Last Modified: 12-04-2024	6.11:8.1.0	**Doc ID:** RM1000000028X31
Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [12/2022 -]
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: ELECTRONICALLY CONTROLLED BRAKE SYSTEM: C050023; Left Front Wheel Speed Sensor Signal Stuck Low; 2023 - 2024 MY Prius Prius Prime [12/2022 -]		

DTC	**C050023**	**Left Front Wheel Speed Sensor Signal Stuck Low**

DESCRIPTION

Refer to DTC C050012.

Click here INFO

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	DTC OUTPUT FROM	PRIORITY	NOTE
C050023	Left Front Wheel Speed Sensor Signal Stuck Low	Any of the following is detected: • When the +BS terminal voltage is 17.4 V or less at a vehicle speed of 10 km/h (6 mph) or more, output voltage from one of the speed sensors is less than that from the other sensors for 15 seconds or more.*2	• Speed sensor installation • Wire harness and connector • Front speed sensor LH • Front speed sensor rotor LH (front axle hub sub-assembly LH)	Comes on	Brake/EPB	A	• SAE Code: C0501 (Case 1 to 3 and 5) • Output ECU: No. 2 skid control ECU (brake actuator assembly)

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	DTC OUTPUT FROM	PRIORITY	NOTE
		• When the +BS terminal voltage is 17.4 V or less at a vehicle speed of 10 km/h (6 mph) or more, output voltage from one of the speed sensors is less than that from the other sensors for 30 seconds or more.*1 • When the +BS terminal voltage is 17.4 V or less at a vehicle speed of 10 km/h (6 mph) or more, output from one of the speed sensors is 0 km/h (0 mph) for 1					

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	DTC OUTPUT FROM	PRIORITY	NOTE
		second or more. • When the +BS terminal voltage is 17.4 V or less at a vehicle speed of 10 km/h (6 mph) or more, outputs from both front speed sensors are 0 km/h (0 mph) for 15 seconds or more.*2 • When the +BS terminal voltage is 17.4 V or less at a vehicle speed of 10 km/h (6 mph) or more, outputs from both front speed sensors are 0 km/h (0 mph) for 30 seconds					

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	DTC OUTPUT FROM	PRIORITY	NOTE
		or more.*1 • A vehicle speed is 30 km/h (19 mph) or more and the rotation direction of one of the wheels is different from those of other 3 wheels as well as it is not detected for 3 second or more.					

*1: for AWD
*2: for 2WD

MONITOR DESCRIPTION

C0501 (Case 1 to 3):

When the vehicle is being driven, if the value of the speed sensor which is outputting the lowest vehicle speed is significantly lower than the values of the other speed sensors, or the value of the speed sensor which is outputting the lowest vehicle speed is 0 km/h (0 mph), the No. 2 skid control ECU (brake actuator assembly) judges that the speed sensor is malfunctioning and illuminates the MIL and stores this DTC.

Also, when a wheel speed is being output (the wheel is not locked), if the output values of the speed sensors for 2 wheels are stuck at 0 km/h (0 mph), the No. 2 skid control ECU (brake actuator assembly) judges that a speed sensor is malfunctioning and illuminates the MIL and stores this DTC.

C0501 (Case 5):

When the vehicle is being driven at a certain speed or more, the rotational direction of 3 wheels is determined, and the rotational direction of 1 wheel is not determined for a certain amount of time, the No. 2 skid control ECU (brake actuator assembly) judges that the speed sensor is malfunctioning and illuminates the MIL and stores this DTC.

MONITOR STRATEGY

Related DTCs	C0501 (Case 1): Wheel speed sensor (FL) range/performance (correlation A) C0501 (Case 2): Wheel speed sensor (FL) range/performance (2 wheels) C0501 (Case 3): Wheel speed sensor (FL) range/performance (correlation B) C0501 (Case 5): Wheel speed sensor (FL) range/performance (rotatory direction)
Required Sensors/Components(Main)	Speed sensor Speed sensor rotor
Required Sensors/Components(Related)	No. 2 skid control ECU (brake actuator assembly) Stop light switch assembly Speed sensor
Frequency of Operation	Continuous
Duration	1 second: C0501 (Case 3) 3 seconds: C0501 (Case 5) 30 seconds: C0501 (Case 1 and 2)
MIL Operation	Immediately
Sequence of Operation	None

