mounted within the prescribed pressure limits. Pressing pressure should be **400 to 600 kg/mm** of diameter of wheel seat. For ICF 16t axle with wheel seat diameter from **176mm to 178mm**, the pressing pressure should be **71t to 108t**.
- Wheels should be mounted (pressed in) carefully on the axle such that the wheel gauge distance is maintained.
- The axle end should be stamped with the shop code, date of mounting, pressing in pressure, axle no., cast no., cons. no. to enable identification of wheels. (see figure 10.5)
- The wheel gauge should be checked by gauging at three or more equi-angular points around the circumference. (see figure 10.6)

List of Tools and Plant

1. EOT crane 5 tonnes
2. Wheel profiling lathe
3. Axle journal turning and burnishing lathe
4. Axle journal grinding machine for assembled wheel set.
5. Hydraulic wheel press with facility for mounting pressure diagram
6. Axle turning lathe
7. Vertical turning lathe
8. Axle centering machine
9. Axle end drilling machine
10. Axle grinder

1004 AXLE BOX ASSEMBLY

In passenger coaches of Indian Railway system, only single bearing type axle box arrangement is used. The inner ring of the bearing is provided with either a cylindrical bore (Direct Mounted type) or with a taper bore and withdrawal sleeve (Sleeve Mounted type). All new passenger coaches built by Indian Railways, use only direct mounted type spherical roller bearings. Therefore, practices related to the sleeve mounted bearings, have not been covered in this manual.

1005 ROLLER BEARINGS

1005a Construction feature of Roller Bearings

Spherical roller bearing consist of an outer ring having a continuous spherical

raceway within which operate, two rows of barrel shaped rollers, which in turn are guided by an inner ring with two raceways separated by a centre rib. The spherical roller bearings have self-aligning properties and therefore can automatically adjust to any deviation in the centre line of the axle.

Spherical roller bearings have a large capacity for radial loads, axle loads in either direction, and complex loads. They are suited for the applications such as railway rolling stocks where vibrations and shock loads are encountered.

Roller Bearings are named according to the shape of rollers. Roller Bearings with spherical rollers are called as Spherical Roller Bearings. (see figure 10.7 for roller bearing arrangement)

Spherical Roller bearing no. 22326/C3 with **130 mm** parallel bore on the inner ring are being used on ICF type coaches. They are directly shrunk fit on the axle journals.

