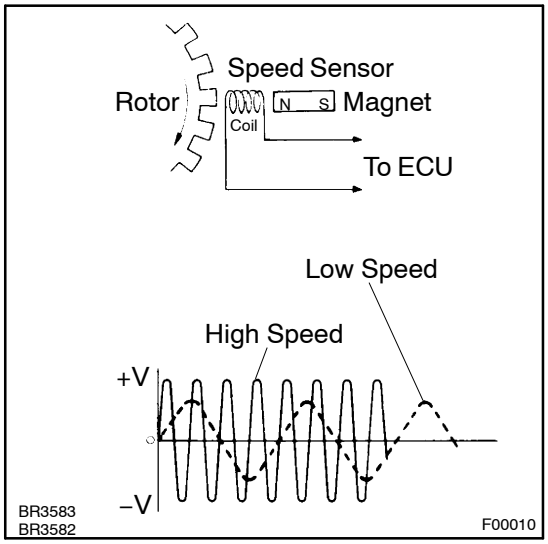
DTC	C0200/31	RIGHT FRONT SPEED SENSOR CIRCUIT

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 the wheel speed and sends the appropriate signals to the ECU. These signals are used to control the ABS control systems. Each of the front and rear rotors has 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.

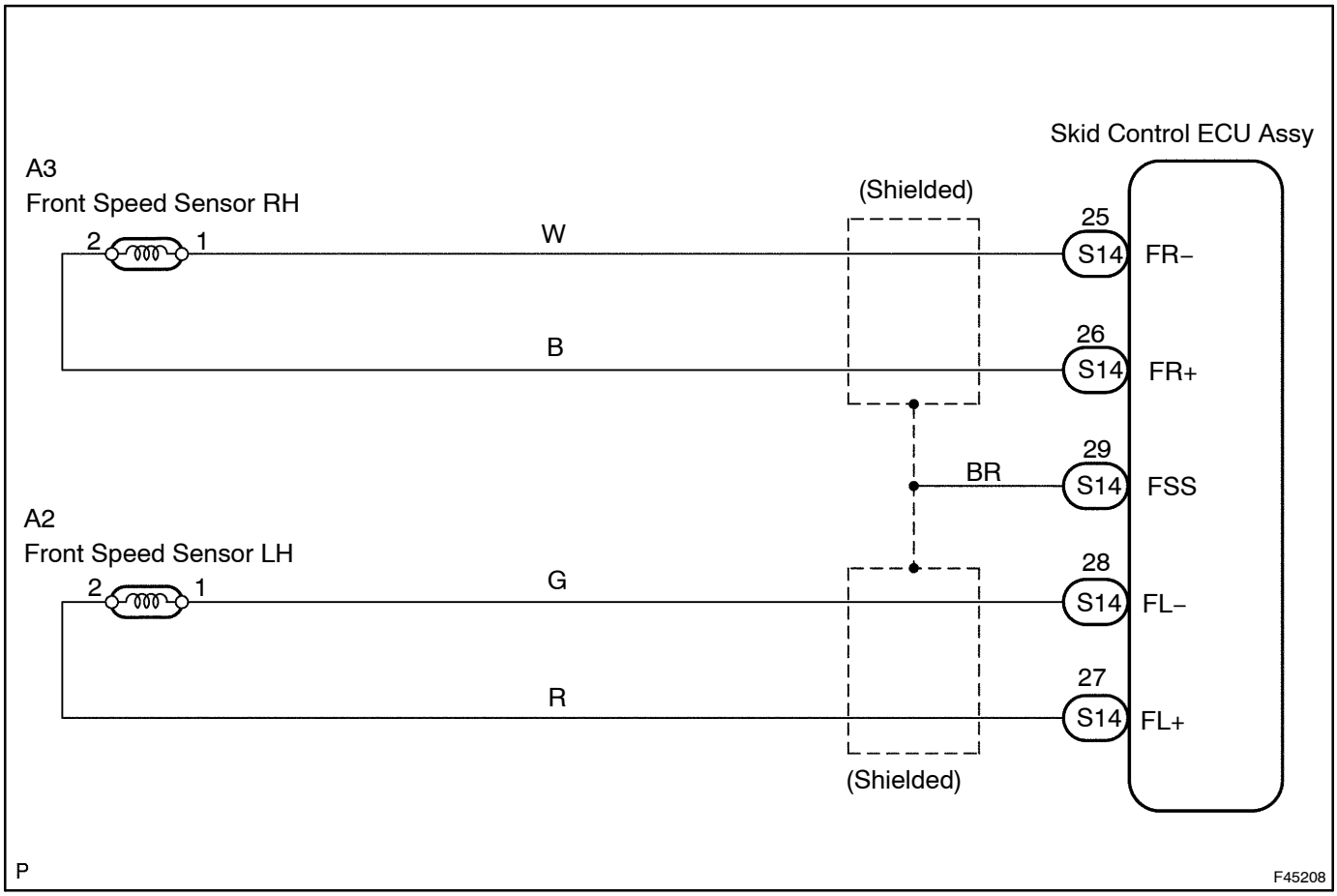
DTC No.	DTC Detection Condition	Trouble Area
C0200/31 C0205/32	Detection of any of conditions 1 to 4: 1. Vehicle speed is 10 km/h (6 mph) or more, and open or short circuit in signal circuit of each vehicle speed sensor have continued for 15 sec. or more 2. Momentary interruption of each vehicle speed sensor signal has occurred more than 7 times 3. Open circuit condition of vehicle speed sensor signal circuit has continued for more than 0.5 sec. 4. Vehicle speed is higher than 20 km/h (12 mph) and noise on abnormal wheel sensor signal continues for 5 sec. or more	• Left front speed sensor • Right front speed sensor • Each speed sensor circuit • Speed sensor rotor • Sensor installation
C1235/35 C1236/36	Continuous noise occurs for 5 seconds or more in speed sensor signals with vehicle speed at 20 km/h (12 mph) or more.	• Left front speed sensor • Right front speed sensor • Speed sensor rotor

