

भारत सरकार Government of India  
रेल मंत्रालय Ministry of Railways  
रेलवे बोर्ड Railway Board



No. 2017/M(C)/138/2Pt1

(E-File no. 3325465)  
New Delhi, Dated 22.08.2022

General Managers,  
All Zonal Railways

**Sub: Permissible restricted speed for LHB coaches with broken primary spring (only in case of enroute failures).**

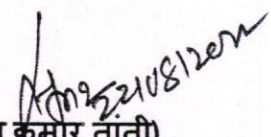
**Ref: i. RDSO letter no. SV. FIAT Spring dated 08.11.2018  
ii. RDSO letter no. SV. FIAT Spring dated 18.08.2022.**

Vide letter under reference (i), in case of enroute breakage of primary spring of LHB Coaches, RDSO had permitted the coaches to run upto the destination at restricted speed of maximum 80 kmph.

Vide reference (ii), RDSO has reviewed the said guidelines and now permitted, LHB coaches with enroute breakage of spring in primary suspension to run at restricted speed of **upto 95 kmph maximum** with certain conditions as detailed in the letter under reference ii.

Zonal Railways are advised to follow the detailed guidelines issued by RDSO immediately and ensure that while permitting such coaches, all other stipulated conditions are strictly complied.

For further necessary action please.

  
(सुमन कुमार तांती)  
निदेशक / यांत्रिक इंजी./कोचिंग  
रेलवे बोर्ड

**C/-All PCME/Zonal Railways for kind information and necessary action please.**

**-ED/Carriage/RDSO for kind information and necessary action please.**





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



No. SV. FIAT Spring

Date: 08.11.2018

**Principal Chief Mechanical Engineers,**

1. Northern Railway, Baroda House, New Delhi - 110 001
2. Western Railway, Churchgate, Mumbai - 400020
3. Central Railway, CSTM, Mumbai - 400 001
4. Eastern Railway, Fairly Place, Kolkata - 700 001
5. Southern Railway, Park Town, Chennai - 600 003
6. North East Frontier Railway, Maligaon, Guwahati - 781 011
7. North Eastern Railway, Gorakhpur - 273 001
8. South Eastern Railway, Garden Reach, Kolkata - 700 043
9. South Central Railway, Secunderabad - 500 071
10. West Central Railway, Jabalpur - 482 001
11. South East Central Railway, Bilaspur - 495 004
12. South Western Railway, Hubli - 580023
13. East Coast Railway, Railway Complex, Bhubaneswar - 751 023
14. East Central Railway, Hajipur - 844 101
15. North Western Railway, Jaipur - 302 006
16. North Central Railway, Allahabad-211 001
17. Konkan Railway Corporation Ltd., Belapur Bhawan, Navi Mumbai - 400 614
18. Integral Coach Factory, Chennai - 600 038
19. Rail Coach Factory, Hussainpur, Kapurthala, Punjab - 144 602
20. Modern Coach Factory, Rae Bareilly - 229 120

**Sub:** Speed Restriction in LHB coaches due to enroute breakage of primary outer spring

**Ref:** PCME/SECR letter no Mech/HQ/2018/06 dt 09-07-2018

Vide letter under ref. above, SECR had requested for issue of guidelines in case of enroute breakage of primary springs in LHB coaches. The dynamic behavior of LHB coach with one broken primary outer spring has been studied at RDSO. Simulation studies for coach dynamic behavior including vehicle stability and ride quality have been carried out on NUCARS software with one broken primary outer spring where the breakage is within one and a half (1.5) coil lengths from top / bottom end. This study has brought out that there is no deterioration in the coach running behavior at speeds upto 80 kmph, with an adequate margin of safety. FIAT OEMs have also recommended that spring breakage shortens the spring, but at the same time increases the stiffness of the spring, so that affected vehicle can be permitted up-to destination station. It is further planned to conduct oscillation trial of a LHB coach fitted with broken primary outer spring to study behaviour at higher speeds.

In view of above, in case of enroute breakage of outer spring of primary stage suspension, the LHB coach can be permitted to run upto the destination with escorting TXR staff at a restricted speed of 80 kmph, provided each of the following conditions are met:

- (i) Only one primary outer spring is broken and all other coil springs / air springs in primary as well as secondary suspension are in good condition. All springs must be checked critically before permitting the coach with restricted speed.



- (ii) The primary outer spring is broken at only one location, which falls within one and a half (1.5) coil lengths from top / bottom end. The corresponding rubber pad primary bump stop must be intact and there should be no oil-leakage or any physical damage to the Primary Vertical Damper. Further, the control arm lug should not have any marks of hitting with the Head Brackett.
- (iii) The broken spring is not displaced from its position.
- (iv) The coach is to be escorted upto destination accompanied with TXR staff.

At the destination, the broken spring should necessarily be replaced and detailed investigation of failure should be carried out. Spring failure reports should continue to be sent to RDSO, as per extant instructions.

DA: Nil.



(Samir Lohani)  
Executive Director/Carriage

Copy to:

EDME (Coaching), Railway Board, Rail Bhawan, New Delhi – 110 001.





