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MC/CTRB/Defects

Date: 18.02.2019

Principal Chief Mechanical Engineer,

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2. Eastern Railway, Fairlie Place, Kolkata - 700 001
3. Northern Railway, Baroda House, New Delhi - 110 001
4. Southern Railway, Park Town, Chennai - 600 003
5. South Central Railway, Rail Nilayam, Secunderabad - 500 071
6. South Eastern Railway, Garden Reach, Kolkata - 700 043
7. North Eastern Railway, Gorakhpur - 273 001
8. Northeast Frontier Railway, Maligaon, Guwahati - 781 011
9. Western Railway, Churchgate, Mumbai - 400 020
10. East Central Railway, Hajipur - 844 101
11. East Coast Railway, Chandrasekharapur, Bhubaneswar - 751 016
12. North Central Railway, Allahabad - 211 001
13. North Western Railway, Jaipur - 302 006
14. South Western Railway, Hubli - 580 023
15. West Central Railway, Jabalpur - 482 008
16. South East Central Railway, Bilaspur - 495 004
17. Konkan Railway Corp. Ltd. Corporate office Belapur Bhawan Navi Mumbai-400 614

Sub: En-route detachment of LHB Coach No. SER 182374 LWSCN from Train No. 12860 due to hot axle at BSL Railway Station of Central Railway on 07.02.2019.

Ref: (i) This office letter no. MC/CTRB/Genl. Dated 06.07.2015
(ii) This office letter no MC/LHB/Brake dated 15.01.2018
(iii) This office letter no. MC/CTRB/Genl. Dated 10.01.2019

Coach number 182374 LWSCN, manufactured by ICF/Chennai on 23.11.2018 & commissioned on 13.01.2019 by SRC Coaching depot, was detached en-route from train number 12860 (HWH-CSMT) at Bhusawal Railway Station of Central Railway on 07.02.19 due to high temperature (103°C) of axle box no. 2 (PP end phonic wheel side) during rolling in examination. The coach was placed at Coaching Depot / Bhusawal for failure investigation.

RDSO official has visited Coaching Depot, Bhusawal (BSL), Central Railway on 09.02.2019 to 10.02.2019 for joint inspection of reported bearing. Investigation revealed that rise in temperature of reported bearing was due to damage to outboard side grease seal of the bearing, as result of rubbing with phonic wheel and M8 bolts. The phonic wheel damage led to the bearing damage and unscrewing & bending of one M20 screw. The bearing was freely rotating onto the journal without any abnormal noise during hand rotation after coach lifting, confirming that M8 bolts unscrewed first during service and then phonic wheel got free from its position & rubbed inside the axle box housing with bearing and other components, resulting in temperature rise and hot axle.

There have been two recent cases of bearing failure (1 en-route +1 during PM) due to hot axle within one & half month from the date of the commissioning of the coaches in this month. Details are as follows:

S. No.	Date of Failure	Location of Failure	Train no.	Coach No.	Primary Depot	Make of CTRB	PU/IOH/POH Workshop	No. of Days from DOC
1.	07.02.19	BSL / CR	12860	182374 LWSCN	SRC/ HWH	Timken	ICF-23.11.18 DOC-13.01.19	25 days
2.	14.02.19	SRC / HWH (during PM)	12859	182338 LWSCN	SRC/ HWH	Timken	ICF-16.11.18 DOC-04.01.19	41 days

For the last case on 14-02-2019, reason reported by SER is working out of phonic wheel, which is similar to the case of hot axle on 7-2-19 at BSL. Further, a check on 6 newly manufactured coaches at LTT Coaching Depot / CR & MMCT Coaching Depot / WR on 17-2-19 & 18-2-19 has brought out that Bolts of phonic wheel/earthing device were found loose in 3 coaches. In one coach, Vyom make bolts were found in earthing device against stipulated makes -LPS, Unbrako or TVS. These defects were then attended to.

RDSO official has also noted during joint inspection that the axle end covers of coach 182374 LWSCN were not opened in D2 schedule (24-01-2019) at SRC Depot/SER. In terms of maintenance instructions for CTRB for LHB coaches, issued vide this office letter no. MC/RB/Defects dated 21-08-2014 & updated & reiterated vide this office letter no. MC/CTR/Defects dated 10.01.2019, M20 screws (security disc), M8 bolts (phonic wheel) & M8 screws (earthing device) should be checked for loosening during D2 & D3 schedules. **SER may kindly investigate the reason for the same and fix up responsibility.**

In view of above,

Zonal Railways should launch an immediate drive to check condition of phonic wheel & earthing device along with their fasteners to cover all newly manufactured coaches in their holding that have not been given D3 schedule till now, as an immediate measure (proforma in Annexure I). The discrepancies brought out in this letter may be specifically checked and attended to where warranted. Compiled exception report may pl. be submitted within 15 days from the date of issue of this letter. While submitting the report, Zonal Railways should verify & also confirm that maintenance of axle box components in LHB coaches at coaching depots is being ensured in terms of instructions issued vide the letters under reference (i), (ii) and (iii) & relevant paras of CAMTECH Maintenance Manual for LHB coaches.

CWEs of Zonal Railways may also conduct audit of maintenance practices for axle box components at the workshops maintaining LHB coaches. Format for audit is attached as Annexure II. Audit reports may pl. be submitted within 15 days from the date of issue of this letter.

DA: As above



(Samir Lohani)
Executive Director (Stds.)/Carriage

Copy to: EDME/Coaching, Railway Board, Rail Bhawan, New Delhi – 110 001

**Condition of Phonic Wheel assembly & Earthing Device Assembly in Newly
Manufactured Coaches**

Depot _____

Rly _____

- 1) Coach Number:
- 2) Manufactured by (PU):
- 3) Date of Manufacturing:
- 4) Date of Commissioning:
- 5) Last D2 Schedule:
- 6) Sick marking details:

NOTE: To check whether M8 bolts of phonic wheel & earthing device are properly torqued or not, calibrated torque wrench will be set at 21Nm & applied on M8 bolts. Number of rounds ($1/4^{\text{th}}$, $1/2$, $3/4^{\text{th}}$, 1 & so on) the bolt rotates or tightens before click of torque wrench indicating torque of 21 Nm will represent looseness of the bolt.