HINT:

- DTC No. C0200/31 and C1235/35 are for the right front speed sensor.
- DTC No. C0205/32 and C1236/36 are for the left front speed sensor.
- Fail–safe function:
  If any trouble occurs in the speed sensor circuit, the ECU will prohibit ABS controls.

- For abnormality in 1 or 2 wheels, BRAKE ASSIST can be performed under the condition that the brake system is normal.
- For abnormality in 3 or 4 wheels, the ECU cuts off current to the solenoid relay and BRAKE ASSIST is prohibited. If the brake pedal is depressed firmly, the brake force may be lower than when BRAKE ASSIST was available.

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Start the inspection from step 1 if using the hand–held tester. If not, start from step 2.

1	READ VALUE OF HAND–HELD TESTER (FRONT SPEED SENSOR)

(a) Connect the hand–held tester (with 24 V VIM) 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 tester screen and the speed value displayed on the speedometer when driving the vehicle.
Skid control ECU assy:

Item	Measurement Item/ Range (Display)	Normal Condition	Diagnostic Note
WHEEL SPD FR	Wheel speed sensor (FR) reading / Min.: 0 km/h (0 mph), Max.: 255 km/h (158 mph)	Actual wheel speed	Speed indicated on speed meter
WHEEL SPD FL	Wheel speed sensor (FL) reading / Min.: 0 km/h (0 mph), Max.: 255 km/h (158 mph)	Actual wheel speed	Speed indicated on speed meter

OK:
There is almost no difference in the speed value of the speed sensor and the speedometer.

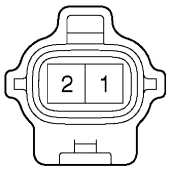
HINT:
There is a tolerance of ± 10 % in the speedometer indication.

NG → **Go to step 4**

OK

2	INSPECT FRONT SPEED SENSOR

Front Speed Sensor RH, LH



Y F48692

(a) Disconnect the sensor connector.
(b) Measure the resistance according to the table below.
Standard:

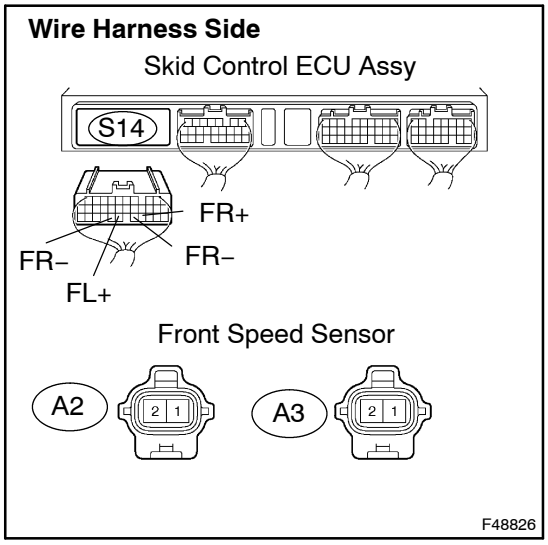
Tester Connection	Specified Condition
1 – 2	0.92 to 1.22 kΩ at 20°C (68°F)
1 – Body ground	10 kΩ or higher
2 – Body ground	10 kΩ or higher

NOTICE:
Check the speed sensor signal last (see page 05–181).

NG → **REPLACE FRONT SPEED SENSOR**

OK

3 CHECK WIRE HARNESS (SKID CONTROL ECU ASSY – FRONT SPEED SENSOR)



(a) Disconnect the S14 ECU connector.
(b) Disconnect the A2 and A3 sensor connectors.
(c) Measure the resistance according to the table below.

