



Detection of Cracks in Articulated Joints of Tailgate Shock Absorbers

Ultrasonic Application Solutions

Application

In the automobile manufacturing process, cracks can occur in the hollow shafts of some plastic ball and socket joints used for tailgate shock absorbers. The cracks occur during assembly of the screw in piston rods. If subjected to mechanical loading, these cracks lead to cracking or splintering of the ball cup shaft, and consequently to failure of the shock absorber unit. The European Solutions Center developed an ultrasonic testing method that will enable the detection of incipient cracks in the cup shaft and sorting of the faulty components.

Solution

These cracks always occur at the end of the shaft as they are caused, during manufacture, by assembly of the screw-in piston rod. The inspection technique provides optimum detectability of small incipient cracks exclusively in this area. As shown in the drawing, the test is carried out using an immersion technique with angle-beam scanning in the circumferential direction of the shaft.



Figure 1: Shaft of ball-and socket joints

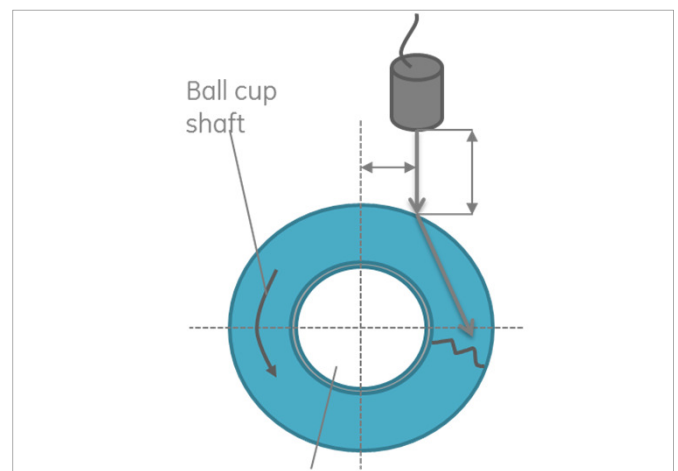


Figure 2: To cover the entire circumferential volume, the shaft has to be rotated through 360°



Immersion Probe H 5 M

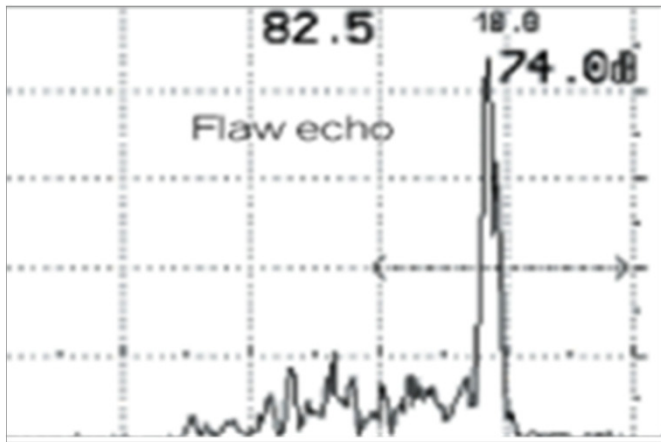


Figure 3: Crack indication

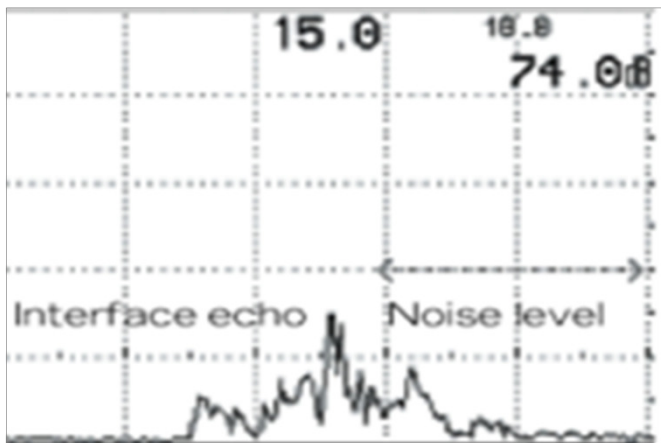


Figure 5: Flaw-free A-scan



Figure 4: Probe H 5 M

These A-scans show typical display indications. Figure 3 shows the detection of a crack from the shaft end. In figure 4 no indication is visible except the interface echo (echo between water and material) which means there's no crack inside the material.

General solution information

- Flaw Detector: USM 36, USM Go+, USIP 40
- Probe: H 5 M

Your benefit

- 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+	0113214
H 5 M	0053258		



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