7) Phonic Wheel Assembly:

		Make of bolt	Property class of bolt	Number of rounds it tightens /rotates before reaching 21Nm (represented by click of torque wrench)
Phonic Wheel 1	M8 Bolt 1			
	M8 Bolt 2			
	M8 Bolt 3			
Phonic Wheel 2	M8 Bolt 1			
	M8 Bolt 2			
	M8 Bolt 3			
Phonic Wheel 3	M8 Bolt 1			
	M8 Bolt 2			
	M8 Bolt 3			
Phonic Wheel 4	M8 Bolt 1			
	M8 Bolt 2			
	M8 Bolt 3			

8) Oiler Ring Assembly of Earthing device:

		Make of bolt	Property class of bolt	Number of rounds it tightens /rotates before reaching 21Nm (represented by click of torque wrench)
Oiler ring 1	M8 Bolt 1			
	M8 Bolt 2			
	M8 Bolt 3			
Oiler ring 2	M8 Bolt 1			
	M8 Bolt 2			
	M8 Bolt 3			

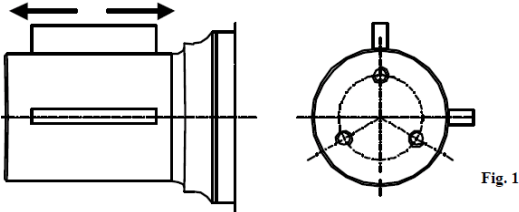
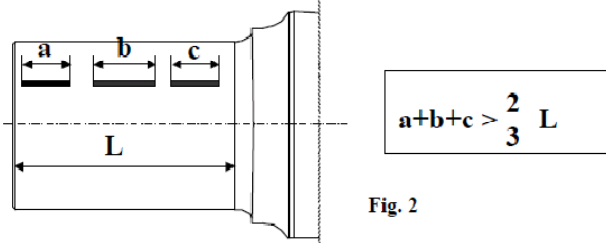
9) Condition of other components of earthing device

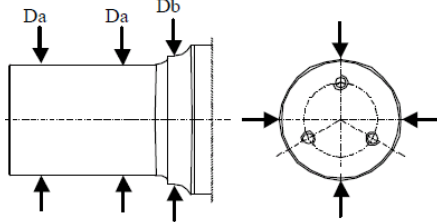

	Condition of wire connection from earthing device to coach	Condition of carbon bars	Condition of spring mechanism
Earthing device 1			
Earthing device 2			

10) Any other remark:

Audit Format: Roller Bearing & Wheel Assembly

1.	<p>Cartridge Tapered Roller Bearing (CTRB):</p> <p>In SS-I, rotate the bearing assembly to detect any abnormal condition. Check the bearing mounted endplay. If endplay is beyond permissible limit(0.025 – 0.330 mm) or if any roughness is detected while rotating the bearing, dismount the bearing and send for reconditioning.</p> <p>In SS-II, dismount the Bearings and send for inspection/reconditioning.</p> <p>Bearing reconditioning is to be carried out whenever bearing is removed from axle due to wheel / bearing failure.</p> <p>If new bearing or reconditioned bearing is fitted, a metal identification tag with the mounting date shall be crimped to the brake disc near the bearing.</p> <p>If the wheel sets are sent for re-profiling without dismounting bearings, lubricate the lathe centres with heavy grease and protect the bearings.</p> <p>For reconditioning of bearings, please refer to OEM's instructions.</p>	12.5	
	Removal of Bearing from Axle		
2.	Check the axle housing end cover mounting screws (M16x45/M16X50) for dimensions and loosening (Tightening torque 170 Nm)		
3.	The bearing assemblies should be removed with help of a bearing press.		
4.	Pressure must only be applied to the backing ring to remove the bearing.		
5.	When bearings are removed from the axle, a pilot sleeve should be fastened to the end of the axle or to the press ram to keep the bearing parts together and protect them from damage.		
6.	Do not drop the bearing assembly when removing it from the pilot sleeve.		
7.	After the bearing assembly is removed from the pilot sleeve, a cardboard insert or a similar device should be inserted in the bore of the bearing assembly to hold the internal bearing components in place.		
8.	Ensure that dismounted bearings are kept in a clean and dry place in covered area.		
9.	Ensure that dismounted bearings are stacked properly and not kept one over the other.		

10.	Thoroughly clean the bores of the housings (Control Arm), remove all rust or corrosion and apply a heavy coating of grease/rust preventive oil to the bores. Place the control arm in the pair.	
11.	Roller bearing removal and installation work should be confined to a specific area.	
12.	Machines and tools designed for roller bearing installation and removal should be used.	
13.	Bearing presses should be equipped with a pressure gauge along with pressure relief valve, so that the specified pressure can be monitored and maintained.	
14.	Bearing presses should be checked with a load cell to ensure that ram pressure as indicated by the dial gauge is covered in the tonnage range.	
Installation of Bearing on Axle		
15.	Clean the bearing seating (axle journal), the axle shoulder for the backing ring seat and blow the threaded holes for axle end cap screws with compressed air. Axle journal & axle shoulder must be free from pre-existing painting and/or antirust coating.	
16.	<p>a) The axle journal must not have waves on its surface. This aspect can be checked by means of a metal ruler smeared with marking blue and moving it forwards and backwards on the axle journal in the axial direction several times. This inspection should be carried out at least in two planes at 90°.</p>  <p>b) If the surface plate leaves an unbroken line, the axle journal is good and suitable for use. If the line left on the journal is a broken line (see Fig. 2) and the length of its parts is less or equal than 2/3 of the total length, the journal must be repaired.</p> <p>c) If several short undulations are detected on the axle journal, the bearing seating must be reground over its entire length. The reground axle journal must be within the specified tolerance limits.</p> 	
17.	Magnetized axles must be demagnetized before mounting the bearings.	

