सत्यमेव जयते

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No. EL/3.2.119/3-ph TBU

Date: 22.12.2016

Chief Electrical Engineer,

1. Central Railway, Mumbai, CST-400 001.
2. East Central Railway, Hazipur-844101.
3. East Coast Railway, Chandrashekharpur, Bhubaneshwar-751016.
4. Eastern Railway, Fairlie Place, Calcutta-700001.
5. North Central Railway, Block-A, Subedarganj, Allahabad- 211033.
6. Northern Railway, Baroda House, New Delhi-110001.
7. South Central Railway, Secunderabad-500 071.
8. South East Central Railway, Bilaspur-495004.
9. South Eastern Railway, Garden Reach, Calcutta-700 043.
10. Southern Railway, Park Town, Chennai-600 003.
11. West Central Railway, Jabalpur-482001.
12. Western Railway, Churchgate, Mumbai-400 020
13. Chittaranjan Locomotive Works, Chittaranjan – 713 331

MODIFICATION SHEET No. RDSO/2016/EL/MS/0455 Rev. '0', Date 22.12.2016

1.0 Title: Modification to brake lever for WAG9/9H Electric locomotives to improve reliability and ensure interchangeability.

2.0 Object:

The brake riggings of WAP7 and WAG9 locos were identical. However, with the introduction of WAP7 locos, instances of failures of brake levers were reported. These were related with higher speed resulting in higher level of vibrations and shocks. RDSO issued modification sheet no.381 to provide conventional brake rigging with less suspended weight on WAP7 locomotives to address the issue of brake lever breakage in WAP7 locomotives. M/s Faiveley had modified its design to prevent breakage of brake levers in WAG9/9H. However, TBU of other make could not be mounted on the modified brake levers leading to problem of interchangeability. M/s KBIL continued to supply as per earlier design incorporating improved welding techniques as recommended by RDSO.

Recently, ELS/TKD based WAG9 loco no. 31299 derailed at GZB while hauling Train No. 19020 on 9.7.2016. Investigation revealed that both outer (KBIL make) and inner (FTIL make) brake levers at wheel No. 7 were found broken. After this incident, a revised maintenance instructions SMI no.251 Rev. 1 was issued to address the failure of brake levers. However, it was also felt that the design of brake lever needs to be improved in view of increased periodicity of inspection. The issue of interchangeability was also proposed to be resolved by issuing a common design.

Further, it was reported that threads of stud are getting worn out resulting in missing slack adjuster.

3.0 Existing Arrangement:

The TBU is fitted with clasp type rigging, one TBU on each wheel. Each TBU and each slave unit is suitable for double brake shoe block fitment suitable for brake shoe head. The brake system is hung from a bracket welded to the bogie frame with freedom

to actuate the brake even when axle floats laterally. The existing brake lever as per CLW drawing nos. 1209-01.116-017, 1209-01.116-023, 1209-01.116-025 & 1209-01.116-026 is being supplied by M/s KBIL and was supplied by M/s FTIL till around mid-2011.

The slack adjuster is connected to brake lever by means of a threaded stud which is tightened onto threaded piece welded onto brake lever. The threads of the stud and the piece wear out leading to falling slack adjuster on line leading to increased stresses on the brake lever.

4.0 Modified Arrangement:

A design for brake lever was developed in consultation with M/s Knorr & M/s Faiveley to ensure interchangeability between the two makes and improved factor of safety following FEA analysis. This modification seeks to strengthen the region close to the suspension bracket by replacing existing ring with a plate which shifts the welding area further away from this point where loads are relatively less increasing the factor of safety.

Also, the threaded hole in new design for brake lever has been made into through hole. The length of stud of shall be increased from 150mm to 170mm to ensure better grip. The modified drawing also provides holes for providing slings.

The modified brake levers as per RDSO drawing no. SKEL-5011, SKEL-5012, SKEL-5013 and SKEL-5014 should henceforth be used on WAG9/9H locomotives.

5.0 Applicable to class of Locomotives :

WAG9/9H locomotives

6.0 Material Required:

Brake levers as per RDSO drawing nos .- SKEL-5011, SKEL-5012, SKEL-5013 and SKEL-5014 and threaded stud M16X170

7.0 Material Rendered Surplus:

Brake levers as per CLW drawing nos. 1209-01.116-017, 1209-01.116-023, 1209-01.116-025 & 1209-01.116-026 and threaded stud M16X150.

8.0 Agency of Implementation:

i. POH workshops to replace unmodified brake levers during POH of locomotives.

ii. Zonal Railways and CLW to procure brake levers for manufacture/replacement/maintenance as per modified RDSO drawings

9.0 Modification Drawing:

RDSO drawing nos. SKEL-5011, SKEL-5012, SKEL-5013 and SKEL-5014

Enclosures: As above

for Director General/Electrical

Copy to: As per Standard Mailing List No. EL/M/0019