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



No. SV. FIAT Spring

Date: 18.08.2022

**Principal Chief Mechanical Engineers,**

1. Northern Railway, Baroda House, New Delhi -110 001.	2. Western Railway, Churchgate, Mumbai - 400020.
3. Central Railway, CSTM, Mumbai - 400 001.	4. Eastern Railway, Fairly Place, Kolkata- 700 001.
5. Southern Railway, Park Town, Chennai - 600 003.	6. North Frontier Railway, Maligaon, Guwahati - 781 001.
7. North Eastern Railway, Gorakhpur -273 001.	8. South Eastern Railway, Garden Reach, Kolkata - 700 043.
9. South Central Railway, Secunderabad - 500 071.	10. West Central Railway, Jabalpur-482 001.
11. South East Central Railway, Bilaspur - 495 004.	12. South Western Railway, Hubli - 580023.
13. East Coast Railway, Railway Complex, Bhubaneshwar - 751 023.	14. East Central Railway, Hajipur - 844 101.
15. North Western Railway, Jaipur - 302 006.	16. North Central Railway, Allahabad -211 001.
17. Konkan Railway Corpo. Ltd., Corporate Office, Belapur Bhawan, Navi Mumbai - 400 614.	18. Integral Coach Factory, Chennai - 600 038.
19. Rail Coach Factory, Kapurthala, Punjab - 144 602.	20. Modern Coach Factory, Raebareli, 229120.

**Sub:** Permissible restricted speed for LHB coaches with broken primary spring (only in case of enroute failures).

- Ref:**
- This office letter of even no. dated 08.11.2018 & 08.08.2022.
  - NWR's letter No. NWR/HQ/M/C&W/Chg./3A (Coach Unusual) dated 12.08.2022.
  - CR's letter No. M.102.C&W.LHB dated 17.08.2022 10.08.2022
  - NER's letter No. M/55/8/LHB/Pt-4 DATED 10.08.2022.
  - NCR's letter No. Mech./NCR/Mech./801/V dated 17.08.2022.
  - SR's letter No. M/CW/271/Maintenance f LHB 2022-23 DATED 12.08.2022.
  - SCR's letter No. M.271/LHB/209/Vol. XI dated 11.08.2022.
  - SWR's letter No. SWR/M/C/26 LHB dated 18.08.2022.
  - SER's letter No. M2/C-17/Coach Maintenance dated 17.08.2022.
  - SECR's letter No. Mech./HQ/007/018/1120 dated 17.08.2022.

The issue of permissible restricted speed (only in case of enroute failures) with broken primary spring of LHB coaches was earlier examined at RDSO. Based on simulation study, recommendations from OEM and experience of field, LHB coaches with broken primary outer spring were permitted to run up to the destination with escorting staff at a restricted speed of maximum 80 kmph in case of enroute breakage of spring in primary suspension of the LHB coach, subject to the broken spring not displaced from its position along-with other conditions detailed in the letter dated 08.11.2018 under ref (i).

The instructions issued in the letter dated 08.11.2018 referred at (i) have been in vogue for more than 3.5 years. Based on the gained experience, the above subject has been reviewed. Feedback for LHB coaches reaching destination with broken primary spring was requested from Zonal Railways vide this office letter dated 08.08.2022 referred at (i).

The following feedback have been received from NWR, CR, NER, NCR, SR, SCR, SWR, SER & SECR vide letters under reference (ii) - (x):

- No significant displacement noticed in broken springs from its position which arrived at destination without any speed restriction/or with speed restriction of 80 kmph.



- No cases of bad riding/jerky behavior in LHB coaches with broken primary spring observed by passengers or escorting staff.
- No any other issues related to safety observed during enroute running of LHB coaches with broken primary springs.

RDSO has also studied cases of coil spring failures at Workshops & Depots and analysis of these cases corroborates the feedback from Zonal Railways. Simulation studies for coach dynamic behaviour including vehicle stability and ride quality have been carried out on NUCARS software with various combinations of broken primary springs. This study brings out that the coach running behaviour remains safe & stable at speeds up to 95 kmph, with an adequate margin of safety. FIAT OEMs have also recommended that spring breakage shortens the spring, but at the same time increases the stiffness of the spring, so that affected vehicle can be permitted up to destination station. Primary springs for LHB Coaches have 1.5 inactive turns & pitch of coil spring increases from inactive coils to active coils. Further, approx. 0.75 coil at each end remains inactive due to end grinding, due to which breakage close to ends does not affect the suspension parameters significantly.

Based on above study and feedbacks received from Zonal Railways, speed restriction and guidelines issued mentioned in letter under reference (i) have been reviewed by RDSO for safe train operation. The following guidelines are now issued:

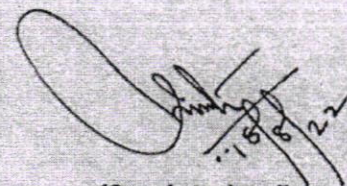
***In case of enroute breakage of spring of primary stage suspension, the LHB coach can be permitted to run upto the destination with escorting TXR staff at a restricted speed of upto 95 (ninety-five) kmph maximum, provided each of the following conditions are met:***

- (i) ***Only one primary spring is broken and all other coil springs / air springs in primary as well as secondary suspension are in good condition.***
- (ii) ***Only one primary spring coil is broken at a location, which falls within two (2.0) coil turns from top/bottom end. The corresponding rubber pad primary bump stop must be intact and there should not be any physical damage to the primary vertical damper. Further, the control arm lug should be in proper condition.***
- (iii) ***The broken spring is not displaced from its position.***
- (iv) ***The coach is escorted up to destination accompanied with TXR staff, who shall ensure that the broken spring is not displaced from its position & other items of suspension are intact at every halt of the train.***

At the destination, the broken spring should necessarily be replaced and detailed investigation of failure should be carried out. Spring failure reports should continue to be sent to RDSO, as per extant instructions.

***These instructions supercede earlier instructions issued on this subject vide letter "SV.FIAT Spring dated 08-11-2018".***

DA: Nil.



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

Copy to:

EDME (Coaching),  
Railway Board, Rail Bhawan,  
New Delhi - 110 001.

} For kind information please.