



भारत सरकार - रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
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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/Defects

Date: 10.01.2019

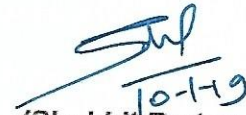
प्रमुख मुख्य यांत्रिक अभियन्ता,

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, बडौदा हाउस, नई दिल्ली- 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, सिकन्दराबाद -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 डिबा 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: Maintenance instructions for Cartridge Taper Roller Bearings (CTRB) for LHB design Coaches.

Please find attached herewith the copy of Do's and Don'ts for Cartridge Taper Roller Bearings (CTRB) for LHB design Coaches for Railway Workshops/Pus and Coaching Depots.

DA: As above.


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

Copy to :-

ED/CAMTECH, Gwalior - 474005 - for kind information please.

DO's and DONT's for CTRB Maintenance Practices

S.No.	DO's	DON'T's
A.	Instructions for CTRB Mounting on Wheelset in Workshops/PUs.	
1.	Before mounting, Inspect axle journal in a clean and well lit area.	
2.	Bearings should be stored in a clean and well lit area.	Do not remover packing & wrapping of bearings until just ready for mounting.
3.	Bearings should be used on FIFO system. Handling of CTRBs should be in such a way that any part of CTRB doesn't get damaged during handling.	Do not use such bearings, which are stored for more than 24 months without mounting on wheelsets.
4.	Axle journal & shoulder must be cleaned with lint free cloth before mounting of CTRB.	Waste must not be used to clean axle journal & shoulder.
5.	Measure axle journal allowable dia. (i.e. 130.043mm - 130.068mm) and axle shoulder allowable dia. (i.e. 160.134mm - 160.174mm).	Protective wrapping should not be removed until just ready for installation.
6.	Ensure that the bearing cones and backing ring have got an interference fit with the axle journal & axle shoulder.	Heat must not be applied to the bearing cone assemblies to facilitate installation. Do not mount bearing by shrink fit process.
7.	Wheel press or Bearing press along with pilot sleeve assembly should be used to mount the CTRB on LHB wheelsets.	Do not use without calibrated Bearing press or Wheel press for bearing mounting.
8.	Coat the bearing seats of the axle with castor oil, heavy mineral oil, or a molybdenum-disulphide and oil mixture before mounting of CTRB.	DO NOT USE WHITE LEAD. Lead compounds may be detrimental to lubricating greases by acting as an oxidation catalyst.
9.	Final mounting force (value to observe) should be 37-42 tonnes (for Timken make) and 28-32 tonnes (for SKF make) on bearing installation.	Oversize bearing cones should not be used.
10.	Apply a sealant to the backing ring/axle interface to minimize the risk of ingress of water through the backing ring contact area with the axle.	Do not apply sealant before mounting of bearings.
11.	A thin coating of a quick-drying rust preventative (lead free) must also be applied to the portion of the axle between the wheel hub and the bearing.	Do not mount security disc without checking & cleaning of threaded holes of axle end.
12.	After mounting of CTRB, mounting end play of bearing should be checked and it should be in limit. (i.e. 0.025mm-0.330mm for new bearings & 0.025mm-0.500mm for old/refurbished bearings).	Do not send wheelset for assembly in bogie without checking Mounted End Play of bearings.
13.	At last mount the phonic wheel with M8 bolts (refer RDSO letter no. MC/CTRB/Genl. dated 06.07.2015) on one side of wheelset (on security disc). Tightening torque of M-8 bolts should be 21 N-m.	
14.	LHB wheelsets with mounted CTRBs should also be handled properly during transportation & during loading/unloading to/from coaches/trucks.	Do not transport more than one wheelsets with mounted CTRBs on fork lifter or by overhead cranes.

