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भारतसरकार-रेलमंत्रालय
अनुसंधानअभिकल्पऔरमानकसंगठन
लखनऊ- 226 011
Government of India - Ministry of Railways
Research, Designs & Standards Organization,
LUCKNOW - 226 011

No. EL/3.1.35/2 (Brake Lever)

Date: 05.05.2014

Chief Electrical Engineer,

1. Central Railway, Mumbai, CST-400 001.
2. East Central Railway, Hazipur-844101.
3. East Coast Railway, Chandrashekharapur, 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

SPECIAL MAINTENANCE INSTRUCTION
No. RDSO/2014/EL/SMI/0280 (Rev. '0') Dated: 05.05.2014

1.0 Title:

Maintenance instructions to prevent crack/ breakage of TM mounting bogie nose in WAP7/WAG9 locomotives.

2.0 Object:

South Central Railway has reported breakage of TM mounting bogie nose in ELS/LGD based WAG9 locomotive no. 31345 which caused derailment in Vijaywada division of SCR on dt 24.04.2014 while working the train no. BCN/TEN. Railway Board has directed RDSO to study the problem and submit recommendations to address the issue.

3.0 Arrangement:

The Traction motor is suspended from bogie mounting nose through torque arm. The torque arm is fixed to bogie mounting lug on the top through spheri block and to TM supporting plate on the bottom side through another spheri block.

4.0 Observations and Investigation:

During the failure investigation it was found that cracks were initiated from both bogie nose portion in fatigue manner and finally TM mounting bogie nose had sheared away perpendicularly. Subsequently the torque arm went down with the TM.

As per CLW drawing no. 1209-01-112-009 Alt '1', fillet radius of 8mm on the bottom surface of TM mounting bogie nose is specified and fillet radius on the upper face of the bogie nose lugs are shown but is not specified.

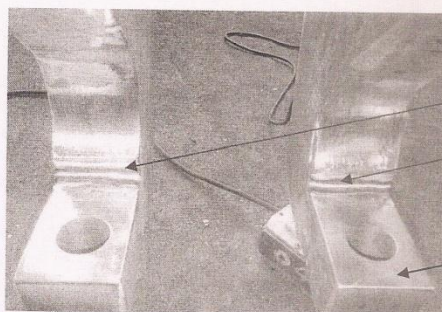
To assess the situation, different bogies were observed at ELS/LGD and it was found that CLW built bogie frame had fillet radius of 8mm on upper face of bogie mounting nose (even-though the radius is not specified in the machining drawing of the CLW) whereas bogies supplied by others vendors had not fillet radius.

The failure of bogie mounting nose in fatigue manner may be attributable to sharp edges at lug hole portion which had acted as notch for fatigue initiation. Development of crack and subsequent failure of bogie mounting nose is due to stress concentration at the lug portion due to sudden change of machining profile.

5.0 Modified Instructions:

For Bogies procured from trade

- One round in situ DPT should be conducted on bogie mounting nose in all bogies of WAP-7/ WAG-9 locomotives after removal of paint on the first opportunity.
- One round of making fillet radius of 8mm on upper face of bogie mounting nose should be carried out immediately by minimal cutting of upper face of bogie mounting nose manually using tungsten carbide buffer tool (16mm spherical). All tool marks should be polished using grinding wheel.
- A modified design of bogie mounting nose to reduce stress concentration at lug portion is as below:-



**Fillet Radius
should be 8 mm**

**Bogie Mounting
Nose**

- DPT should be conducted on the bogie mounting nose after machining. Champhering of edges of bogie mounting nose should be done by using grinding wheel.
- As a precautionary measure safety sling should be provided as per RDSO SMI NO. 269 (Rev. '0') to prevent falling of Traction motor in case of failure of bogie mounting nose in WAP7/WAG9 locomotive.
- DPT should be conducted thereafter on bogie mounting nose during every MOH/IOH/POH schedule.
- The bogie frame should be procured with fillet radius 8mm (R-8) on upper face of the bogie mounting nose. For this purpose CLW/CRJ should revise its drawing no.1209-01-112-009 to shown fillet radius of 8mm (R-8) on upper surface of the bogie mounting nose. Modified bogie frame should be procured as per revised drawing and fitted.

6.0 Application to Class of Locomotives:

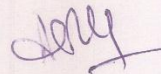
All WAP-7/WAG-9 Electric locomotives.

7.0 Agency of Implementation:

All Electric Loco sheds maintaining 3-phase locomotives, POH workshops.

8.0 Periodicity of Implementation:

As mentioned above.



(A. K. Rastogi)
for Director General/Electrical