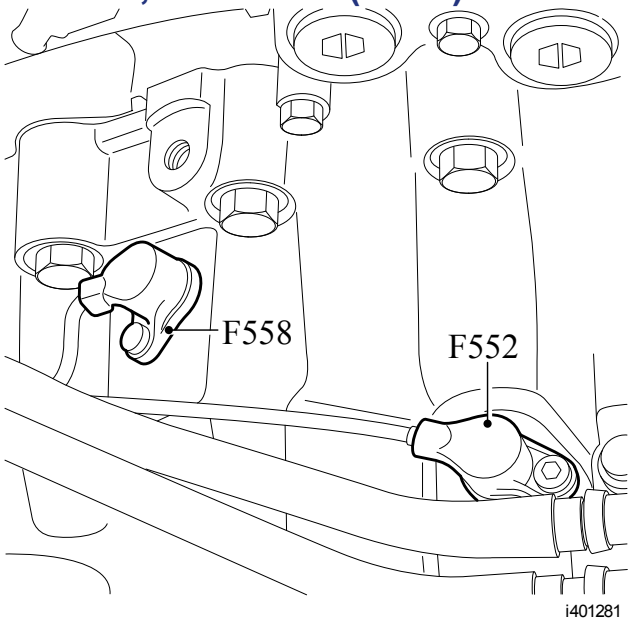
Sensor, camshaft (F558)



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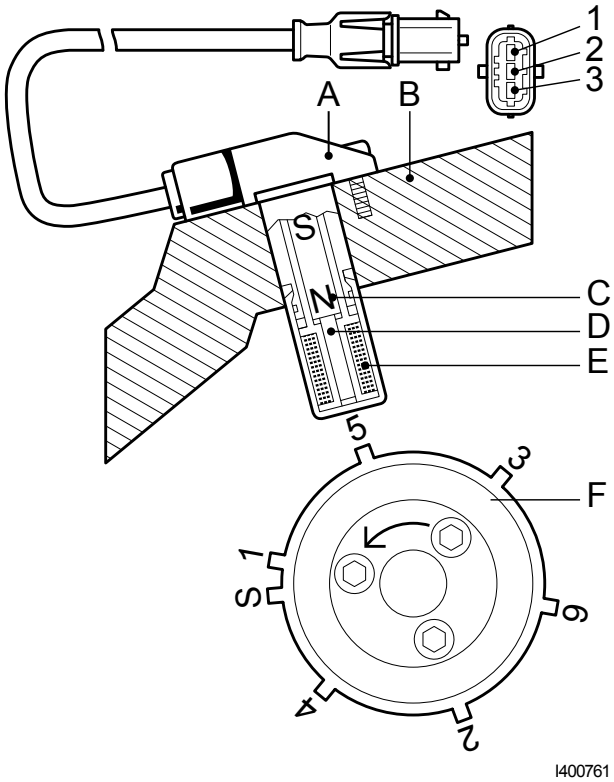
Together with the crankshaft sensor, the camshaft sensor (F558) is responsible for synchronization when starting the engine. The signal also provides information related to cylinder detection. If the crankshaft sensor (F552) is defective, the camshaft signal acts as a reserve signal for registering engine speed and determining the correct injection timing.

The camshaft sensor (A) is mounted onto 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 sensor can generate a specific alternating signal by means of a tooth pattern on the pulse wheel (F). The sensor has three connections. Pins 1 and 2 are responsible for the signal. Pin 1 is the signal connection, and pin 2 is the ground connection. Pin 3 is connected to the shield around the signal wires and to the ground connection (pin 2). This prevents outside signals from affecting the signal.



