ABS WHEEL-SPEED SENSOR AND ABS SENSOR ROTOR

id041500104900

Purpose/Function

- The ABS wheel-speed sensor and ABS sensor rotor detect the rotation condition of each wheel and transmit this information to the DSC HU/CM.
- The signal from the ABS wheel-speed sensor is the primary signal that the DSC HU/CM uses when carrying out control.

Construction

- The ABS wheel-speed sensor utilizes a semi-conductor element that contains an active drive circuit (MR element*). The front sensor is installed on the steering knuckle and the rear sensor is installed on the wheel hub (2WD) or hub support (4WD).
- The front ABS sensor rotor utilizes a magnetic encoder system that functions with magnetic rubber, and is integrated into the front wheel hub. Therefore, if there is any malfunction of the front ABS sensor rotor, replace the front wheel hub.
- The rear ABS sensor rotor utilizes a magnetic encoder system that functions with magnetic rubber, and is integrated into the rear wheel hub (2WD) or shaft and ball joint component (4WD). Therefore, if there is any malfunction of the rear ABS sensor rotor, replace the rear wheel hub (2WD) or shaft and ball joint component (4WD).

*: A magneto-resistive force means that an exterior magnetic field acts on the element, changing the resistance of the element.

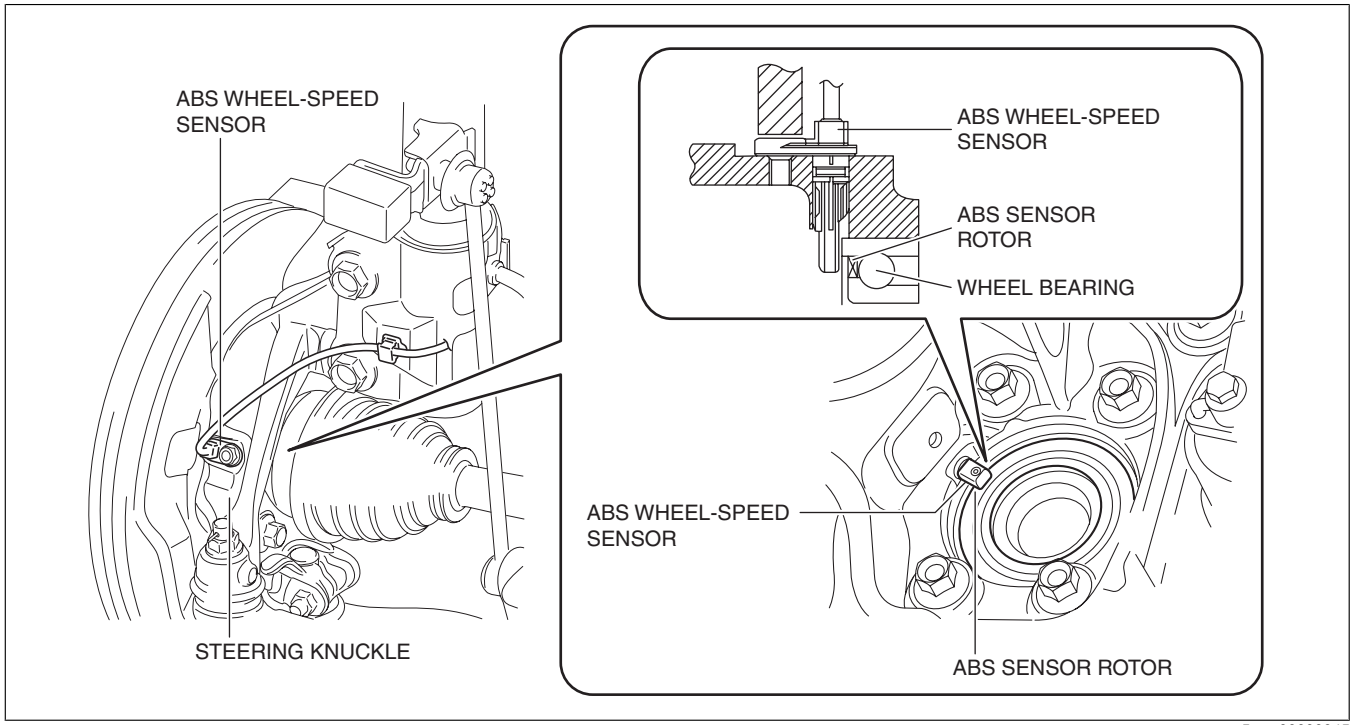
Caution

- **When inspecting the ABS wheel-speed sensor, do not use a tester to inspect resistance. It is possible that the voltage from the tester could damage the semiconductor inside the ABS wheel-speed sensor. Inspect using the PID data monitor of the Mazda modular diagnostic system (M-MDS).**