18.	<p>Checking of the bearing seating:</p> <p>Axle should be checked on bearing seat diameters / (axle journal) (130.043-130.068mm), axle shoulders (160.134-160.174 mm) and radii with proper gauges to determine that finished axle dimensions are within prescribed tolerances to obtain proper fit of cone assembly, backing ring and backing spacer/distance ring. Any roller bearing found with the high spots should be carefully reground for the full circumference and length of bearing seats.</p> <p>The diameters $\varnothing D_a$ and $\varnothing D_b$ must be measured to Fig. 3 below, in 2 planes at 90° (maximum different value between 2 points = 0.012 mm) in 3 points (see the dimensions below).</p>  <p style="text-align: right;">Fig. 3</p> <p>$D_a = 130 (+0.068 \text{ to } +0.043) \text{ mm}$ $D_b = 160 (+0.174 \text{ to } +0.134) \text{ mm}$</p>	
19.	Axle bearing seat diameters should be concentric with the wheel seat diameters.	
20.	<p>The bearing seats (axle journal & axle shoulder) are best measured using a dial snap gauge; the instrument least count with DRO facility should be 1 micron.</p> 	
21.	Axle journal should be protected if there is possibility of damage or deformation resulting from mishandling or uneven pressures applied to axle ends.	
22.	The axle end holes should be checked with a "GO NO-GO" thread plug gauge. Threads of M20X60 screws should be checked with GO NO-GO thread ring gauge.	
23.	Bearing should be installed with bearing press	
24.	Machines and tools designed for bearing installation should be used.	
25.	Fit the pilot sleeve on to the end of the axle using a screw to hold it in a position, slide the bearing assembly over the pilot sleeve as far as it will go and place the assembly sleeve behind the bearing assembly.	

26.	Coat the bearing seats of the axle with castor oil, heavy mineral oil, or a molybdenum-disulphide and oil mixture. Do not use white lead.	
27.	Apply the pressure to the end of the assembly sleeve until the bearing assembly is correctly seated. Ensure that seating load applied during assembly should be between 37 – 42 T for Timken make bearing and 28 – 32 T for SKF make Bearing.	
28.	Apply the Security disc, locking plate and M20X60 hexagonal head screws to RDSO drawing CG-15067, of property class 8.8 and of specified make TVS, UNBRAKO and LPS (RDSO letter No. MC/CTRB/Genl. dated 06.07.2015). Tighten the screws with a torque of 200 N-m and bend the locking plate tabs.	
29.	Check the bearing mounted end play with dial indicator mounted on a magnetic base. Ensure that Mounted end play (MEP) should be between 0.025 – 0.330 mm.	
30.	To minimize the risk of ingress of water through the backing ring of contact area with the axle shoulder, apply a sealant to the backing ring and axle interface.	
31.	A thin coating of quick-drying rust preventive must also be applied to the portion of the axle between the wheel hub and the bearing.	
Storage and handling of CTRB fitted wheel sets		
32.	Wheel and axle assemblies with roller bearings applied must be handled with care.	
33.	Wheel and axle assemblies with bearing applied, may be stored on single-storage track overlapped to conserve storage space. With this storage track arrangement the flanges of the wheels should not contact either the roller bearing assemblies or axle bodies of adjacent wheel set assemblies.	
34.	Bearing mounted on wheel sets without axle boxes fitted must be protected from the external environment by means of a cylindrical protection sleeve made in a durable material such as plastic covering the full length of the bearing, from axle Journal end. The protection must allow air circulation to avoid condensation.	
35.	Completed wheel sets and mounted Roller Bearings should be placed in covered areas (possibly closed), protected from bad weather conditions.	
36.	Un mounted roller bearings and components must be stored in an area that is clean and well protected from moisture.	

37.	Roller bearings, either new or used, that are placed in storage as individual components or as bearing assemblies, should be used in order in which they were stored, oldest stock first.		
38.	New roller bearings and components should not be removed from shipping package until they are to be installed onto an axle or assembled as a bearing assembly.		
	Wheel-set fitment under Bogie		
39.	Ensure that housing (control arms) bore and the outside surfaces of the bearing cup must be free from dirt, or other foreign material, which may prevent the housing from seating properly on the bearings.		
40.	Remove the possible fretting corrosion from the internal surface of the axle box housing (control arms) by using only glass paper 180 – 220.		
41.	The axle box (control arm) bore should be examined for excessive wear irregular wear and corrosion.		
42.	Ensure that axle bearing equipment (i.e. Phonic wheel, slip assembly for Earthing device) are properly mounted on the axle end with the help of M8 screw/bolt (RDSO drawing No. CG-15071 for Phonic wheel and RDSO drawing No. CG-15070 for Earthing device fasteners) of property class 10.9 and of specified make of TVS, UNBRAKO and LPS (RDSO letter No. MC/CTRB/Genl. dated 06.07.2015). Tighten the screws/bolts with a torque of 21 N-m. The security disc holes should be checked with a “GO NO-GO” thread plug gauge. Threads of bolts / screws should be checked with GO NO-GO thread ring gauge.		
43.	End locking plate shall be of Stainless Steel and it shall not be reused.		
44.	The locking screws/bolts while fitting should have no radial or axial play		
45.	Washers of M8x35 bolts of Phonic wheel of CTRB should be replaced in every unlocking of the bolts. Spring washers to IS 3063 Type-B should be used.		
46.	Check Phonic wheel OD/teeth- wear and damage. Replace if necessary.		
47.	Check condition of phonic wheel sensor gap by feeler gauge. Gap should be 0.9 mm to 1.4 mm for KB make and FTRTIL make.		
48.	Check condition of sensor fixing bolts and replace them if necessary.		
49.	Check wear of carbon bars and replace them if carbon bars of length less than equal to 8mm.		
	Wheels and Axle	12.5	

50.	Perform wheel profiling and wheel balancing (for Speed \geq 130 Kmph). Refer to RCF Spec. No. MDTS - 168 for balancing procedure.	12.5	
51.	Perform a general overhaul of the axle, remove signs of corrosion, renew corrosion protection and repaint the axle. Check wear of wheels, if necessary, replace them.	12.5	
52.	Perform an ultrasonic test on wheel and axle assembly to verify absence of internal cracks and damages.	12.5	
53.	Perform DP test on rim web transition area. RDSO letter No.MC/WA/Genl. 03.11.2011.		
54.	Check for wheel shelling as per the following; Depth 1.5 mm (Max.) Length 40 mm (Max.) Depth of Hollow Tyre 3 mm (Max.) Ref.: RDSO letter No. MC/WH/SHL dated 23.09.2009		
55.	CTRB fitted wheel sets shall be provided with protection covers prior to tyre turning to avoid damage to the seals during tyre turning. Unprotected CTRB fitted wheel sets shall not to be parked in vicinity of wheel lathes. RDSO letter No. MC/RB/Defects dated 05.09.2014		
56.	Ensure that the wheel size are to the required size on the same axle i.e. difference of 0.5 mm for the same axle.	4.4.1 (b)	
57.	The distance between two wheel flanges (wheel gauge) should be 1600mm (+2/-1)	4.4.1 (a)	
58.	Wheel profile gauge of 0.1mm least count should be used for measurement of flange height and flange thickness.	4.4.1 (d)	
59.	Wheel diameter (915 mm for new and 845 mm for condemn wheel) with 857 mm for last shop issue size should be followed. The wheel diameter should be measured with the help of trammel gauge having a least count of 0.1mm.	4.4.1 (b)	
60.	The wheel profile for new wheel should conform to RDSO SK-91146. In service wheels should be turned to intermediate wheel profile to RDSO SK-92082 (29.4mm to 25mm flange thickness) as applicable for high speed coaches running at 110kmph and above. The wheel profiles of below 22mm flange thickness are not permitted in service on high speed coaches. RDSO letter No. MC/WA/Genl. 28.04.2006/02.05.2006.		

