

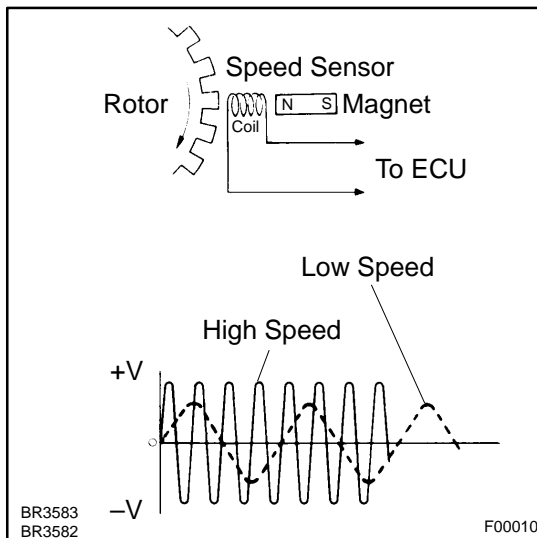
CIRCUIT INSPECTION

DTC	C0200 / 31 – C0215 / 34	Speed Sensor Circuit
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DTC	C1235 / 35, C1236 / 36	Foreign Matter is Attached on Tip
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DTC	C1238 / 38, C1239 / 39	Foreign Matter is Attached on Tip
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CIRCUIT DESCRIPTION



The speed sensor detects wheel speed and sends the appropriate signals to the ECU. These signals are used for control of the ABS 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 detect 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 4.: 1. At vehicle speed of 12 km/h (6 mph) or more, pulses are not input for 30 sec. 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. Continuous noise occurs into the speed sensor signals with the vehicle speed at 20 km/h (12 mph) or more. 4. The condition that the speed sensor signal circuit is open continues for 0.6 sec. or more.	<ul style="list-style-type: none"> • Right front, left front, right rear and left rear speed sensor • Each speed sensor circuit • Speed sensor rotor • Wire harness
C1235 / 35 C1236 / 36 C1238 / 38 C1239 / 39	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 sec. or more.	<ul style="list-style-type: none"> • Right front, left front, right rear and left rear speed sensor • Speed sensor rotor • Wire harness

HINT:

