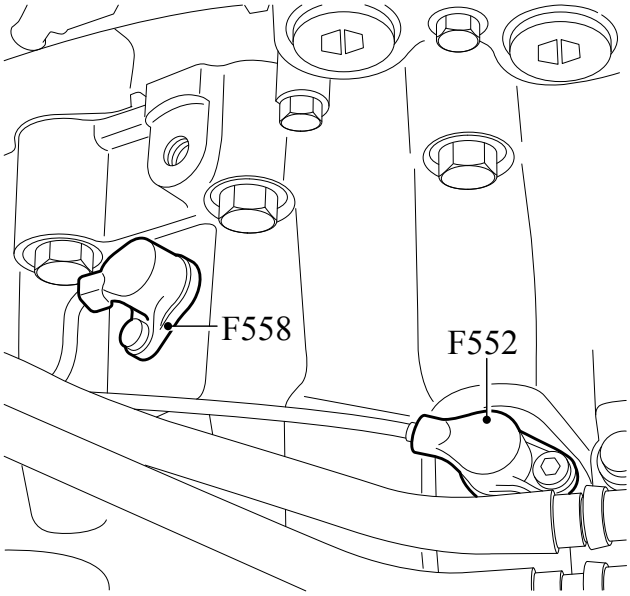
# Crankshaft sensor (F552)

The crankshaft sensor (F552) registers the engine speed and is used to determine the injection timing. Together with the camshaft sensor, the crankshaft sensor is responsible for synchronization when starting the engine. If there is no camshaft signal, the crankshaft signal is used for cylinder detection.

The crankshaft sensor (A) is mounted on the flywheel housing (B). It is an inductive sensor that consists of a magnet (C), metal core (D), and coil (E). Inductive means that the sensor can generate an alternating voltage signal independently using a changing magnetic field. The pattern of holes in the flywheel (F) means that the sensor can generate a specific alternating signal. The pattern consists of three segments, each with 18 holes and an area with two holes missing (G). Each segment is used for calculations on two specific cylinders (1/6, 2/5, and 3/4).

The sensor has three connections. Pins 1 and 2 are responsible for the signal. Pin 2 is the signal connection, and pin 1 is the ground connection. Pin 3 is connected to the shield around the signal wires and to the ground connection (pin 1). This prevents outside signals from affecting the engine speed signal.

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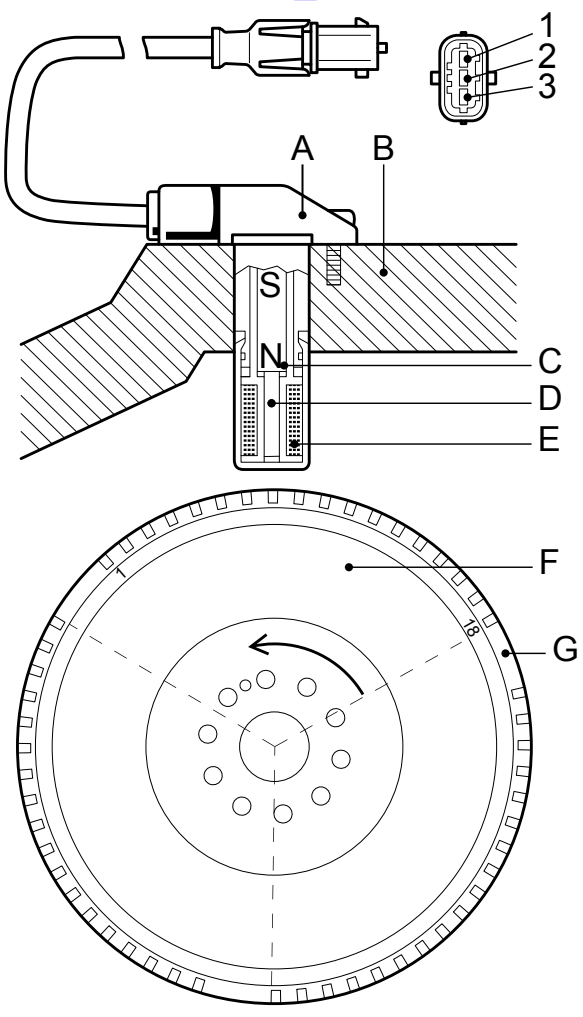


