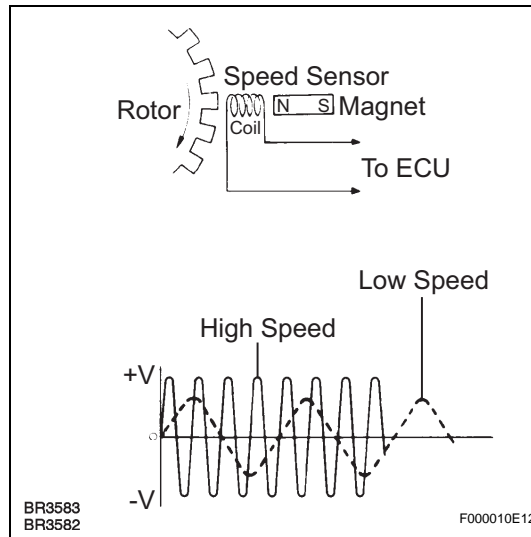


<b>DTC</b>	<b>C0200/31</b>	<b>Right Front Wheel Speed Sensor Signal</b>
<b>DTC</b>	<b>C0205/32</b>	<b>Front Speed Sensor LH Circuit</b>
<b>DTC</b>	<b>C1235/35</b>	<b>Foreign Object is Attached on Tip of Front Speed Sensor RH</b>
<b>DTC</b>	<b>C1236/36</b>	<b>Foreign Object is Attached on Tip of Front Speed Sensor LH</b>

**DESCRIPTION**

The speed sensor detects wheel speed and sends the appropriate signals to the ECU. These signals are used to control the ABS control system. The front and rear rotors have 48 serrations each.



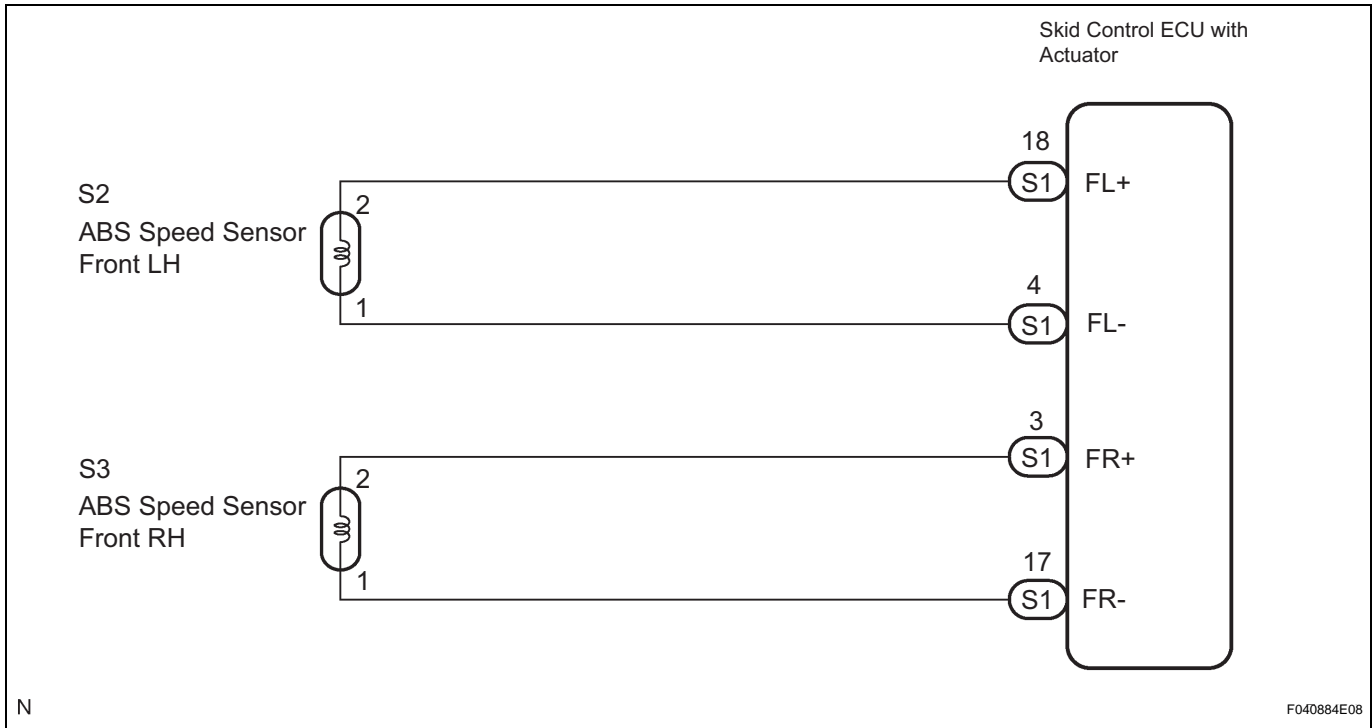
When the rotors rotate, the magnetic field emitted by the permanent magnet in the speed sensor generates AC voltage. Since the frequency of this AC voltage changes in direct proportion to the speed of the rotor, the frequency is used by the ECU to detect the speed of each wheel.