15.	While lowering bogie on LHB wheelsets, due care should be taken to avoid any possibility of damage to any part of bearing.	
B.	Instructions for Wheel Turning	
1.	It is not necessary to remove the bearing assembly during wheel turning, but the bearing assembly must be suitably protected (refer RDSO letter no. MC/RB/Defects dated 05.09.2014) to prevent any steel chips from damaging or entering the bearing. Heavy grease must be used to lubricate the lathe centers.	Do not use white lead to lubricate the lathe centers.
2.	After the wheel turning operation has been completed, clean the end faces and centre holes and bolt holes of the axle. Reapply the end caps, using new locking plates, and torque tighten the bolts in accordance with installation instructions.	Do not mount security (end cap) with once used locking plate.
C.	Instructions for CTRB Dismounting from Wheelsets in Workshops.	
1.	Check the condition of bearing before removing from the axle. Check for bearing cup, seals, cap screws and end caps. If any damage is observed, record the same and also check the condition of mate/other end bearing and record the findings.	
2.	Pressure must only be applied to the backing ring to remove the bearing.	
3.	Ensure that the withdrawal plate and pulling ring adapter is of the correct size for the bearing to be removed. Proper contact with the backing ring and puller alignment is necessary for efficient bearing removal.	
4.	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 parts in place and it should be stored in covered & dry place.	Do not drop the bearing assembly when removing it from the pilot sleeve.
D.	Maintenance instructions of CTRB for Coaching Depots.	
1.	Check the physical condition of phonic wheel, WSP sensor, Carbon bars, spring assembly and oiler ring of earthing device in D2 & D3 schedule.	
2.	Check M-20 (security disc), M-8 bolts (phonic wheel) & M8 screws (earthing device) for loosening and came out from holes in D2 & D3 schedule.	
3.	Check grease oozing and abnormal sound from bearings in D2 & D3 schedule.	
4.	Check M-16 screws of Control arm for loosening and came out from holes in trip schedule.	
5.	Check drain holes of lower control arm for blocked/open in trip schedule. Please ensure holes are open.	
6.	Check Axle box housing out of position in trip, D2 and D3 schedule.	Don't ignore control arm out of position, it may cause a load concentration on the bearing and if continued in service for any length of time may result in serious bearing damage.

E.	Instructions for C&W running staff:	
1.	Check bearings for abnormal temperature rise in an axle box in service at halting stations by the non contact type thermometer (laser gun). If axle box temperature found 65 ⁰ C or above but below 80 ⁰ C, Recheck the temperature to next halting station.	Don't try to check bearings temperature, if train is in motion.
2.	If axle box temperature found 80 ⁰ C or above, Coach should be withdrawn from service.	
3.	If the difference between two bearings is more than 20 ⁰ C, the warmer bearing should be removed.	





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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.

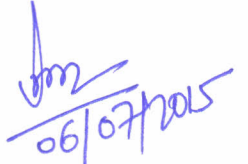
- i. Drawing No. of Hex. Head Screw for CTRB M20X60 (LHB Shell with FIAT Bogies) : CG-15067
- ii. Drawing No. of Hex. Head Bolt for Phonic wheel of CTRB M8X35 (LHB Shell with FIAT Bogies): CG-15071
- iii. Drawing No. of Hex. Head Screw for Earthing device of CTRB M8X25 (LHB Shell with FIAT Bogies): CG-15070

