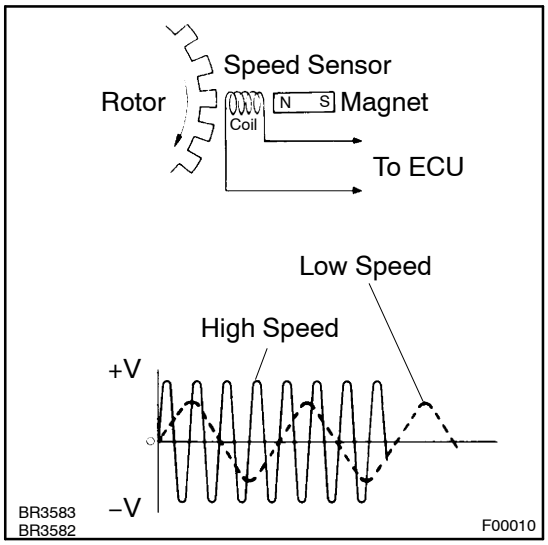
DI6X5–03

CIRCUIT INSPECTION

DTC	C0200 / 31 – C1239 / 39	Speed Sensor Circuit

CIRCUIT DESCRIPTION



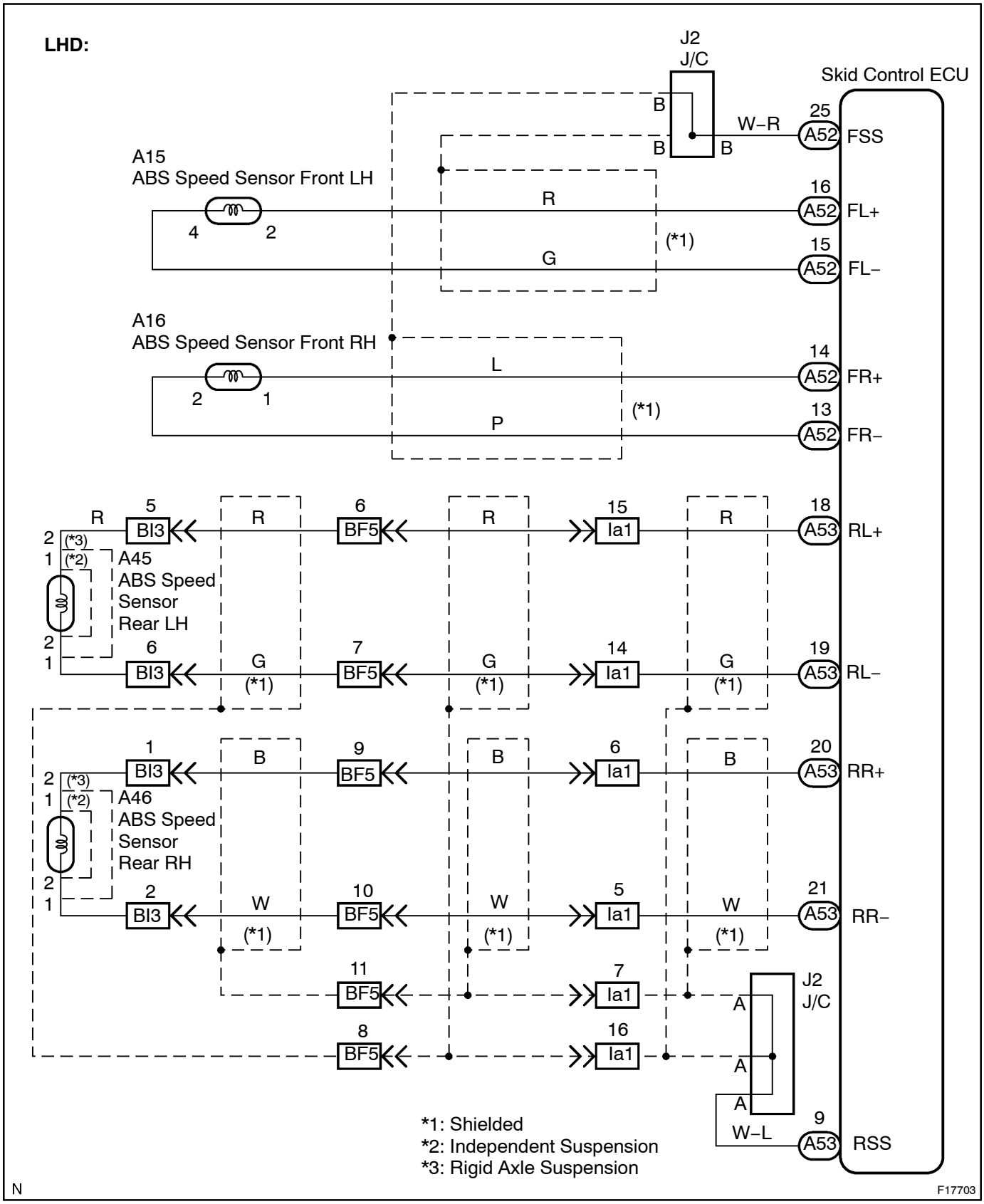
The speed sensor detects wheel speed and sends the appropriate signals to the ECU. These signals are used for control of both the ABS & BA & TRC & VSC control system. The front and rear rotors each have 48 serrations.
When the rotors rotate, the magnetic field emitted by the permanent magnet in the speed 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 detect the speed of each wheel.