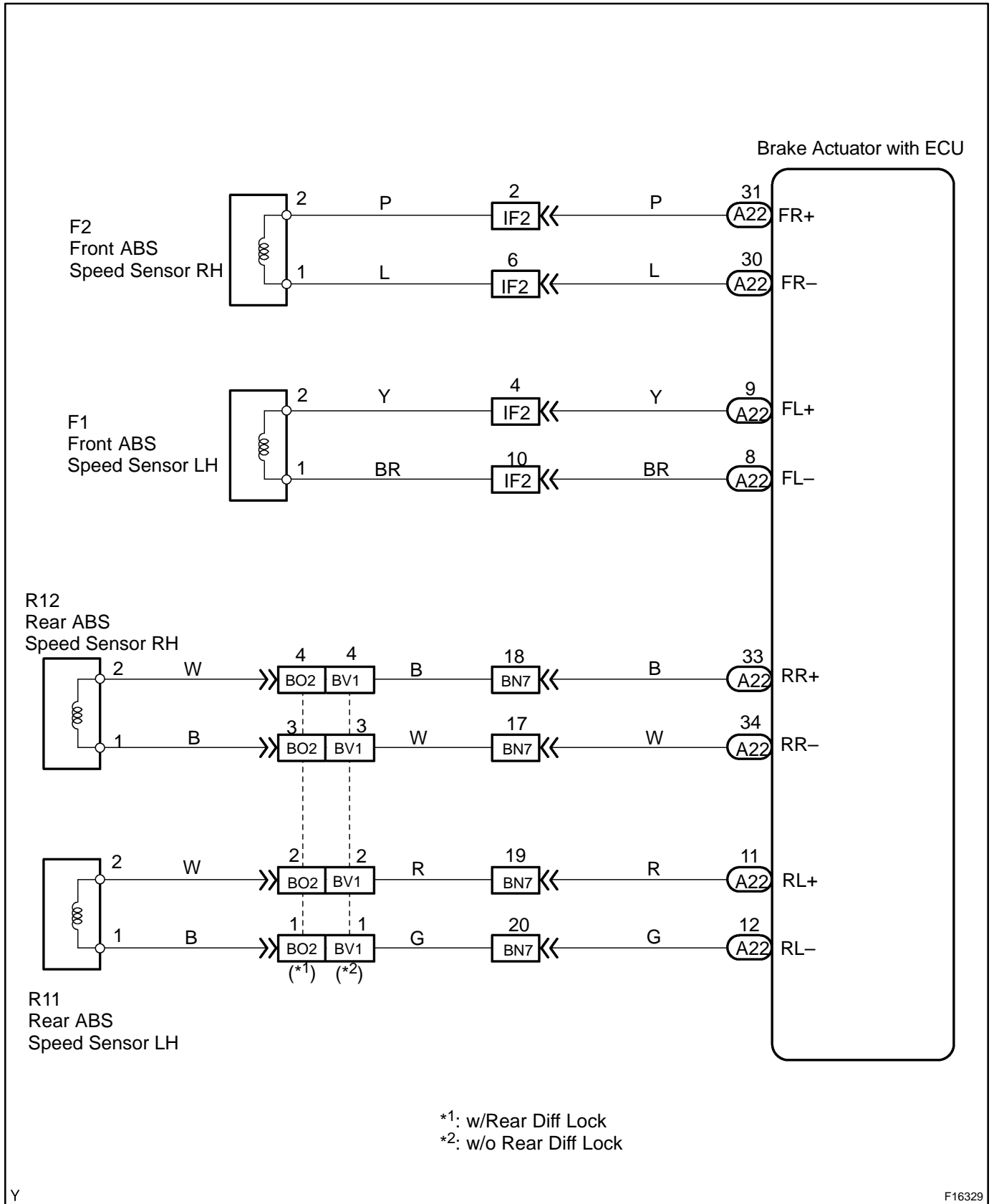
DTC No. C0200 / 31 and C1235 / 35 is for the right front speed sensor.

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 ON and push the hand-held tester main switch ON.
- (c) Select the DATA LIST mode on the hand-held tester.

CHECK:

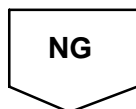
Check that there is no difference between the speed value output from the speed sensor displayed on the hand-held tester and the speed value displayed on the speedometer when driving the vehicle.

OK:

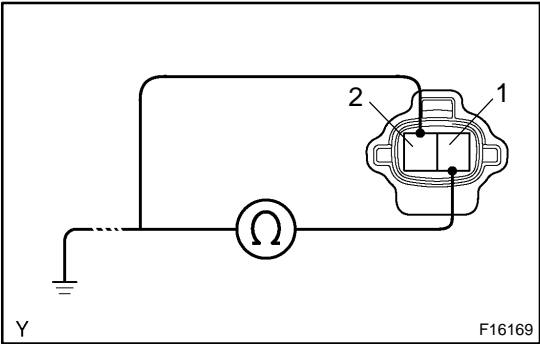
There is almost no difference from the displayed speed value.

HINT:

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



2	Check speed sensor.
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Front:

PREPARATION:

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

CHECK:

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

OK:

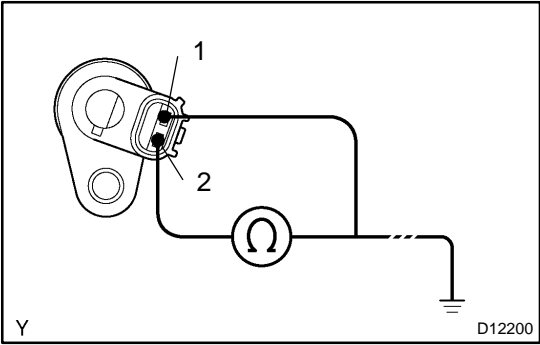
Resistance: 0.9 – 1.2 kΩ

CHECK:

Measure resistance between terminal 1 or 2 of speed sensor connector and body ground.

OK:

Resistance: 1 MΩ or higher



Rear:

PREPARATION:

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

CHECK:

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

OK:

Resistance: 0.9 – 1.3 kΩ

CHECK:

Measure resistance between terminal 1 or 2 of speed sensor connector and body ground.