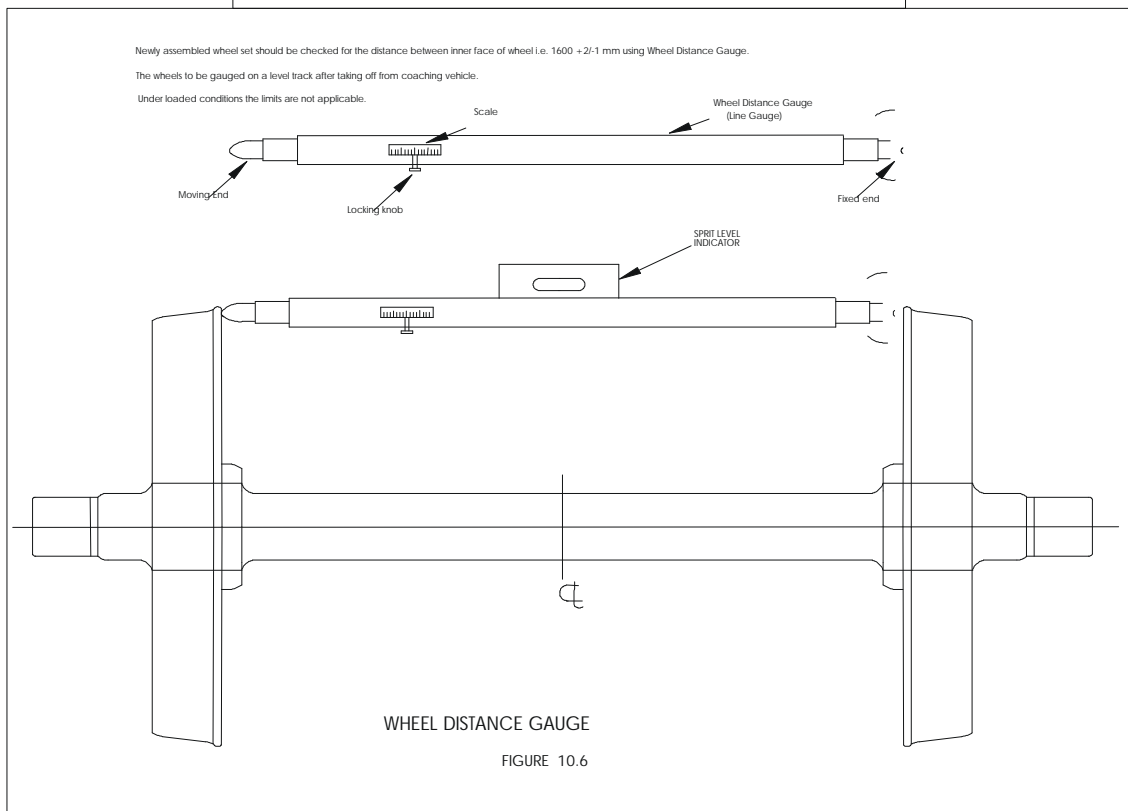
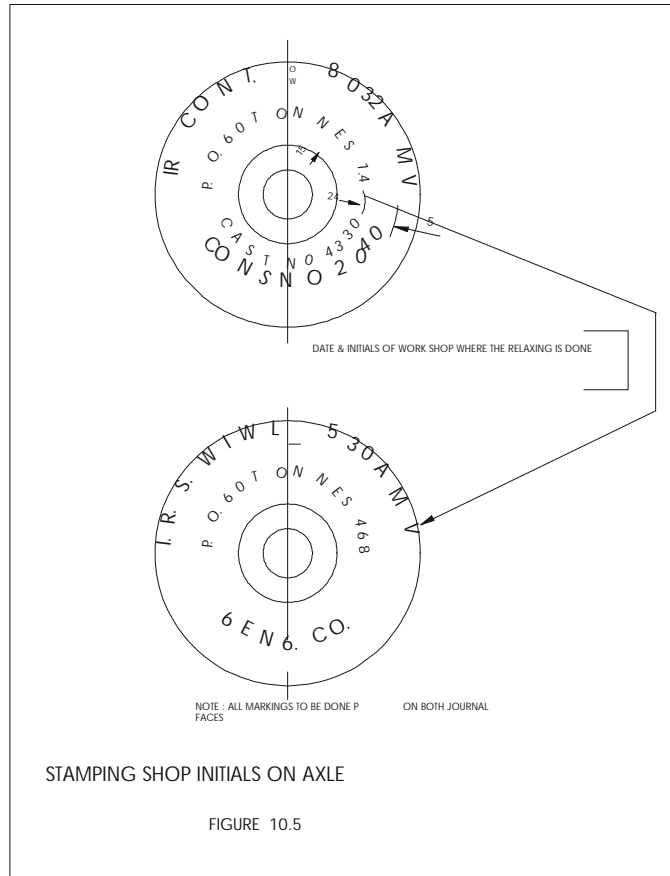
These roller bearings need to be inspected periodically at a pre-defined schedule in the workshop in a Roller Bearing Maintenance Shop well equipped with all the facilities and proper lay out. The period of maintenance specified is as follows:

