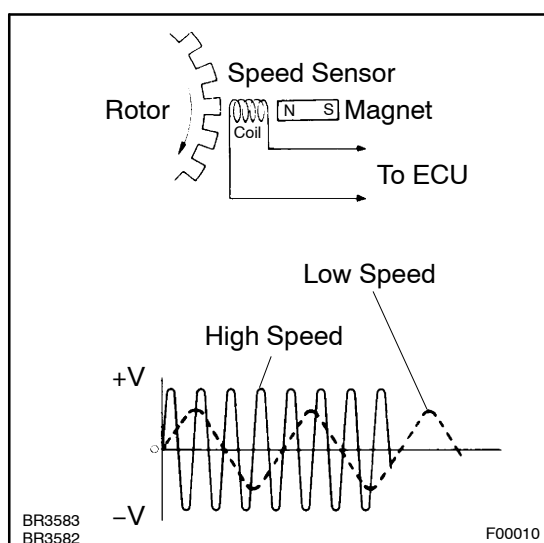


DTC	C0200/31	RIGHT FRONT SPEED SENSOR
DTC	C0205/32	LEFT FRONT SPEED SENSOR
DTC	C1235/35	FOREIGN MATTER IS ATTACHED ON TIP OF RIGHT FRONT SENSOR
DTC	C1236/36	FOREIGN MATTER IS ATTACHED ON TIP OF LEFT FRONT SENSOR

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.

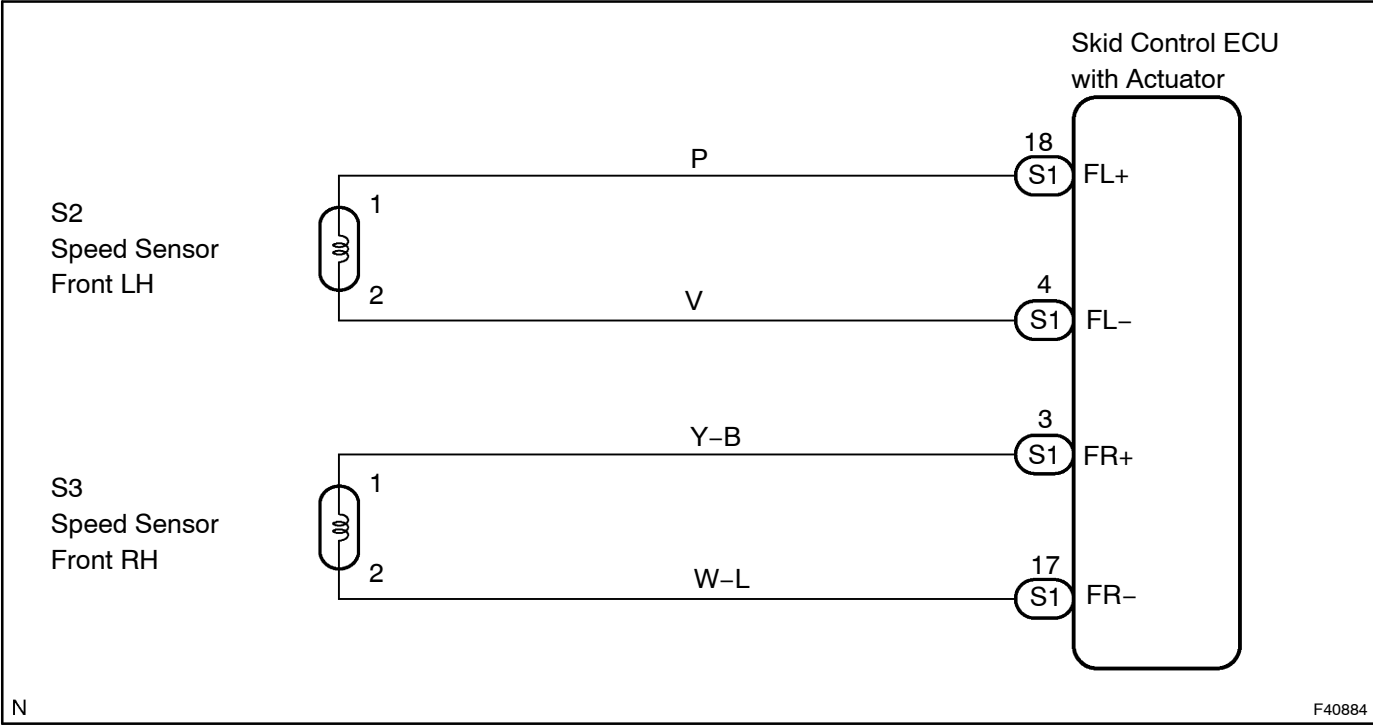
When the rotors rotate, the magnetic field emitted by the permanent magnet in the speed sensor generates AC voltage. Since the frequency of this AC voltage changes in direct proportion to the speed of the rotor, the frequency is used by the ECU to detect the speed of each wheel.

