Title: Calibration of STD2 Ultrasonic Reference Rail

1 Scope

Work Instruction for calibration of a STD2 ultrasonic reference rail. To be used in the absence of a manufacturers calibration instruction.

Note If calibrating STD2 and STD3 together, refer to CAL609 Section 5.

2 Preparation

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

Equipment required:

- 200mm vernier calliper
- Network Rail calibrated and assessed STD2 reference rail. For clarity in this document referred to as taché ovale standard.
- Ultrasonic flaw detector meeting the requirements of BS-EN-12668
- 70^{o} 2.5Mhz single crystal 15mm diameter transducer (see below)

All Instrumentation 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.

STD2 reference rail used by the contractor for calibration shall have been individually assessed by Network Rail and authorised for use in the calibration of STD2 reference rails.

The 70^{o} 2.5 MHz single crystal 15mm diameter transducer shall be beam plotted and used for calibration purposes only. The maximum angle error shall be not greater than $\pm 1^{o}$.

3 Method

3.1 Check that the identification number is clearly visible on the side of the rail head. If this is not the case, re-stamp the serial number onto the **side** of the rail head away from any corner or change in section.

3.2 Check that there is no surface corrosion. It is not expected to have highly polished surfaces, but the surface should be clean and free from contaminates and corrosion pitting. Where corrosion exists and it is not possible to remove with a **brass** wire brush, the rail shall be repaired. The calibration rail shall be stored in a lightly oil impregnated rag to minimise surface corrosion.

NOTE No rust is permitted on the running surface of the rail but other areas can be contaminated and still function correctly.

3.3 Check for surface damage to the calibration rail paying particular attention to areas where "corner reflectors" are used to set sensitivity, and where the transducer makes contact with the block. Indentations or bruises greater than 2mm in diameter shall be repaired.

3.4 Check the height of the rail. This should be nominally 157mm with a maximum deviation of ± 3.0mm. The measured dimension in millimetres shall be stamped on the **side** of the railhead near the serial number to 1 decimal place.

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3.5 Check the slot located in the foot of the rail. Depth 2.9mm, width 5.95mm ±0.1mm and slot length 12.0mm +5.0mm/– 1.0mm.

3.6 Check the ultrasonic response from the taché ovale simulated defect (7mm flat bottomed hole) by comparing to the signal taché ovale standard. Set the signal from the simulated taché ovale on the taché ovale standard to 80% full screen height (FSH). Check the taché ovale from the STD2 rail is 80% FSH ± 2dB.

Applicable to master STD2 reference rails only

3.7 Check the horizontal slot (simulated E crack) in the bolt hole for depth, 10.0mm deep. The maximum deviation shall be ± 0.2mm.

3.8 Check the top slot (simulated A crack) in the bolt hole for depth, 2.5mm deep. The maximum deviation shall be ± 0.2mm.

3.9 Check the lower slot (simulated D crack) in the bolt hole for depth, 2.5mm deep. The maximum deviation shall be ± 0.2mm.

3.10 Results shall be recorded on the calibration form (see Appendix A) and retained for audit purposes.

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