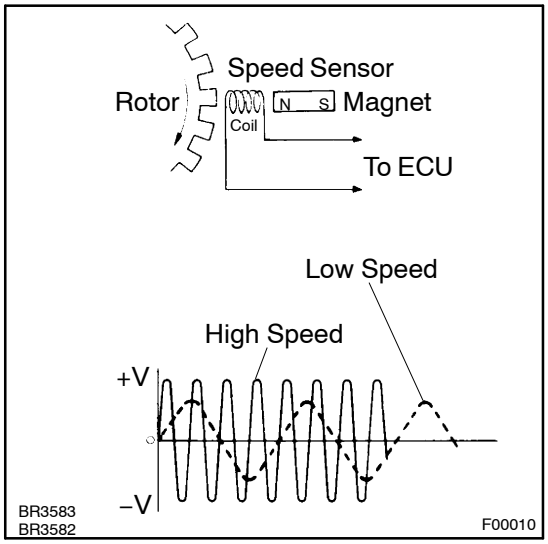
DTC	C0200/31	RIGHT FRONT SPEED SENSOR

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

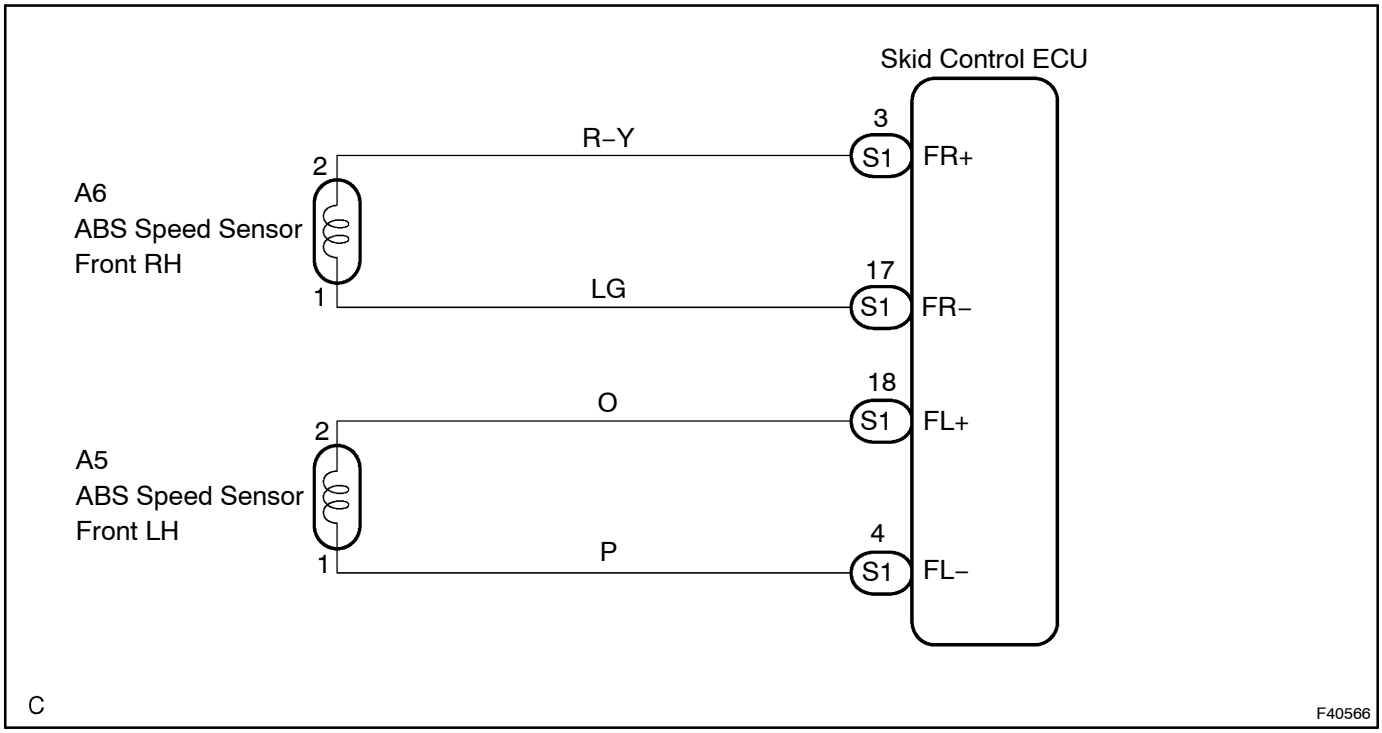


The speed sensor detects wheel speed and transmits the appropriate signals to the ECU. These signals are used for control of the ABS and VSC control systems. Each of the front and rear rotors has 48 serrations.
When the rotors rotate, the magnetic field generated by the permanent magnet in the speed sensor induces 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	(1) All the following conditions continues for at least 1 second. • Vehicle speed is more than 10 km/h (6 mph). • Open or short in vehicle speed sensor signal circuit of faulty wheel continues for 1 second or more. (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 for at least 5 seconds. • Vehicle speed is more than 20 km/h (12 mph). • Vehicle speed sensor signal receives noise.	• Right front and left front speed sensor • Each speed sensor circuit • Sensor installation

HINT:
DTC No. C0200/31 and C1330/35 is the right front speed sensor.
DTC No. C0205/32 and C1331/36 is 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 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 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 on the hand–held tester and the speed value displayed on the speedometer when driving the vehicle.

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

