



Detection of Transverse Cracks in Hollow Axle Wheelsets

Ultrasonic Application Solutions

Application

Hollow train axles must be inspected in order to detect transverse cracks.

This applies to new and used axle wheelsets. The critical parts of the trains and rail are continuously inspected to find possible defects that could cause a serious incident.

Ultrasound inspection is the most common and reliable technique to ensure secure testing.



Figure 1&2: The hollow axles of a train

Solution

Special hollow-shaft angle-beam probes, which are positioned inside the longitudinal bore, were designed for this test application.

Two transducer elements are incorporated in the probe, scanning forward and backward. The usual angles of incidence are 45° and 70° for transverse waves.

The frequencies normally used are 2 MHz and 4 MHz. The diameter of the probe is adapted to the bore diameter.

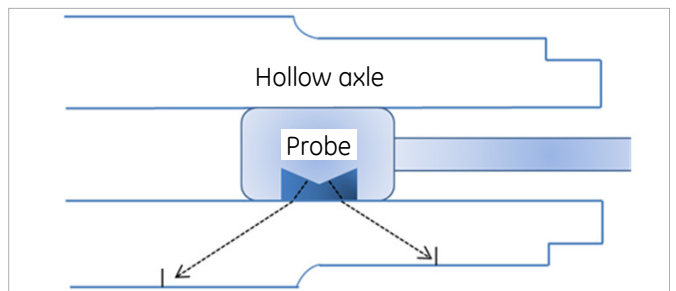
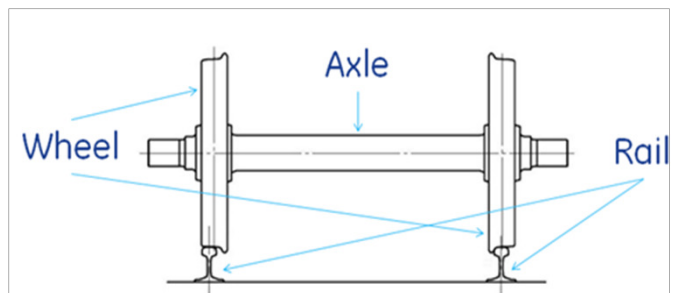


Figure 3 & 4: Schematic image of axle & test setup

Flaw Detector: USM 36, USM Go & Probe: HW45 / 45B4G / dia. 49.3



Figure 4: Hollow axle probe

The probe is connected to a guide rod via a gaiter. The guide rod is provided with length indicators for both scanning directions so that the corresponding scanning point in each case can be determined. The two scanning directions can be selected via a switch.

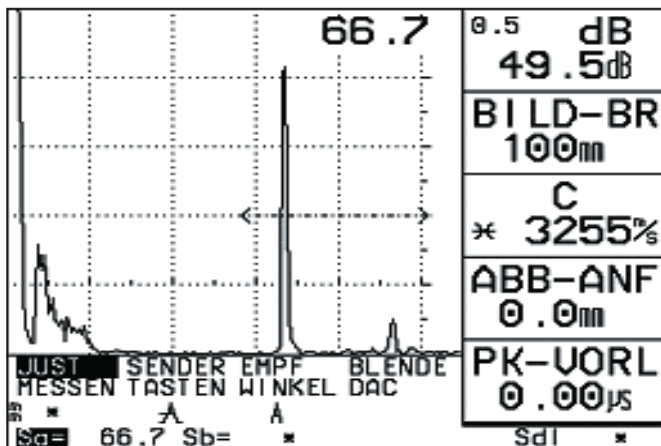


Figure 5: A-scan

The A-scan shows the indication of a 2mm deep saw notch in the hollow shaft. Any mountings such as bearings, wheels, and brake disks should be removed before testing.

General solution information

- Possibility of the inspection of hollow axles with different bore diameters for the inspection of transverse cracks
- Frequencies of 2 and 4MHz available
- Beam angles of 37°, 45° and 70° available

Your benefits

- Ensure high quality
- Reduce field failures and potential liability
- Save money by eliminating destructive testing and by improving your process

Part numbers

USM 36	0037400	USM Go	0109706
HW 45/45 B 4G/ 49.3	0068166		

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