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

No. EL/8.11.17/J3 Dated 23.11.1992

SPECIAL MAINTENANCE INSTRUCTIONS : RDSO/ELRS/SMI/150

1. TITLE :

Ultrasonic testing of armature shaft of Hitachi Traction Motor type HS 1050 Er/HS15250A.

2. APPLICATION :

WAM4, WAG5 & other electric locomotives fitted with Hitachi TM type HS 1050Er/HS15250A.

3. OBJECT :

To detect the cracks in armature shaft of Traction Motor prior to the fitment of TM on locomotives with a view to avoid the failure of Traction Motors due to breakage of armature shaft in service.

4. PROCEDURE :

Till such time the detailed code of practice for the armature shaft of Traction Motor type HS 1050Er/HS15250A is prepared by M&C Dte. RDSO/Lucknow. Railways may adopt the following procedure of theoretical calculations for the ultrasonic testing of armature shaft of HS 1050Er/HS15250A Traction Motor.

4.1 EQUIPMENT & ACCESSORIES REQUIRED

4.1.1 EQUIPMENT

- Ultrasonic flow detector Model
- UFD-67/6255A/6258 of ECIL Make.
- UFD 301 M of Vibrations make.
- ESM - 2 MR of EEC Make.

or any other equipment having similar characteristics.

4.1.2 ACCESSORIES :

Normal probe of 25.5 MHz, dia 15/20 mm lead Zirconate Titanite or similar crystal.

4.2 CALCULATED SIGNAL POSITIONS :

4.2.1 PROBING FROM PINION END

Calibration - 1 main scale division - 150 mm

Sl.No.	Item	Distance mm	Signal Division
1.	Reflection from shaft end	1336	8.9
2.	Reflection from commutator seat outer fillet	1236	8.2
3.	Delayed reflection from commutator seat inner fillet	1216	8.1
4.	Reflection from commutator seat inner fillet	1083	7.2
5.	Delayed reflection from armature overhang seat inner fillet	1056	7.0
6.	Reflection from armature overhang seat inner fillet	913	6.1
7.	Delayed reflection from collar inner fillet	676	4.5
8.	Delayed reflection from collar inner fillet	546	3.6
9.	Deflection from collar inner fillet	388	2.6

4.2.2 PROBING FROM COMMUTATOR END

Calibration :- 1 main scale division = 150 mm

Sl. No.	Item	Distance (mm)	Signal Division
1.	Reflection from shaft end	1336	8.9
2.	Reflection from pinion seat end	1306	8.7
3.	Delayed reflection from collar outer fillet	1256	8.4
4.	Delayed reflection from collar outer filled	1126	7.5
5.	Reflection from collar outer fillets	968	6.5

5. SCHEDULE OF IMPLEMENTATION

One cyclic check should be carried out on all shafts more than six years in service. Thereafter it should be carried out during annual overhaul/repair.

6. **AGENCY OF IMPLEMENTATION**

i) All Production Units including CLW/CRJ

ii) All Traction Motor Repair Shops.

iii) All Electric loco Sheds having locomotive fitted with Hitachi TM

iv) All POH Workshops having repair facility for Hitachi TM.

7. **DISTRIBUTION**

As per enclosed list.

Encl: Nil

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