फैक्स/Fax : 91-0522-458500
तार : 'रेलमानक' लखनऊ
Telegram : 'RAILMANAK', Lucknow
टेलीफोन/Tele : 451200 (PBX)
450567 (DID)

सत्यमेव जयते

भारत सरकार - रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ - 226011
Government of India-Ministry of Railways
Research Design & Standards Organisation
Lucknow - 226011

No. EL/1.3.10 Dated 4.8.2000

SPECIAL MAINTENANCE INSTRUCTION No.ELRS/SMI/0221-2000 (Rev.0)

1. TITLE : The maintenance practices to be followed during AOH maintenance schedule of MSU of traction motor type HS 15250A/TAO-659.

2. OBJECT : During 26th MSG(EL) meeting held at Bangalore, S.Rly. on 7th and 8th April'99, Railways had highlighted few cases of failures of MSU of traction motor type HS 15250A on account of dropping of its adjustment washer and failure of its taper roller suspension bearings.

   The matter has been investigated in details and SMI No. ELRS/SMI/0217-2000 (Rev.-0) and its Amendment No. 1 have been issued to Railways vide this office letter of even number dated 24.2.2000 and 7.4.2000 respectively.

   To improve the performance and reliability of MSU of traction motor type HS 15250A and TAO 659, it is recommended that Railways should follow this SMI for their AOH maintenance schedule of traction motor type HS 15250A/TAO-659. Technical input on this matter has been given by M/s Timken India Ltd.

3. PRECAUTION AND MAINTENANCE PRACTICES WHICH ARE TO BE FOLLOWED DURING AOH MAINTENANCE SCHEDULE :

   DO's DURING AOH :

   1. In the maintenance checking of suspension bearing and unit, listen for any abnormal noise from the MSU.

   2. Check the bearing for abnormally high temperature by touching the outside of bearing housings of suspension tube.

   3. Also check for loose or missing bolts to prevent MSU failure and damage to bearings.

   4. The MSU is secured to the magnet frame with M36 bolts. The bolts may slacken from time to time. Check the tightness of the M36 bolts using a torque wrench. if found loose retighten to correct torque value of 12,100 Kg-Cm to 14,500 Kg.Cm. Use only hot forged and rolled threaded bolts in line with technical circular No. ELRS/TC/0043 of 15.7.1999 from sources contained in the list of approved suppliers dated 30.6.2000 Item 15.0(p).

5. Check suspension tube for cracks, breakage and distortion. Also check for proper sealant application. If the sealant is missing or insufficient, apply the sealant (KE 45-RTV) as instructed by Hitachi/RDSO. Refer Hitachi manual showing the positions where sealant is to be applied.

6. Check the condition of M36 bolts, locking wire and washers. Replace the damaged bolts, washers and locking wire. Torque tighten the bolts.

7. Check for missing adjustment washer.

8. Check axial end play of MSU. It should be within 0.05 mm to 0.25 mm.

9. Check for sufficient grease by rocking the MSU tube by pushing hard with leg. If the MSU rocks for more than 4 times, then this is the indication that the MSU either has less grease or the axial end play is very much in excess, if this be so, pull out the MSU from service and send for overhauling of the MSU and thorough inspection of the bearings and allied components.

10. Before replenishing the grease in the respective bearings, drain out the water from the pneumatic pipeline before attaching the pneumatic pump pipe connection. Check water content in the grease in the pump barrel. Ensure dry air for filling grease with the help of pneumatic pump. Grease must be stored in moisture free chamber.

11. A simple method is to heat a small steel plate to about 200 degree C. then spread a little grease on the heated steel plate. If the grease contains water there will be spattering sound of water. There should be no doubt about grease melting because the grease will not melt at 200 degrees centigrade.

12. Check felt seals of gear case and if found defective replace these with new ones to avoid leakage of compound from the gear case and entry into the bearings.

13. Even during re-discing, take out the adjustment washer. Ensure that disc presses abutment piece. Re-fit correct size adjustment washer to have axial end play of 0.05 mm to 0.25 mm. The parallelism of the adjustment washer, after grinding should be within 0.025mm. Correct axial/lateral play ensures correct radial clearance of the assembled bearings in the MSU.

    When press fitting gear side wheel disc, make sure the disc hub does not (repeat) does not touch the gear hub. Press fitting gear side wheel disc after road side wheel disc has been pressed in position will help to ensure correct gauge length to match the rail-gauge.