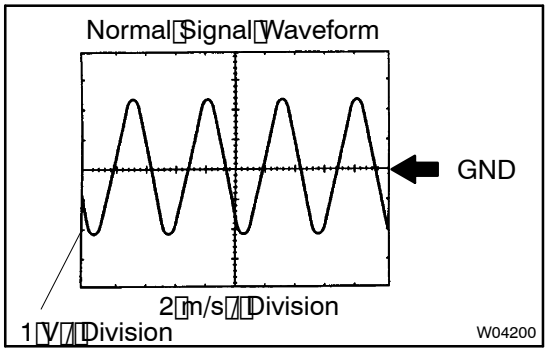
OK:
There is almost no difference from the displayed speed value.

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

NG → **Go to step 3**

OK

2	INSPECT SPEED SENSOR AND SENSOR ROTOR SERRATIONS



INSPECTION USING OSCILLOSCOPE

(a) Connect the oscilloscope to terminal 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 a figure should be output.

HINT:

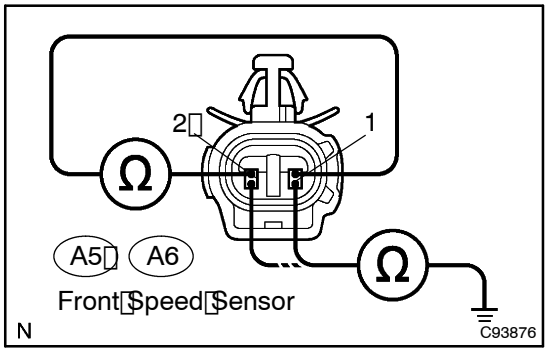
- As the vehicle speed (wheel revolution speed) increases, a cycle of the waveform narrows and the fluctuation in the output voltage becomes greater.
- When noise is identified in the waveform on the oscilloscope, error signals are generated due to the speed sensor rotor's scratches, looseness or foreign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

NG	Go to step 6

OK

REPLACE ABS & TRACTION ACTUATOR ASSY (SEE PAGE 32–43)

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.

Standard:

LH:

Tester Connection	Specified Condition
A5–1 (FL+) – A5–2 (FL–)	0.6 to 2.5 kΩ

RH:

Tester Connection	Specified Condition
A6–1 (FR+) – A6–2 (FR–)	0.6 to 2.5 kΩ

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

Standard:

LH:

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

RH:

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

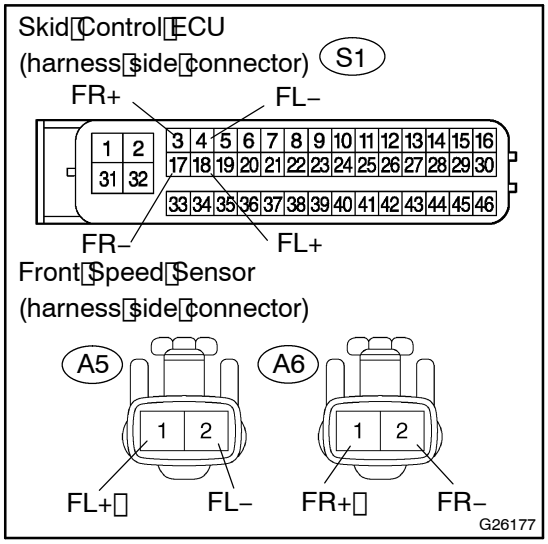
NOTICE:

Check the speed sensor signal after replacement (see page 05–234).