TYPICAL ENABLING CONDITIONS

Case 1

Monitor runs whenever the following DTCs are not stored	C0501 (Case 2): Wheel speed sensor (FL) range/performance (2 wheels) C0501 (Case 4): Wheel speed sensor (FL) range/performance (pulse output high) C0502: Wheel speed sensor (FL) voltage circuit open C0503: Wheel speed sensor (FL) voltage circuit high C0504 (Case 1): Wheel speed sensor (FL) intermittent/erratic (moment open) C0504 (Case 2): Wheel speed sensor (FL) intermittent/erratic (a piece of metal noise) C0504 (Case 3): Wheel speed sensor (FL) intermittent/erratic (a piece of metal rotor noise) C0507 (Case 2): Wheel speed sensor (FR) range/performance (2 wheels) C0507 (Case 4): Wheel speed sensor (FR) range/performance (pulse output high) C0508: Wheel speed sensor (FR) voltage circuit open C0509: Wheel speed sensor (FR) voltage circuit high C050A (Case 1): Wheel speed sensor (FR) intermittent/erratic (moment open) C050A (Case 2): Wheel speed sensor (FR) intermittent/erratic (a piece of metal noise) C050A (Case 3): Wheel speed sensor (FR) intermittent/erratic (a piece of metal rotor noise)

	C050D (Case 2): Wheel speed sensor (RL) range/performance (2 wheels) C050D (Case 4): Wheel speed sensor (RL) range/performance (pulse output high) C050E: Wheel speed sensor (RL) voltage circuit open C050F: Wheel speed sensor (RL) voltage circuit high C0510 (Case 1): Wheel speed sensor (RL) intermittent/erratic (moment open) C0510 (Case 2): Wheel speed sensor (RL) intermittent/erratic (a piece of metal noise) C0510 (Case 3): Wheel speed sensor (RL) intermittent/erratic (a piece of metal rotor noise) C0513 (Case 2): Wheel speed sensor (RR) range/performance (2 wheels) C0513 (Case 4): Wheel speed sensor (RR) range/performance (pulse output high) C0514: Wheel speed sensor (RR) voltage circuit open C0515: Wheel speed sensor (RR) voltage circuit high C0516 (Case 1): Wheel speed sensor (RR) intermittent/erratic (moment open) C0516 (Case 2): Wheel speed sensor (RR) intermittent/erratic (a piece of metal noise) C0516 (Case 3): Wheel speed sensor (RR) intermittent/erratic (a piece of metal rotor noise) C137D: Brake system voltage circuit high C14E1 (Case 1): Wheel speed sensor (FL) voltage circuit low C14E1 (Case 2): Wheel speed sensor (FL) voltage circuit low (continuation) C14E4 (Case 1): Wheel speed sensor (FR) voltage circuit low C14E4 (Case 2): Wheel speed sensor (FR) voltage circuit low (continuation) C14E7 (Case 1): Wheel speed sensor (RL) voltage circuit low C14E7 (Case 2): Wheel speed sensor (RL) voltage circuit low (continuation) C14EA (Case 1): Wheel speed sensor (RR) voltage circuit low C14EA (Case 2): Wheel speed sensor (RR) voltage circuit low (continuation)
All of the following conditions are met	A, B, C, D, E, F, G and H
A. Chassis dynamometer mode	Off
B. Following condition is met	More than 0.012 seconds
IGR voltage	3.5 V or higher
C. Command to all ABS hold solenoids	Off
D. Command to all ABS release solenoids	Off
E. Following condition is met	More than 0.22 seconds

+BS voltage	17.4 V or less
F. Difference between the highest speed sensor output value and the second lowest speed sensor output value	Less than 20% of the highest speed sensor output value
G. The second lowest speed sensor output value	60 Hz + 2 km/h (1.24 mph) or more
H. IGP voltage	Higher than 10 V

