

ISO 9001:2015	Document No. RDSO/M&C/NDT/123/2002 Rev-2, July, 2020	Version No. 1.0	Effective Date:
Technical Specification for Magnetic crack Detector for examination of cracks in Camshaft and connecting rods of Diesel Locomotives.			



RESEARCH DESIGNS & STANDARDS ORGANISATION

Manak Nagar, Lucknow-226011

RDSO /M&C/NDT/123/2002 (Rev-2), July 2020



TECHNICAL SPECIFICATION FOR MAGNETIC CRACK DETECTOR FOR EXAMINATION OF CRACKS IN CAMSHAFT AND CONNECTING RODS OF DIESEL LOCOMOTIVES.

Amendment History:

S. No.	Amendment date	Version	Reasons for Amendment
1.	2002	NA	First issue specification No. M&C/NDT/123/2002
2.	July 2010	NA	First revision of specification No. M&C/NDT/123/2002, Rev-I, July 2010.
3.07.2020	1.0	The Specification should be generic & preferably reference to National Standard.(Reference: PED/QA (Mech)'s note no. QAM/Spl. DG/Misc., dtd. 15.06.2020).

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1. Scope:

This specification covers the technical and functional requirements of magnetic crack detector to be used for detection of surface and subsurface cracks in all orientation of camshafts and connecting rods of **Diesel** loco. The equipment shall be suitable for crack detection utilising wet fluorescent magnetic particle method.

2. Functional Requirements:

- 2.1 The equipment shall have provision for longitudinal and circular magnetisation.
- 2.2 The equipment shall have **inbuilt** arrangement for automatic demagnetisation after magnetic particle test.
- 2.3 Equipment shall be stationary horizontal type suitable for shop floor application.
- 2.4 It shall be able to accommodate work pieces up to 1000 mm length and diameter up to 230 mm.
- 2.5 Black hood facility for viewing under ultraviolet lamp shall be integral part of the equipment.
- 2.6 The equipment shall be suitable for crack detection through various detection method e.g. 'Threaded Bar', 'Coil Magnetisation', 'Through Current' etc.
- 2.7 The test method applicable shall be continuous (inking during magnetisation) or residual (inking after magnetisation) as the case may be.
- 2.8 Magnetising current control shall be through step less arrangement by SCR.
- 2.9 Magnetising field control shall be step less by SCR.
- 2.10 The crack detector shall be provided with indicating meters for current, voltage etc. with digital readout retention.
- 2.11 For facilitating crack detection through head stock, clamping arrangement through pneumatic (4 Kg/cm²) shall be provided.
- 2.12 Magnetic ink spraying system shall be through hand held nozzle connected to a re-circulating pump.
- 2.13 The crack detector shall be provided with pre-set electronic timer for controlling magnetisation period.
- 2.14 For facilitating movement of cables and pneumatic hoses connected to Tail Stock, cable drag chain shall be provided.
- 2.15 Thyristorised current **circuitary** shall be provided for infinite step control.
- 2.16 The equipment shall be provided with emergency cut-off switch to prevent accident.

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Technical Parameters

- 3.1 Approx. Dimensions of the equipment shall be 2000 mm in length x 600 mm in width x 200 mm in height.
- 3.2 The equipment shall be operable using 440 volts, 3 Phase, 50 Hz, 200 Amp current.
- 3.3 The magnetising current shall be 5000 Amps (Max) AC and 5000 Amps (Max) HWDC.
- 3.4 Magnetising field in the coil shall be 18 KAT (**Kilo**-Amp-Turns).
- 3.5 Magnetising coil dia shall be 400 mm approx.
- 3.6 The clamping length between head stocks shall be operable from 100 mm to 1000 mm.
- 3.7 The ink tank shall be made of stainless steel (AISI-304) with a capacity of 60 Lts.
- 3.8 The ink tray provided in the equipment shall be made of stainless steel (AISI -304) and shall be segmental type.
- 3.9 The control panel shall be operable from 24 volts.

4. General requirements

- 4.1 Two sets of operating instruction and service manual shall be provided along with the equipment.
- 4.2 The supplier shall arrange to train two operators after installation and commissioning at free of cost.
- 4.3 The training shall include operation, maintenance and trouble shooting of the crack detector.
- 4.4 The supplier shall guarantee satisfactory operation of the equipment for a minimum period of two years from the date of commissioning. All components and sub assemblies shall be replaced free of cost during the warranty period in the event of their failure.

5. Spares and Accessories

- 5.1 Spares and accessories required for smooth operation of the crack detector for a minimum period of 02 years shall be provided by the supplier.
- 5.2 One number each of ultraviolet intensity meter, artificial test block, Keto's ring, magnetic field indicator, Residual field indicator and Centrifuged tube (100 ml with stand) shall be supplied along with the equipment.

NOTE : "Firm should comply Make in India policy and Public Procurement (Preference to Make in India) order - 2017 under this specification" and subsequent amendment done time to time.

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