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

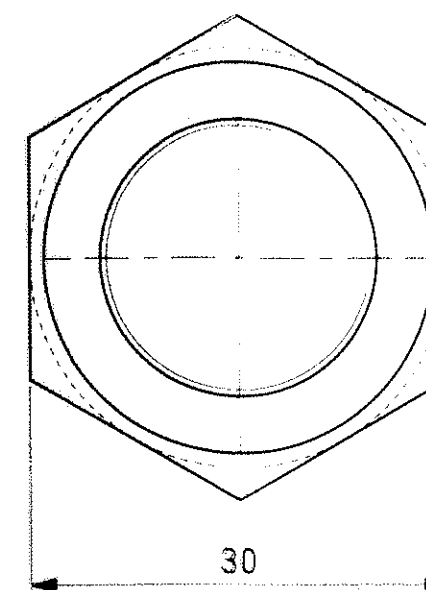
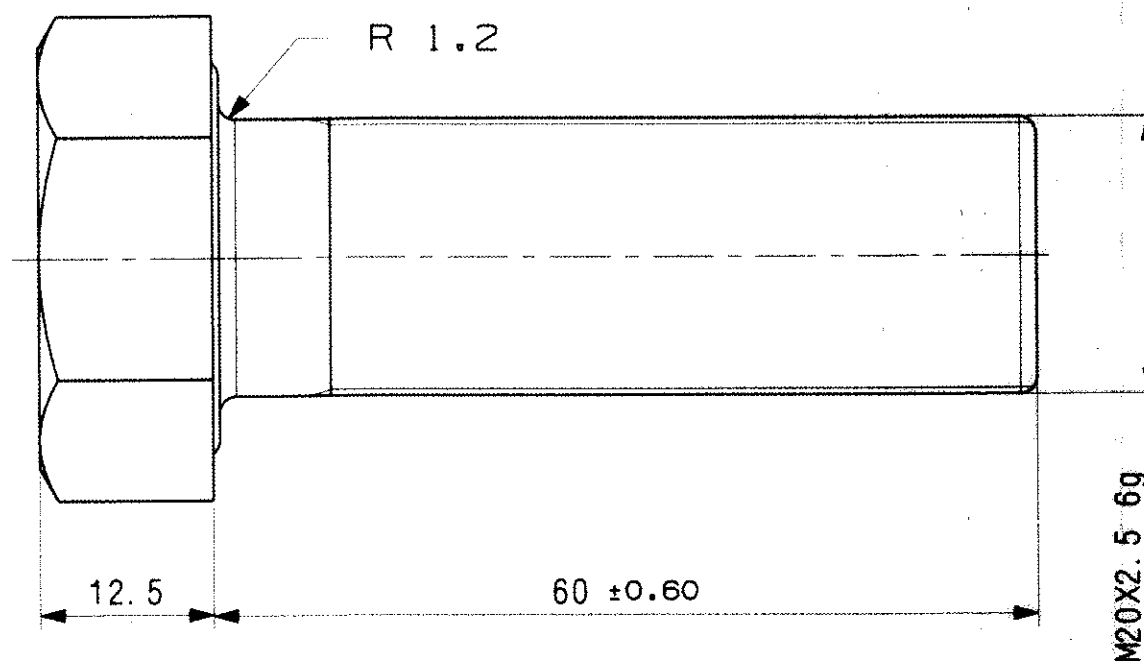
- i. The axle end holes should be checked with GO - NO GO thread plug gauge for correct size and thread condition. If any of the tapped hole is worn out, the axle shall be detained in workshop for thorough examination and repair as per maintenance manual for LHB Coaches.
- ii. End locking plates should 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:-