Case 2

Monitor runs whenever the following DTCs are not stored	C0501 (Case 4): Wheel speed sensor (FL) range/performance (pulse output high) C0502: Wheel speed sensor (FL) voltage circuit open C0503: Wheel speed sensor (FL) voltage circuit high C0504 (Case 1): Wheel speed sensor (FL) intermittent/erratic (moment open) C0504 (Case 2): Wheel speed sensor (FL) intermittent/erratic (a piece of metal noise) C0504 (Case 3): Wheel speed sensor (FL) intermittent/erratic (a piece of metal rotor noise) C0507 (Case 4): Wheel speed sensor (FR) range/performance (pulse output high) C0508: Wheel speed sensor (FR) voltage circuit open C0509: Wheel speed sensor (FR) voltage circuit high C050A (Case 1): Wheel speed sensor (FR) intermittent/erratic (moment open) C050A (Case 2): Wheel speed sensor (FR) intermittent/erratic (a piece of metal noise) C050A (Case 3): Wheel speed sensor (FR) intermittent/erratic (a piece of metal rotor noise) C050D (Case 4): Wheel speed sensor (RL) range/performance (pulse output high) C050E: Wheel speed sensor (RL) voltage circuit open C050F: Wheel speed sensor (RL) voltage circuit high C0510 (Case 1): Wheel speed sensor (RL) intermittent/erratic (moment open) C0510 (Case 2): Wheel speed sensor (RL) intermittent/erratic (a piece of metal noise) C0510 (Case 3): Wheel speed sensor (RL) intermittent/erratic (a piece of metal rotor noise) C0513 (Case 4): Wheel speed sensor (RR) range/performance (pulse output high) C0514: Wheel speed sensor (RR) voltage circuit open C0515: Wheel speed sensor (RR) voltage circuit high C0516 (Case 1): Wheel speed sensor (RR) intermittent/erratic (moment open) C0516 (Case 2): Wheel speed sensor (RR) intermittent/erratic (a piece of metal noise) C0516 (Case 3): Wheel speed sensor (RR) intermittent/erratic (a piece of metal rotor noise) C137D: Brake system voltage circuit high

	C14E1 (Case 1): Wheel speed sensor (FL) voltage circuit low C14E1 (Case 2): Wheel speed sensor (FL) voltage circuit low (continuation) C14E4 (Case 1): Wheel speed sensor (FR) voltage circuit low C14E4 (Case 2): Wheel speed sensor (FR) voltage circuit low (continuation) C14E7 (Case 1): Wheel speed sensor (RL) voltage circuit low C14E7 (Case 2): Wheel speed sensor (RL) voltage circuit low (continuation) C14EA (Case 1): Wheel speed sensor (RR) voltage circuit low C14EA (Case 2): Wheel speed sensor (RR) voltage circuit low (continuation)
All of the following conditions are met	A, B, C, D, E, F, G, H and I
A. Chassis dynamometer mode	Off
B. Following condition is met	More than 0.012 seconds
IGR voltage	3.5 V or higher
C. Command to all ABS hold solenoids	Off
D. Command to all ABS release solenoids	Off
E. Following condition is met	More than 0.22 seconds
+BS voltage	17.4 V or less
F. Brake pedal operation	Off
G. Parking brake	Off
H. Difference between the highest speed sensor output value and the second highest speed sensor output value	Less than 20% of the highest speed sensor output value
I. The second highest speed sensor output value	60 Hz + 2 km/h (1.24 mph) or more

Case 3

Monitor runs whenever the following DTCs are not stored	C0501 (Case 1): Wheel speed sensor (FL) range/performance (correlation A) C0501 (Case 2): Wheel speed sensor (FL) range/performance (2 wheels) C0501 (Case 4): Wheel speed sensor (FL) range/performance (pulse output high) C0502: Wheel speed sensor (FL) voltage circuit open C0503: Wheel speed sensor (FL) voltage circuit high C0504 (Case 1): Wheel speed sensor (FL) intermittent/erratic (moment open) C0504 (Case 2): Wheel speed sensor (FL) intermittent/erratic (a piece of metal noise) C0504 (Case 3): Wheel speed sensor (FL) intermittent/erratic (a piece of metal rotor noise)

