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No. SV.FIAT.Spring

Date: 16.12.2019

Principal Chief Mechanical Engineers,

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Southern Railway, Park Town, Chennai - 600 003
South Central Railway, Rail Nilayam, Secunderabad - 500 071
South Eastern Railway, Garden Reach, Kolkata - 700 043
North Eastern Railway, Gorakhpur - 273 001
Northeast Frontier Railway, Maligaon, Guwahati - 781 011
Western Railway, Churchgate, Mumbai - 400 020
East Central Railway, Hajipur - 844 101
East Coast Railway, Chandrasekharapur, Bhubaneswar - 751 016
North Central Railway, Allahabad - 211 001
North Western Railway, Jaipur - 302 006
South Western Railway, Hubli - 580 023
West Central Railway, Jabalpur - 482 008
South East Central Railway, Bilaspur - 495 004
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Integral Coach Factory, Chennai - 600 038
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Sub:- Breakage of primary springs in LHB coaches

Ref:- i. RCF letter No MD 44121 dated 06-08-19.
ii. RDSO letter no SV.FIAT.Spring dated 28.06.2019 & RCF
CAI/RCF/MECH/LHB/016 dated 21.06.2019

1. In analysis of failures of coil springs in primary suspension of LHB AC coaches, it has been observed that failure rate of primary springs per hundred population of coaches is relatively higher in LWACCN coaches. Accordingly, CAI for providing compensating rings of specified thickness below primary bump stop in primary suspension of LHB AC coaches was issued vide letter under ref (ii).
2. Further, it is observed that LWACCN coaches are provided with primary outer spring (free height 324.5 mm) and primary inner spring (free height 337 mm). Due to difference of free heights between inner and outer spring, inner spring leads the nest & compresses first, taking more load in the suspension. Failure rate of inner spring in LWACCN coach is found to be highest in LHB coaches.
3. To balance spring nest of primary suspension of LWACCN coach, a study has been conducted by RDSO & RCF. In this study, it has been found that provision of 12 mm thick compensating ring below primary rubber bump stop with outer spring (drawing no. 1277142) and inner spring (drawing no. 1277143) in primary suspension of LWACCN coaches results in equitable load distribution between inner and outer

springs and significant increase in factor of safety of springs (upto 20%). There is no effect on load-deflection characteristics of primary suspension (within permitted tolerance range) & dynamic behavior of LWACCN coaches in dynamic simulation studies with this arrangement. Similar suspension arrangement is already in use in LHB Double Decker coaches running on IR network, which have similar tare weight as LWACCN coach & cover gross weight of LWACCN coach within its designed maximum weight, and also do not have significant failure rate of primary springs. RCF has already turned out 2 LWACCN coaches with this provision & no adverse report regarding primary suspension in these coaches has been received over the last 5 months.

4. Minimizing breakage of primary springs in LWACCN coaches is an area requiring immediate attention. Breakage of primary springs also results in higher stresses in other bogie components such as dampers, bearings etc. The issue was also deliberated in detail at 19th CMG meeting on 22nd - 24th Nov '19. In view of above, it has been decided that 12 mm thick compensating ring below primary rubber bump stop with outer spring as per drawing no. 1277142 & inner spring as per drawing no. 1277143 in primary suspension of LWACCN coaches shall be provided during manufacturing, shop schedules & sick line attentions. For LWACCN coaches only, these instructions supersede instructions issued vide letter under ref (ii). For rest of LHB AC coaches, instructions issued vide letter under ref (ii) need to be followed. However, instructions issued vide letter under ref (ii) may be followed for LWACCN coaches until material for provision of 12 mm thick compensating ring below primary rubber bump stop with outer spring as per drawing no. 1277142 & inner spring as per drawing no. 1277143 in LWACCN coaches is implemented.



(Shobhit Pratap Singh)
Joint Director (VDG)/Carriage

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PCME / RCF/Kapurthala, Punjab-144602 For kind information & for necessary changes in drawings of primary suspension of LWACCN coaches.