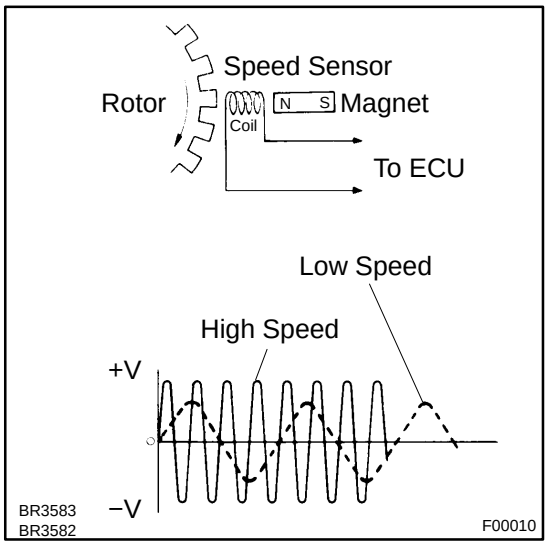
DTC	C0200/31	RIGHT FRONT SPEED SENSOR

DTC	C0205/32	LEFT FRONT SPEED SENSOR

DTC	C1235/35	FOREIGN MATTER IS ATTACHED ON TIP OF RIGHT FRONT SENSOR

DTC	C1236/36	FOREIGN MATTER IS ATTACHED ON TIP OF LEFT FRONT SENSOR

CIRCUIT 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.

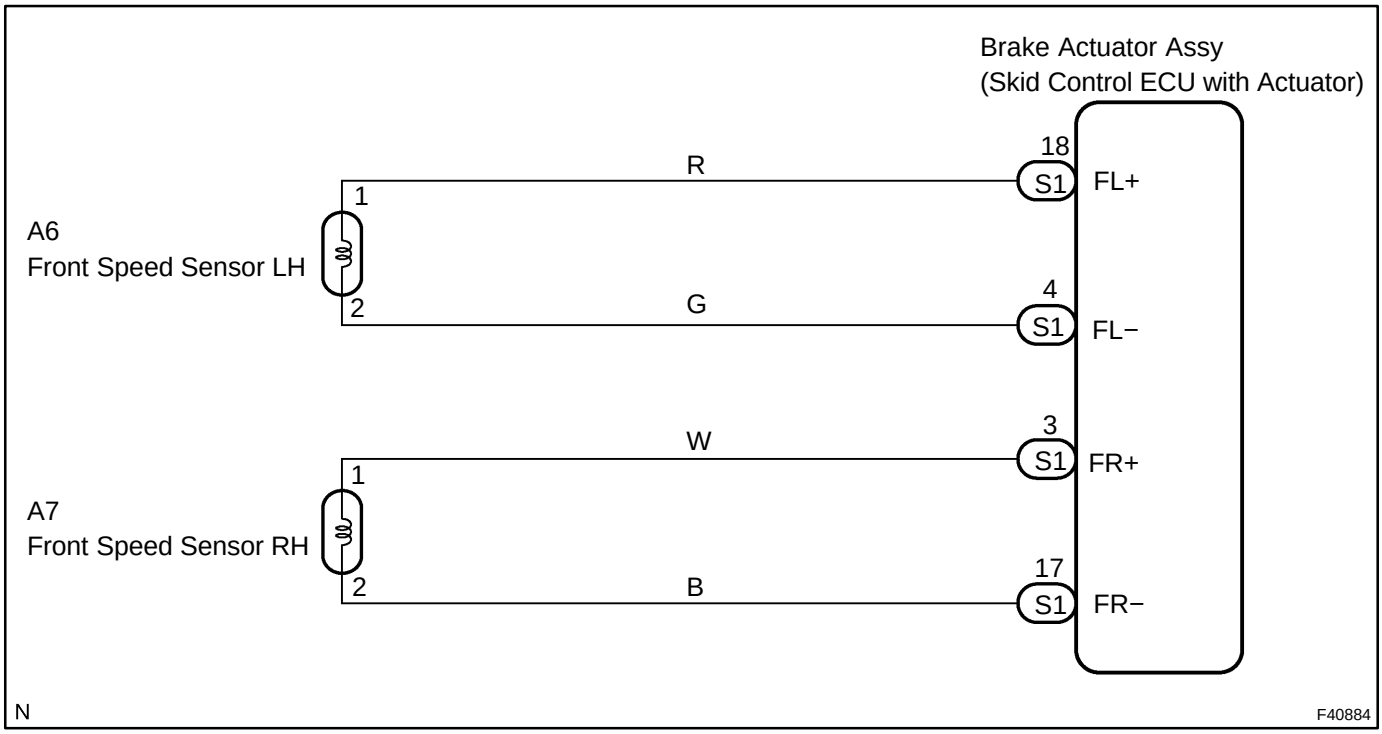
When the rotors rotate, the magnetic field emitted by the permanent magnet in the speed sensor generates AC voltage. Since the frequency of this AC voltage changes in direct proportion to the speed of the rotor, the frequency is used by the ECU to detect the speed of each wheel.