DTC No.	DTC Detection Condition	Trouble Area
C0200/31 C0205/32	<ol style="list-style-type: none"> <li>All the following conditions continues for at least 1 second.                             <ul style="list-style-type: none"> <li>Vehicle speed is more than 6 mph (10 km/h).</li> <li>Open or short in vehicle speed sensor signal circuit.</li> </ul> </li> <li>Momentary interruption of the sensor signal of faulty wheel has occurred 7 times or more.</li> <li>Sensor signal circuit is open for 0.5 seconds.</li> </ol>	<ul style="list-style-type: none"> <li>Right front and left front speed sensor</li> <li>Each speed sensor circuit</li> <li>Sensor rotor</li> <li>Sensor installation</li> </ul>
C1235/35 C1236/36	<p>All the following conditions for at least 5 seconds.</p> <ul style="list-style-type: none"> <li>Vehicle speed is more than 12 mph (20 km/h).</li> <li>Vehicle speed sensor signal receives interference.</li> </ul>	<ul style="list-style-type: none"> <li>Right front and left front speed sensor</li> <li>Sensor installation</li> </ul>

**HINT:**

- DTC C0200/31 and C1235/35 are for the right front speed sensor.
- DTC C0205/32 and C1236/36 are for the left front speed sensor.

**WIRING DIAGRAM**



**HINT:**

Start the inspection from step 1 when using the intelligent tester and start from step 3 when not using the intelligent tester.

**1 READ VALUE OF INTELLIGENT TESTER (FRONT SPEED SENSOR)**

- (a) Connect the intelligent tester to the DLC3.
- (b) Start the engine.
- (c) Select the DATA LIST mode on the intelligent tester.

Item	Measurement Item / Range (Display)	Normal Condition
WHEEL SPD FR	Wheel speed sensor (FR) reading / min.: 0 km/h (0 MPH, max.: 326 km/h (202 MPH)	Actual wheel speed
WHEEL SPD FL	Wheel speed sensor (FL) reading / min.: 0 km/h (0 MPH, max.: 326 km/h (202 MPH)	Actual wheel speed

- (d) Check that there is no difference between the speed value output from the speed sensor displayed on the intelligent tester and the speed value displayed on the speedometer when driving the vehicle.

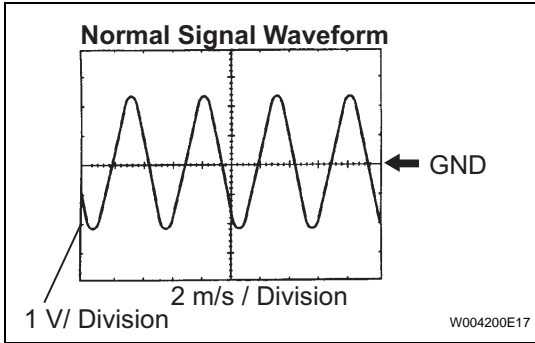
**OK:**

**There is almost no difference from the displayed speed value.**

**HINT:**

There is tolerance of +- 10 % in the speedometer indication.

**2 INSPECT SPEED SENSOR AND SENSOR ROTOR SERRATIONS**



- (a) INSPECTION USING OSCILLOSCOPE
- (1) Connect the oscilloscope to terminal FR+ - FR- or FL+ - FL- of the skid control ECU.
  - (2) Drive the vehicle at about 19 mph (30 km/h), and check the signal waveform.

**OK:**

A waveform as shown in a figure should be output.

**HINT:**

- As the vehicle speed (wheel revolution speed) increases, a cycle of the waveform narrows and the fluctuation in the output voltage becomes greater.
- When noise is identified in the waveform on the oscilloscope, error signals are generated due to the speed sensor rotor's scratches, looseness or foreign matter attached to it.