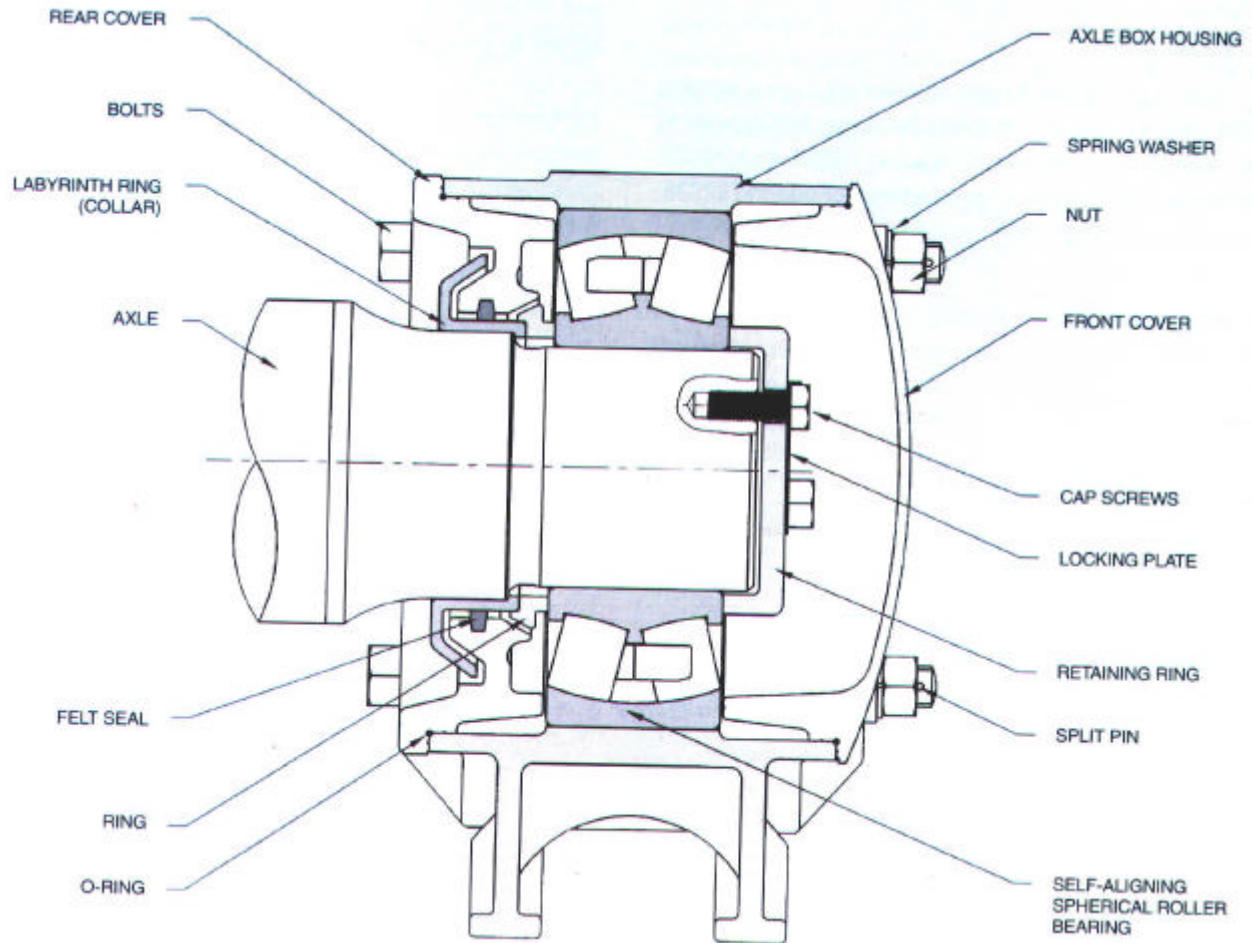
Periodicity of Inspection of Roller Bearing

- All roller bearings should be cleaned, inspected and filled with fresh grease at every POH.
- All bearings should be dismantled every alternate **POH or 2 lakh km** whichever is earlier in the workshop for renewal of felt sealing ring and overhaul of the roller bearings.

1005b Roller Bearing Maintenance in Shop

Roller Bearing Maintenance Shop should be well equipped with all the tools, equipment and facilities for careful bearing handling. It should have proper workflow for easy maintenance of roller bearings. Clean surroundings and dust free atmosphere should be maintained in the shop. It should have adequate equipment and facilities for cleaning, handling, dismantling, dismantling, inspection, repair and storage of roller bearings.





DIRECT MOUNED ROLLER BEARING ARRANGEMENT

Figure 10.7

1005c List of Tool and Plants for Roller Bearing maintenance

Following are the tools and plants required for a Roller Bearing Maintenance Shop.

Table 10.3

Sr.	Nature of Work	Equipment/Facility required
1	Cleaning of Roller Bearing	Automatic roller bearing cleaning equipment with 3 stage cleaning of pre-wash, wash and water rinsing.
2	Cleaning of Axle Boxes	Axle box cleaning plant with Bosch tank and spray jet cleaning in a close chamber
3	Axle Box extraction	Axle Box extractor
4	Dismounting of Spherical Roller Bearings - taper bore	Hydraulic dismounting Equipment – Withdrawal Nut
5	Dismounting of Spherical Roller Bearings - straight bore	Hydraulic Dismounting equipment
6	Mounting of Roller Bearings	Induction heater with de-magnetising device
7	Securing of end locking bolts	Torque wrench and torque wrench tester

