GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS
RESEARCH DESIGNS & STANDARDS ORGANISTION
Manak Nagar,
Lucknow-226011
FAX (0522) 450374

No. EL/1.3.10 Dated 19.4..2000

SPECIAL MAINTENANCE INSTRUCTION NO.ELRS/SMI/0218-2000(Riv.'0')

1. Title : Improvement in the reliability of plain sleeve suspension bearings of TAO 659 traction motor by arresting the leakage of suspension bearing oil from various locations.

2. Object: Railways have reported the cases of leakage of suspension bearings oil from the axle cap joint and oil pump fixation bracket and also the contamination of gear case compound with the suspension bearings oil. The leakage of suspension bearings oil results in the starvation of suspension bearing oil in the bottom sump of axle cap of TAO 659 traction motor which causes the failures of suspension bearings like – bearing seizure/worn out white metallic lining of suspension bearing.

The matter has been investigated in details. The leakage of suspension bearing oil mainly takes place at the axle cap and oil pump support bracket, which is due to the improper quality of material of their gaskets or aging of gasket. Some times the leakage of suspension bearing oil also takes place from the felt seals of suspension bearings collar which is due to either the improper quality of felt seal material or improper practices followed by shed/manufacturer during its fitment on the suspension bearings collar. This result in the contamination of the suspension bearing oil with gear case compound or vise-versa.

To overcome this problem and also to improve the performance of suspension bearings of TAO 659 traction motors, it is recommended to follow this SMI which states the procedure as well as precautions which are to be taken during the fitment of felt seals at suspension bearing collar and gasket at axle cap joint and oil pump support bracket.

3. Application : TAO 659 traction motor having plain sleeve suspension bearing arrangement fitted on WAM4/WAP1 & 3/WAG5/WCAM1&2 class of locomotives.

4. Work to be carried out : Follow the following procedure for the fitment of felt seal and gasket.

4.1 Fitment of felt seal at suspension bearing collars :

4.1.1 Material : Felt seal - Extra hard grade as per IS 1719-1988.

4.1.2 Procedure : Cut the felt seal procured as per above specification as per requirement.

4.1.3 Treatment of felt seal : The felt seal cut to size should be treated as follows:

4.1.3.1 Heat lube oil or grease in oven at temperature of 70-80 deg. C for 10 hours.

4.1.3.2 Dry out the felt strips cut to size at temperature of 50 to 60 deg C for 2 hours.

4.1.3.3 Submerge the felt strips in the melted grease/lube oil and let them become impregnated for 15 minutes at 100deg. C in the oven.

4.1.3.4 Remove from the oven and allow the felts to cool in the open air under submerged condition in the grease for at least 2 hours.

4.1.3.5 Remove the felts from the grease and allow to cool.

4.1.3.6 Protect the felts from dust by covering them with paraffin paper.

4..1.4 Mounting of felt seal :

4.1.4..1 The grooves where the felt seals are to be placed should be cleaned and deburred properly.

4.1.4.2 Press the one end of the treated felt seal by finger into the groove of the suspension bearing collar.

4.1.4.3 Use the mallet (wooden hammer) for mild pressing the felt seal, in order to achieve complete insertion into the groove of the suspension bearing collars.

4.1.4.4 After complete insertion, the felt seal should project at least 2 to 3 mm above the face of the groove. If the project of the felt is less than 2 mm, remove that felt seal from the groove and replace it by another treated felt seal and refit the same as per above usual process.

4.1.4.5 Fix the treated felt seal properly seated into the groove of the suspension bearing collars by 12 nos. copper or aluminium snap head rivets size 3 mm dia x 14 mm length (Six nos. of rivets per suspension bearing collar i.e, 24 rivets per traction motor (12 PE & 12 CE sides).