	Control Arm	12.5	
61.	Perform a general overhaul of the control arm: remove signs of corrosion, renew corrosion protection and repaint the components.		
62.	<p>Check wear limit of control arm bore as follows; (Ref: RCF's letter No. MD 44121 dated: 13.08.08)</p> <p>If the control arm bearing surface reaches a diameter of 230.5 mm (i.e. wears out by more than 0.5 mm), the control arm should be considered worn out and rejected.</p> <p>In case, the dia. is between 230.5 mm and 230.312 mm, the control arm may be re-machined by providing a cut of 0.3 to 0.5 mm on the face of control arm. (This machining operation should not be carried out more than once).</p> <p>In case, the diameter is less than 230.312 mm, the control arm may be reused without re-machining.</p>		
63.	The control arm mating surface with bearing should be coated with "Blasol - 135" solution, to prevent corrosion.		
64.	Examine the rubber joint for cracks/damage and ageing. Replace, if necessary.		
65.	Clean drain holes of lower control arm	4.4.3	
66.	Place the control arm in the pair.		
67.	<p>Axle Box Instruments:Overhaul the grounding equipment. Check spring mechanism for self-regulation. Replace carbon bar and slip assembly. Replace all worn parts.</p> <p>Carry out overhauling and testing of WSP equipment as per OEM's instructions.</p>	12.5	
68.	<p>The followings Tools & Equipments are required for maintenance of CTRB of FIAT bogie. This list is not exhaustive and may require additional items as required.</p> <ol style="list-style-type: none"> 1. Wheel profile lathe. 2. Wheel balancing machine. 3. Wheel press (for pressing wheel on axle). 4. Axle diameter measurement gauge/micrometer. 5. GO/NO-GO threads plug gauge for axle ends. 6. Gauge for checking Bearing Mounted End Play. 7. Parallelism and diameter checking tools for control arm. 8. CTRB mounting press and accessories. 9. UST equipments for Axles. 		
69.	Housekeeping, segregation of clean and dirty area, proper stacking of materials, segregation of rejected and serviceable materials, Proper material handling being done in the section or not.		
70.	Availability of Personal Protective Equipments (PPEs).		
71.	Display and availability of the work instructions.		



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MC/CTRB/Genl.

Date: 06.07.2015

The General Manager (Mech.),

1. Central Railway, Chhatrapati Shivaji Terminus, Mumbai - 400 001
2. Eastern Railway, Fairlie Place, Kolkata - 700 001
3. Northern Railway, Baroda House, New Delhi - 110 001
4. Southern Railway, Park Town, Chennai - 600 003
5. South Central Railway, Rail Nilayam, Secunderabad - 500 071
6. South Eastern Railway, Garden Reach, Kolkata - 700 043
7. North Eastern Railway, Gorakhpur - 273 001
8. Northeast Frontier Railway, Maligaon, Guwahati - 781 011
9. Western Railway, Churchgate, Mumbai - 400 020
10. East Central Railway, Hajipur - 844 101
11. East Coast Railway, Chandrasekharpur, Bhubaneswar - 751 016
12. North Central Railway, Allahabad - 211 001
13. North Western Railway, Jaipur - 302 006
14. South Western Railway, Hubli - 580 023
15. West Central Railway, Jabalpur - 482 008
16. South East Central Railway, Bilaspur - 495 004
17. Integral Coach Factory, Chennai - 600 038
18. Rail Coach Factory, Hussainpur, Kapurthala, Punjab - 144 602
19. Rail Coach Factory, Lalganj, Raebareli - 229 120
20. Konkan Railway Corp. Ltd. Corporate office Belapur Bhawan Nawi Mumbai - 400 614

Sub: Hexagonal Head Screws/Bolt used for CTRB of FIAT bogies.

Ref: (i). ECoR's letter No. MCSW/IED/MM/M-14-1 (LHB)/1302 dated 27.05.2015.

(ii). WR's letter No. M 113/17/4 dated 20.04.2015.

(iii) This office letter no. MC/RB/Defect dated 06.06.2012.

In reference to above, RDSO have standardized the drawings of Hex. Head Screw for CTRB M20X60, Hex. Head Bolt for Phonic wheel of CTRB M8X35 and Hex. Head Screw for Earthing device of CTRB M8X25 by specifying tolerance on threads, property class and make. The following drawings of the fasteners are enclosed herewith.

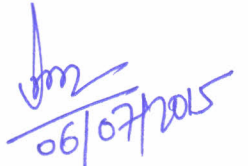
- i. Drawing No. of Hex. Head Screw for CTRB M20X60 (LHB Shell with FIAT Bogies) : CG-15067
- ii. Drawing No. of Hex. Head Bolt for Phonic wheel of CTRB M8X35 (LHB Shell with FIAT Bogies): CG-15071
- iii. Drawing No. of Hex. Head Screw for Earthing device of CTRB M8X25 (LHB Shell with FIAT Bogies): CG-15070

Railways are also advised to follow the procedure as below during locking/unlocking of the screws/bolt used for CTRB of FIAT bogies:

