



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



No. MC/LHB/Brake

Date: 16.03.2021

**Reminder**

**Principal Chief Mechanical Engineer,**

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, Prayagraj - 211 001
5. Northern Railway, Baroda House, New Delhi - 110 001	6. North Western Railway, Jaipur - 302 006
7. East Central Railway, Hajipur - 844 101	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. Konkan Railway Corp. Ltd. Corporate office, Belapur Bhawan, Navi Mumbai- 400 614
15. Western Railway, Churchgate, Mumbai - 400 020	

**Sub:** Implementation status of consolidated instructions for addressing the problem of Wheel Shelling in LHB Coaches.

**Ref:** i) This office letter of even no. dated-18.01.2021. (Copy enclosed)

ii) This office letter of even no. dated-09.11.2020.

iii) This office letter of even no. dated-15.04.2019.

Vide letter at ref (iii) above, Zonal Railways were advised for implementation of the following instructions for mitigating Wheel Shelling problem in LHB Coaches:

- Brake Cylinder Pressure:** Zonal Railways/ PUs should not resort to alteration in Brake Cylinder pressure of LHB coaches from the specified value of  $3.0 \pm 0.1$  kg/cm<sup>2</sup>.
- Dump Valve Choke Sizes:** As described under letter at ref (iii).
- Air Brake Pipes & Fittings:** Standardized upgraded flexible hoses to Drg.No.CG-19036, Alt.1(Flexible Hose-650mm for Bogie) & Drg.No.CG-19037, Alt.1(Flexible Hose-500mm for Brake Actuators).
- Ensuring Integrity of electrical connections of WSP System and free movement of brake callipers:** As described under letter at ref (iii).
- Revised Wiring layout with Modified Junction Boxes:** Junction Boxes with Mil-grade connectors (Drg.No.CG-19005 Alt.1) & WSP wiring layout (Drg.No.CG-18246).

In connection to this, Zonal Railways were requested to provide feedback for the LHB coaches fitted with the above modifications vide ref at (i) & (ii) above, but reply from above Zonal Railways either still not received or partial information received to this office & the same are pending till date. In this regard, after analysing of wheel shelling data received from Zonal Railways, it has been noted that Wheel Shelling problem is drastically increasing day by day. Which is serious issue for LHB coaches.

In view of the above, Zonal Railways are hereby once again requested to provide the above stated item wise status of implementation of these modifications/ instructions and feedback regarding wheel shelling for LHB coaches fitted with these modifications in conjunction to compliance of other relevant instructions issued by RDSO time to time for mitigating wheel shelling. The reply may please be sent at earliest.

DA: Ref (i)

(Sudhir Singh) 16.03.21

Jt. Director/E&S and Brakes  
for Director General/Carriage  
E-mail: [director.carr.es@rdsol.railnet.gov.in](mailto:director.carr.es@rdsol.railnet.gov.in)



No. MC/LHB/Brake

Date: 18.01.2021

**Principal Chief Mechanical Engineer,**

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, Prayagraj - 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. Northeast Frontier Railway, Maligaon, Guwahati - 781 011
15. Western Railway, Churchgate, Mumbai - 400 020	16. East Central Railway, Hajipur - 844 101
17. Konkan Railway Corp. Ltd. Corporate office, Belapur Bhawan, Navi Mumbai- 400 614	

**Sub:** Implementation status of consolidated instructions for addressing the problem of Wheel Shelling in LHB Coaches.

**Ref:** i) This office letter of even no. dated-09.11.2020.  
ii) This office letter of even no. dated-15.04.2019. (Copy enclosed)

Vide letter at ref (ii) above, Zonal Railways were advised for implementation of the following instructions in regard to Wheel Shelling problem in LHB Coaches:

- Brake Cylinder Pressure:** Zonal Railways/ PUs should not resort to alteration in Brake Cylinder pressure of LHB coaches from the specified value of  $3.0 \pm 0.1$  kg/cm<sup>2</sup>.
- Dump Valve Choke Sizes:** As described under letter at ref (ii).
- Air Brake Pipes & Fittings:** Standardized upgraded flexible hoses to Drg.No.CG-19036, Alt.1(Flexible Hose-650mm for Bogie) & Drg.No.CG-19037, Alt.1(Flexible Hose-500mm for Brake Actuators).
- Ensuring Integrity of electrical connections of WSP System and free movement of brake callipers:** As described under letter at ref (ii).
- Revised Wiring layout with Modified Junction Boxes:** Junction Boxes with Mil-grade connectors (Drg.No.CG-19005 Alt.1) & WSP wiring layout (Drg.No.CG-18246).