5. Fitment of gasket at Axle Cap joints and oil pump bracket:

5.1 Material : Gasket as per IS 2712-1979, Grade 0/1

5.1.1 Procedure :

5.1.1.1 Cut the gasket procured as per above specification as per requirement.

5.1.1.2 Clean the surface of axle cap face, magnet frame face and oil pump support base face properly.

5.1.1.3 Apply a layer of Dunlop rubber adhesive or equivalent sealant to the surface of the gasket.

5.1.1.4 Place the gasket on the surface where is required to be fitted.

5.1.1.5 Tighten the Hex Head bolts of axle cap and oil pump support bracket as per the Clause 6.

6. Procedure for lightening of bolts:

6.1 Axle cap fixation bolts :

6.1.1 Tighten the axle cap fixation hex. Head bolts size M36x200 L as per RDSOSMI No. RDSO/ELRS' SMI/0205-98 (Rev.0)

6.1.2 Tightening torque should be 121-145 Kgm

6.1.3 Tightening sequence as per sketch enclosed in the annexure.

6.2 Oil Pump support base fixation bolts :

- Tighten the oil pump support base fixation Hex Head bolts size M12x25L at a torque of 20 Kgm.
- Follow the tightening sequence as per sketch enclosed in the annexure.

7. Material Required :

- Extra hard grade felt seal as per IS 1719-1988.
- Gasket as per IS 2712-1979, Grade 0/1.
- Dunlop rubber adhesive or equivalent sealant.

8. Material rendered surplus : Nil

9. Reference : Discussion with Traction Motor manufacturers.

10. Periodicity of implementation :
- During manufacturing of new traction motors
- During AOH of locomotives.
- During overhauling or whenever the suspension bearing fails due to its seizure or excessive oil leakage.

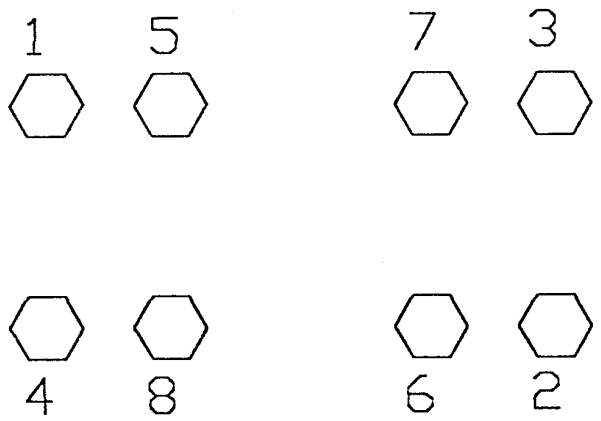
11. Agency of implementation :
- All TM manufacturers.
- All repair workshops.
- All Electric Loco Sheds.

12. Distribution : As per enclosed list.

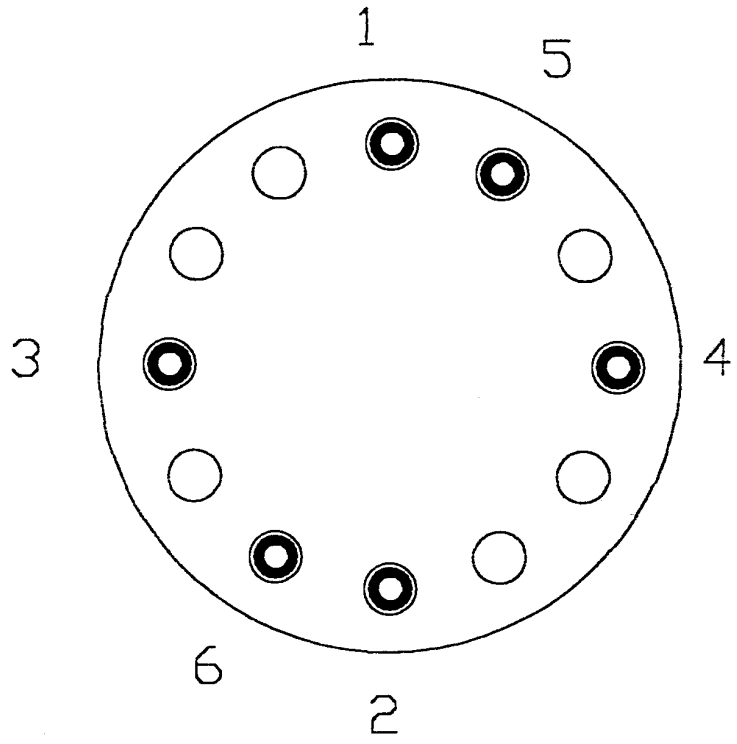
Rajiv Kumar

DA: One sketch

(R. K Kulshrestha)
For Director General (Elec)



SEQUENCE OF TIGHTNESS OF AXLE CAP FIXATION BOLTS



SEQUENCE OF TIGHTENING OF OIL PUMP BASE FIXATION BOLTS