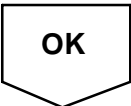
OK:

Resistance: 1 MΩ or higher

NG	Replace speed sensor.
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NOTICE:

Check the speed sensor signal last (See page [DI-534](#)).

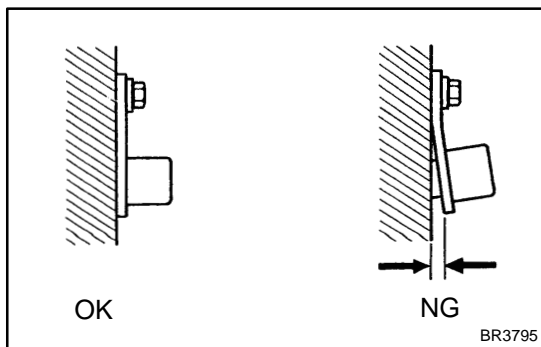


3 Check for open and short circuit in harness and connector between each speed sensor and skid control ECU (See page IN-28).

NG Repair or replace harness or connector.

OK

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: 8.0 N·m (82 kgf·cm, 71 in.-lbf)

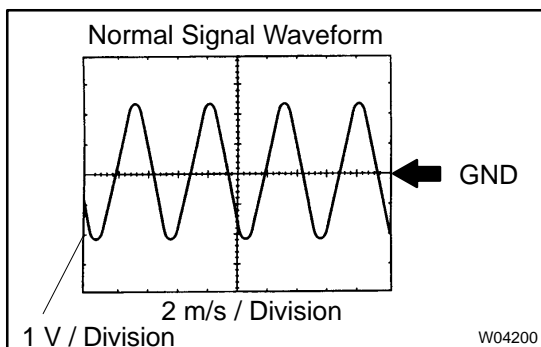
NG Replace speed sensor.

NOTICE:

Check the speed sensor signal last (See page DI-534).

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 each of terminals FR+ – FR–, FL+ – FL–, RR+ – RR– or RL+ – RL– of the ABS ECU.

CHECK:

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

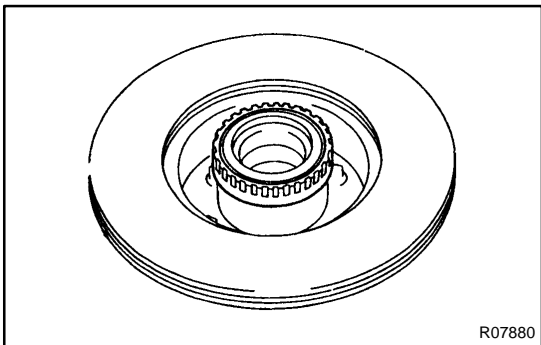
HINT:

- 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 brake actuator ASSY.

NG

6 Check sensor rotor and sensor tip.



Front:

PREPARATION:

Remove the front axle hub (See page SA-15, SA-24).

CHECK:

Check the sensor rotor serrations.

OK:

No scratches, missing teeth or foreign objects.

PREPARATION:

Remove the front speed sensor (See page BR-59).

CHECK:

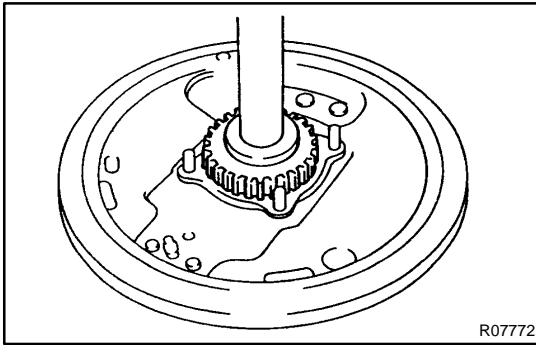
Check the sensor tip.

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 rear axle shaft (See page [SA-129](#)).

CHECK:

Check the sensor rotor serrations.

OK:

No scratches, missing teeth or foreign objects.

PREPARATION:

Remove the rear speed sensor (See page [BR-62](#)).

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-534](#)).

OK**Check and replace brake actuator ASSY.**