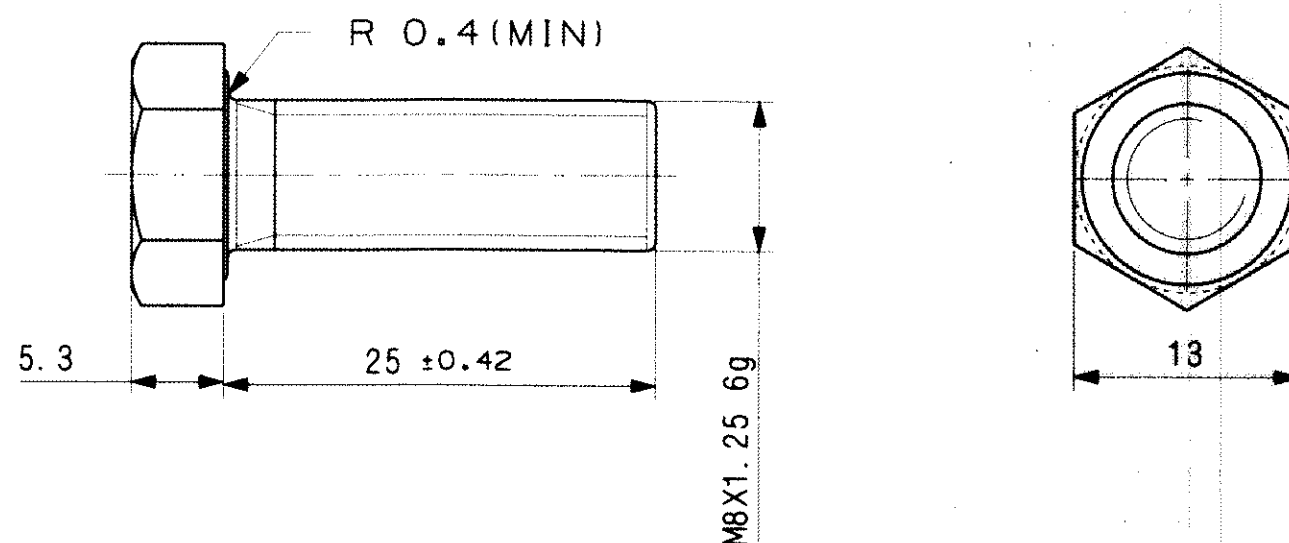
1. THE HEX. HEAD SCREW SHALL BE OF MAKE TVS OR UNBRAKO OR LPS ONLY.
2. FOR OTHER DIMENSIONS & GEOMETRY REFER IS: 1364 (PART-2) OR BSEN ISO 4017 (LATEST VERSION).
3. HEX. HEAD SCREW THREADS SHOULD BE FORMED BY COLD ROLLING PROCESS AND THREAD PROFILE SHALL CONFORM TO IS: 4218 PART-IV. HEX. HEAD SCREW THREADS 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	CHKD.	DATE

ASSEMBLY DRGS.	SUPERSEDED BY:-	INDIAN RAILWAY STANDARDS
REFERENCE :-	SUPERSEDES:-	LHB SHELL WITH FIAT BOGIES
	SCALE: P	HEX. HEAD SCREW FOR CTRB M20X60
	2:1	(LHB SHELL WITH FIAT BOGIES)
	C	
	D	
	J.SSTD/13/15	
CDIC NO. :-	B.G.	R.D.S.O. (CG)
		CG-15067



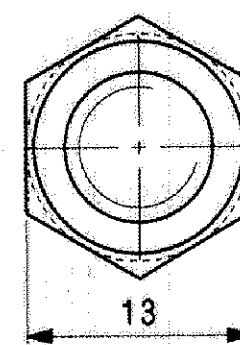
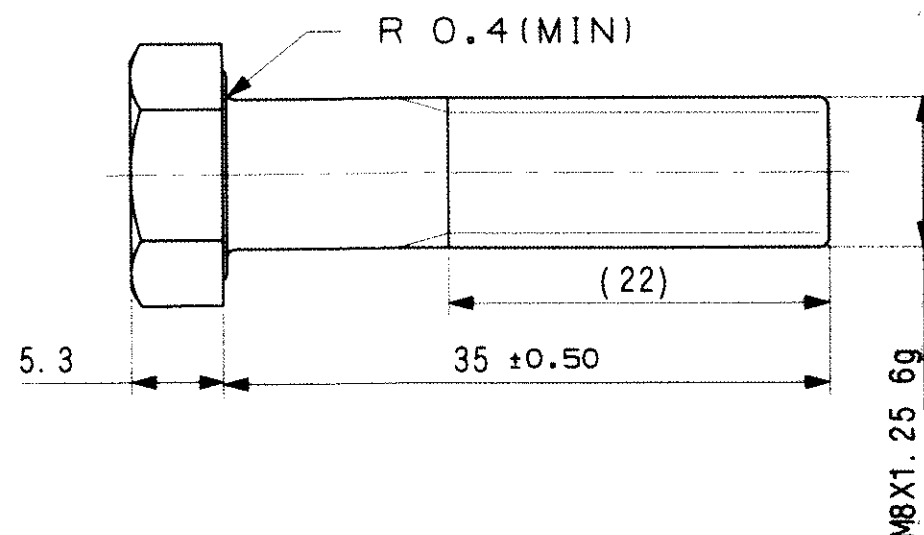
NOTE:-