In connection to this, Zonal Railways were requested to provide feedback for the LHB Coaches fitted with the above modifications vide (i) above, but reply from Zonal Railways either still not received or partial information received to this office & the same are pending till date. Therefore, Zonal Railways are again requested to provide the above stated item wise status of implementation of these modifications/ instructions and feedback regarding wheel shelling for LHB coaches fitted with these modifications in conjunction to compliance of other relevant instructions issued by RDSO time to time for mitigating wheel shelling. The reply may please be sent at earliest.

DA: Ref (i),(ii)

18.01.21  
(Sudhir Singh)

Jt. Director/E&S and Brakes  
for Director General/Carriage  
E-mail: [director.carr.es@rdso.railnet.gov.in](mailto:director.carr.es@rdso.railnet.gov.in)



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No. MC/LHB/Brake

Date: 09.11.2020

**Principal Chief Mechanical Engineer,**

1. Central Railway, Chhatrapati Shivaji Terminus, Mumbai - 400 001	2. North Central Railway, Allahabad - 211 001
3. Eastern Railway, Fairlie Place, Kolkata - 700 001	4. West Central Railway, Jabalpur - 482 008
5. South East Central Railway, Bilaspur - 495 004	6. Southern Railway, Park Town, Chennai - 600 003
7. Konkan Railway Corp. Ltd. Corporate office, Belapur Bhawan, Nawi, Mumbai - 400 614	8. Northeast Frontier Railway, Maligaon, Guwahati - 781 011
9. South Central Railway, Rail Nilayam, Secunderabad - 500 071	10. East Central Railway, Hajipur - 844 101
11. South Eastern Railway, Garden Reach, Kolkata - 700 043	12. Western Railway, Churchgate, Mumbai - 400 020
13. North Eastern Railway, Gorakhpur - 273 001	

**Sub:** Status for air brake modifications in LHB Coaches - Wheel Shelling.


- Ref:** i) This office letter of even no. dated 27.02.2019, 24.06.2019, 23.08.2019, 04.08.2020.  
ii) This office letter of even no. dated 06.02.2020.  
iii) This office letter of even no. dated 04.06.2020.

Vide letters at reference (i) above, Zonal Railways were advised for implementation of the following modifications in regard to Wheel Shelling problem in LHB Coaches:

- **WSP system:** Junction Boxes with Mil-grade connectors (Drg. No.CG-19005 Alt.1) & WSP wiring layout (Drg. No.CG-18246).
- **Air brake pipes & its fittings:** Standardized upgraded flexible hoses to Drg.No.CG-19036 (Flexible Hose-650mm for Bogie) & Drg.No.CG-19037 (Flexible Hose-500mm for Brake Actuators).

In this connection, ZRs were requested to provide feedback for the LHB Coaches fitted with the above modifications vide ref (ii) & (iii) above, but reply from above stated Railways is still not received & pending till date. Therefore, ZRs are again requested to provide the status of implementation of these modifications and feedback regarding wheel shelling for LHB coaches fitted with these modifications in conjunction to compliance of other relevant instructions issued by RDSO time to time for mitigating Wheel Shelling. The reply may please be mail at director.carr.es@rds.gov.in.

**DA:** Ref (ii) & (iii).

  
(Shailendra Kr. Sharma)  
Jt. Director/E&S and Brakes  
for Director General/Carriage



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No. MC/LHB/Brake

Date: 15.04.2019

**Principal Chief Mechanical Engineers,**

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: Consolidated instructions regarding modifications for addressing the problem of Wheel Shelling in LHB Coaches.**

Wheel shelling is a serious issue in LHB Coaches. With the sharp increase in population of LHB coaches, the problem of wheel shelling needs to be addressed on priority. In this connection, RDSO has conducted detailed study to identify the major causes for wheel shelling and published Carriage Research Reports RDSO/CG/CRR-18001 dated 28.03.2018 and RDSO/CG/CRR-18002 dated 27.09.2018. Following major causes have been identified for wheel shelling:

- Non-optimal choke sizes of Dump Valves and obstructions in air-brake piping between dump valves and brake cylinders.
- Wrong / Loose electrical connections of WSP system.
- Jamming of Brake Calipers / Actuators.
- Poor design of Junction Box prone to dust/water ingress.

RDSO has issued instructions time to time to Zonal Railways/PUs/OEMs in connection with wheel shelling. Implementation of these instructions have brought about 60-70% reduction in sick marking due to wheel shelling in various depots such as SDAH/ER, LKO/NR, SBC/SWR etc. This letter consolidates all instructions recently issued for the benefit of Zonal Railways and PUs for ease of implementation.