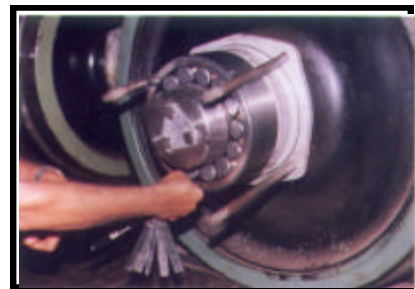
Sr.	Nature of Work	Equipment/Facility required
8	Visual inspection of dismantled roller bearings	Magnifying glass with light
9	Measuring/checking of radial clearance	Long feeler gauge set with number of leaves with different thickness
10	Measurement of journal/ shoulder diameter	Outside micrometers
11	Inspection of axle end tapped holes	Thread plug gauges for different sizes of tapped holes
12	Inspection of locking bolts	Thread ring gauges for different sizes of Locking bolts
13	Exact quantity of grease to be filled	Volumetric containers with different Sizes for different quantity of grease
14	Identification of bearings, inspection details	Engraving / Etching machine

1005d Inspection of Roller Bearings in Mounted Position

Following procedure should be adopted for carrying out inspection of roller bearings in mounted position.

- Clean the exterior of axle box, front cover, axle box housing.
- Remove axle box with the help of mechanical screw type puller, by taking care to protect axle centre with the use of pad not allowing the screw to rest on the axle centre. The end locking plate should be removed.
- Examine the grease for consistency, colour, contamination with water, foreign particles, etc.
- If the grease is in good condition, the bearing should not be dismantled, provided its felt sealing ring and rear cover do not require renewal.
- Remove old grease. Roller bearing and its components should be thoroughly washed and cleaned with kerosene and then petrol/white spirit.
- All components viz., rollers, cage, outer and inner rings (races), roller track of outer ring should be examined after swiveling the outer ring.
- Bearing should be rejected for the following defects: -
 - Pitted or flaked roller tracks and rollers.
 - Cracked or deformed or badly worn out cage
 - Cracked inner or outer ring
 - Scored or damaged outer surface of the outer ring

- Indentation or rings or rollers
- Scoring of roller tracks or rollers
- Rust/corrosion, damage or excessive fretting corrosion
- Brinelling or false brinelling
- Rings exhibiting deep straw or blue or purple colour indicating heat effect
- Excessive or less radial clearance.
- Radial clearance should be measured in a mounted position with a long feeler gauge simultaneously over both the rows of roller (see figure 10.8). The blades of the feeler gauge should be inserted between the outer ring and the unloaded rollers. While measuring the radial clearance, the rollers should not be allowed to roll over the blade. The acceptable range of radial clearance for bearing in mounted position on journal for different makes of roller bearings is given in table 10.4.



Checking Bearing radial clearance in mounted condition
Figure 10.8

Table 10.4
(Reference Letter no. MC/ RB/ Genl
dtd. 10.7.98)

Bearing make	Radial clearance in mm
SKF	0.105 to 0.296 mm
FAG/NORMA	0.080 to 0.185 mm
NEI/NBC	0.080 to 0.190 mm

- After inspection, if bearing is found satisfactory for further service, the bearing may be cleaned further for re-assembly and greasing. Care should be taken that outer ring is aligned or turned back to its original position slowly. Jerky movement of outer ring can cause damage to rollers.
- Carry out detailed inspection of all other parts for wear, mechanical damage and any other defect, the locking plate should be fitted in position, the end locking bolts tightened with a torque wrench to a correct torque value as given below:

11 to 12 m kg. For M16 bolts.

15 to 16 m kg. For M20 bolts.

- Torque wrenches should be periodically checked for accuracy with torque wrench tester.
- Bend all tabs of locking plate against the sides of the bolt using adjustable rib joint plier.
- The date, the month, and the year of attention and workshop code should be punched on the locking plate in case of retaining ring and on the annular nut in case of annular nut type arrangement (see figure 10.9)

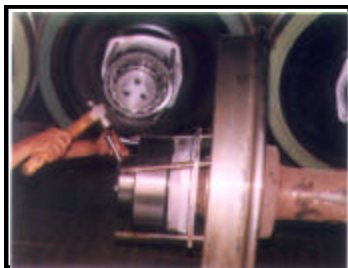


Figure 10.9

- Fresh grease should be packed between the rollers and the space between rear cover and the roller bearing. Correct quantity of grease is filled in each axle box for which volumetric containers having unique shape and size are used to eliminate mistake by staff.

- A truncated cone of grease should be formed to in from of the bearing. The 'V' grooves in the rear cover should also be filled with fresh grease after thorough cleaning.
- The axle box housing, front cover and 'V' grooves on their faces should be thoroughly cleaned and checked for damages, distortion and trueness of dimensions. After filling the fresh grease in the grooves, the axle box housing should be carefully pushed on the bearing and the front cover tightened in position. The nuts of the axle box should be secured with the split pin. Month, year and workshop code should be stenciled on the front cover and the axle box sealed. The free rotation of the axle box should be checked by hand.