DTC No.	DTC Detecting Condition	Trouble Area
C0200/31 C0205/32	(1) All the following conditions continue for at least 1 second. • Vehicle speed is more than 10 km/h (6 mph). • 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 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 20 km/h (12 mph). • Vehicle speed sensor signal is received.	• Right front and left front speed sensor • Each speed sensor circuit • 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

HINT:

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

1	READ VALUE OF INTELLIGENT TESTER II(FRONT SPEED SENSOR)
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- (a) Connect the intelligent tester II to the DLC3.
- (b) Start the engine.
- (c) Select the DATA LIST mode on the intelligent tester II.

Item	Measurement Item / Range (Display)	Normal Condition
FR Wheel Speed	Wheel speed sensor (FR) reading / min.: 0 km/h (0 MPH, max.: 326 km/h (202 MPH)	Actual wheel speed
FL Wheel Speed	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 by the intelligent tester II and the speed value displayed on the speedometer when driving the vehicle.

OK:

There is almost no difference from the displayed speed value.

HINT:

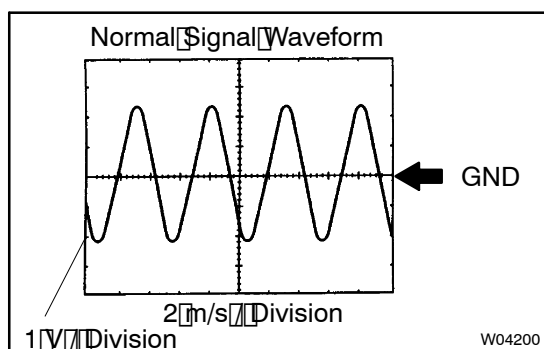
There is tolerance of $\pm 10\%$ in the speedometer indication.

NG

Go to step 3

OK

2 INSPECT SPEED SENSOR AND SENSOR ROTOR SERRATIONS



INSPECTION USING OSCILLOSCOPE

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

OK:

A waveform as shown in the figure should be output.

HINT:

- As 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 scratches, looseness or foreign matter attached to it.

NG

Go to step 6

OK

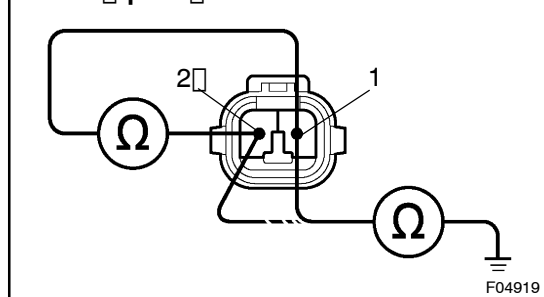
REPLACE ABS & TRACTION ACTUATOR ASSY (SEE PAGE 32-20)

NOTICE:

When replacing the ABS & TRACTION actuator assy, perform zero point calibration (see page 05-610).

3 INSPECT FRONT SPEED SENSOR

Front Speed Sensor:



- Make sure that there is no looseness at the connectors' locking part and connecting part.
- Disconnect the front speed sensor S2 and S3 connectors.
- Measure the resistance according to the value(s) in the table below.

Standard (at 20°C (68°F)):

LH:

Tester Connection	Specified Condition
1 (FL+) - 2 (FL-)	1.4 to 1.8 kΩ
1 (FL+) - Body ground	10 kΩ or higher
2 (FL-) - Body ground	10 kΩ or higher

RH:

Tester Connection	Specified Condition
1 (FR+) - 2 (FR-)	1.4 to 1.8 kΩ
1 (FR+) - Body ground	10 kΩ or higher
2 (FR-) - Body ground	10 kΩ or higher

NG

REPLACE FRONT SPEED SENSOR

NOTICE:

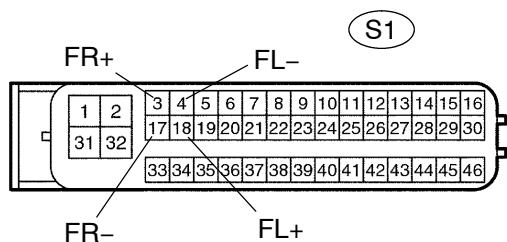
Check the speed sensor signal after replacement

(see page 05-613)

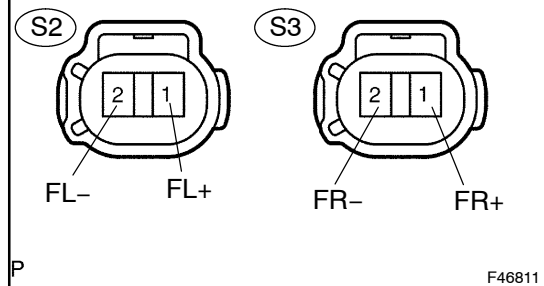
OK

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

Skid Control ECU:



Front Speed Sensor:



- Disconnect the skid control ECU S1 connector and the front speed sensor S2 and S3 connectors.
- Measure the resistance according to the value(s) in the table below.

