



# Detection of Cracks and Bond Defects in Disk Brake Linings

## Ultrasonic Application Solutions

### Application

This application is about the testing of brake bodies, consisting of a steel base plate, a welded-on grid mat as bonding agent and the sinter-fused braking material (friction lining).

The European Solutions Center presents a solution by providing a probe type that enables a dry and point-to-point coupling via through transmission technique using two probes.

### Solution

The existing brake lining structure with its extremely high sound absorption and scattering requires the through-transmission technique using a test frequency of 100 kHz. We recommend the use of the probes type B 0,1 NN for this application.

To ensure uniform coupling a pressure of ~100N must be applied to each probe (mechanical device required). Figure 3 is an example of the distribution of the through-transmission amplitude over the lining surface, obtained by point scanning.

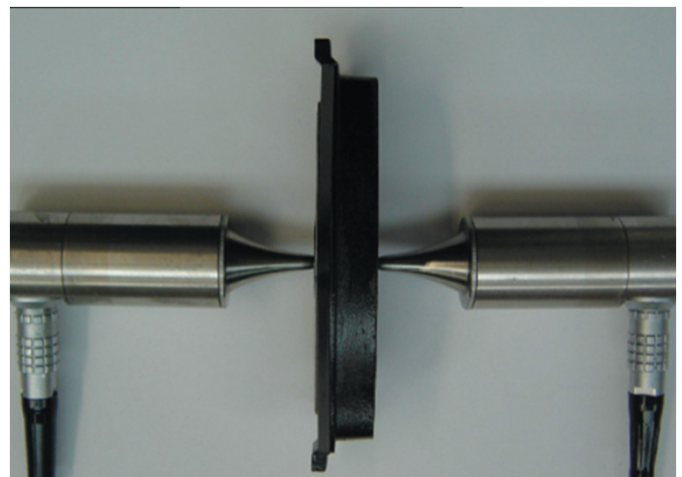


Figure 1: Inspection setup

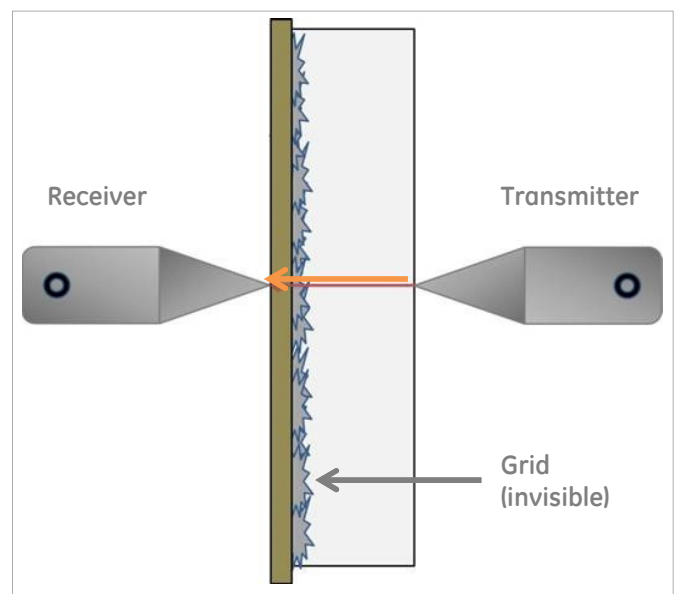


Figure 2: Schematic arrangement of the probes

## Low Frequency Straight Beam Probe with Exponential Horn



Figure 3: Probes B 0,1 NN

The B 0,1 NN is a 100KHz straight-beam probe with a steel tipped exponential horn for increased intensity and sound propagation with a large aperture as well as a Lemo-1-socket. The probe is only suitable for through transmission operation on soft materials.

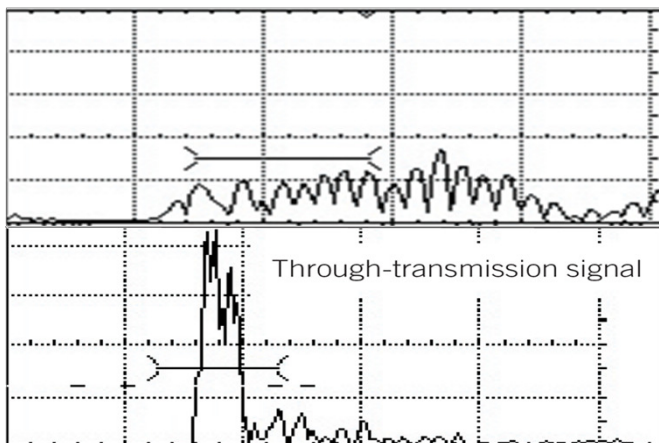


Figure 4: Through transmission amplitudes

In the case of cracks and bonding defects, a low through transmission amplitude is obtained due to the reduced acoustic transmittance (figure 4 top). On the other hand, a high sound amplitude indicates a flaw-free area (figure 4 bottom).

### General solution information

#### Probe

- B 0,1 NN (two probes for through transmission operation)

#### Instruments

- USM Go+
- USM 36

### Your benefit

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

#### Part numbers

B 0,1 NN	0058769	USM Go+	0113214
USM 36	0037400		

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