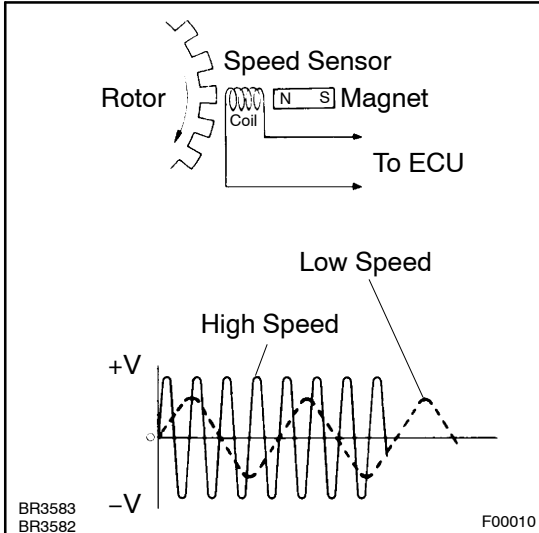


CIRCUIT INSPECTION

DTC	C0200 / 31 - C1239 / 39	Speed Sensor Circuit
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CIRCUIT DESCRIPTION



The speed sensor measures wheel speed and sends the corresponding signals to the ECU. These signals are used to control both the ABS & TRC & VSC control system. The front and rear rotors each have 48 serrations.

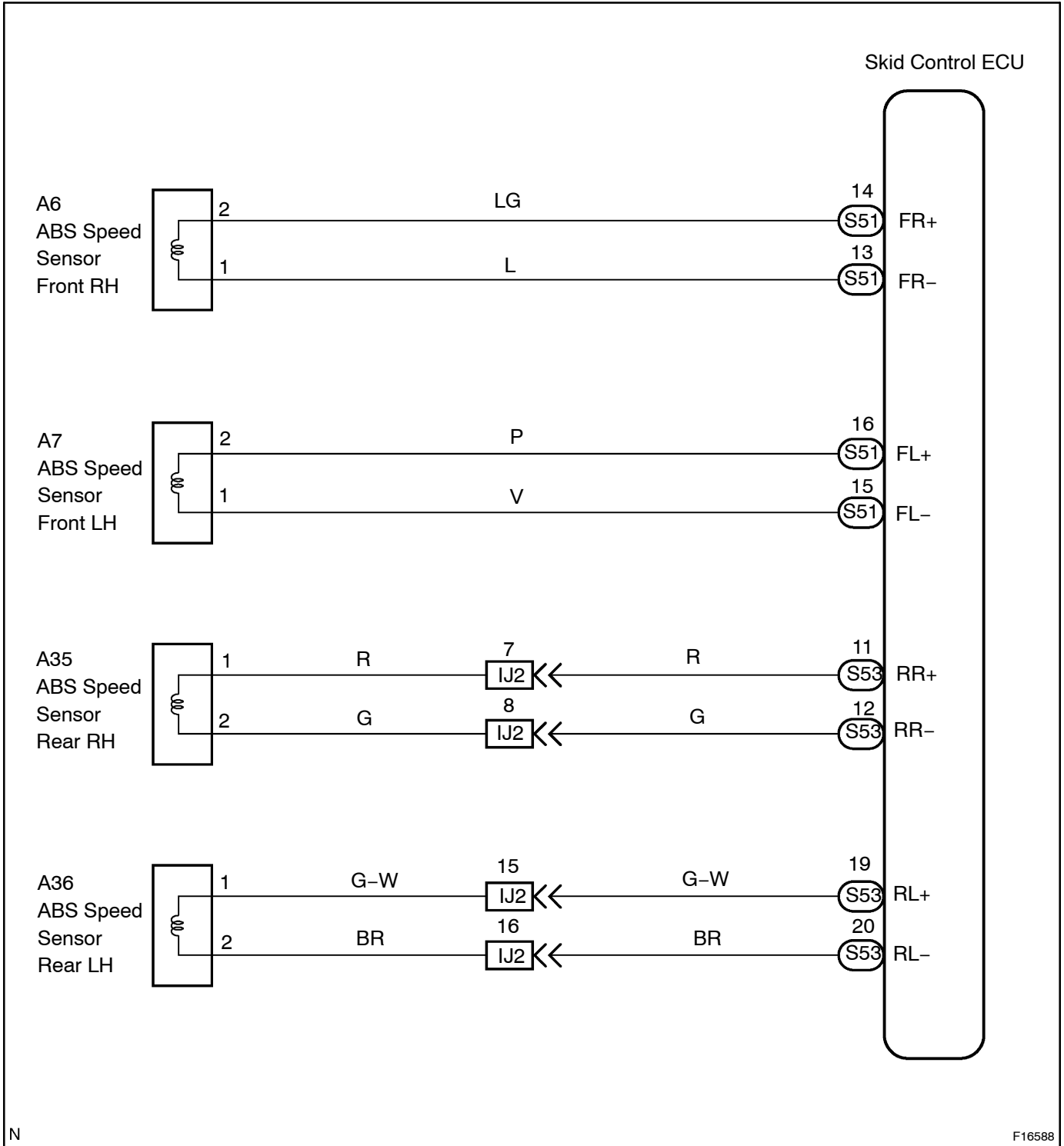
When the rotors rotate, the magnetic field emitted by the permanent magnet in the speed sensor generates an AC voltage. Since the frequency of this AC voltage changes in direct proportion to the speed of the rotor, the frequency is used by the ECU to measure the speed of each wheel.