14. Check the condition of grease nipples. If missing or damaged fix fresh ones. .

15. Earthing brushes should be checked during IC/AOH.

16. For replenishment of grease follow R.DSO directive.

RWE	GWE
150 gms	250 gms
(During IC)	(During IC)

17. Tighten all the eight Hex Hd. Bolts size M12x70L in their position at the specified torque.

DON'Ts LIST – DURING AOH :

1. DON'T FORGET TO TIGHTEN ALL REPLACED / LOOSE BOLTS BY TORQUE WRENCH AND AT CORRECT VALUE.
2. DON'T WELD ADJUSTMENT WASHERS AS THIS WILL CAUSE FAILURE OF THE BEARINGS DUE TO ELECTRIC ARCING FROM WELDING AND ALSO WILL CAUSE LOSS OF LATERAL PLAY.
3. DON'T FORGET TO APPLY SEALENT (KE-45-RTV) ON THE SLIT OF THE TWO HALVES OF THE ADJUSTMENT WASHERS, ON THE O.D.
4. DON' T FORGET TO ADJUST EARTHING BRUSH CORRECTLY DURING IC AND AOH SCHEDULE.
5. DON'T FORGET TO APPLY ONLY DRY AIR THROUGH PNEUMATIC PUMP SO THAT WATER DOES NOT ENTER THE BEARINGS ALONG WITH THE GREASE.
6. DON'T FORGET TO APPLY SEALANT (KE-45 –RTV) IN THE JOINTS BETWEEN MSU AND MOTOR TO AVOID WATER AND DIRT ENTRY INTO THE BEARINGS. APPPLY SEALENT ACCORDING TO HITACHI MAINTENANCE MANUAL, PAGE NOS. 95 & 96 (FIG. EL 1-104 & EL 1-105).
7. DON'T FORGET TO CHECK THAT THE HUB OF ROAD SIDE WHEEL HAS DEFINITELY TOUCHED THE ABUTMENT PIECE.
8. DON'T ALLOW THE GEAR SIDE WHEEL HUB TO TOUCH GEAR HUB DURING REDISCING.
9. DON' T FORGET TO CHECK LATERAL PLAY OF EACH MSU.
10. DON'T FORGET TO ROCK THE MSU TO ASCERTAIN NOISE. LACK OF GREASE, EXCESS LATERAL PLAY AND DAMAGED BEARINGS, EXCESS LATERAL PLAY CAUSE BEARING FAILURE.
11. DON'T FORGET TO CHECK COMPOUND LEAKAGE DUE TO DEFECTIVE FELT SEALS IN GEAR CASE.
12. DON' T FORGET TO SEND THE MSU FOR OVERHAULING IF THERE IS SIGN OF (GEAR CASE) COMPOUND ENTRY INTO THE MSU.
13. DON'T FORGET TO CHECK LOOSE ENCLOSURE (ITEM 9). SOMETIMES THESE HAVE BEEN FOUND TO BE LOOSE. THOUGH THESE ARE SUPPOSED TO BE SHRUNK FITTED. IF THE ENCLOSURE IS LOOSE THEN THERE IS EVERY LIKELYHOOD OF ITS SECURING BOLTS BREAKING IN SUCH A SITUATION LABYRINTH SEALING ARRANGEMENT WILL GET DAMAGED.

4. APPLICATION :

Motor suspension unit of traction motor type HS 15250A/TAO 659.

5. MATERIAL REQUIRED :

- KE 45- RTV
- Loctite 222/ ANR 124.
- Magnetic Dial Gauge, L/C = 0.01 mm.
- Torque Wrench : i) 0 – 150 Kgf-m
  ii) 0 – 10 Kgf-m.
- Grease Servogem RR-3 as per requirement.

6. MATERIAL RENDERED SURPLUS - NIL

7. REFERENCE :

- Timken India's list on preventive maintenance during AOH.
- 26th MSG/EL held at Bangalore, S.Rly. on 7th & 8th Ajpril'99.
- RDSO's SMI No. ELRS/SMI/0217-2000 (Rev-0) dated 24.2.2000 and its Amendment No. 1 dated 7.4.2000.

8. AGENCY OF IMPLEMENTATION :

- All Electric Loco Sheds/Workshops.
- All TM manufacturers.

9. PERIODICITY OF IMPLEMENTATION :

- During AOH
  OR
  Whenever the adjustment washer/suspension bearing fails.
- During rediscing.

10. DISTRIBUTION : As per mailing list.

Encl: Nil

(R K Kulshrestha)
For Director General (Elec)