

Government of India
Ministry of Railways
Research, Designs & Standards Organisation
Manak Nagar, Lucknow - 226 011

No. EL/3.2.5

Dated 23.5.1995

Modification Sheet No. RDSO/WAM4/188

1. **Title :** Adoption of forged armature Rear on the armature shaft of TAO 659 Traction Motors.
2. **Application :** TAO 659 Traction Motors.
3. **Object :**

In the past Railways had reported large cases of the failures of TAO-659 Traction Motors due to the breakage of ribs of the armature head. Investigations had revealed that this was due to small thickness of ribs and less radius at their root and top. Subsequently, the thickness of the B-B and `C-C` sections of the ribs had been increased (i.e. section 'B-B' : Thickness from 6 to 8 and 10 to 12, section 'C-C' : Thickness from 10 to 12 and 14 to 16). The radius at the root and top was also increased from R4 to R10. Dye penetrate/magnaflux testing have also been included in the inspection stage to detect early cracks, if any.

Even after these modifications, such type of failures could not be eliminated completely. Railways are still reporting the failure of Traction Motors due to breakage of ribs of armature head.

To overcome this problem it is now decided that cast armature head should be replaced by forged armature head. Northern Rly. has used few numbers of forged armature head on the armature shafts of TAO-659 Traction Motors and reported satisfactorily performance of these forged armature heads.

In view of this, it is now recommended that Railways/Production Units should use forged armature head only during manufacturing/reshafting stage. The existing cast armature head should be replaced by forged armature during reshafting/overhaul in a phased manner.

3. Work to be carried out :

- Remove the cast armature head, armature key from the armature shaft.
- Clean armature shaft, key and armature head with the trichloroethylene.
- Reinsert the armature key in the key way of armature shaft
- Heat the armature head in the electric oven fitted with thermostat and pyrometer etc. at a temp. of 16⁰C for 2 hours.

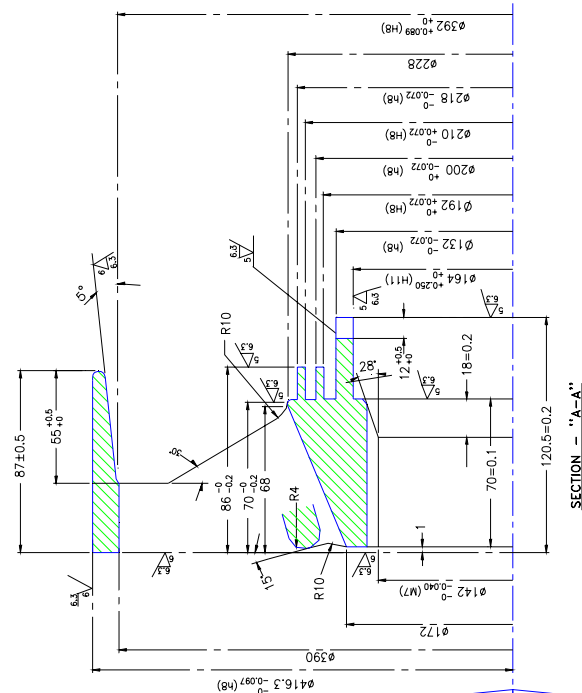
- Mount this heated armature head on the armature shaft as per existing practice allowed by Railways/workshops.
 - Check the alignment and its distance with respect to the face of the pinion end Portion of the armature shaft with the help of vernier caliper.
5. **Reference drawings :** RDSO Drg. No.SKEL - 4343 and 4345
6. **Periodicity of Implementation :**
- During reshafting/overhaul
 - During manufacturing of new armature.
7. **Agency of Implementation:**
- All Electric Loco Sheds
 - POH Workshop of Railways
 - CLW, Chittaranjan.
 - Crompton Greaves Ltd., Bombay.
 - BHEL, Bhopal.
8. **Name of supplier :**
1. M/s Ghaziabad Ispat Udyog P. Ltd. C-89,
Bulandsahar Industrial Area, Ghaziabad-201002
 2. M/s R. P. Machine Tools.
E-193, Kavi Nagar Industrial Area,
Ghaziabad-201 002.
9. **Distribution :** As per enclosed list.



Encl: As Above


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

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1. MATERIAL AS PER I.S.: 1875-1978 CLASS-2.
2. WEIGHT OF PROOF MACHINED FORGING=35KG=12%
3. TOLERANCES ON DIMENSIONS AND WEIGHT ON THE FORGING SHALL CONFORM TO SPECIFICATION NO. NM-102-00A.
4. WHEN TOLERANCE IS NOT PRESCRIBED, THE GENERAL MACHINING TOLERANCES SHALL BE AS FOLLOWS:-

5. THIS FORGING SHALL BE PERFECTLY ANNEALED BOTH BEFORE AND AFTER MACHINING AND FINAL FINISH MACHINING.
6. THE FORGING SHALL BE DELIVERED IN FULLY MACHINED, ANNEALED, DYE-PENETRATION TESTED TO CHECK FINE CRACKS BEFORE DESPATCH.
7. BEFORE ANNEALING, THE RING WILL BE FITTED AND WELDED WITH STAINLESS ELECTRODE FOR BALANCING PURPOSE.
8. STATIC UNBALANCE, CORRECTION SHOULD BE DONE ONLY BY MILLING, DRILLING, GRINDING ETC, BUT NOT BY WELDING EXTRA WEIGHTS.
9. ON MACHINED FORMING THE UNBALANCE SHOULD NOT EXCEED 0.020 KG/MM (e.96 GRAMS AT R 208 MM, OR SAY 100 GRAMS)

REF. No.	PART No.	DESCRIPTION		SCALE:--	1:1	APPD. BY	FIRST ISSUED	No./EMU	MATL.	SPEC.
ARMATURE HEAD FOR TAO-6S9 TRACTION MOTOR (BIGGER DIA)										
RDSO. ELEC. DTC			SKEL - 4343							
							SUPERSEDED BY			