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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ALT.	ITEM	AUTHY.	DESCRIPTION	CKD.	DATE

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



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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पत्रांक: एमसी/आरबी/डिफेक्ट

दिनांक : 05.09.2014

महाप्रबन्धक (यांत्रिक)

1. मध्य रेलवे, छत्रपति शिवाजी टर्मिनस, मुम्बई- 400 001.
2. पूर्व रेलवे, फेयरली प्लेस, कोलकाता - 700 001.
3. उत्तर रेलवे, बड़ौदा हाउस, नई दिल्ली - 110 001.
4. दक्षिण रेलवे, पार्क टाउन, चेन्नई - 600 003.
5. दक्षिण मध्य रेलवे, रेल निलायम, सिकन्दराबाद - 500 071.
6. दक्षिण पूर्व रेलवे, गार्डेन रीच, कोलकाता - 700 043.
7. पूर्वोत्तर रेलवे, गोरखपुर - 273 012.
8. पूर्वोत्तर सीमान्त रेलवे, मालीगौव, गुवाहाटी - 781 011.
9. पश्चिम रेलवे, चर्चगेट, मुम्बई - 400 020.
10. पूर्व मध्य रेलवे, हाजीपुर - 844 101.
11. पूर्व तटीय रेलवे, बीडीए रेंटल कालोनी, रेलवे काम्प्लेक्स, चन्द्रशेखरपुरा, भुवनेश्वर, उड़ीसा - 751 016.
12. उत्तर मध्य रेलवे, हार्लिंग रोड, इलाहाबाद - 211 001.
13. उत्तर पश्चिम रेलवे, जयपुर - 302 006.
14. दक्षिण पश्चिम रेलवे, हुबली - 580 023.
15. पश्चिम मध्य रेलवे, जबलपुर - 482 001.
16. दक्षिण पूर्व मध्य रेलवे, आर ई आफिस काम्प्लेक्स, बिलासपुर - 495 004.
17. कोंकण रेलवे कारपोरेशन लि., कारपोरेट ऑफिस, बेलापुर भवन, नवी मुम्बई - 400 614
18. इन्टीगरल कोच फैक्ट्री, चेन्नई - 600 038.
19. रेल कोच फैक्ट्री, हुसैनपुर, कपूरथला - 144 602.

विषय: Protection of CTRB during tyre turning of LHB wheelsets fitted with CTRB.

In reference to above, it is advised that during tyre turning of LHB wheelsets fitted with CTRB, some burnt chips/coils/swarfs of the removed material of wheel tread likely to fall on the CTRBs. These chips/coils/swarfs of the wheel material are having high temperature and sharp edges/points and may cause damage to the grease seals of CTRB.

Hence, it is advised to provide adequate protection/covers to CTRBs during tyre turning of LHB wheelsets fitted with CTRB, to prevent the damage of the grease seals of CTRB. Further, it is also advised that unprotected tyre turned wheels and due tyre turned LHB wheelsets fitted with CTRB shall not be parked in the vicinity of Wheel Lathe as burnt chips/coils/swarfs are often found flying in the working space.

संलग्नक: कुछ नहीं

(Signature)
05/09/2014
(दीपेन्द्र कुमार)

निदेशक /मानक/सवारीडिब्बा

Copy to:

EDME (Coaching), Rail Bhawan, Railway Board, New Delhi- For kind information.