



भारत सरकार - रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ - 226 011
EPBX (0522) 2451200
Fax (0522) 2458500

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



MC/CTRB/Defects

Date: 18.02.2019

**Principal Chief Mechanical Engineer,
Integral Coach Factory,
Chennai – 600 038**

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

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. The joint inspection note is attached herewith as Annexure-I. Brief details are as follows:-

i.	Train No	:	12860 (HWH-CSMT) UP
ii.	Train Name	:	(HWH-CSMT) Gitanjali Express
iii.	Coach No	:	SER 182374 LWSCN
iv.	Coach Built Date	:	23/11/2018 by ICF/Chennai
v.	Date of commissioning (DOC)	:	13/01/2019
vi.	Bearing No.	:	06-18-13487 (Damaged)
vii.	D2	:	24/01/2019
viii.	D1	:	04/02/2019
ix.	Kmsearned	:	4077 kms from DOC
x.	Primary Examination	:	SRC (Santragachi), SER
xi.	Bearing Make	:	Timken
xii.	Date of failure	:	07/02/2019
xiii.	Bearing is within warranty or not	:	Within Warranty
xiv.	Conclusion	:	Due to M8 Bolts unscrewed first during service, phonic wheel became free and rubbed inside the housing causing damage.

As per findings (Annexure II), it is seen 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.

It is highlighted here that 2 newly manufactured coaches by ICF, Chennai have been detached (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. It has also been reported that allen bolts have been used instead of hexagonal head bolts on oiler ring of earthing device. This is not in conformance to instructions issued for types of fasteners to be used for oiler ring, vide this office letter No. MC/CTRB/Genl. dated 06.07.2015 & reiterated vide this office letter No. MC/CTRB/Genl. dated 10.01.2019.

06 other newly manufactured coaches by ICF were also checked at LTT Coaching Depot /CR,& MMCT Coaching Depot /WR on 17-2-18 & 18-2-18. Observations are attached as Annexure III. 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. Allen bolts were found in place hexagonal head bolts in earthing device in 4 coaches, which makes tightening of allen bolts of earthing device at coaching depots very difficult in absence of suitable adapter for torque wrench. MMCT depot has changed allen bolts in these 4 coaches with hexagonal head bolts of stipulated make & property class.

Your attention is invited to this office letters at Ref (i) and (ii) detailing the requirements of fasteners, thread sealant, torqueing etc. for the phonic wheel assembly. These instructions should be complied with. I also request your personal attention to audit the practices being followed at ICF for handling & fitment of CTRBs, Phonic Wheel & Earthing Device. Zonal Railways are being advised separately for checking these aspects in newly manufactured coaches.

DA: As above



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

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

Copy: PCME / RCF and MCF for kind inf.and to audit their practices in these areas.

Joint Inspection Note

Dated: 10 February 2019

History:

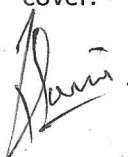
Train No: 12860 (HWH-CSMT) UP
Train Name: Gitanjali Express
Coach no: SER 182374 LWSCN
Coach built: 23/11/2018 ICF
DOC: 13/01/2019
D2: 24/01/2019
D1: 04/02/2019
Earned kms: 4077 kms from DOC
Primary Examination: SRC (Santragachi), SER
Date of failure: 07/02/2019
Bearing is within warranty or not: Within Warranty
Bearing no: 06-18-13487 (damaged)
06-18-13507 (Other end)

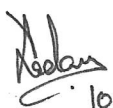
While running in train number 12860 (HWH-CSMT) the coach number 182374 LWSCN was detached at Bhusawal Railway Station on 07-02-19 due to more temperature rise (103°C) of axle box no. 2 (from PP end) during rolling in examination, the coach was placed at coach care centre Bhusawal for joint inspection of bearing with RDSO, SER, BSL & Timken representatives.

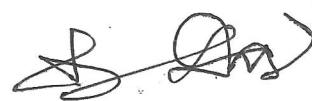
The joint inspection was carried out on 09-02-19 and 10-02-19 and the observations recorded are as follows:

Observations:

1. The end cover of reported axle box no. 2 (phonic wheel end) was opened for inspection.
2. The phonic wheel found damage and broken into pieces and the tooth of phonic wheel was worn out.
3. The all M8 bolts were found worn out and melted during inspection.
4. The all M20 screws head were deformed/worn out and one screw was bend & rotating as unscrewed their half of the length during rubbing with phonic wheel & M8 bolts.
5. The locking plate was damaged and torn at unscrewed M20 screw position, the locking plate at rest of 02 M20 screws were found intact but in rubbed condition.
6. Rubbing marks & grooving found inside the axle end cover.
7. The sensor of phonic wheel was completely damaged and melted.
8. The outboard side grease seal of the bearing was found damaged after opening the end cover.