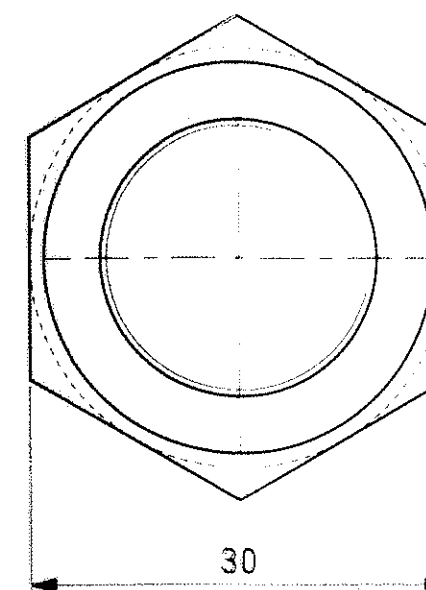
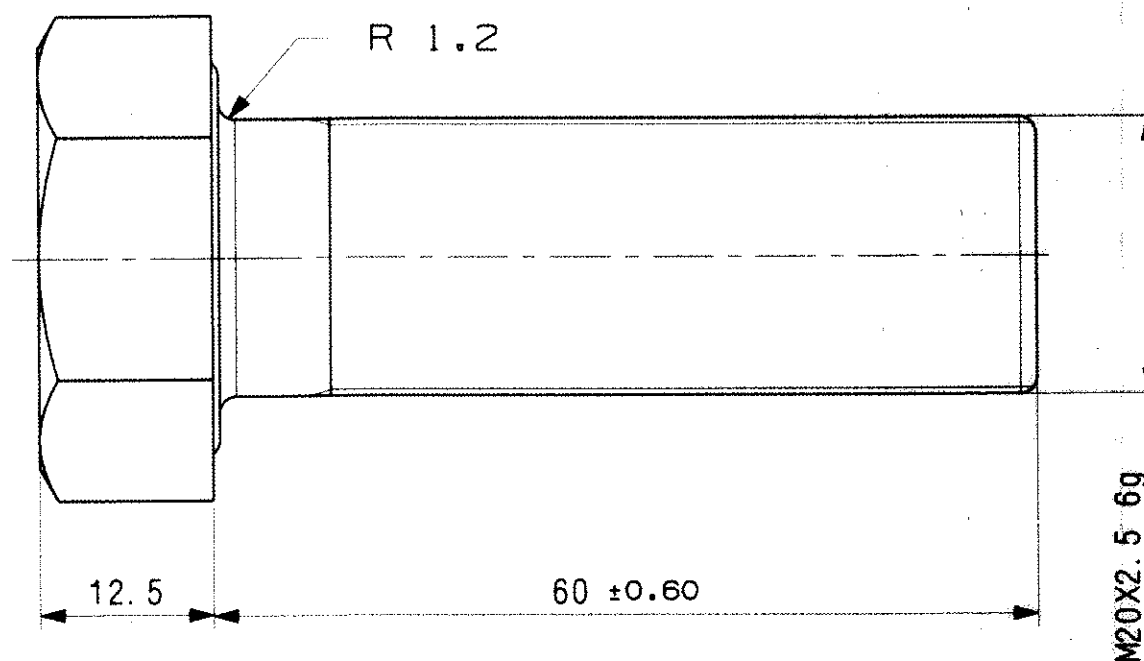
- i. The axle end holes should be checked with GO - NO GO thread plug gauge for correct size and thread condition. If any of the tapped hole is worn out, the axle shall be detained in workshop for thorough examination and repair as per maintenance manual for LHB Coaches.
- ii. End locking plates should be replaced every time its folds are opened to unscrew Hex. Head Screw for CTRB M20X60.

- iii. The locking screws/bolt should be of high tensile steel and of reputed brands as mentioned in the applicable drawings. The condition of their threads should be checked with GO - NO GO thread ring gauges and worn out bolts replaced.
- iv. The locking screws/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. The locking screws/bolt in service should not be reused unless they meet the above standards.
- v. The locking screws/bolt while fitting should have no radial or axial play.
- vi. Washers of M8X35 bolts of Phonic wheel of CTRB should be replaced in every unlocking of the bolts.

DA: As above


06/07/2015

(Deependra Kumar)
Director/Std./Carriage
For Director General/ Carriage



NOTE:-

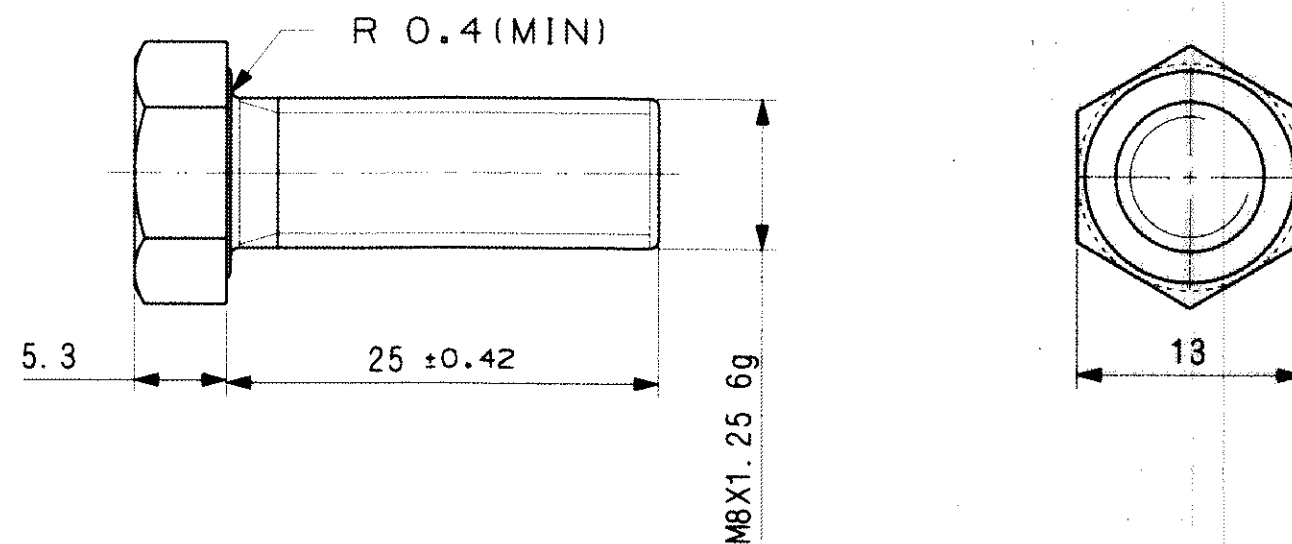
1. THE HEX. HEAD SCREW SHALL BE OF MAKE TVS OR UNBRAKO OR LPS ONLY.
2. FOR OTHER DIMENSIONS & GEOMETRY REFER IS: 1364 (PART-2) OR BSEN ISO 4017 (LATEST VERSION).
3. HEX. HEAD SCREW THREADS SHOULD BE FORMED BY COLD ROLLING PROCESS AND THREAD PROFILE SHALL CONFORM TO IS: 4218 PART-IV. HEX. HEAD SCREW THREADS TOLERANCE CLASS SHOULD BE 6g (IS: 1364 PART-2/ IS: 4218 PART-IV) AND TO WORK IN AXLE END THREADED HOLES TO A TOLERANCE CLASS OF 6H (IS: 4218 PART-IV).
4. THE THREAD PROFILE SHALL BE CHECKED / MEASURED BY TRAVELLING MICROSCOPE OR PROFILE PROJECTOR IN ADDITION TO CONVENTIONAL THREAD GAUGE.
5. MATERIAL OF HEX. HEAD SCREWS SHALL BE STEEL TO IS: 1367 PART-3 OR BSEN ISO 898-1 (LATEST VERSION) AND PROPERTY CLASS 8.8. THE MAXIMUM DEPTH OF COMPLETE DECARBURIZATION, SHALL BE 0.015MM.
6. MECHANICAL PROPERTIES OF STEEL SHALL BE IN ACCORDANCE WITH IS: 1367 PART-3 OR BSEN ISO 898-1 (LATEST VERSION).
7. THE SURFACE TREATMENT OF HEX. HEAD SCREW SHALL BE PHOSPHATE COATING HAVING COATING WEIGHT 4.3 TO 5.5 G/M² (PHOSPHATING PROCESS CLASS-B) TO IS: 3618.
8. SAMPLING SHALL BE IN ACCORDANCE WITH IS: 2614.
9. MARKING AND MODE OF DELIEVERY OF HEX. HEAD SCREWS SHALL BE IN ACCORDANCE TO IS: 1367 PART-18.
10. IN REGARD TO REQUIREMENT NOT COVERED ABOVE, HEX. HEAD SCREWS SHALL CONFORM TO IS: 1367 PART-1.