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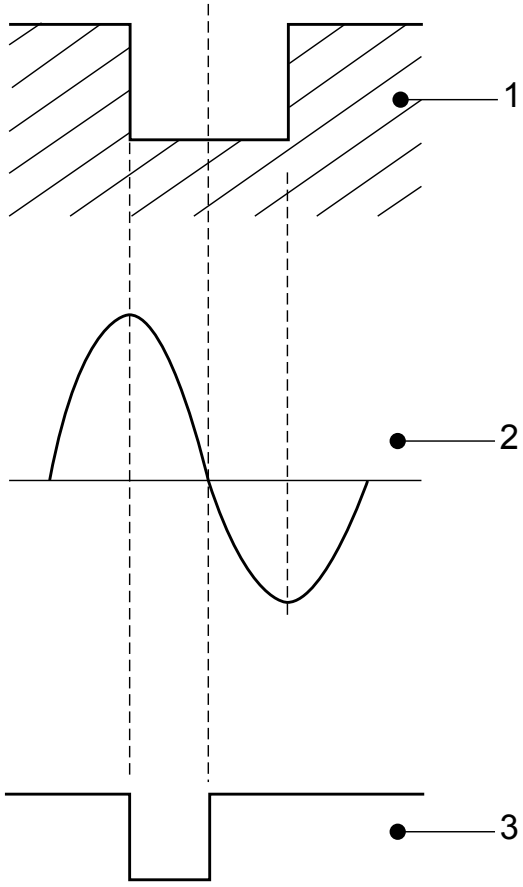
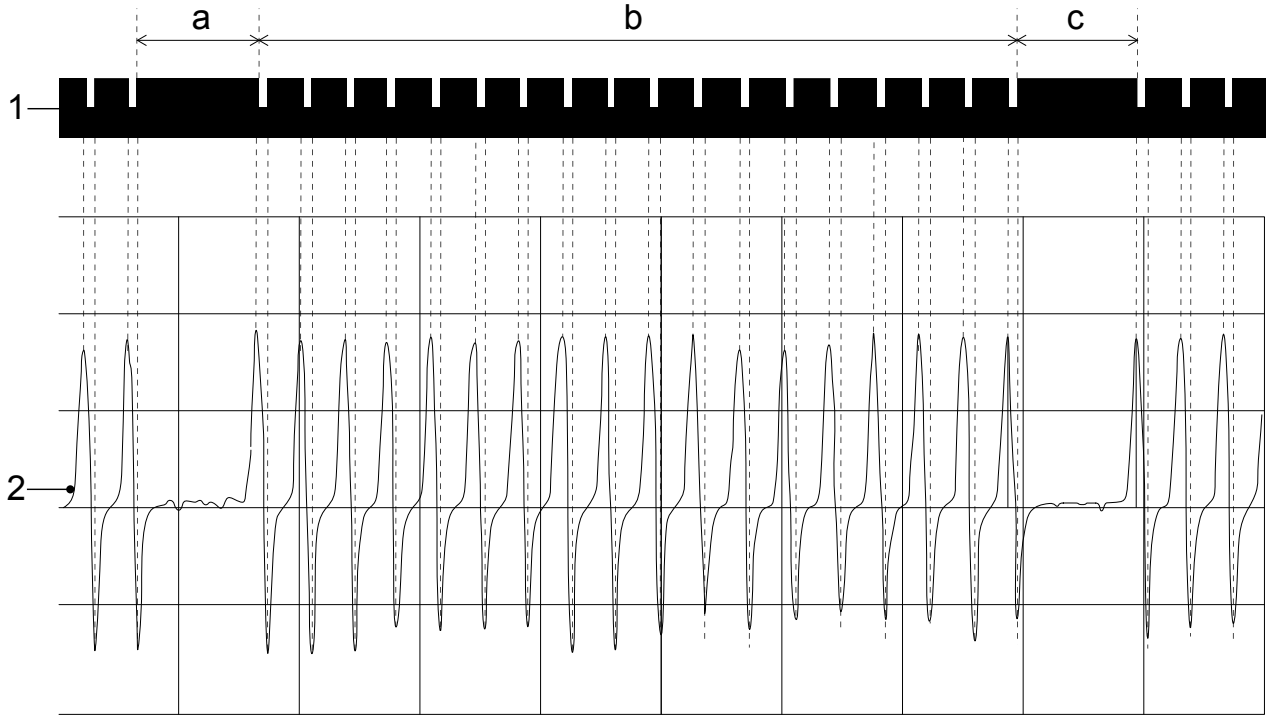
1 Electrical connection, ground
2 Electrical connection, signal
3 Electrical connection, shield
A Sensor, crankshaft

B Flywheel housing
C Magnet
D Metal core
E Coil
F Flywheel
G Hole pattern

The most powerful changes in the magnetic field of the sensor take place when the pattern of holes (1) in the flywheel changes from a hole to a tooth and vice versa. A sine-wave alternating voltage (2) is generated as a result of this changing magnetic field. As a hole approaches, the crankshaft sensor signal must be at the maximum positive value. The crankshaft sensor signal must drop to the maximum negative value as the end of the hole approaches. This is determined by the sensor connections to the electronic unit! The electronic unit converts this sine-wave alternating voltage signal into a digital signal (3), which it uses to carry out calculations.



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Sine-wave signals (2) can be measured with an oscilloscope when the engine is running, using the pattern of holes in the flywheel (1). Each hole in a segment (b) generates a sine-wave pulse. When the area with the two holes missing (a and c) passes underneath the crankshaft sensor, the pulse pattern is interrupted. This enables the sensor to detect the end of the segment.

### Effect of output signal on the system:

- Synchronization during starting
- Injection timing calculation
- Registration of engine speed
- Cylinder detection if there is no camshaft signal

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