DTC No.	DTC Detecting Condition	Trouble Area
C0200/31 C0205/32	(1) All the following condition continues for at least 1 second. • Vehicle speed is more than 6 mph (10 km/h). • Open or short in vehicle speed sensor signal circuit. (2) Momentary interruption of the sensor signal of faulty wheel has occurred 7 times or more. (3) Sensor signal circuit is open for 0.5 seconds.	• Right front and/or left front speed sensor • Each speed sensor circuit • Sensor rotor • Sensor installation
C1235/35 C1236/36	All the following conditions continue for at least 5 seconds. • Vehicle speed is more than 12 mph (20 km/h). • Vehicle speed sensor signal is received.	• Right front and/or left front speed sensor • Sensor rotor • Sensor installation

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



INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator assy, perform zero point calibration (see page 05−987).

HINT:

Start the inspection from step 1 when using the hand−held tester and start from step 2 when not using the hand−held tester.

1	READ VALUE OF HAND−HELD TESTER(FRONT SPEED SENSOR)

(a) Connect the hand−held tester to the DLC3.

(b) Start the engine.

(c) Select DATA LIST mode on the hand−held 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 hand−held tester and the speed value displayed on the speedometer when driving the vehicle.

OK:

There is almost no difference in the displayed speed value.

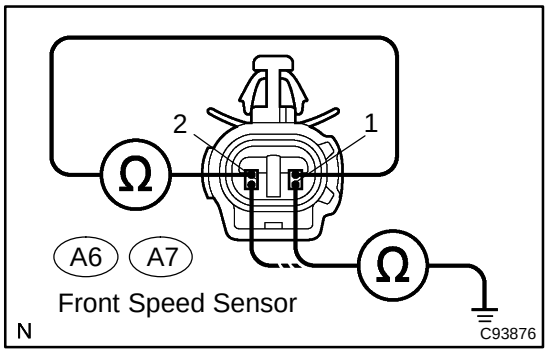
HINT:

There is tolerance of ± 10 % in the speedometer indication.

OK → **Go to step 4**

NG

2 INSPECT FRONT SPEED SENSOR



(a) Make sure that there is no looseness at the locking part and connecting part of the connector A6 or A7.

(b) Disconnect the speed sensor connector.

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

Standard:

LH:

Tester Connection	Specified Condition
A6−1 (FL+) − A6−2 (FL−)	0.92 to 1.22 kΩ at 20°C

RH:

Tester Connection	Specified Condition
A7−1 (FR+) − A7−2 (FR−)	0.92 to 1.22 kΩ at 20°C

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

Standard:

LH:

Tester Connection	Specified Condition
A6−1 (FL+) − Body ground	10 kΩ or higher
A6−2 (FL−) − Body ground	10 kΩ or higher

RH:

Tester Connection	Specified Condition
A7−1 (FR+) − Body ground	10 kΩ or higher
A7−2 (FR−) − Body ground	10 kΩ or higher

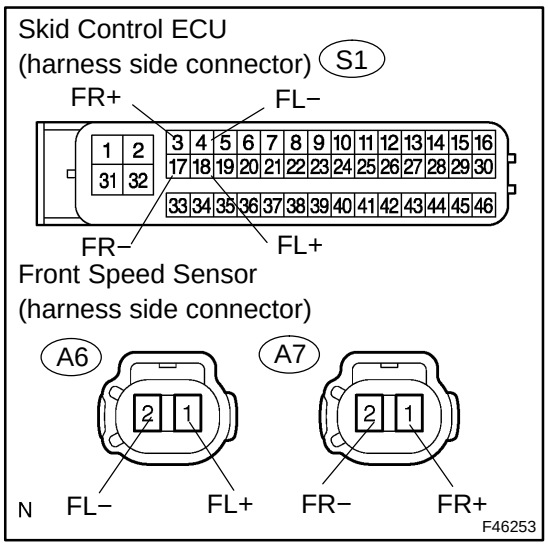
NG → **REPLACE FRONT SPEED SENSOR (SEE PAGE 32−66)**

NOTICE:

Check the speed sensor signal after replacement (see page 05−990).