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ALT.	ITEM	AUTHY.	DESCRIPTION	CKD.	DATE

ASSEMBLY DRGS.	SUPERSEDED BY:-	INDIAN RAILWAY STANDARDS
REFERENCE :-	SUPERSEDES:-	LHB SHELL WITH FIAT BOGIES
	SCALE: P	
	2:1	
	C	
	D	
	J.SSTD/13/15	
CDIC NO. :-	B.G.	R.D.S.O. (CG)
		CG-15067

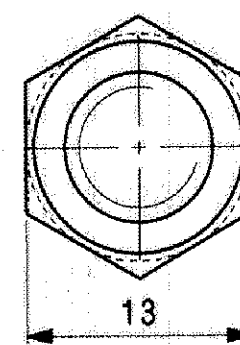
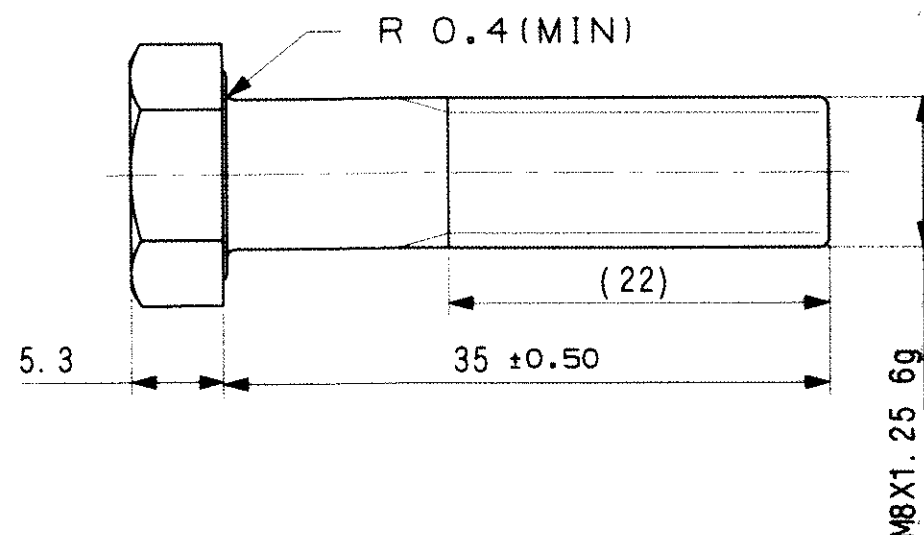


NOTE:-

1. THE HEX. HEAD SCREW SHALL BE OF MAKE TVS OR UNBRAKO OR LPS ONLY.
2. FOR OTHER DIMENSIONS & GEOMETRY REFER IS: 1364 (PART-2) OR BSEN ISO 4017 (LATEST VERSION).
3. HEX. HEAD SCREW THREADS SHOULD BE FORMED BY COLD ROLLING PROCESS AND THREAD PROFILE SHALL CONFORM TO IS: 4218 PART-IV. HEX. HEAD SCREW THREADS TOLERANCE CLASS SHOULD BE 6g (IS: 1364 PART-2/ IS: 4218 PART-IV) AND TO WORK IN SECURITY DISC THREADED HOLES TO A TOLERANCE CLASS OF 6H (IS: 4218 PART-IV).
4. THE THREAD PROFILE SHALL BE CHECKED / MEASURED BY TRAVELLING MICROSCOPE OR PROFILE PROJECTOR IN ADDITION TO CONVENTIONAL THREAD GAUGE.
5. MATERIAL OF HEX. HEAD SCREWS SHALL BE STEEL TO IS: 1367 PART-3 OR BSEN ISO 898-1 (LATEST VERSION) AND PROPERTY CLASS 10.9. THE MAXIMUM DEPTH OF COMPLETE DECARBURIZATION, SHALL BE 0.015MM.
6. MECHANICAL PROPERTIES OF STEEL SHALL BE IN ACCORDANCE WITH IS: 1367 PART-3 OR BSEN ISO 898-1 (LATEST VERSION).
7. THE SURFACE TREATMENT OF HEX. HEAD SCREW SHALL BE PHOSPHATE COATING HAVING COATING WEIGHT 4.3 TO 5.5 G/M² (PHOSPHATING PROCESS CLASS-B) TO IS: 3618.
8. SAMPLING SHALL BE IN ACCORDANCE WITH IS: 2614.
9. MARKING AND MODE OF DELIVERY OF HEX. HEAD SCREWS SHALL BE IN ACCORDANCE TO IS: 1367 PART-18.
10. IN REGARD TO REQUIREMENT NOT COVERED ABOVE, HEX. HEAD SCREWS SHALL CONFORM TO IS: 1367 PART-1.