Item wise consolidated list of instructions issued by RDSO (2018-19):

**1. Brake Cylinder Pressure**

(Ref: RDSO letter no. MC/LHB/Brake dated 20.04.2018 to PCMEs / All Zonal Rlys and PUs)

Zonal Railways / PUs should not resort to alteration in Brake Cylinder pressure of LHB Coaches from the specified value of 3.0±0.1kg/cm<sup>2</sup>.

## 2. Dump Valves Choke Sizes

(Ref: RDSO letter no. MC/LHB/Brake dated 27.09.2018 to PCMEs / All Zonal Rlys and PUs)

Dump Valve choke sizes should be ensured as under:

Brake System Make/Model	Exhaust Choke Size	Charging Choke Size
KBIL (Model MGS2)	Remove existing 7mm choke	Replace existing 5mm choke with 9mm choke
FTRTIL (Model SWKP AS20R)	Remove existing 9 mm choke	Replace existing 6mm choke with 9mm choke

Above modification should be ensured in all newly manufactured as well as existing LHB coaches.

## 3. Air Brake Pipes & Fittings

(Ref: 1) RDSO letter no. MC/LHB/Brake dated 08.03.2019 to PCMEs / RCF, MCF, ICF  
2) Presentation on Wheel Shelling by Bengaluru Division / SW Railway in 18<sup>th</sup> CMG  
3) RDSO letter no. MC/LHB/Brake dated 12.04.2019 to PCMEs / All Zonal Rlys and PUs)

Deviations in air-brake pipes and fittings between dump valves and brake cylinders have been reported in a number of coaches resulting in choking of BC air pressure and inadequate dumping action by the WSP. This results in sluggish response of WSP during wheel sliding causing higher temperatures and consequently formation of martensite.

PU to ensure that all newly manufactured LHB coaches should be turned out with standard sizes of piping and end fittings as per Alstom Manual.

Coaching depots of Zonal Railways are required to identify existing coaches having these deviations (starting with coaches prone to wheel shelling) and rectify them. Workshops to ensure 100% attention in this regard before turning out the coaches.

## 4. Self-Lubricating Bushes for Brake Calipers/Actuators

(Ref: 1) RDSO letter no. MC/LHB/Brake dated 06.09.2018  
2) M/s FTRTIL letter no. FTRTIL/MKTG/RDSO/LKO/DB-001 dated 25.09.2018)

Only self-lubricating bushes should be fitted in Brake Calipers/Actuators. For KBIL make Brake Calipers, such bushes are already fitted. As regards FTRTIL, RDSO has instructed immediate switchover to self-lubricating non-metallic bushes. The same has been confirmed vide FTRTIL letter at Ref (2) for all new supplies and also replacement in depots/ workshops under AMC.

PU should ensure that all newly manufactured LHB coaches should be fitted with Brake Calipers/Actuators having self-lubricating bushes. Zonal Railways are required to carry out this modification under AMC attention.

*It has also been reported that lubrication like SAE-40 oil is used at some depots to keep the caliper free in operation. Due to use of oil, the grease film of self-lubricating bushes gets damaged and these bushes no longer function as designed. Also, dust gets accumulated in form of muck which may obstruct freeness of caliper and can affect brake releasing and application timing. **As such, practice of oiling with self-lubricating bushes needs to be stopped immediately.***

## 5. Ensuring Integrity of electrical connections of WSP System and free movement of brake calipers

(Ref: RDSO letter no. MC/LHB/Brake dated 27.09.2018 to PCMEs / All Zonal Rlys and PUs)

Zonal Railways were requested to take action as per CRR Report 18002 vide Ref. above. Para 5.3.3 of the CRR report is reproduced below:

"The trials also bring out that integrity of electrical connections of WSP system and free movement of brake calipers during brake application / release is absolutely vital in reducing wheel shelling. Zonal Railways need to launch a special drive to ensure this."

*It has also been reported that Train Examiners in some depots are not taking responsibility of WSP electrical wiring / Junction Boxes. It is clarified that all wiring after 110V DC power connection to the WSP unit is the responsibility of the Train Examiner. Zonal Railways to ensure.*

**6. Revised Wiring layout with Modified Junction Boxes**

(Ref: 1) RDSO letter no. MC/LHB/Brake dated 30.01.2019 to PCMEs / PUs  
2) RDSO letter no. MC/LHB/Brake dated 27.02.2019 to PCMEs / All Zonal Rlys)

Revised wiring layout for WSP system (**Drg.No.CG-18246 Alt.0**) with IP67 grade Junction Boxes having provision of MIL-grade connectors (**Drg.No.CG-19005 Alt.1**) should be implemented by PUs for all newly manufactured coaches.

Zonal Railways / PUs should ensure compliance of above to eliminate the problem of Wheel Shelling.

DA: All referred letters.



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

Copy to: EDME (Chg.)/Rail Bhawan, Railway Board New Delhi- 110 001 for kind information please.