1005f Lubrication

- The quantity of grease filled per axle box

SKF make bearing **2.00 kg**

Other make bearings **1.75 kg**

- Only lithium base grease of approved brands should be used

▪ Guidelines for storage of Grease

1. Grease drums should be stored in vertical position in a covered room.
2. Take all precautions to prevent contamination of grease due to dirt, moisture, dust foreign particles etc.
3. Always store grease in container with cover.
4. Never mix different types of grease.
5. Use only clean tools and container when handling the grease.

1005g Inspection of other Roller Bearing Components

- The following components other than roller bearing should be inspected during roller bearing maintenance in the workshop.
 - Axle end holes
 - End locking plates
 - End locking bolts
 - Retaining Ring
 - Collar
 - Felt ring
 - Rear and Front Cover
 - Axle box housing

i) Axle end hole

The axle end holes should be checked with GO-NO GO thread plug gauge for correct size and thread condition. If any of the tapped hole is worn out, a helical thread insert could be fitted in that hole for using the same size of bolt. The practice of blocking of worn out holes and drilling a new hole 60° away from old ones reduces the probing are on axle face for ultrasonic testing.

ii) End locking plate

End locking plates should be replaced every time its folds are opened to unscrew bolt.

iii) End locking bolt

- The end locking bolts should be of high tensile steel of reputed brand/RDSO approved manufacturers. The condition of their threads should be checked with GO-NO GO thread ring gauges and worn out bolts replaced.
- The bolt head should be free from any damages and should have proper spanner grip. The length of the bolt should be less than that of tapped axle end holes. Bolts in service should not be reused unless they meet the above standards.
- Bolt while fitting should have no radial or axial play.

iv) Retaining ring

The retaining ring should be cleaned and inspected for flatness and correct dimensions. The mating surfaces must be free from burr, sharp edge, rust or any other type of defect that will prevent proper seating with mating part.

v) Collar

The collar should not be dismantled

unless it is damaged or the interference fit with the axle is lost. Once dismantled, it should be invariably replaced.

vi) Felt ring

Whenever the rear cover is removed from the roller bearing axle box, the felt ring should be replaced. New felt ring should be soaked in warm cylinder oil to IS-1589-60 type I Gr. 3 heated to 40° to 50° C for 30 minutes and smeared with the same grease as used in the axle box before fitting in the rear cover.

vii) Rear and front cover

These covers should be cleaned and inspected for any crack, correct dimensions and concentricity of bolt holes. The height should be 61 ± 0.1 mm in the as cast condition and may be checked with the help of a gauge. In case the cover is worn out, it should be replaced. However the height of the shoulder from the face of both front cover and rear cover should be 60 ± 0.1 mm (refer RDSO's letter no. MC/RB/General dtd. 24/27-3-2000).

viii) Axle box housing

The axle boxes should be thoroughly cleaned in the axle box cleaning plant and inspected. Check for any mechanical damage or distortion. The housing should be free from score marks, excessive corrosion and any wear. The dimensions of the bore and width should be within specified tolerance limits. The axle box should be checked for distortion, particularly at the spring seat. Use cylindrical gauge fitted with dial indicator to check housing bore diameter at bearing seat (see figure 10.10 & 10.11). Check the bore at several places and it must be within specified tolerances. Housings not conforming to the limits or otherwise found unsatisfactory must be rejected.

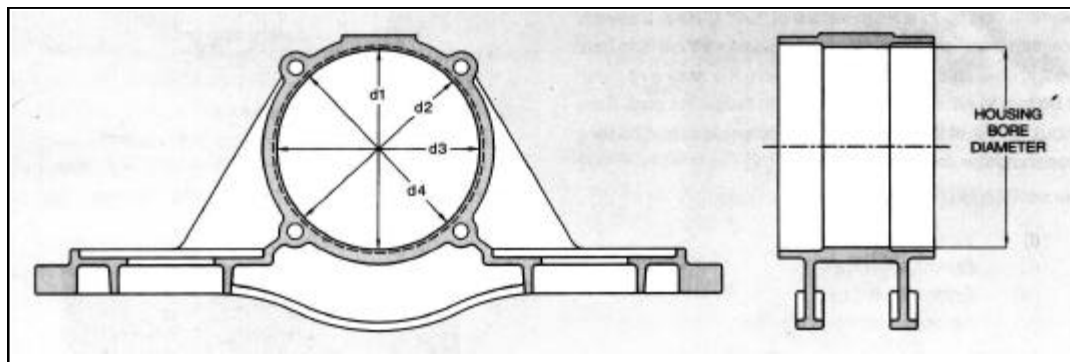


Figure 10.10

Axle box faces should be even. The width of the box should be 216 ± 0.1 mm between faces.