C0507 (Case 1): Wheel speed sensor (FR) range/performance (correlation A)
C0507 (Case 2): Wheel speed sensor (FR) range/performance (2 wheels)
C0507 (Case 3): Wheel speed sensor (FR) range/performance (correlation B)
C0507 (Case 4): Wheel speed sensor (FR) range/performance (pulse output high)
C0508: Wheel speed sensor (FR) voltage circuit open
C0509: Wheel speed sensor (FR) voltage circuit high
C0510 (Case 1): Wheel speed sensor (RL) intermittent/erratic (moment open)
C0510 (Case 2): Wheel speed sensor (RL) intermittent/erratic (a piece of metal noise)
C0510 (Case 3): Wheel speed sensor (RL) intermittent/erratic (a piece of metal rotor noise)
C0513 (Case 1): Wheel speed sensor (RR) range/performance (correlation A)
C0513 (Case 2): Wheel speed sensor (RR) range/performance (2 wheels)
C0513 (Case 3): Wheel speed sensor (RR) range/performance (correlation B)
C0513 (Case 4): Wheel speed sensor (RR) range/performance (pulse output high)
C0514: Wheel speed sensor (RR) voltage circuit open
C0515: Wheel speed sensor (RR) voltage circuit high
C0516 (Case 1): Wheel speed sensor (RR) intermittent/erratic (moment open)
C0516 (Case 2): Wheel speed sensor (RR) intermittent/erratic (a piece of metal noise)
C0516 (Case 3): Wheel speed sensor (RR) intermittent/erratic (a piece of metal rotor noise)
C050A (Case 1): Wheel speed sensor (FR) intermittent/erratic (moment open)
C050A (Case 2): Wheel speed sensor (FR) intermittent/erratic (a piece of metal noise)
C050A (Case 3): Wheel speed sensor (FR) intermittent/erratic (a piece of metal rotor noise)
C050D (Case 1): Wheel speed sensor (RL) range/performance (correlation A)
C050D (Case 2): Wheel speed sensor (RL) range/performance (2 wheels)
C050D (Case 3): Wheel speed sensor (RL) range/performance (correlation B)
C050D (Case 4): Wheel speed sensor (RL) range/performance (pulse output high)
C050E: Wheel speed sensor (RL) voltage circuit open
C050F: Wheel speed sensor (RL) voltage circuit high
C051C (Case 1): Acceleration sensor range/Performance (acceleration sensor lock)
C051C (Case 2): Acceleration sensor range/Performance (GL1, GL2 lock)

C051C (Case 3): Acceleration sensor range/Performance (acceleration sensor output)
C051D: Acceleration sensor missing calibration
C051E: Acceleration sensor intermittent/erratic
C0520 (Case 1): Acceleration sensor (GL1, GL2) out of range
C0520 (Case 2): Acceleration sensor GL2 out of range
C0520 (Case 3): Acceleration sensor internal check
C052B (Case 1 to 7): ABS pump motor performance (gate voltage)
C052B (Case 8): ABS pump motor performance (motor relay current)
C052B (Case 9): ABS pump motor performance (freewheeling MOS current)
C052D: ABS pump motor circuit high
C052E (Case 1 to 4): ABS pump motor circuit open (motor circuit)
C052E (Case 5 and 6): ABS pump motor circuit open (motor relay)
C053D: Master cylinder pressure sensor exceeded learning limit
C0540 (Case 1): Pressure sensor lost communication
C0540 (Case 2): Pressure sensor internal check
C0540 (Case 3): Pressure sensor invalid data
C0555: Wheel speed sensor (FL) range/performance
C0556: Wheel speed sensor (FR) range/performance
C0557: Wheel speed sensor (RL) range/performance
C0558: Wheel speed sensor (RR) range/performance
C056B: Pressure sensor intermittent/erratic
C0597: ABS hold solenoid performance
C05C1: Brake pedal position sensor learning not complete
C1103 (Case 1): Brake pedal position sensor voltage circuit open
C122E: Pressure sensor voltage circuit low
C122F: Pressure sensor voltage circuit high
C1240: Yaw rate and acceleration sensor incorrect
C124A: Identification signal
C12A7 (Case 1 and 2): ABS hold solenoid (FL) circuit open
C12A7 (Case 3): ABS hold solenoid (FL) circuit low
C12A8 (Case 1): ABS hold solenoid (FL) circuit high (solenoid Off current)
C12A8 (Case 2 and 3): ABS hold solenoid (FL) circuit high (IC data)
C12A8 (Case 4): ABS hold solenoid (FL) circuit high (solenoid On current)
C12B2: ABS release solenoid (FL) circuit low
C12B3: ABS release solenoid (FL) circuit high
C12BD (Case 1 and 2): ABS hold solenoid (FR) circuit open

