



# Bonding Test between the Cylinder Liners and the Casing of Engines

## Ultrasonic Application Solutions

### Application

In the automobile industry, many car parts need to be inspected, for example the engine.

The engine block unit is made of cast aluminum. Cylinder liners are made of gray cast iron and have a wall thickness of few millimeters. In order to ensure a long life cycle, the bonding quality between liner and surrounding aluminum casting has to be inspected.

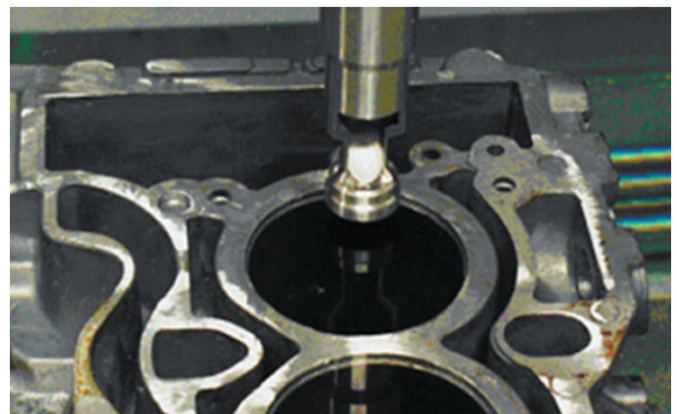


Figure 1: Engine block inspection

### Solution

As shown in fig. 2, the wall of the liner is scanned using an immersion probe H 5 K, vertical beam and a deflection mirror. The bond quality can be determined from the amplitude of the backwall echo (BE):

A small echo indicates „good bonding“ and a high signal „bad bonding“ accordingly. Figure 2 shows an engine block and the probe holder with the deflection mirror. This system makes it possible to helically scan the entire cylinder.

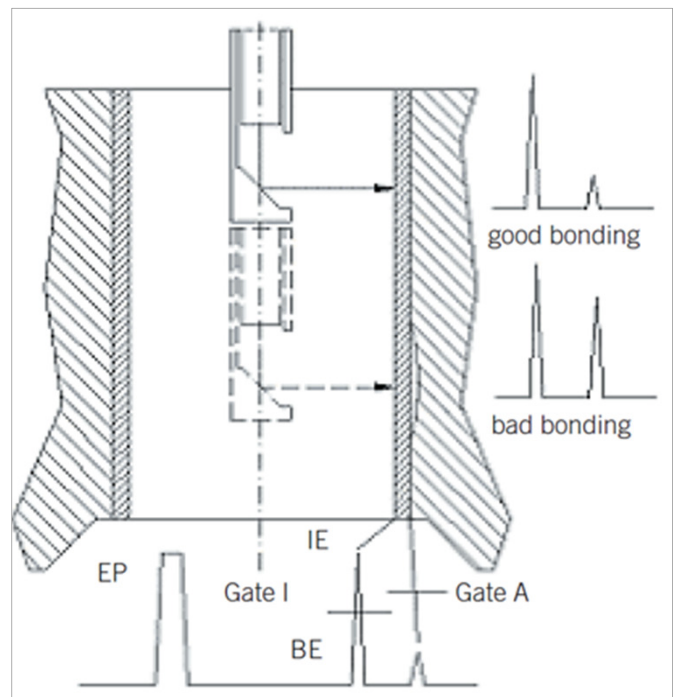


Figure 2: Test arrangement

## The H 5 M with deflection mirror



Figure 3: H 5 M Immersion probe



Figure 4 & 5: 45° angle mirror and usage with probe

### General solution information

- Flaw Detector: USIP 40
- Probe: H 5 M
- Accessory: 45° angle mirror

The H 5 M probe is suitable for wall thickness measurements. It can also be used for testing small parts for small flaws and inhomogeneity's, e.g. all types of bonding flaws in soldered joints, flaws in thin welded joints, cracks, cavities and pores, castings and sintered metal.

The 45° angle mirror is built to fit the H M immersion probe family. The generated ultrasound beam is reflected by the mirror and diverts the beam at an angle of 90° in respect to the original beam direction.

### Your benefit

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

#### Part numbers

USIP 40	0036535	H 5 M	0053258
Mirror	0069766		

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