



Measurement of Remaining Wall Thickness of Cylinder Liners

Ultrasonic Application Solutions

Application

Cylinder liners which are used on rail vehicles and diesel drives, should be inspected by ultrasound. During maintenance and overhaul of these parts it is necessary to check the remaining wall thickness of the liner in-situ.

The measurements determine corrosion damage caused by coolant, and assist in deciding whether to keep or exchange liners.



Figure 1: Cylinder liner made of gray cast iron

Solution

The determination of wall thickness on components having corroded reflection surfaces is best carried out using transmit – receive (TR) probes. The graphite lamellar structure in the material GG30 can be tested at an operating frequency of 4MHz.

This produces a steep backwall echo pulse shape which results in improved measuring reliability and accuracy. To ensure steady and uniform coupling, the probe contact face must match the inside diameter of the liner.



Figure 2: MSEB Dual Element Probe

Results

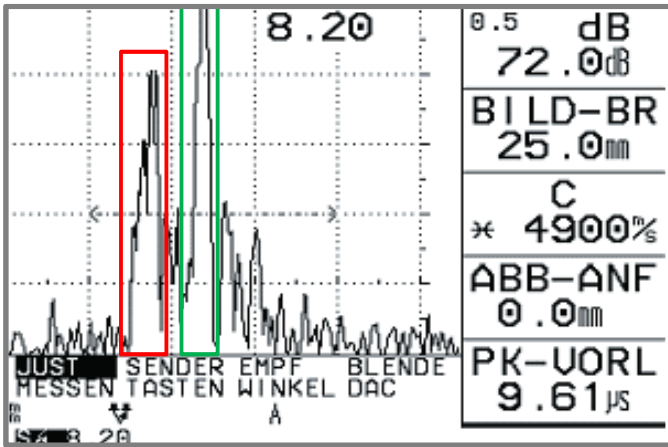


Figure 3: Setup

To monitor the signal shape and assist evaluation, an ultrasonic instrument with A-scan display should always be used. Figure 3 shows the detected corrosion (red) and the backwall echo (green) of a cylinder liner.

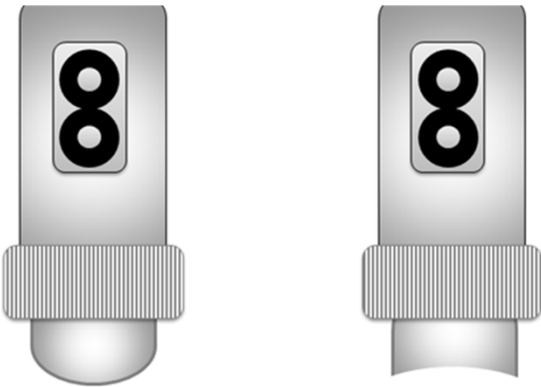


Figure 4: Contoured coupling face

To ensure steady and uniform coupling, the probe contact face must match the inside (or outside) diameter of the liner. This is achieved by shaping the delay line of the probe as specified by the customer. The TR acoustic barrier is orientated parallel to the liner axis.

General solution information

- Dual element (TR) probe: MSEB 4 E-R.. (A-D) 4MHz with matching coupling face
- Ultrasonic flaw detectors: USM 36, USM Go, Thickness Gauge DMS Go.

Your benefit

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

Part numbers			
MSEB 4 E	0057462	USM 36	0037400
USM Go	0109706	DMS Go	0110533

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