DTC No.	DTC Detecting Condition	Trouble Area
C0200 / 31 C0205 / 32 C0210 / 33 C0215 / 34	Detection of any of conditions 1. through 3.: 1. At vehicle speed of 10 km/h (6 mph) or more, open or short circuit of the speed sensor signal circuit continues for 15 sec. 2. Momentary interruption of the speed sensor signal occurs 7 times or more. 3. Open circuit of the speed sensor signal circuit continues for 0.5 sec. or more.	<ul style="list-style-type: none"> • Right front, left front, right rear, left rear speed sensor • Each speed sensor circuit • Speed sensor rotor
C1235 / 35 C1236 / 36 C1238 / 38 C1239 / 39	Continuous noise occurs in to the speed sensor signals with the vehicle speed at 20 km/h (12 mph) or more continues for 5 sec or more.	<ul style="list-style-type: none"> • Right front, left front, right rear, left rear speed sensor • Speed sensor rotor

HINT:

- DTC No. C0200 / 31 and C1235 / 35 is for the right front speed sensor.
- DTC No. C0205 / 32 and C1236 / 36 is for the left front speed sensor.
- DTC No. C0210 / 33 and C1238 / 38 is for the right rear speed sensor.
- DTC No. C0215 / 34 and C1239 / 39 is for the left rear speed sensor.

WIRING DIAGRAM



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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	Check output value of speed sensor.
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PREPARATION:

- (a) Connect the hand-held tester to the DLC3.
- (b) Turn the ignition switch to ON and push the hand-held tester main switch to ON.
- (c) Select the DATALIST mode on the hand-held tester.

CHECK:

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.

OK:

There is almost no difference from the displayed speed value.

HINT:

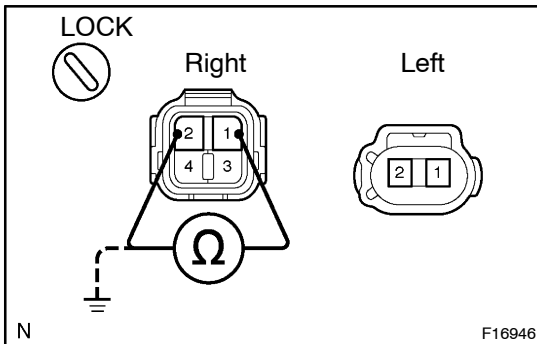
There is tolerance of $\pm 10\%$ in the speedometer indication.

OK

Go to step 4.

NG

2	Check speed sensor.
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Front:

PREPARATION:

- (a) Remove the front fender moulding and fender liner.
- (b) Make sure that there is no looseness at the connector lock part and connecting part of the connector.
- (c) Disconnect the speed sensor connector.

CHECK:

Measure resistance between terminals 1 and 2 of the speed sensor connector.

OK:

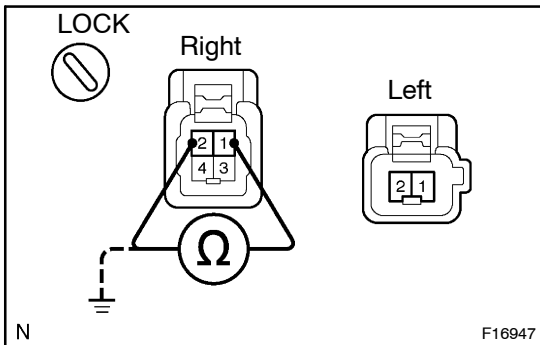
Resistance: $1.6 \pm 0.2 \text{ k}\Omega$ at 20°C

CHECK:

Measure resistance between terminals 1 and 2 of the speed sensor connector and body ground.

OK:

Resistance: $1 \text{ M}\Omega$ or higher

**Rear:****PREPARATION:**

- Remove the luggage compartment trim front cover.
- Make sure that there is no looseness at the connector lock part and connecting part of the connector.
- Disconnect the speed sensor connector.

CHECK:

Measure resistance between terminals 1 and 2 of the speed sensor connector.

OK:

Resistance: $1.1 \pm 0.2 \text{ k}\Omega$ at $20 \pm 3^\circ \text{C}$

CHECK:

Measure resistance between terminals 1 and 2 of the speed sensor connector and body ground.