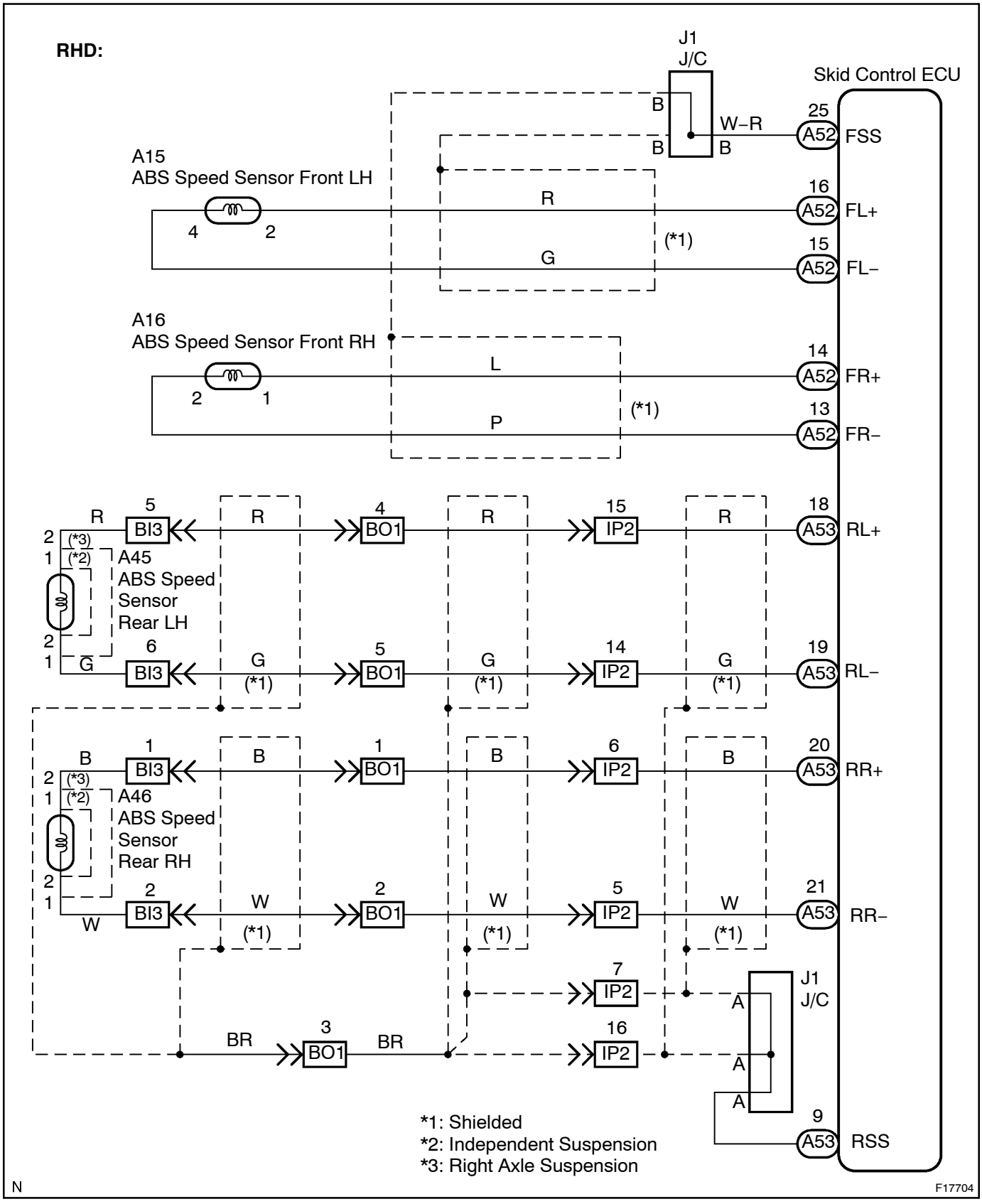
DTC No.	DTC Detecting Condition	Trouble Area
C0200 / 31 C0205 / 32 C0210 / 33 C0215 / 34	Detection of any of conditions 1. through 4.: 1. At vehicle speed of 10 km/h (6 mph) or more, pulses are not input for 15 sec. 2. Momentary interruption of the speed sensor signal occurs at least 7 times in the time 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 0.12 sec. or more.	• Right front, left front, right rear and left rear speed sensor • Each speed sensor circuit • 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.	• 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