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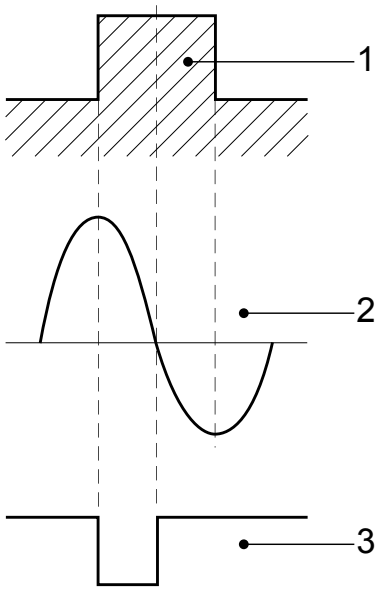
1 Electrical connection, signal
2 Electrical connection, ground
3 Electrical connection, shield
A Sensor, camshaft
B Flywheel housing
C Magnet
D Metal core
E Coil

F Pulse wheel

The most powerful changes in the magnetic field of the sensor take place when the tooth pattern (1) on the pulse wheel changes from a tooth to a hole and vice versa. A sine-wave alternating voltage (2) is generated as a result of this changing magnetic field. As a tooth approaches, the camshaft sensor signal must be at the maximum positive value. The camshaft sensor signal must drop to the maximum negative value as the end of the tooth 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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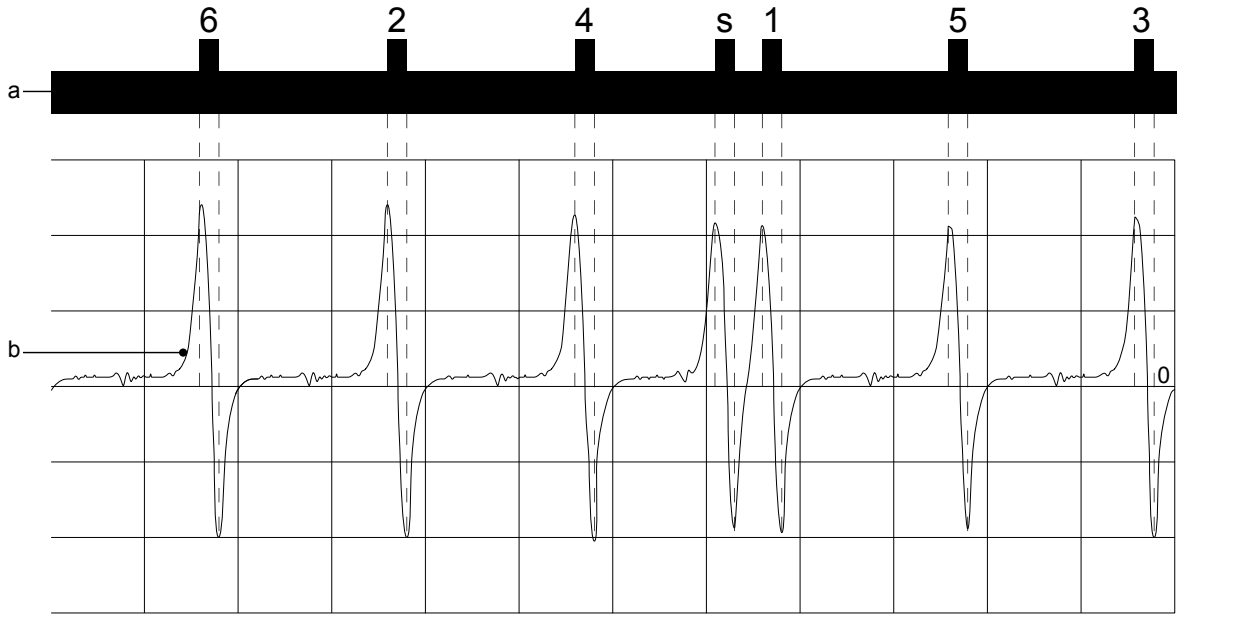

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Sine-wave signals (2) can be measured with an oscilloscope when the engine is running, using the tooth pattern on the pulse wheel (1). Each tooth, and therefore pulse, corresponds to a specific cylinder. The additional tooth before the cylinder -1 tooth is the synchronization tooth (S). The pulse this generates is required to realize the synchronization procedure together with the crankshaft sensor signal.

Effect of output signal on the system:

- Synchronization during starting
- Cylinder detection
- Calculation of injection timing if the crankshaft sensor is defective
- Registration of the engine speed if the crankshaft sensor is defective

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