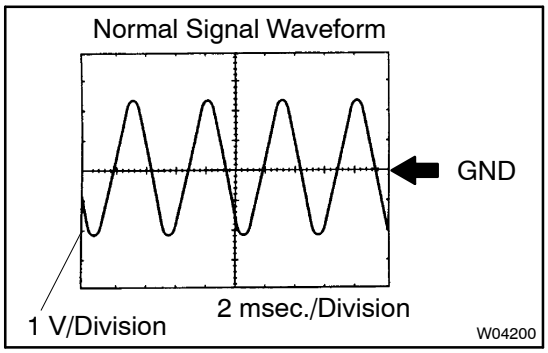
Standard:

Tester Connection	Specified Condition
S14–26 (FR+) – A3–1 (FR+)	Below 1Ω
S14–27 (FL+) – A2–1 (FL+)	Below 1Ω
S14–25 (FR–) – A3–2 (FR–)	Below 1Ω
S14–28 (FL–) – A2–2 (FL–)	Below 1Ω
A3–1 (FR+) – Body ground	10 kΩ or higher
A2–1 (FL+) – Body ground	10 kΩ or higher
A3–2 (FR–) – Body ground	10 kΩ or higher
A2–2 (FL–) – Body ground	10 kΩ or higher

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

OK

4 CHECK SPEED SENSOR AND SENSOR ROTOR SERRATIONS



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

OK:

The waveform shown in the illustration is output.

HINT:

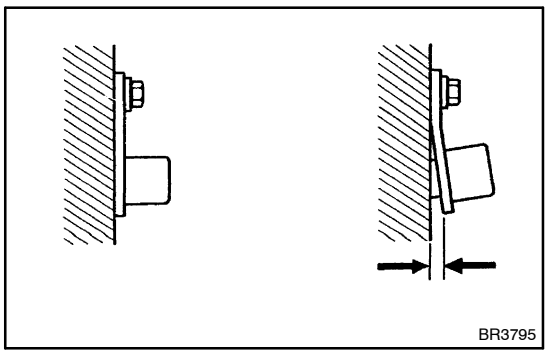
- As the vehicle speed (wheel revolution speed) increases, the signal's wavelength shortens and amplitude (output voltage) increases.
- When noise is present in the waveform, the speed sensor rotor may have scratches, be loose, have foreign objects or be broken. If so, error signals will be generated.
- When noise is present in the waveform, error signals are generated. The speed sensor rotor may have scratches, be loose or have foreign objects.

NG → **Go to step 5**

OK

REPLACE SKID CONTROL ECU ASSY (See page 01–27)

5	INSPECT SPEED SENSOR TIP



(a) Check the speed sensor installation.
OK:
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)

NOTICE:
Check the speed sensor signal last (see page 05–181).

NG → **REPLACE SPEED SENSOR FRONT**

OK

6	INSPECT SPEED SENSOR TIP

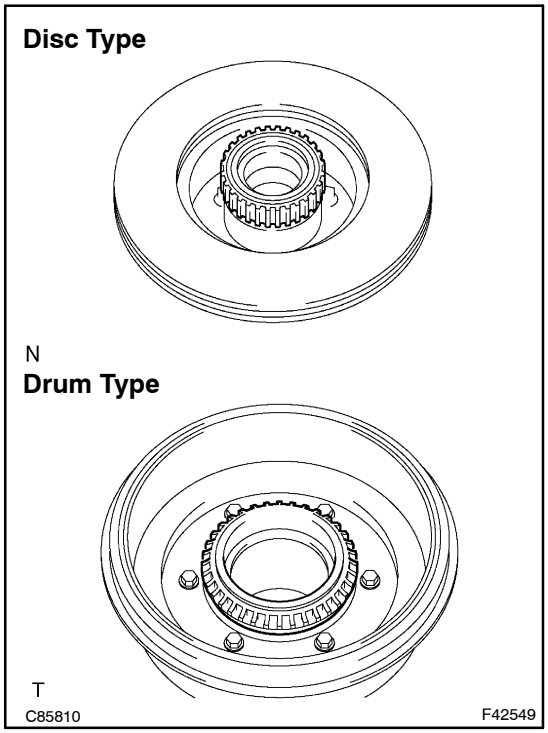
(a) Remove the front speed sensor (see Pub. No. RM1008E, page 32–89).
(b) Check the sensor tip.
OK: No scratches or foreign objects on the sensor tip.

NOTICE:
Check the speed sensor signal last (see page 05–181).

NG → **CLEAN OR REPLACE SPEED SENSOR**

OK

7 INSPECT SPEED SENSOR ROTOR



(a) Remove the front speed sensor rotor (see Pub. No. RM1008E, page 32–89).

(b) Check the sensor rotor serrations.

Standard:

No scratches, missing teeth or foreign objects.

HINT:

If a foreign object is present, remove it and check the output waveform after reassembling.

NOTICE:

Check the speed sensor signal last (see page 05–181).

NG → **CLEAN OR REPLACE SENSOR ROTOR**

OK

REPLACE SKID CONTROL ECU ASSY (See page 01–27)