Figure 10.11

1006 MAINTENANCE WHEN BEARING IS DISMOUNTED.

1006a Dismounting of bearing

- For dismounting roller bearings, a special hydraulic dismantling equipment is used (see figure 10.12). Following is the procedure for dismounting of roller bearing - Oil is injected between the journal and bore of the inner ring with high pressure, which expands inner ring resulting in breaking of interference. The bearing becomes loose on the journal and slides over it. The bearing is then removed from the journal and sent to the cleaning plant. Bearing after cleaning is thoroughly inspected for defects.
- All bearing components such as inner ring, outer ring, rollers, cage are examined for cracks, damage and breakage. Roller (track of outer ring) is examined by swiveling the outer ring. Roller track of inner ring is examined by mechanically pulling out a few rollers from the cage.
- Inspection of roller bearings should be carried out under sufficient light, using magnifying glass. If the bearing is found free from all the defects mentioned above, the radial clearance is measured with proper feeler gauge and compared with the permissible limits prescribed by RDSO in the maintenance manual for different makes of roller bearings. If any of the components is found to be defective or radial clearance is not within prescribed limits, the bearing is rejected and discarded from service.

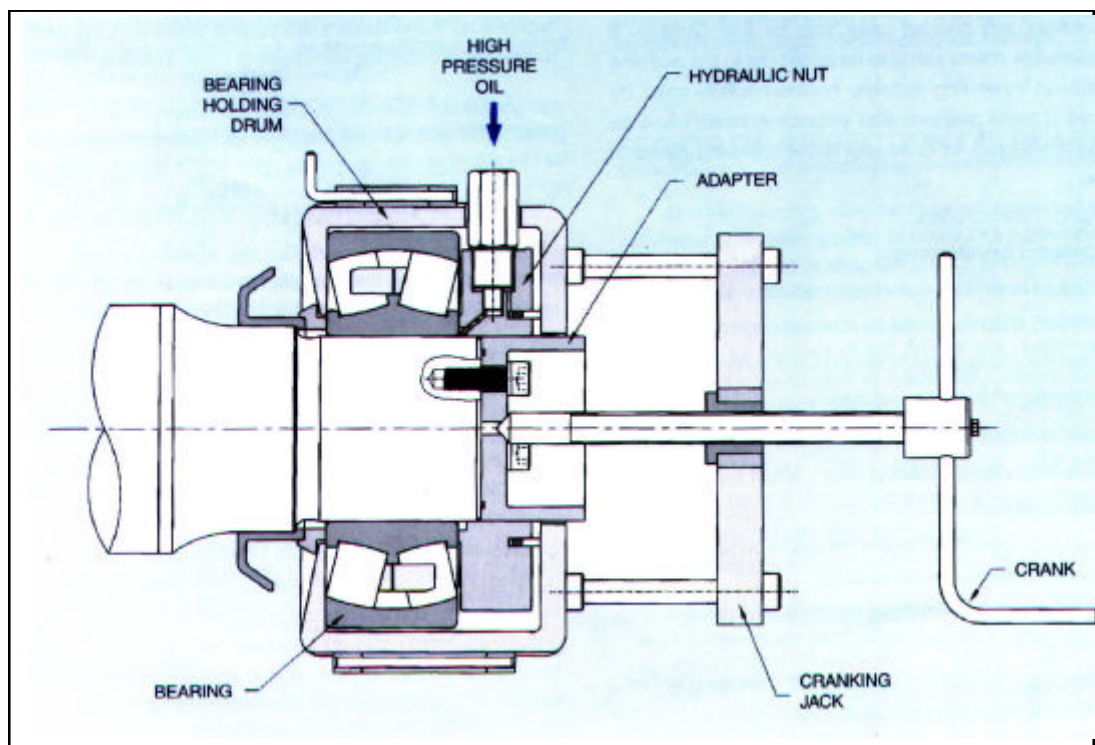


Figure 10.12