

Title: Calibration Ultrasonic Transducers

1 Scope

Work Instruction for the calibration of Network Rail approved ultrasonic transducers. To be used in the absence of a manufacturers calibration instruction.

2 Preparation

The calibration shall be carried out using the minimum of Category 'A' Master instruments.

Equipment required:

- Ultrasonic flaw detector meeting the requirements of BS EN 12668-1
- Oscilloscope with a minimum 100MHz bandwidth
- Calibration block A2 meeting the requirements of BS EN 12223
- Test block A5 meeting the requirements of BS2704
- 50mm Radius universal calibration block. NR ref CB87

All equipment shall have the appropriate certificate of calibration traceable through United Kingdom Accreditation Service and shall be rechecked at intervals of no more than 1 year.

3 Method

3.1 Calibration shall be conducted to the manufacturer's specification otherwise to ESI 98.7 for 0° transducers, ESI 98.8 for shear wave transducers and ESI 98.2 for miniature shear wave transducers.

3.2 Record serial numbers and check general condition and record results.

3.3 Check all parameters specified in either appendix A, B or C as appropriate and record results.

3.4 Report the summary condition of instrument and highlight deficiencies that have been corrected.

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Appendix A. 0° Transducer Calibration Result Sheet

Transducer Type:		Manufacturer:		Serial Number:	
Date last checked:		Next check due:			
Master Equipment Used:					
100MHz Oscilloscope:		Ultrasonic Flaw Detector:			
A2 Test Block:		A5 Test Block:			
50mm Radius Universal Test Block (CB87)					

Table 1 Ref ESI 98.7

Parameter	Limits	Reading	Pass	Fail	Comments
1. Visual Examination	Free from mechanical damage				
2. Probe Face Flatness	Gap ≤0.05mm				
3. Signal/Noise Curves (New Probes Only)	N/A		N/A	N/A	
4. Overall Gain	≥65 dB Single ≥50 dB Twin				
5. Electronic Noise	≥80 dB Single ≥70 dB Twin				
6. Short Range Internal Echoes	≥20 dB Single ≥30 dB Twin				

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Parameter	Limits	Reading	Pass	Fail	Comments
7. Spurious Long Range Echoes R Max > 50mm	<u>Single Crystal</u> >24 dB If Dxf ≤20 >30 dB If Dxf >20 ≤40 >36 dB If Dxf >40 <u>Twin Crystal</u> >12dB				
8. Beam Angle	< 1.5°				
9. Side Lobes	20dB< Main Beam				
10. Subsidiary Maxima	Non Discernible				
11. Pulse Shape	Secondary Peaks. 20dB< Main peak.				
12. Cycle Spacing	± 15% of mean spacing.				
13. Frequency	± 10% Nominal Freq.				
14. Pulse Length	>3.5MHz < 2.5 μs >1.8MHz < 3.5μs >0.9MHz < 6.0 μs				

Examined by:	Signed:	Date:

NOTE Failed equipment is to be labelled 'Do Not Use' and quarantined until rectified or scrapped.