**NOTICE:**

When replacing the ABS actuator assembly, perform zero point calibration (See page BC-5).

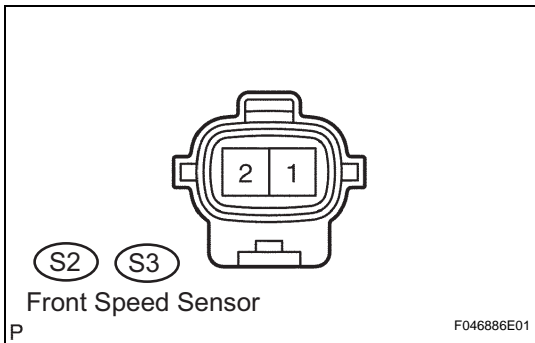
**NG** →

Go to step 6

**OK**

**REPLACE ABS AND TRACTION ACTUATOR**

**3 INSPECT FRONT SPEED SENSOR**



- (a) Make sure that there is no looseness at the connectors' locking part and connecting part of connector.
- (b) Disconnect the speed sensor connector.
- (c) Measure the resistance according to the value(s) in the table below.

**Resistance:**

**LH**

Tester Connection	Specified Condition
S2-2 (FL+) - S2-1 (FL-)	0.6 to 2.5 kΩ

**RH**

Tester Connection	Specified Condition
S3-2 (FR+) - S3-1 (FR-)	0.6 to 2.5 kΩ

- (d) Measure the resistance according to the value(s) in the table below.

**Resistance:**

**LH**

Tester Connection	Specified Condition
S2-2 (FL+) - Body ground	10 kΩ or higher

Tester Connection	Specified Condition
S2-1 (FL-) - Body ground	10 kΩ or higher

**RH**

Tester Connection	Specified Condition
S3-2 (FR+) - Body ground	10 kΩ or higher
S3-1 (FR-) - Body ground	10 kΩ or higher

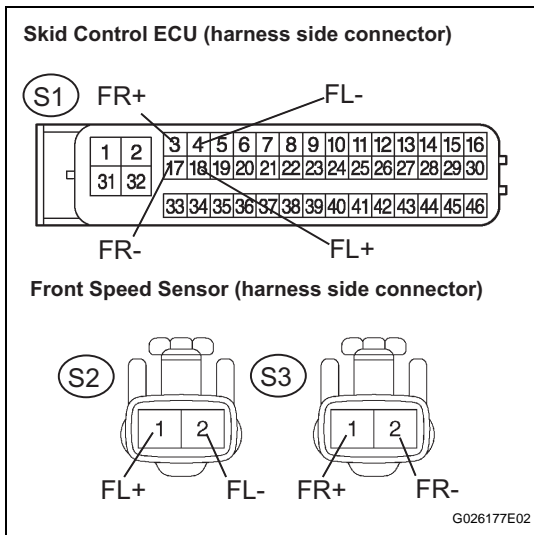
**NOTICE:**

Check the speed sensor signal after replacement  
(See page BC-16).

**NG** → **REPLACE FRONT SPEED SENSOR**

**OK**

**4 CHECK HARNESS AND CONNECTOR (FRONT SPEED SENSOR - SKID CONTROL ECU)**



- (a) Disconnect the skid control ECU connector and the front speed sensor connector.
- (b) Measure the resistance according to the value(s) in the table below.

**Resistance:**  
**LH**

Tester Connection	Specified Condition
S1-18 (FL+) - S2-2 (FL+)	Below 1 Ω
S1-4 (FL-) - S2-1 (FL-)	Below 1 Ω

**RH**

Tester Connection	Specified Condition
S1-3 (FL+) - S3-2 (FL+)	Below 1 Ω
S1-17 (FL-) - S3-1 (FL-)	Below 1 Ω

- (c) Measure the resistance according to the value(s) in the table below.

