## Construction

An active wheel-speed sensor is fitted to each wheel.

On the front axle there is increment gear opposite the wheel-speed sensor.

On the rear axle there is a ring of magnets around the wheel bearing (increment wheel). The north and south poles of the increment wheel alternate.
One north pole with one south pole constitutes one increment (cf. tooth/gap on an increment gear).
The wheel-speed sensor consists of 3 Hall sensors and an electronic evaluation unit.

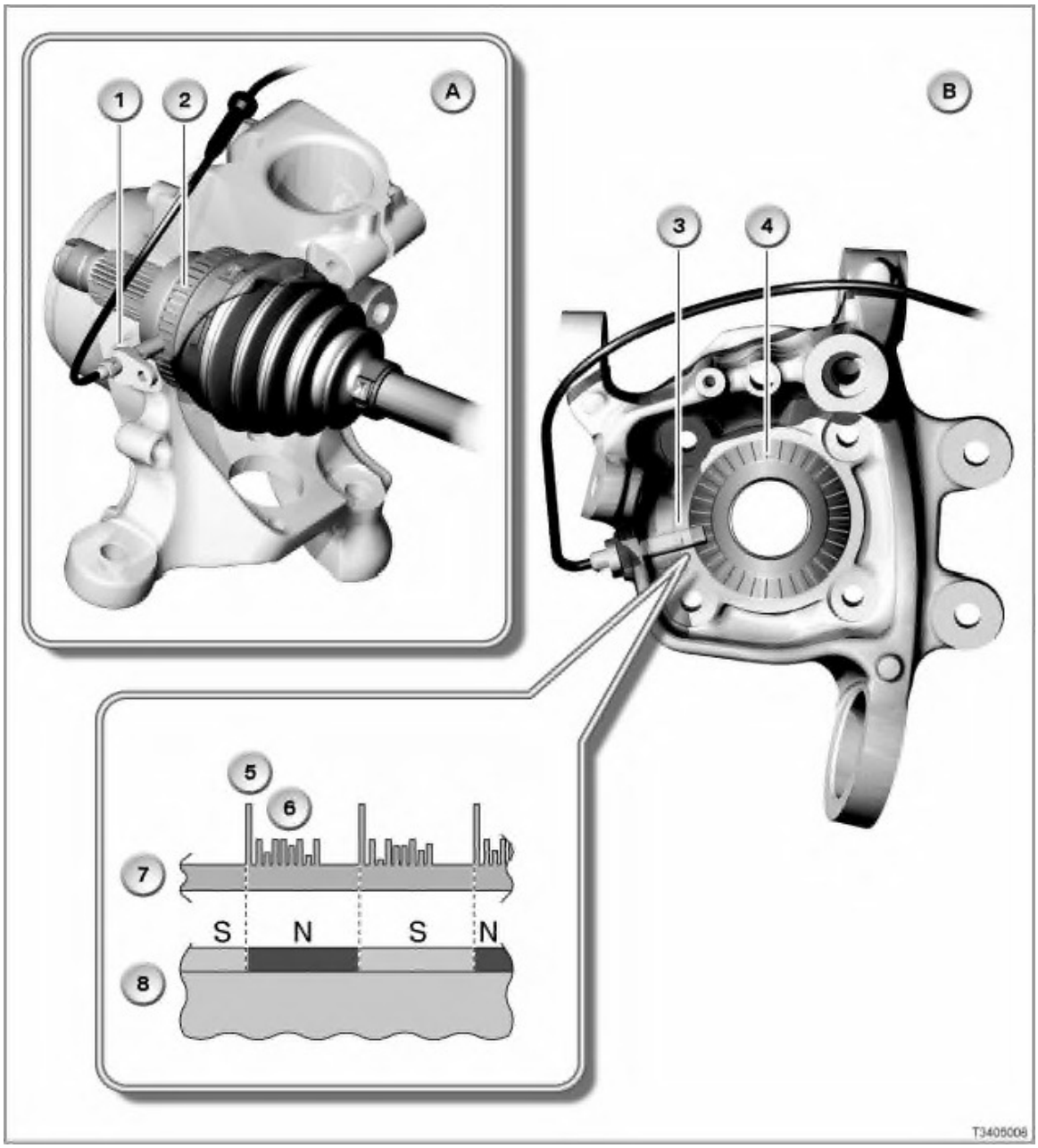


Illustration shows E60, E61

| Item | Description | Item | Description |
|---|---|---|---|
| A | Front axle | B | Rear axle |
| 1 | Wheel-speed sensor | 2 | Increment gear |
| 3 | Wheel-speed sensor | 4 | Wheel bearing with increment wheel |
| 5 | Pulse for speed of rotation | 6 | Additional information, for example direction of rotation and air gap |

| | | | |
|---|---|---|---|
| 7 | Signal path | 8 | Wheel bearing with magnets |

**How it works**

The complete signal processing takes place in the active wheel-speed sensors.

For example, the wheel-speed sensor on the rear axle:
The active wheel-speed sensors change their electrical resistance when influenced by a magnetic field. Each increment generates 2 pulses in the wheel-speed sensor (96 pulses/revolution of wheel). For the data transmission to the control unit, additional data are added alongside the pulse. Functionally, this integrated data processing goes beyond the simple recording of speed of rotation.

The following additional information is possible, e.g.:

- Direction of rotation of wheel
- Air gap
- Vehicle standstill

In contrast to earlier wheel-speed sensors, a current pulse is transmitted approximately every 0.75 seconds when the vehicle is stationary. This current pulse indicates the availability of the wheel-speed sensor.

The active wheel-speed sensors give the following benefits:

- Fast and reliable recognition of direction of travel
- Improved actuation of transmission control
- Improved actuation of navigation system