Note

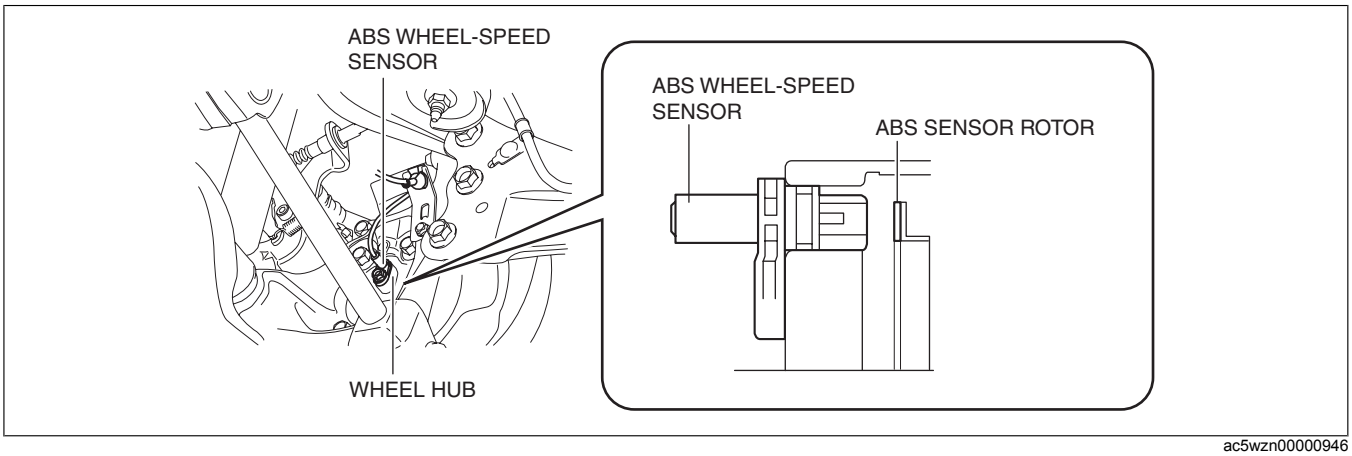
- Magnetic encoder: A plate that has positive and negative poles (marked out) in a continuous, alternating line.

Front ABS wheel-speed sensor and sensor rotor



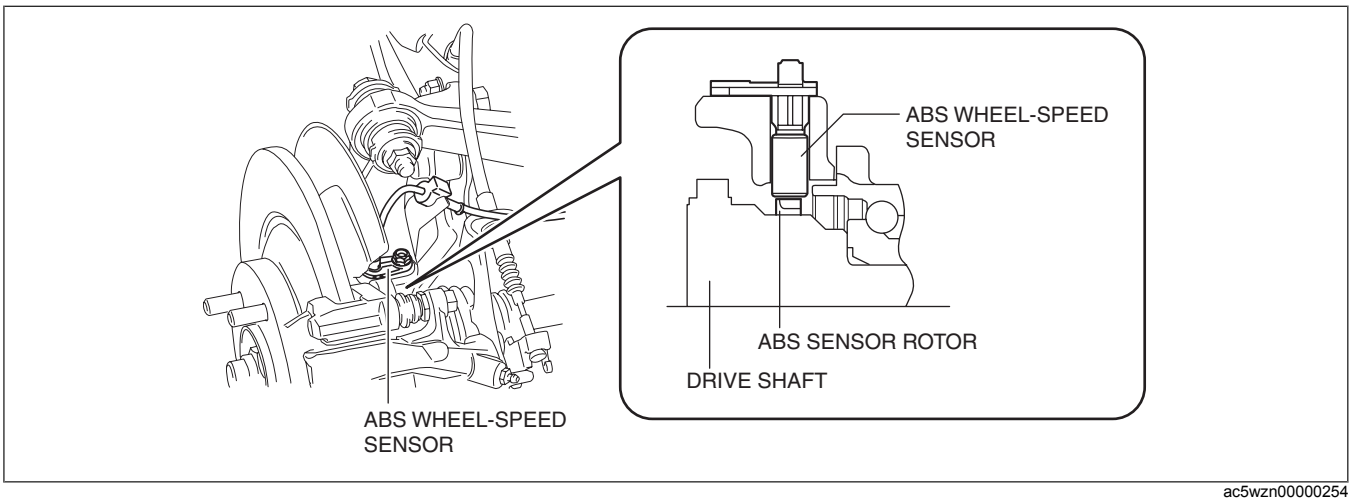
ac5wzn00000945

Rear ABS wheel-speed sensor and sensor rotor (2WD)