**Resistance:**  
**LH**

Tester Connection	Specified Condition
S1-18 (FL+) - Body ground	10 kΩ or higher
S1-4 (FL-) - Body ground	10 kΩ or higher

**RH**

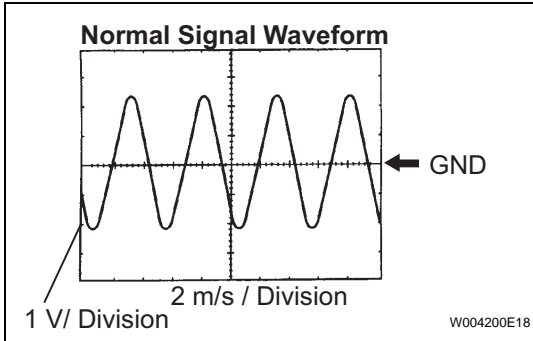
Tester Connection	Specified Condition
S1-3 (FL+) - Body ground	10 kΩ or higher
S1-17 (FL-) - Body ground	10 kΩ or higher

**NG** → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

**OK**

**5 INSPECT SPEED SENSOR AND SENSOR ROTOR SERRATIONS**

- (a) INSPECTION USING OSCILLOSCOPE
- (1) Connect the oscilloscope to terminal FR+ - FR- or FL+ - FL- of the skid control ECU.
  - (2) Drive the vehicle at about 19 mph (30 km/h), and check the signal waveform.



**OK:**

**A waveform as shown in a figure should be output.**

**HINT:**

- As the vehicle speed (Wheel revolution speed) increases, a cycle of the waveform narrows and the fluctuation in the output voltage becomes greater.
- When noise is identified in the waveform on the oscilloscope, error signals are generated due to the speed sensor rotor's scratches, looseness or foreign matter attached to it.

**NOTICE:**

**When replacing the ABS actuator assembly, perform zero point calibration (See page BC-5).**

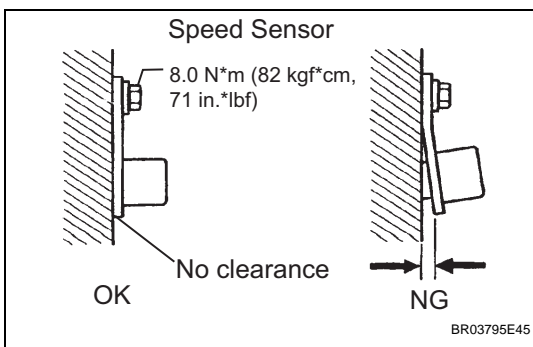
**NG** →

**Go to step 6**

**OK**

**REPLACE ABS AND TRACTION ACTUATOR**

**6 INSPECT FRONT SPEED SENSOR INSTALLATION**



- (a) Check the speed sensor installation.

**OK:**

**The installation bolt is tightened properly. There is no clearance between the sensor and the front steering knuckle.**

**Torque: 8.0 N\*m (82 kgf\*cm, 71 in.\*lbf)**

**NOTICE:**

**Check the speed sensor signal after the replacement (See page BC-16).**

**NG** →

**REPLACE FRONT SPEED SENSOR**

**OK**

**7 INSPECT SPEED SENSOR TIP**

- (a) Remove the front speed sensor (See page BC-113).
- (b) Check the sensor tip.

**OK:**

**No scratches or foreign matter on the sensor tip.**

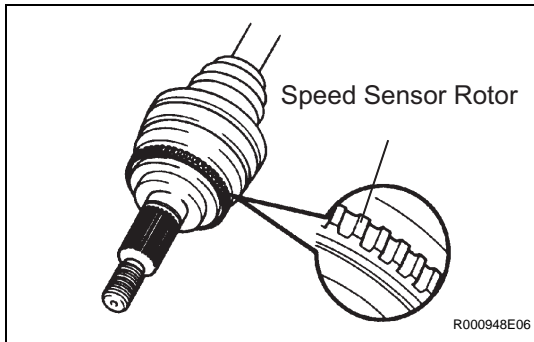
**NOTICE:**

Check the speed sensor signal after the replacement  
(See page [BC-16](#)).

NG

CLEAN OR REPLACE SPEED SENSOR

OK

**8 INSPECT SPEED SENSOR ROTOR**

- (a) Remove the front speed sensor rotor.
- (b) Check the sensor rotor serrations.

**OK:**

**No scratches, missing teeth or foreign matter on the rotors.**

**HINT:**

If there is foreign matter in the rotor, remove it and check the output waveform after reassembly.

**NOTICE:**

Check the speed sensor signal after the replacement  
(See page [BC-16](#)).

**NOTICE:**

When replacing the ABS & TRACTION actuator assembly, perform zero point calibration (See page [BC-5](#)).

NG

REPLACE FRONT DRIVE SHAFT ASSEMBLY

OK

**REPLACE ABS AND TRACTION ACTUATOR**