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ASSEMBLY DRGS.		SUPERSEDED BY:-		INDIAN RAILWAY STANDARDS	
REFERENCE :-		SCALE P		LHB SHELL WITH FIAT BOGIES	
		2:1		HEX. HEAD SCREW FOR EARTHING	
		J.SSD/17/15		DEVICE OF CTRB M8X25	
		R.D.S.O. (CG)		(LHB SHELL WITH FIAT BOGIES)	
CDIC NO. :-		B.G.		CG-15070	
ALT. ITEM	AUTHY.	DESCRIPTION	CRD.	DATE	



NOTE:-

1. THE HEX. HEAD BOLT SHALL BE OF MAKE TVS OR UNBRAKO OR LPS ONLY.
2. FOR OTHER DIMENSIONS & GEOMETRY REFER IS: 1364 (PART-1) OR BSEN ISO 4014 (LATEST VERSION).
3. HEX. HEAD BOLT THREADS SHOULD BE FORMED BY COLD ROLLING PROCESS AND THREAD PROFILE SHALL CONFORM TO IS: 4218 PART-IV. HEX. HEAD BOLT THREADS TOLERANCE CLASS SHOULD BE 6g (IS: 1364 PART-1/IS: 4218 PART-IV) AND TO WORK IN SECURITY DISC THREADED HOLES TO A TOLERANCE CLASS OF 6H (IS: 4218 PART-IV).
4. THE THREAD PROFILE SHALL BE CHECKED / MEASURED BY TRAVELLING MICROSCOPE OR PROFILE PROJECTOR IN ADDITION TO CONVENTIONAL THREAD GAUGE.
5. MATERIAL OF HEX. HEAD BOLT SHALL BE STEEL TO IS: 1367 PART-3 OR BSEN ISO 898-1 (LATEST VERSION) AND PROPERTY CLASS 10.9. THE MAXIMUM DEPTH OF COMPLETE DECARBURIZATION, SHALL BE 0.015MM.
6. MECHANICAL PROPERTIES OF STEEL SHALL BE IN ACCORDANCE WITH IS: 1367 PART-3 OR BSEN ISO 898-1 (LATEST VERSION).
7. THE SURFACE TREATMENT OF HEX. HEAD BOLT SHALL BE PHOSPHATE COATING HAVING COATING WEIGHT 4.3 TO 5.5 G/M² (PHOSPHATING PROCESS CLASS-B) TO IS: 3618.
8. SAMPLING SHALL BE IN ACCORDANCE WITH IS: 2614.
9. MARKING AND MODE OF DELIVERY OF HEX. HEAD BOLT SHALL BE IN ACCORDANCE TO IS: 1367 PART-18.
10. IN REGARD TO REQUIREMENT NOT COVERED ABOVE, HEX. HEAD BOLT SHALL CONFORM TO IS: 1367 PART-1.

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ALT. ITEM	AUTHY.	DESCRIPTION	CHKD.	DATE

ASSEMBLY DRGS.	SUPERSEDED BY:-	INDIAN RAILWAY STANDARDS
REFERENCE :-	SCALE P	LHB SHELL WITH FIAT BOGIES
	2:1	HEX. HEAD BOLT FOR PHONIC
	C	WHEEL OF CTRB M8X35
	D	(LHB SHELL WITH FIAT BOGIES)
	J.SSD/18/15	
CDIC NO. :-	B.G.	R.O.S.O. (CG)
		CG-15071



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Government of India-Ministry of Railways
Research Designs & Standards Organisation
Lucknow - 226 011
DID (0522) 2450115
DID (0522) 2465310



2868

No. MC/LHB/Brake

Date 15.01.2018

General Manager (Mechanical)

1. Central Railway, Chhatrapati Shivaji Terminus, Mumbai - 400 001	2. East Coast Railway, Chandrasekharapur, Bhubaneswar - 751 016
3. Eastern Railway, Fairlie Place, Kolkata - 700 001	4. North Central Railway, Allahabad - 211 001
5. Northern Railway, Baroda House, New Delhi - 110 001	6. North Western Railway, Jaipur - 302 006
7. Southern Railway, Park Town, Chennai - 600 003	8. West Central Railway, Jabalpur - 482 008
9. South Central Railway, Rail Nilayam, Secunderabad - 500 071	10. South Western Railway, Hubli - 580 023
11. South Eastern Railway, Garden Reach, Kolkata - 700 043	12. South East Central Railway, Bilaspur - 495 004
13. North Eastern Railway, Gorakhpur - 273 001	14. Integral Coach Factory, Chennai - 600 038
15. Western Railway, Churchgate, Mumbai - 400 020	16. Rail Coach Factory, Hussainpur, Kapurthala, Punjab - 144 602
17. Northeast Frontier Railway, Maligaon, Guwahati - 781 011	18. Modern Coach Factory, Raebareli, Lalganj - 229206
19. East Central Railway, Hajipur - 844 101	20. Konkan Railway Corp. Ltd. Corporate office, Belapur Bhawan, Nawi, Mumbai-400 614

Sub: Maintenance of WSP of LHB Coaches.

Ref: This office letter no.MC/LHB/Brake dated 07.12.2011.

Vide letter under reference, RDSO had issued instructions to Railways for ensuring proper maintenance of WSP system which has very important role in controlling wheel shelling. Accordingly, following instructions on WSP are reiterated:

- Special drive should be taken for checking of Phonic Wheel assembly.
- M8 size screw to IS 1367 Pt.III Class 10.9 along with spring washer to the IS 3063 type-B should be used for securing phonic wheel. LOCTITE 243 or equivalent glue should be used to ensure rigid connection between internal and external thread.
- Non-standard fasteners should be replaced immediately.
- The phonic wheel screws should be tightened with 21N-m torque.
- The clearance between the phonic wheel & speed sensor should be 0.9 to 1.4mm. This gap should be checked in quarterly schedule or whenever required.
- The phonic wheel & speed sensor should be procured through OEMs/OEM's approved sources only. M/s Knorr Bremse, M/s Faiveley Transport & M/s Escorts are OEM of this item.
- Railways must ensure that Air Brake system/WSP is maintained as per OEM's Maintenance Manual.

