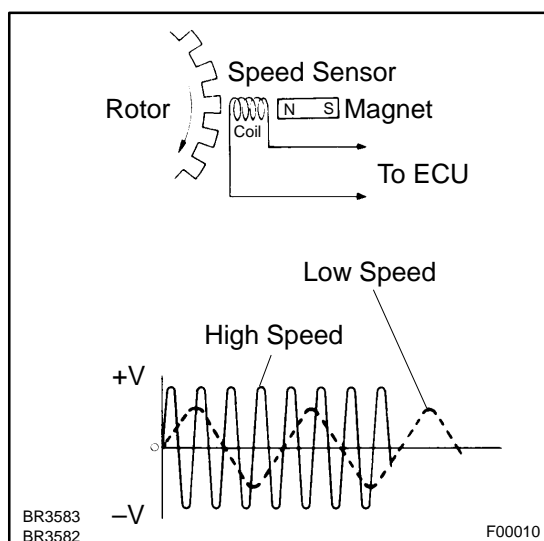


DTC	C0200/31	RIGHT FRONT SPEED SENSOR
DTC	C0205/32	LEFT FRONT SPEED SENSOR CIRCUIT
DTC	C1235/35	FOREIGN MATTER IS ATTACHED ON TIP OF RIGHT FRONT SENSOR
DTC	C1236/36	FOREIGN MATTER IS ATTACHED ON TIP OF LEFT FRONT SENSOR

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, respectively.

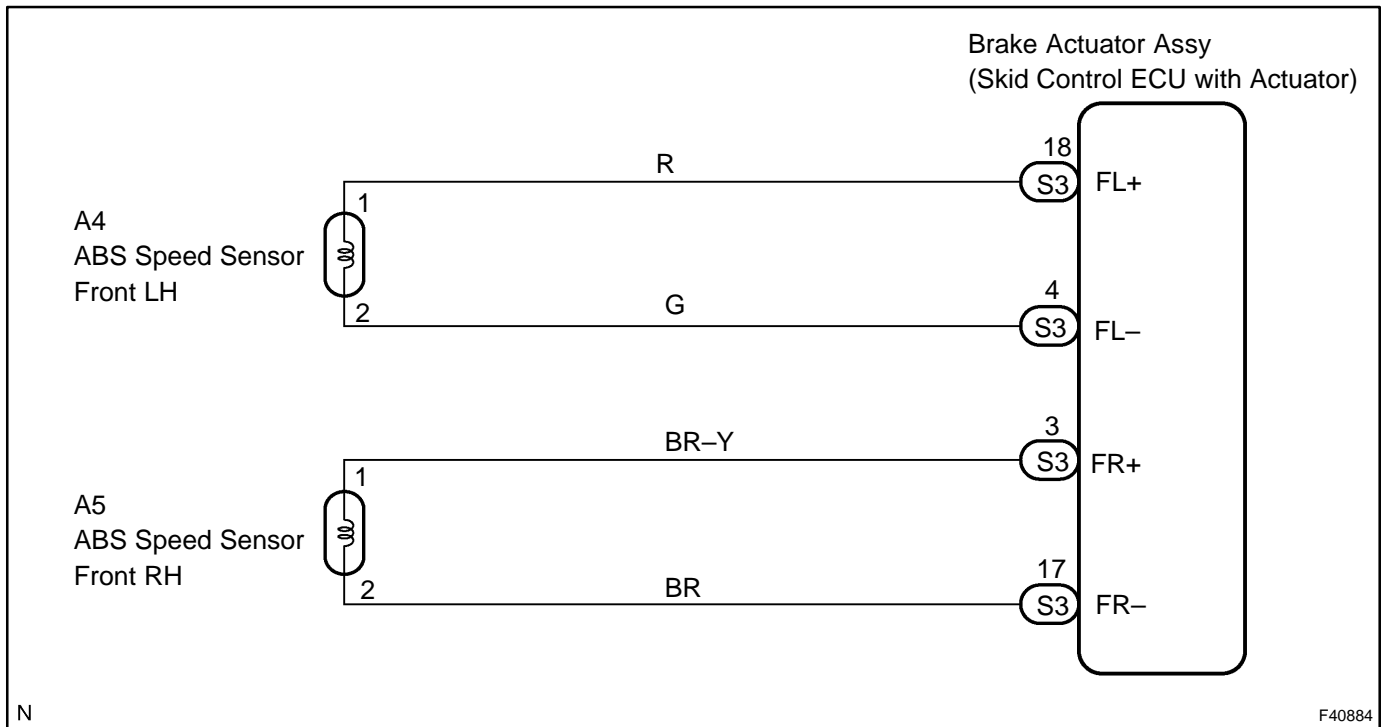
When the rotors rotate, the magnetic field emitted by the permanent magnet in the speed sensor generates an AC voltage. Since the frequency of this AC voltage changes in direct proportion to the speed of the rotor, the frequency is used by the ECU to detect the speed of each wheel.

