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Government of India
Ministry of Railways

**SPECIFICATION FOR THE EQUIPMENT OF MAGNETIC
PARTICLE TESTING OF AXLE**

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SPECIFICATION FOR THE EQUIPMENT OF MAGNETIC PARTICLE TESTING OF
AXLE

1. **Scope:**

This specification covers functional and technical requirements of equipment for magnetic particle testing of loco axles to detect surface and sub-surface cracks/ discontinuities oriented in longitudinal and transverse direction .

2. **Functional requirements :**

- 2.1 The equipment shall be stationary type test unit and shall accommodate the total length of the axle (i.e 2700 mm max. with diameter 300 mm.approx.)
- 2.2 The equipment shall have facility for circular and longitudinal magnetisation.
- 2.3 The equipment shall have suitable arrangement for clamping and declamping the axle through pneumatic pressure.
- 2.4 The equipment shall have facility to demagnetise the axle after testing.
- 2.5 The equipment shall have preset timer to control magnetisation period.
- 2.6 The equipment shall be provided with view hood facility for viewing under ultraviolet lamp.
- 2.7 The equipment shall be provided with inking system.
- 2.8 The equipment shall have AC & HWDC magnetisation current.
- 2.9 The equipment shall have provision for job rotation.
- 2.10 The equipment shall have facility to measure residual magnetic field.

3. **Technical Parameters.**

- 3.1 The equipment shall have a test bench made up of heavy MS channel and shall have capability for holding the loco axle load. The working height of the bench shall be approx. 750 mm. The test bench shall have facility to accommodate varying job length.
- 3.2 The equipment shall have facility to magnetise the axle by through current technique with varying current from 0- 6000 Amp. AC or HWDC in infinite steps for detecting longitudinal cracks and for longitudinal magnetisation with magnetising field of 15 KAT in 500 mm. dia. coil in infinite steps for detecting transverse cracks. A digital ammeter shall be provided to read out the magnitude of current.
- 3.3 There shall be provision for measuring residual magnetic field. The residual field indicator shall have range ± 25 G.

- 3.4 The equipment shall have an electronic timer and shall be able to set from 1-5 sec. for controlling magnetisation period to protect the axle from over heating.
- 3.5 To facilitate visual examination of entire job under UV lamp, view hood facility shall be provided with equipment to darken the test bench. The UV lamp shall be of minimum 100 watts fitted with knop filter and fan cooled arrangement.
- 3.6 The inking tank and inking tray shall be made of stainless steel to AISI 304. Inking shall be done by recirculating pump from self-agitated ink bath by a hand nozzle with flexible hose. The capacity of ink tank shall be minimum 75 Lts.
- 3.7 Magnetisation shall be done by AC power supply 6000 Amp A.C & 6000 Amp HWDC, 415 volts, 3 phase, 50 Hz. for circular and longitudinal magnetisation of the axle.
4. **Spares:**
The manufacturer shall be able to supply the spares for normal maintenance of the equipment for a period of minimum three years from the commissioning date.
5. **Training:**
During commissioning of the equipment manufacturer shall provide demonstration cum training to 3 operators for easy operation of the equipment free of charge.
6. **Document to be supplied:**
Manufacturer shall provide the following documents along with the equipment,
 - a) Operating manual
 - b) Maintenance manual
 - c) Certificate of quality conformance
7. **Warranty:**
Guarantee for satisfactory operation of the system for a period of one year from the commissioning date of the equipment. After the guarantee period, annual maintenance contract for servicing/ repair shall be entered into.