

ISO 9001:2015	Document No. RDSO /M&C/NDT/114/2000 (Rev-2), July 2020	Version No. 1.0	Effective Date:
Technical Specification for lathe centre probe for Ultrasonic Testing of B.G.Axles using contact method.			



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RDSO /M&C/NDT/114/2000 (Rev-2), July 2020

TECHNICAL SPECIFICATION FOR LATHE CENTRE PROBE FOR ULTRASONIC TESTING OF B.G.AXLES USING CONTACT METHOD.

Amendment History:

S. No.	Amendment date	Version	Reasons for Amendment
1.	2000	NA	First issue specification No . M&C/NDT/114/2000
2.	July 2010	NA	First revision of specification No . M&C/NDT/114/2000, 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 stipulates the requirements of probe having special shape, various frequency of Piezo-Electric Crystal (Natural or synthetic). It shall be housed in unbreakable, robust, wear resistance, ergonomically designed in metallic/moulded casings. The probe shall provide good service life and shall be water and oil proof.

2. General Requirements:

The probe shall be single crystal fitted with conical shaped Perspex to suit lathe centre bore in the axle (sketch enclosed). It shall be suitable for ultrasonic testing of journal as well as wheel seat outer fillet of an axle with shrink fitting bearing races. The crystal of a suitably shaped test probe should have maximum sensitivity at the inner end of the bearing races.

It should be capable of detecting 0.5mm crack in the zone of maximum sensitivity and 1.0 mm crack in the zone of outer bearing race. With this test probe design, attempts to achieve adequate sensitivity had to be accompanied by efforts to prevent echo of sound passing through the interface between axle and bearing race appearing in the trace at the points where flaw echoes can be expected.

3. Characteristics of probe

a. Frequency	-	2.0 – 2.5 MHz
b. Pulse Shape	-	Smooth
c. Angle of refraction	-	29°
d. Type of wave	-	Transverse
e. Diameter of probe	-	20mm – 35mm
f. Apex Angle	-	60° or 90°
g. Arm length	-	60mm - 80mm

4. Backing material

It shall be of best quality to damp unwanted oscillations and shall produce clear oscillogram pattern to facilitate unambiguous and sensitive crack detection.

5. Adhesive

Adhesive material used shall be of high quality to achieve desired sensitivity, smooth trace pattern to avoid ringing and obtained shortest decay time .

6. Perspex

High quality Perspex material should be provided to achieve required conical shape of the probe indicating probe index mark with thickness of Perspex from the crystal.

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7. Arm length of the probe:

It should have adequate length i.e. **60-** 80mm approx. for holding it and should be knurled for proper gripping.

8. Tropicalisation:

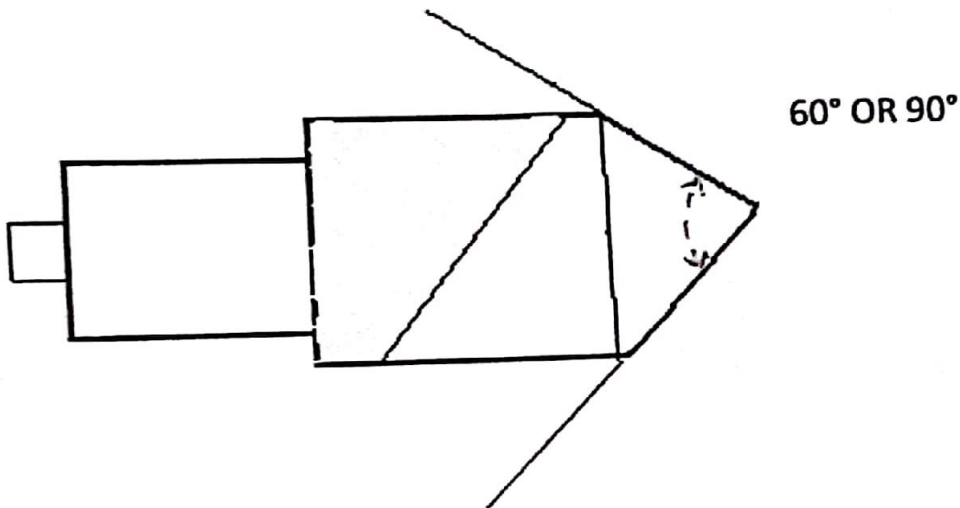
The probe shall be fully tropicalised to withstand $- 20^0\text{C}$ to $+ 75^0\text{C}$ temperature during testing.

9. Marking :

All the probes to be supplied should have manufacture’s emblem, frequency, dia. of the probe, apex angle, probe index marking and serial number.

10. Supply :

The probe manufactures/ suppliers supplying the probes to Indian Railways shall be equipped with the facilities to check the probe quality, sensitivity with help of oscilloscope or spectrum analyser etc.



SKETCH FOR LATHE CENTRE PROBE

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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