DTC No.	DTC Detecting Condition	Trouble Area
C0200/31 C0205/32	Detection of any of conditions 1. through 3.: 1. At vehicle speed of 10 km/h (6 mph) or more, pulses are not input for 15 secs. 2. Momentary interruption of the speed sensor signal occurs at least 7 times in the time between switching the ignition switch ON and switching it OFF. 3. The condition that the speed sensor signal circuit is open continues for 0.5 secs. or more.	<ul style="list-style-type: none"> • Right front and left front speed sensor • Each speed sensor circuit • Speed sensor rotor
C1235/35 C1236/36	At the vehicle speed of 20 km/h (12 mph) or more, the condition that noise is included in the speed sensor signal continues for 5 secs. or more.	<ul style="list-style-type: none"> • Right front and left front speed sensor • Speed sensor rotor

HINT:

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

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

Start the inspection from step 1 in case of using the hand-held tester and start from step 2 in case of not using hand-held tester.

1	READ VALUE OF HAND-HELD TESTER(FRONT SPEED SENSOR)
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- (a) Connect the hand-held tester to the DLC3.
- (b) Start the engine.
- (c) Select the DATA LIST mode on the hand-held tester.
- (d) Check that there is no difference between the speed value output from the speed sensor displayed by the hand-held tester and the speed value displayed by the speedometer when driving the vehicle.

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

Standard:

There is almost no difference in the displayed speed value.

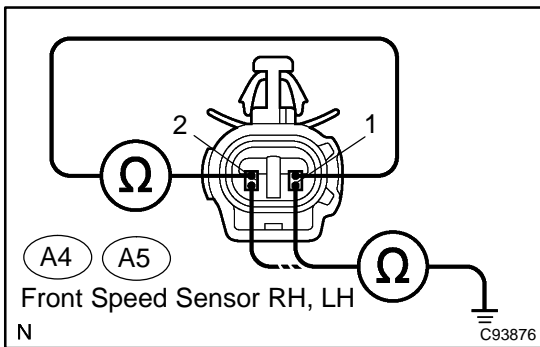
HINT:

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

NG	Go to step 4
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OK

2 INSPECT FRONT SPEED SENSOR



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

Standard:

Tester Connection	Specification
1 - 2	1.4 to 1.8 kΩ at 20 °C

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

Standard:

Tester Connection	Specified Condition
FL+ (A4-1) - Body ground	10 kΩ or higher
FL- (A4-2) - Body ground	
FR+ (A5-1) - Body ground	
FR- (A5-2) - Body ground	

NG → **REPLACE SPEED SENSOR FRONT RH**

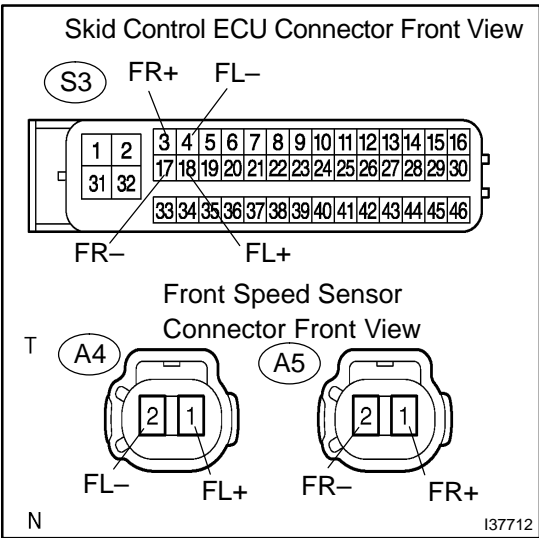
NG → **REPLACE SPEED SENSOR FRONT LH**

NOTICE:

Check the speed sensor signal after replacement (See page 05-269).