OK:

Resistance: $1 \text{ M}\Omega$ or higher

**NOTICE:**

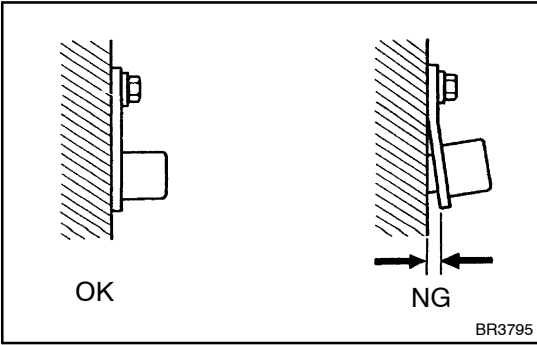
Check the speed sensor signal last (See page DI-3).



3	Check for open and short circuit in harness and connector between each speed sensor and skid control ECU (See page IN-31).
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4 Check sensor installation.



CHECK:

Check the speed sensor installation.

OK:

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

Torque: 7.8 N·m (80 kgf·cm, 69 in·lbf)

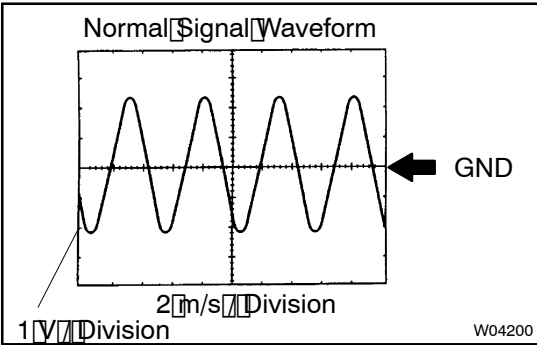
NG Replace speed sensor.

NOTICE:

Check the speed sensor signal last (See page DI-3).

OK

5 Check speed sensor and sensor rotor serrations.



(REFERENCE) INSPECTION USING OSCILLOSCOPE

PREPARATION:

- (a) Remove the skid control ECU with connectors still connected.
- (b) Connect the oscilloscope to the terminals FR+ – FR–, FL+ – FL–, RR+ – RR– or RL+ – RL– of the skid control ECU.

CHECK:

Drive the vehicle at the speed of about 20 km/h (12 mph), and check the signal waveform.

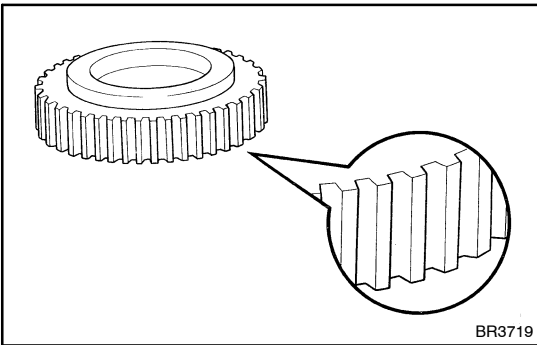
HINT:

- As the vehicle speed (rpm of the wheels) 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.

OK

Check and replace skid control ECU.

NG

6 Check sensor rotor and sensor tip.**Front:****PREPARATION:**

Remove the front axle hub and the speed sensor.

CHECK:

Check the sensor rotor serrations.

OK:**No scratches, missing teeth or foreign objects on the sensor rotor.****PREPARATION:**

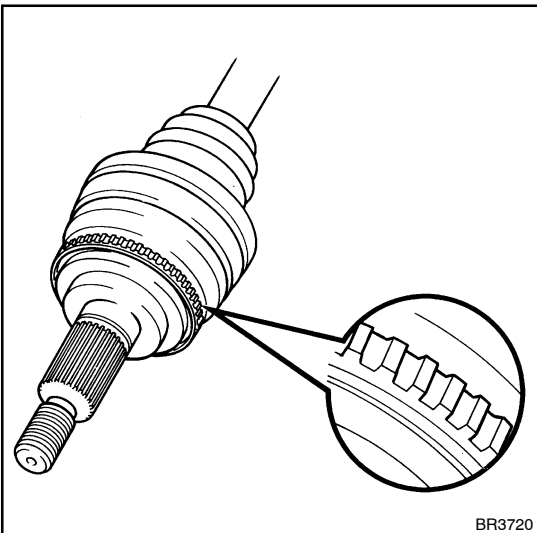
Remove the front speed sensor.

CHECK:

Check the sensor tip.

OK:**No scratches or foreign objects on the sensor tip.****HINT:**

If foreign matter (including that on the sensor rotor side) is identified, remove it and after reassembling, check the output waveform.

**Rear:****PREPARATION:**

Remove the drive shaft.

CHECK:

Check the sensor rotor serrations.

OK:**No scratches, missing teeth or foreign objects.****PREPARATION:**

Remove the rear speed sensor.

CHECK:

Check the sensor tip.

OK:**No scratches or foreign objects on the sensor tip.****HINT:**

If foreign matter (including that on the sensor rotor side) is identified, remove it and after reassembling, check the output waveform.

NG

Replace speed sensor or rotor.

NOTICE:Check the speed sensor signal last ([See page DI-3](#)).

OK

Check and replace skid control ECU.