RHD:
J1
J/C
Skid Control ECU
B
B
W–R
B
25
A52
FSS
A15
ABS Speed Sensor Front LH
4
2
R
G
(*1)
16
A52
FL+
15
A52
FL–
A16
ABS Speed Sensor Front RH
2
1
L
P
(*1)
14
A52
FR+
13
A52
FR–
R
5
BI3
R
4
BO1
R
15
IP2
R
18
A53
RL+
2
1
(*3)
(*2)
A45
ABS Speed Sensor Rear LH
2
1
G
6
BI3
G
(*1)
5
BO1
G
(*1)
14
IP2
G
(*1)
19
A53
RL–
B
1
BI3
B
1
BO1
B
6
IP2
B
20
A53
RR+
2
1
(*3)
(*2)
A46
ABS Speed Sensor Rear RH
2
1
W
2
BI3
W
(*1)
2
BO1
W
(*1)
5
IP2
W
(*1)
21
A53
RR–
7
IP2
J1
J/C
A
A
A
BR
3
BO1
BR
16
IP2
9
A53
RSS
*1: Shielded
*2: Independent Suspension
*3: Right Axle Suspension
N
F17704

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.**

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 DATALIST 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.

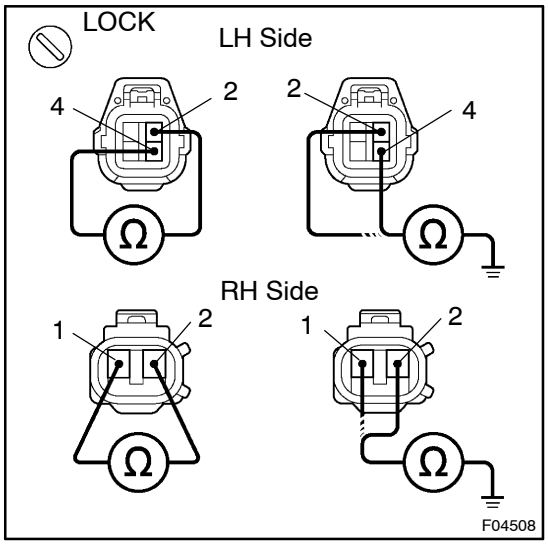
OK:
There is almost no difference from the displayed speed value.

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

OK → **Check and replace skid control ECU.**

NG

2	**Check speed sensor.**



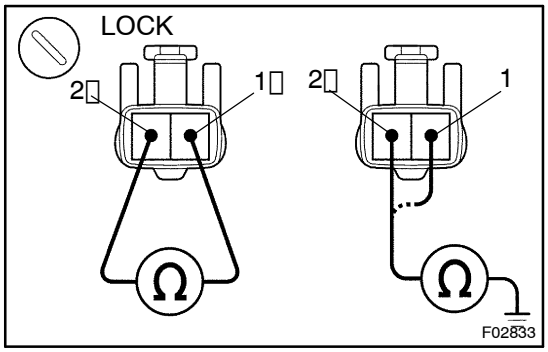
Front:

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

CHECK:
- LH side:
  Measure resistance between terminals 2 and 4 of speed sensor connector.
- RH side:
  Measure resistance between terminals 1 and 2 of speed sensor connector.

OK:
Resistance: 0.92 – 1.22 kΩ

CHECK:
- LH side:
  Measure resistance between terminals 2 and 4 of speed sensor connector and body ground.
- RH side:
  Measure resistance between terminals 1 and 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 speed sensor connector.