OK

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



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

Standard:

Tester Connection	Specified Condition
FR+ (S3-3) – FR+ (A5-1)	1 Ω or less
FL+ (S3-18) – FL+ (A4-1)	
FR- (S3-17) – FR- (A5-2)	
FL- (S3-4) – FL- (A4-2)	

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

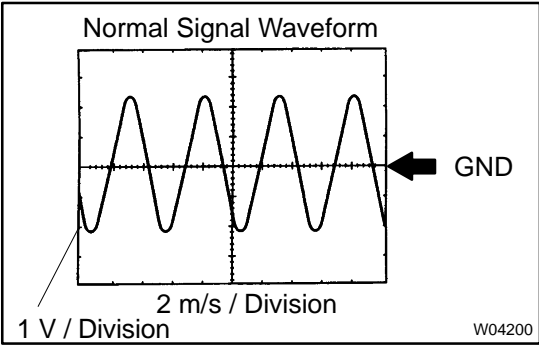
Standard:

Tester Connection	Specified Condition
FR+ (A5-1) – Body ground	10 kΩ or higher
FL+ (A4-1) – Body ground	
FR- (A5-2) – Body ground	
FL- (A4-2) – Body ground	

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

OK

4 INSPECT SPEED SENSOR AND SENSOR ROTOR SERRATIONS



(REFERENCE) INSPECTION USING OSCILLOSCOPE

- (a) Connect the oscilloscope to the terminal FR+ – FR- and FL+ – FL- of the skid control ECU.
- (b) Drive the vehicle at about 20 km/h (12 mph), and check the signal waveform.

Standard:

Output the voltage waveform that is higher than the specified value.

HINT:

- As the vehicle speed (wheel revolution speed) increases, a cycle of the waveform becomes shorter 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 deposited on it.

NG → **Go to step 5**

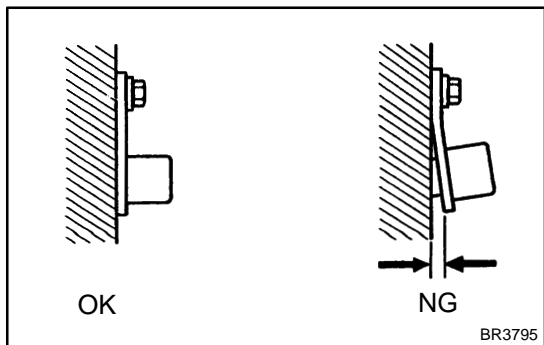
OK

REPLACE BRAKE ACTUATOR ASSY(See page 32-39)

NOTICE:

When replacing the brake actuator assy, perform the zero point calibration (See page 05-279).

5 INSPECT FRONT SPEED SENSOR INSTALLATION



- (a) Check the speed sensor installation.

Standard:

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

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

NG

REPLACE SPEED SENSOR FRONT RH

NG

REPLACE SPEED SENSOR FRONT LH

NOTICE:

Check the speed sensor signal after replacement (See page 05-269).

OK

6 INSPECT SPEED SENSOR TIP

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

Standard:

No scratches or foreign objects on the sensor tip.

NG

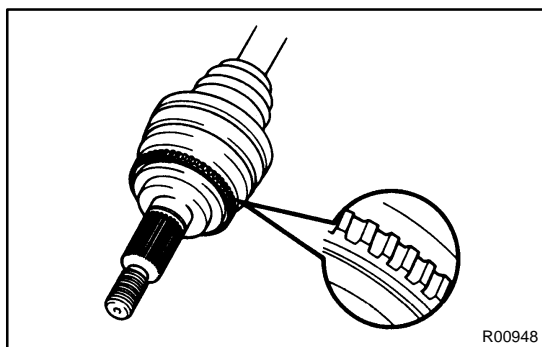
CLEAN OR REPAIR SPEED SENSOR

NOTICE:

Check the speed sensor signal after replacement (See page 05-269).

OK

7	INSPECT SPEED SENSOR ROTOR
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- (a) Remove the front drive shaft.
- (b) Check the sensor rotor serrations.

HINT:

If foreign matter is attached, remove it and after reassembling, check the output waveform.

NG

CLEAN OR REPAIR SPEED SENSOR ROTOR

NOTICE:

Check the speed sensor signal after replacement
(See page 05-269).

OK

REPLACE BRAKE ACTUATOR ASSY(See page 32-39)
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NOTICE:

When replacing the brake actuator assy, perform the zero point calibration (See page 05-279).