OK

3	CHECK HARNESS AND CONNECTOR(FRONT SPEED SENSOR − SKID CONTROL ECU)



(a) Disconnect the skid control ECU connector S1 and the front speed sensor connector A6 or A7.

(b) Measure the resistance between terminals of the skid control ECU and front speed sensor.

Standard:

LH:

Tester Connection	Specified Condition
S1−4 (FL−) − A6−2 (FL−)	Below 1 Ω
S1−18 (FL+) − A6−1 (FL+)	Below 1 Ω

RH:

Tester Connection	Specified Condition
S1−17 (FR−) − A7−2 (FR−)	Below 1 Ω
S1−3 (FR+) − A7−1 (FR+)	Below 1 Ω

(c) Measure the resistance between terminals of the skid control ECU harness side connector and body ground.

Standard:

LH:

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

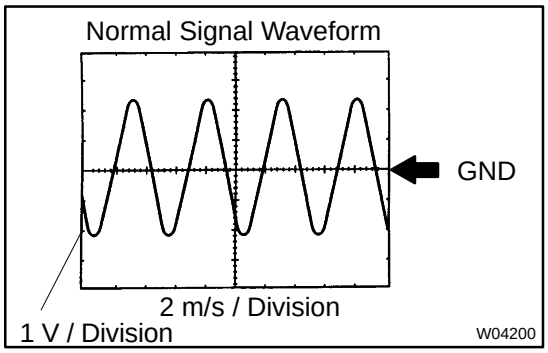
RH:

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

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

OK

4 INSPECT SPEED SENSOR AND SENSOR ROTOR SERRATIONS



INSPECTION USING OSCILLOSCOPE

(a) Connect the oscilloscope to terminals FR+ − FR− or FL+ − FL− of the skid control ECU.

(b) Drive the vehicle at about 19 mph (30 km/h) and check the signal waveform.

OK:

A waveform as shown in the figure should be output.

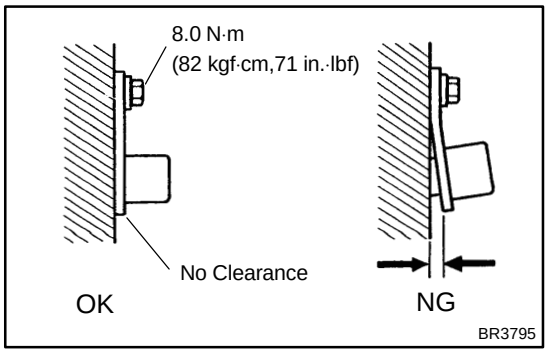
HINT:

- 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.

OK	REPLACE BRAKE ACTUATOR ASSY (SEE PAGE 32−63)

NG

5 INSPECT FRONT SPEED SENSOR INSTALLATION



(a) Check the speed sensor installation.

OK:

There is no clearance between the sensor and front steering knuckle.

The installation bolt is tightened properly.

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

NG	REPLACE FRONT SPEED SENSOR

NOTICE:

Check the speed sensor signal after replacement (see page 05−990).

OK

6	INSPECT SPEED SENSOR TIP

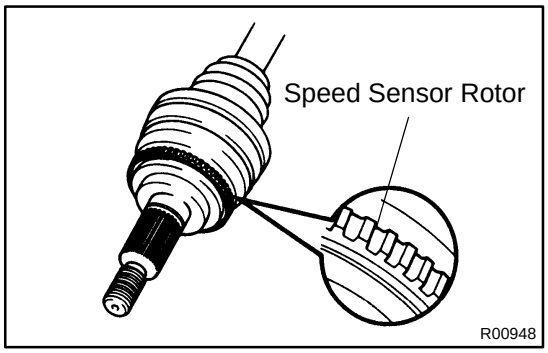
(a) Remove the front speed sensor (see page 32−66).
(b) Check the sensor tip.
OK:
No scratches or foreign matter on the sensor tip.

NG → **CLEAN OR REPLACE SPEED SENSOR (SEE PAGE 32−66)**

NOTICE:
Check the speed sensor signal after replacement (see page 05−990).

OK

7	INSPECT SPEED SENSOR ROTOR



(a) Remove the front drive shaft.
(b) Check the sensor rotor serrations.
OK:
No scratches, missing teeth or foreign matter.

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

NG → **REPLACE OUTBORD JOINT SHAFT ASSY (SEE PAGE 30−23)**

NOTICE:
Check the speed sensor signal after replacement (see page 05−990).

OK

REPLACE BRAKE ACTUATOR ASSY (SEE PAGE 32−63)