CHECK:

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

OK:

Resistance: 1.0 – 1.4 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.**

NOTICE:

Check the speed sensor signal (See page DI–185).

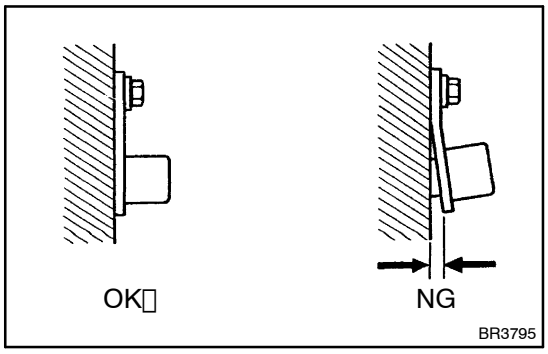
OK

3	**Check for open and short circuit in harness and connector between each speed sensor and ECU (See page IN–38).**

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 shaft.

NG	Replace speed sensor.

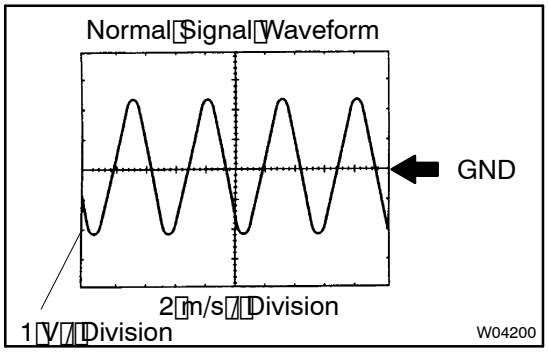
NOTICE:

Check the speed sensor signal last (See page DI–185).

OK

5	Check speed sensor and sensor rotor serrations.

(REFERENCE) INSPECTION USING OSCILLOSCOPE



PREPARATION:

(a) Remove the skid control ECU.

(b) Connect the oscilloscope to the each of terminals FR+, FL+, RR+ or RL+ and GND of the skid control ECU.

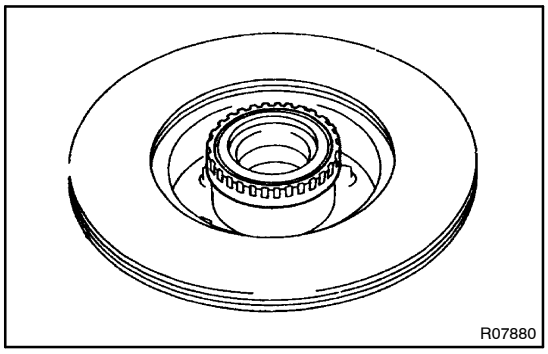
CHECK:

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

OK	Check and replace skid control ECU.

NG

6	Check sensor rotor and sensor tip.



Front:

PREPARATION:

Remove front axle hub (See Pub No. RM616E on page SA–21).

CHECK:

Check the sensor rotor serrations.

OK:

No scratches, missing teeth or foreign objects.

PREPARATION:

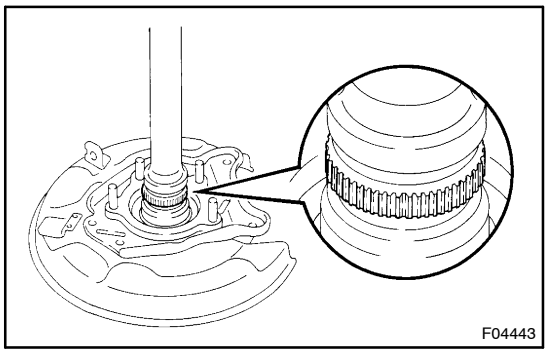
Remove front speed sensor (See Pub No. RM616E on page BR–89).

CHECK:

Check the sensor tip.

OK:

No scratches or foreign objects on the sensor tip.



Rear:

PREPARATION:

Remove the rear axle shaft (See Pub No. RM616E on page SA–161).

CHECK:

Check the sensor rotor serrations.

OK:

No scratches, missing teeth or foreign objects.

PREPARATION:

Remove rear speed sensor (See Pub No. RM616E on page BR–92).

CHECK:

Check the sensor tip.

OK:

No scratches or foreign objects on the sensor tip.

NG	Replace speed sensor or rotor.

NOTICE:

Check the speed sensor signal last (See page DI–185).

OK

Check and replace skid control ECU.