NG → **REPLACE FRONT SPEED SENSOR (SEE PAGE 32–45)**

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.

Standard:

LH:

Tester Connection	Specified Condition
S1–18 (FL+) – A5–1 (FL+)	Below 1 Ω
S1–4 (FL–) – A5–2 (FL–)	Below 1 Ω

RH:

Tester Connection	Specified Condition
S1–3 (FR+) – A6–1 (FR+)	Below 1 Ω
S1–17 (FR–) – A6–2 (FR–)	Below 1 Ω

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

Standard:

LH:

Tester Connection	Specified Condition
S1–18 (FL+) – Body ground	10 kΩ or higher
S1–14 (FL–) – Body ground	10 kΩ or higher

RH:

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

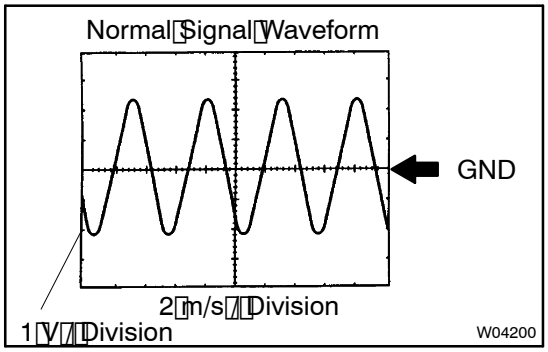
NOTICE:

Check the speed sensor signal after replacement (see page 05–234).

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

OK

5 INSPECT SPEED SENSOR AND SENSOR ROTOR SERRATIONS



INSPECTION USING OSCILLOSCOPE

(a) Connect the oscilloscope to terminal 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 a figure should be output.

HINT:

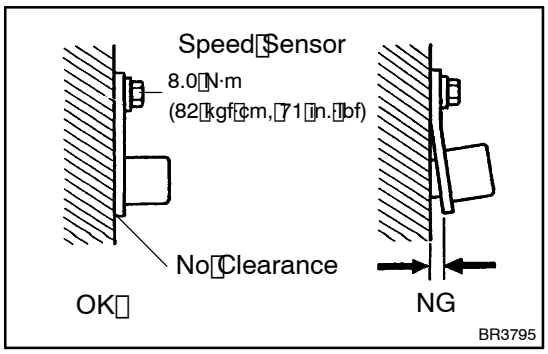
- As the vehicle speed (wheel revolution speed) increases, a cycle of the waveform narrows and the fluctuation in the output voltage becomes greater.
- When noise is identified in the waveform on the oscilloscope, error signals are generated due to the speed sensor rotor's scratches, looseness or foreign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

NG	**Go to step 6**

OK

REPLACE ABS & TRACTION ACTUATOR ASSY (SEE PAGE 32–43)

6 INSPECT FRONT SPEED SENSOR INSTALLATION



(a) 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.

NOTICE:

Check the speed sensor signal after the replacement (see page 05–234).

NG	**REPLACE FRONT SPEED SENSOR (SEE PAGE 32–45)**

OK

7	INSPECT SPEED SENSOR TIP

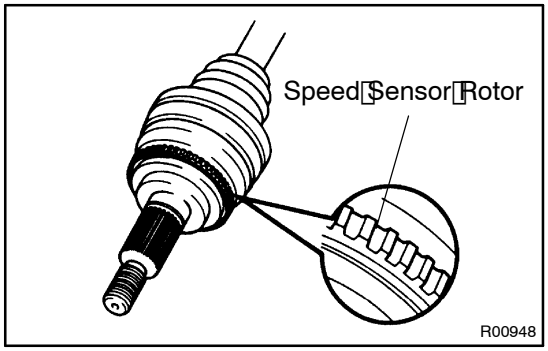
(a) Remove the front speed sensor (see page 32–45).
(b) Check the sensor tip.
OK:
No scratches or foreign matter on the sensor tip.

NOTICE:
Check the speed sensor signal (see page 05–234).

NG → **CLEAN OR REPAIR 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 (see page 05–234).

NG → **CLEAN OR REPAIR SPEED SENSOR ROTOR**

OK

REPLACE ABS & TRACTION ACTUATOR ASSY (SEE PAGE 32–43)