10.02.2019



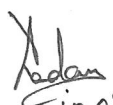
9. The coach was lifted and observed the bearing condition, the bearing serial no 06-18-13487 outboard side grease (front side) seal casing found damage and rubber lip was melted and deformed. Rubbing found on the out board side grease seal.
10. The inboard side grease seal and backing ring was found ok and intact. No damage found on the inboard side grease seal and backing ring.
11. Bearing OD found in good condition and no heating on the bearing OD.
12. The bearing was rotating freely onto the journal and no abnormal noise was observed during rotation.
13. Some amount of grease was found on the Cup OD at outboard side and on the bore of the control arms (lower and upper half).
14. Rubbing marks found inside the upper & lower control arm at outboard side only.
15. The other end bearing 06-18-13507 was found in Ok condition.
16. All wheels found to be Ok and no shelling was observed.


Conclusion:

Based on the visual observations it is clear that rise in temperature of bearing was occurred due to the bearing outboard side grease seal damage due to rubbing with phonic wheel and M8 bolts causing temperature rise and grease oozing out from bearing. The phonic wheel damage leads to the bearing damage and unscrewing & bending of one M20 screw. The bearing was rotating onto the journal freely without any abnormal noise during rotation after coach lifting.

It is concluded that the M8 bolts unscrewed first during service and then phonic wheel free from its position & rubbed inside the housing with bearing and other components consequentially temperature rise.


(Gagandeep Saini)
Rep./Timken


10.02.19
(V.K. Yadav)
JE/D/Carriage/RDSO


10-2-19 (Banibrata Das) (V.B. Das)
SSE/C&W/SRC/SER


(V.B. Das)
SSE/C&W/BSL/CR

Findings:

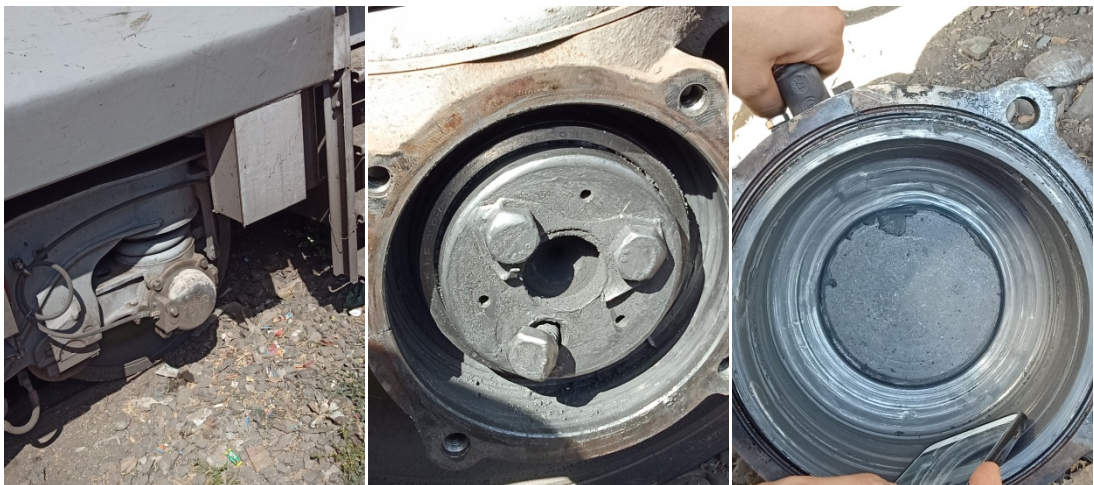
1. The axle end cover of reported axle box no. 2 (phonic wheel end) was opened for inspection. Phonic wheel was found damaged and broken into pieces and the teeth of phonic wheel had worn out.



2. Speed sensor was not found inside the axle box as the speed sensor had completely damaged and melted due to rubbing with phonic wheel and M8 bolts.
3. The all M8 bolts were found in worn out and damaged condition. Out of 03 M8 bolts, head of one bolt was not found inside the axle box. Remaining 02 M8 bolts & half M8 bolt were found in rubbed & damaged condition inside the axle box.