Standard:

LH:

Tester Connection	Specified Condition
S1-18 (FL+) - S2-1 (FL+)	Below 1 Ω
S1-4 (FL-) - S2-2 (FL-)	Below 1 Ω
S1-18 (FL+) - Body ground	10 kΩ or higher
S1-4 (FL-) - Body ground	10 kΩ or higher

RH:

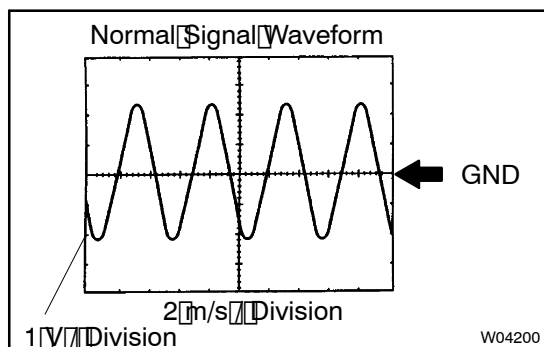
Tester Connection	Specified Condition
S1-3 (FR+) - S3-1 (FR+)	Below 1 Ω
S1-17 (FR-) - S3-2 (FR-)	Below 1 Ω
S1-3 (FR+) - Body ground	10 kΩ or higher
S1-17 (FR-) - Body ground	10 kΩ or higher

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

5 INSPECT SPEED SENSOR AND SENSOR ROTOR SERRATIONS



INSPECTION USING OSCILLOSCOPE

- Connect the oscilloscope to terminals FR+ - FR- or FL+ - FL- of the skid control ECU.
- Drive the vehicle at about 30 km/h (19 mph), and check the signal waveform.

OK:

A waveform as shown in the figure should be output.

HINT:

- As 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 scratches, looseness or foreign matter attached to it.

NG

Go to step 6

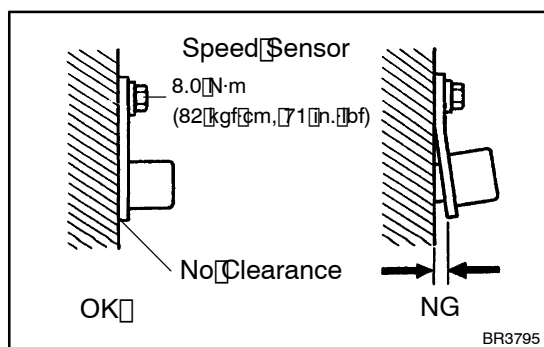
OK

REPLACE ABS & TRACTION ACTUATOR ASSY (SEE PAGE 32-20)

NOTICE:

When replacing the ABS & TRACTION actuator assy, perform zero point calibration (see page 05-610).

6 INSPECT FRONT SPEED SENSOR INSTALLATION



- Check the speed sensor installation.

OK:

- The installation bolt is tightened properly.

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

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

NG

REPLACE FRONT SPEED SENSOR

NOTICE:

Check the speed sensor signal after replacement (see page 05-613).

OK

7 INSPECT SPEED SENSOR TIP

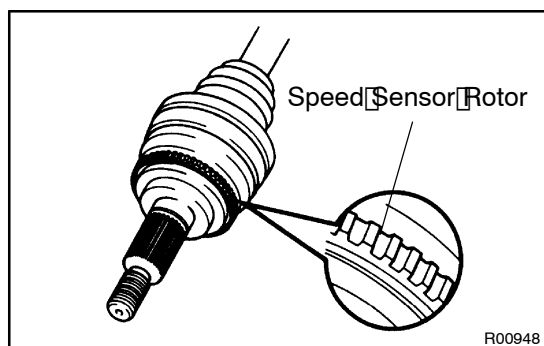
- (a) Remove the front speed sensor.
 (b) Check the sensor tip.

OK:

No scratches or foreign matter on the sensor tip.

NG**CLEAN OR REPLACE SPEED SENSOR****NOTICE:**

Check the speed sensor signal after cleaning or replacement (see page 05-613).

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.

NG**CLEAN OR REPLACE SPEED SENSOR ROTOR****NOTICE:**

Check the speed sensor signal after cleaning or replacement (see page 05-613).

OK**REPLACE ABS & TRACTION ACTUATOR ASSY (SEE PAGE 32-20)****NOTICE:**

When replacing the ABS & TRACTION actuator assy, perform zero point calibration (see page 05-610).