ac5wzn00000946

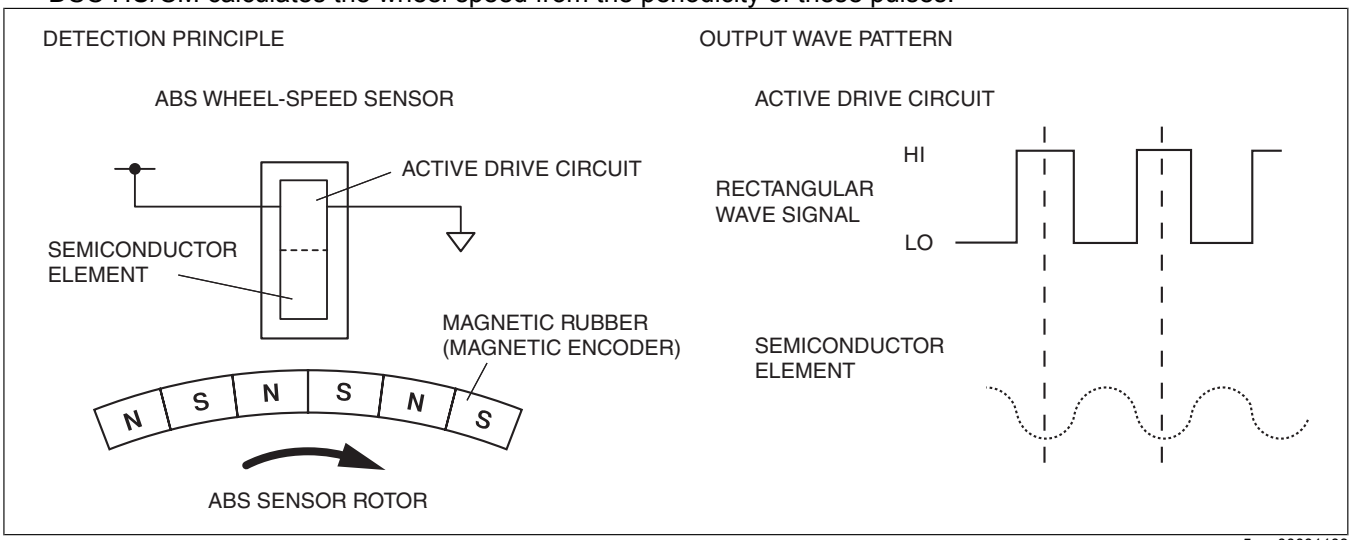
Rear ABS wheel-speed sensor and sensor rotor (4WD)



ac5wzn00000254

Operation

- As the ABS sensor rotor rotates, the magnetic flux between the ABS wheel-speed sensor and the ABS sensor rotor change periodically. This periodic change is in proportion to the rotation speed.
- The semiconductor element in the wheel speed sensor detects the change in magnetic flux, and the active drive circuit converts it to a rectangular wave signal for the current, which is transmitted to the DSC HU/CM.
- For every single rotation of the ABS sensor rotor, 44 rectangular wave pulse signals are output. The CM in the DSC HU/CM calculates the wheel speed from the periodicity of these pulses.



am5ezn00001103

Fail-safe

DTC No.	Fail-safe function
C0030:07	• Illuminates the ABS warning light and TCS/DSC indicator light. • Illuminates the master warning light.* • Tire pressure monitoring system warning light illuminates after flashes. • Inhibits the ABS, TCS, DSC, roll over mitigation (ROM), brake assist control, hill launch assist (HLA), TPMS, smart city brake support (SCBS)*, and secondary collision reduction (SCR) controls. (Additionally, when any malfunction is detected in two wheels or more, EBD control is inhibited and the brake system warning light is illuminated.)
C0031:07	
C0031:11	
C0031:15	
C0031:29	
C0031:2F	
C0031:64	
C0033:07	
C0034:07	
C0034:11	
C0034:15	
C0034:29	
C0034:2F	
C0034:64	
C0036:07	
C0037:07	
C0037:11	
C0037:15	
C0037:29	
C0037:2F	
C0037:64	
C0039:07	
C003A:07	
C003A:11	
C003A:15	
C003A:29	
C003A:2F	
C003A:64	

* : Vehicle with smart city brake support (SCBS).