4. Heads of all M20 screws were deformed/worn. One M20 screw was bent & partially unscrewed.

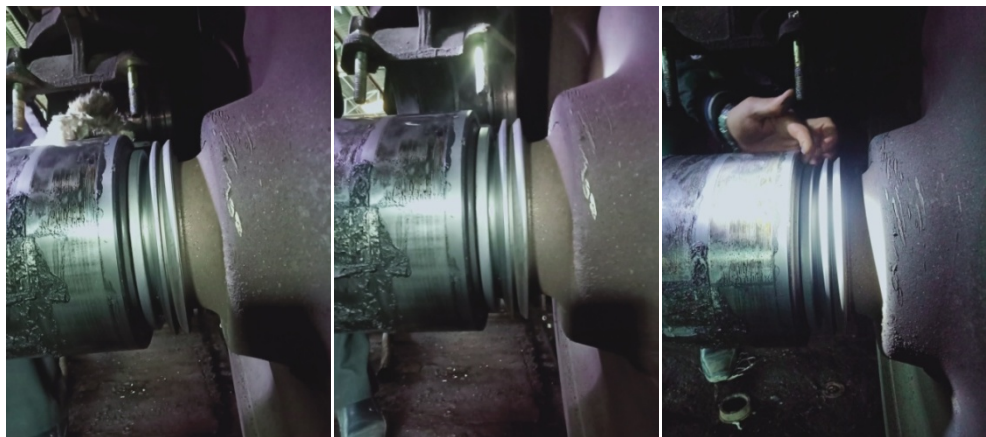


5. Part of locking plate was damaged and missing at partially unscrewed M20 screw position. Remaining locking plate at rest of 02 M20 screw positions was found intact but in rubbed condition.

6. Rubbing marks & grooving were found at inside surface of the axle end cover.
7. The outboard side grease seal of the bearing was found in damaged condition.



8. The coach was lifted in Sick Line. Outboard side grease (front side) seal of the reported bearing serial no. 06-18-13487 was found damaged and rubber lip had melted and deformed. Rubbing marks were observed on the out board side grease seal.
9. The inboard side grease seal and backing ring were found ok and intact. No damage found on the inboard side grease seal and backing ring of the reported bearing.



10. Bearing OD surface was found in good condition and no heating mark was found on the bearing OD surface.
11. The reported bearing was rotating freely onto the axle journal during hand rotation and no abnormal noise was observed during rotation of bearing.
12. Some amount of grease was found on the reported bearing Cup OD surface at outboard side and on the bore of the control arms (lower and upper half).



13. Rubbing marks were observed inside the upper & lower control arm towards outboard side only.

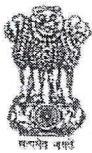


14. At the other end (axle box no. 1), bearing 06-18-13507 was found in good condition.



15. All wheels of the coach were found to be in good condition and no wheel shelling was observed on wheel tread.

S. No.	Date	Location	Coach No.	Mfg. Details	Observation
1.	17.02.19	LTT	182660	ICF-01.12.18 DOC-09.02.19	<i>3 phonic wheel bolts were found loose by half pitch. Retorqued.</i> <i>One bolt found loose by 1 pitch. Retorqued.</i>
2.	18.02.19	LTT	182659	ICF-04.12.18 DOC-13.02.19	All phonic wheel bolts found properly torqued.
3.	18.02.19	MMCT	191083	ICF-Jan 2019 DOC-17.02.19	All phonic wheel bolts were properly torqued. <i>Vyom make bolts were found in earthing device against stipulated make-LPS, Unbrako & TVS.</i> <i>Bolts of earthing device were loose by 1 pitch. Retorqued.</i> Allen bolts were found in place hexagonal head bolts in earthing device.
4.	18.02.19	MMCT	191068	ICF-Jan 2019 DOC-17.02.19	<i>2 phonic wheel bolts were found loose by half pitch. Retorqued.</i> Allen bolts were found in place hexagonal head bolts in earthing device.
5.	18.02.19	MMCT	191069	ICF-Jan 2019 DOC-17.02.19	Allen bolts were found in place hexagonal head bolts in earthing device.
6.	18.02.19	MMCT	182814	ICF-Jan 2019 DOC-17.02.19	Allen bolts were found in place hexagonal head bolts in earthing device.



भारत सरकार - रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ - 226 011
EPBX (0522) 2451200
Fax (0522) 2458500

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, Chandrasekharpur, 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