Government of India
Ministry of Railways
Research, Designs & Standards Organisation

Manak Nagar,
Lucknow- 226011

No.EL/3.2.82 Dated 25-03-1993

MODIFICATION SHEET NO. RDSO/WAM4/ 174

1. Title

Improved interconnector layout for TAO 659 Traction Motor.

2. Application

On all TAO 659 Traction Motor.

3. Object

Railways have reported large cases of the insulation failures burning/overheating of TAO 659 Traction Motor due to earthing under the fixing clamps, cracking and open circuiting of inter connectors near their brazed joints etc. It is also observed that while brazing of inter connectors with their respective field coils terminal leads , the terminal leads of the field coils are pressed with the help of wooden mallet to create a space for inserting the brazing tenge in the proper position. This develops stresses in the lead portion. At present interconnectors for both main pole and compole coils are on one side i.e. commutator end side.

To imprive the performance of traction motor and also to minimise the interconnectors failures in service, it is suggested that the main pole coil leads to be shifted from the commutator end to the pinion end side and modified arrangement of interconnectors as shown in RDSO Drg. No.SKEL 4216 and SKEL 4217 may be adopted.

Advantage:

This proposed arrangement is better since :-

- Since overlap is avoided and the length of inter connectors are reduced. This results in less rubbing of inter connectors with each other and consequent insulation failures.

- Improved insulation scheme for the inter-connectors elliminate the failures of inter connectors due to earthing.

- Reduced copper length of inter connectors means saving in copper & less copper lossess.

- Due to the shifting of main pole coils inter-connectors, on P.E. side, sufficient space will be available in both commutator and pinion end side for doing the brazing of the inter-connectors with the terminal leads of field coils.

Details of Modification

- Remove M-seal/RTV Silicone sealing compound by breaking from the main pole fixing bolts head and C-Clamp fixing screws head used for inter connectors.

- Remove all inter connectors by debrazing.

- Remove all main pole fixing bolts and C -clamp screws.

- Remove the main assemblies along with their coils.

- Remove the mild steel cover plate from the air out let of the magnet frame just above and adjacent to pinion end suspension bearing housing. This will make space available to take out main field leads from PE side.

- Make a hole of proper size in the terminal box towards pinion end side as shown in RDSO Drg. No. SKEL 4215 to accommodate the main pole coils inter connectors 'E' & 'F'.

- Clean the complete stator by the compressed air.

- Prepare the inter connectors of the required size and length for main pole and com pole coils as per RDSO Drg. No.SKEL 4216 and 4217 and do the bright annealing after forming the inter connectors of required shape.

- Adopt the improved insulation scheme for the same as suggested by RDSO in the modification sheet No. WAM4/169 dated 30.1.1992.

- Mount the main pole core assemblies along with their coils on the magnet frame in such a way that their terminal leads should be towards pinion end side of traction meter.

- Tighten the fixation bolts of main pole core with the help of torque wrench at the specified value and also check the equi-distance of main pole and their eccentricity.

- Brazed the inter connectors with their respective coils lead as shown in RDSO Drg. No.SKEL with the help of electric resistance heating using carbon blocks in the specially designed brazing tongs.

- Brazing of all inter connectors with the coils terminal leads should be done with silver brazing material LYON ALEMAND 400 C80 flux CDA 523 Powder or equivalent silver brazing rod, Rupatam foil with suitable flux.

- Clean the brazed portion properly and inspect the brazed joints.

- Insulate the brazed protion as per the insulation scheme suggested by RDSO for the inter connectors in the modification sheet No. WAM4/169.

- Varnish the complete stator with Alsthom 16513 varnish or equivalent and bake it as usual.

- Tighten the pole fixation bolts and inter-connector C-clamp fixing screws at the specified torque with the help of torque wrench under hot and cold condition. The inter connector C-clamp along with its fixing screw may be modified as required.

- Block the openings available inside the terminals box for entering of inter connectors located towards its commutator end and pinion end side with RTV silicone rubber compound (Single Component) Type 685/KE-45. The RTV compound will set and get cured at room temperature with in two hours and get cured fully with in 24 hours without baking.

- Where stiffnees are used for holding the inter connectors, the inter connectors should be properly binded with it.

5. Schedule of Implementation

During AOH/Repair

6. Material Required

- Flexible cable and rectangular copper strip of required size and length as per RDSC Drg. No. SKEL 4215, 4216 & 4217.

- Kapton adhesive tape of size 0.065 mm thick and 20 mm wide.

- M/s. Hitachi Tape- "TV-HBT H5-0.5.

  OR

  M/s. Johnson & Johnson- Conflex BM tape of size 0.15 mm thick and 20 mm wide.

- - Anti track varnish 16513.

  Brazing Materials - LION- ALEMAND 400 C 80 flux CDA 523 powder or equivalent silver brazing rod, Rupatam foil and suitable flux.

7. Source of Supply of Materials:

1. For HTV-HBT H5-0.5 Tape

   M/s. Hitachi Works of Hitachi Ltd.
   3-1-1 Saiwai- Cho,
   Hitachi- shi, Ibra Kai- Ken,
   JAPAN

2. For Conflex BM Tape

   M/s. Johnson & Johnson,
   30, Forjett Street, / 9/43 Kirti Nagar,
   BOMBAY- 400036 New Delhi- 110 015

3. For RTV Silicone Rubber Compound
   (Single component)
   a) RTV Type 685
   M/s. Anabond Pvt. Ltd.,
   3A, III Floor, Adyar Bridge Road,
   Adyar,
   MADRAS- 600020.

   b) RTV type KE-45

   M/s. ACKA BOND ADHESIVE SEALANTS,
   17, Raghunath Dadaji Street,
   Maruti Lane,
   4th Floor,
   Fort,
   BOMBAY- 400001

or equivalent from -

M/s. Jayantilal J. Gandhi Corporation,
404/405 Amit Indistrial Estate,
61, Dr. S.S.Rai Road,
BOMBAY- 400012.

Other Materials may be pur chased from the existing suppliers of Railways/Production Units.

8. Agency for Implementation

- All traction motors/POH Shops
- All Electric Loco Sheds.
- All Production Units.

9. Distribution

As per enclosed list.

Encl: As above

(P.K.Jain)
for Director General/Elect.