Railways are requested to ensure strict compliance of above.

DA: *NIL*

Indrajit Singh
(Indrajit Singh)

Executive Director (Stds.)/Carriage



भारत सरकार - रेल मंत्रालय
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Government of India-Ministry of Railways
Research Designs & Standards Organisation
Lucknow - 226 011
DID (0522) 2450115
DID (0522) 2465310



MC/CTRB/Genl.

Date: 10.01.2019

प्रमुख मुख्य यांत्रिक अभियन्ता,

1. मध्य रेलवे, छत्रपति शिवाजी टर्मिनस, मुम्बई- 400 001.	11. पूर्व तटीय रेलवे, बीडीए रेंटल कालोनी, रेलवे काम्प्लेक्स, चन्द्रशेखरपुरा, भुवनेश्वर, उड़ीसा- 751 016.
2. पूर्व रेलवे, फेयरली प्लेस, कोलकाता- 700 001.	12. उत्तर मध्य रेलवे, हारिंग रोड, इलाहाबाद-211 001.
3. उत्तर रेलवे, बड़ौदा हाउस, नईदिल्ली- 110 001.	13. उत्तर पश्चिम रेलवे, जयपुर- 302 006.
4. दक्षिण रेलवे, पार्कटाउन, चेन्नई- 600 003.	14. दक्षिण पश्चिम रेलवे, हुबली- 580 023.
5. दक्षिण मध्य रेलवे, रेल निलायम, सिकन्द्राबाद -500 071.	15. पश्चिम मध्य रेलवे, जबलपुर- 482 001.
6. दक्षिण पूर्व रेलवे, गार्डनरीच, कोलकाता- 700 043.	16. दक्षिण पूर्व मध्य रेलवे, आरई आफिस काम्प्लेक्स, बिलासपुर- 495 004.
7. पूर्वोत्तर रेलवे, गोरखपुर- 273 012.	17. आधुनिक रेल डिवा कारखाना, लालगंज रायबरेली-229 206
8. पूर्वोत्तर सीमान्त रेलवे, मालीगाँव, गुवाहाटी- 781 011.	18. इन्टीगरल कोच फैक्ट्री, चेन्नई- 600 038.
9. पश्चिम रेलवे, चर्चगेट, मुम्बई- 400 020.	19. रेल कोच फैक्ट्री, हुसैनपुर, कपूरथला- 144 602.
10. पूर्व मध्य रेलवे, हाजीपुर- 844 101.	20. कोंकण रेलवे कार्पोरेशन लि., कार्पोरेट आफिस, बेलापुर भवन, नवी मुम्बई- 400 614.

Sub: En-route detachment of LHB coaches due to Hot Axle.

Ref: (i). Southern Railway letter No. M/CW/274/18th CMG dated 03.01.2019.

(ii). Agenda Items of 18th CMG.

There have been 12 reported cases of hot axle in LHB coaches during 2018-19 till 04.01.2019, in comparison to 02 cases in 2017-18 & 03 cases in 2016-2017. The sudden increase in en-route failures of CTRBs in LHB design coaches has been observed. Preliminary investigations have brought out following observations:

1. In hot axle case of coach no. CR/14117/C LWACCN on dated 28.04.2018, LTT Coaching Depot of CR has informed that this failure happened due to missing and loosening of control arm fasteners.
2. In hot axle case of coach no. ECR/15062/C LWACCN on dated 24.07.2018, M/s Timken has highlighted the wheel shelling marks observed on wheel tread.
3. Southern Railway, vide letter mentioned under reference, has reported that the cases of non standard size bolts used by PUs in securing of slip ring disc is leading to working out of bolts from security disc and damaging the earthing device assembly, leading to Roller Bearing failure.
4. Southern Railway also mentioned intermixing of fasteners of earthing device & phonic wheel during maintenance.
5. During previous Audits by RDSO, in majority of cases, earthing cable was found missing. WSP system was also found not functional.
6. Few maintenance issues were raised by M/s SKF in their preliminary report for cases of hot axles dated 11.08.2018 (ET) & 13.08.2018 (ALD):
 - a) Handling of wheels & CTRBs - Slight damage on seal of other end bearing has been noticed in hot axle case dated 11.08.2018.
 - b) Pinching of outer cup by improper fitment of control arm has been noticed in hot axle case dated 13.08.2018.


For such alarming increase in cases of hot axles, it is requested to follow the RDSO instructions in this regard:

1. The control arm maintenance must be ensured in terms of RDSO letter no. SV.FIAT dated 03.04.2018 & 15.05.2018.
2. RDSO Instruction regarding tyre turning on account of wheel shelling issued to Railways vide letter no. MC/WA/Genl. dated 01.11.2017.
3. Quality of fasteners for Bearing assembly is to be ensured in terms of RDSO letter No. MC/CTRB/Genl. dated 06.07.2015.
4. RDSO instruction regarding protection of CTRB during tyre turning of LHB wheelsets fitted with CTRB vide letter no. MC/RB/Defects dated 05.09.2014.
5. Maintenance instructions for Cartridge Taper Roller Bearings (CTRB) for LHB Coaches issued vide letter no. MC/CTRB/Defects dated 10.01.2019.
6. Functional earthing device and WSP must be ensured.
7. Handling of CTRBs should be in such a way that any part of CTRB doesn't get damaged during handling.
8. LHB wheelsets with mounted CTRBs should also be handled properly in workshops/PUs, during transportation of wheelsets by wagons/coaches/trucks (fixture supporting wheels should be ensured) & during loading/unloading to/from coaches/trucks. While lowering bogie on wheelsets, due care should be taken to avoid any possibility of damage to any part of bearing. While handling/transporting wheels by overhead cranes, mobile cranes or fork lifter, multiple wheelsets should not be handled at a time.

A drive in this regard may be launched to ensure that instructions issued are being followed.

DA: As above.




(Shobhit Pratap Singh)
Dy. Director/VDG/Carriage
for Director General/Carriage

Copy to: for kind information please.

DME/Coaching, Railway Board, Rail Bhawan, New Delhi - 110 001