C12BD (Case 3): ABS hold solenoid (FR) circuit low
C12BE (Case 1): ABS hold solenoid (FR) circuit high (solenoid Off current)
C12BE (Case 2 and 3): ABS hold solenoid (FR) circuit high (IC data)
C12BE (Case 4): ABS hold solenoid (FR) circuit high (solenoid On current)
C12C8: ABS release solenoid (FR) circuit low
C12C9: ABS release solenoid (FR) circuit high
C12D3 (Case 1 and 2): ABS hold solenoid (RL) circuit open
C12D3 (Case 3): ABS hold solenoid (RL) circuit low
C12D4 (Case 1): ABS hold solenoid (RL) circuit high (solenoid Off current)
C12D4 (Case 2 and 3): ABS hold solenoid (RL) circuit high (IC data)
C12D4 (Case 4): ABS hold solenoid (RL) circuit high (solenoid On current)
C12DE: ABS release solenoid (RL) circuit low
C12DF: ABS release solenoid (RL) circuit high
C12E9 (Case 1 and 2): ABS hold solenoid (RR) circuit open
C12E9 (Case 3): ABS hold solenoid (RR) circuit low
C12EA (Case 1): ABS hold solenoid (RR) circuit high (solenoid Off current)
C12EA (Case 2 and 3): ABS hold solenoid (RR) circuit high (IC data)
C12EA (Case 4): ABS hold solenoid (RR) circuit high (solenoid On current)
C12F4: ABS release solenoid (RR) circuit low
C12F5: ABS release solenoid (RR) circuit high
C12F6: ABS hold solenoid other functional
C12F7: ABS hold solenoid other functional
C13BF: SM solenoid other functional
C13C2 (Case 1 and 2): SM1 solenoid circuit open
C13C2 (Case 3): SM1 solenoid circuit low
C13C3 (Case 1): SM1 solenoid circuit high (solenoid Off current)
C13C3 (Case 2 and 3): SM1 solenoid circuit high (IC data)
C13C3 (Case 4): SM1 solenoid circuit high (solenoid On current)
C13CB (Case 1 and 2): SM2 solenoid circuit open
C13CB (Case 3): SM2 solenoid circuit low
C13CC (Case 1): SM2 solenoid circuit high (solenoid Off current)
C13CC (Case 2 and 3): SM2 solenoid circuit high (IC data)
C13CC (Case 4): SM2 solenoid circuit high (solenoid On current)
C137D: Brake system voltage circuit high

	C1427: ABS pump motor stuck C143B: Brake system voltage power supply relay circuit high C143C: Brake system voltage power supply relay circuit open C14E1 (Case 1): Wheel speed sensor (FL) voltage circuit low C14E1 (Case 2): Wheel speed sensor (FL) voltage circuit low (continuation) C14E4 (Case 1): Wheel speed sensor (FR) voltage circuit low C14E4 (Case 2): Wheel speed sensor (FR) voltage circuit low (continuation) C14E7 (Case 1): Wheel speed sensor (RL) voltage circuit low C14E7 (Case 2): Wheel speed sensor (RL) voltage circuit low (continuation) C14EA (Case 1): Wheel speed sensor (RR) voltage circuit low C14EA (Case 2): Wheel speed sensor (RR) voltage circuit low (continuation) P05DB: Brake pedal position sensor invalid data P05DD: Brake pedal position sensor circuit open P05DE: Brake pedal position sensor circuit high P05DF: Brake pedal position sensor intermittent/erratic P05E0: Brake pedal position sensor "A"/"B" correlation U0125: Lost communication with multi-axis acceleration sensor module
All of the following conditions are met	A, B, C, D, E, F, G, H and I
A. Chassis dynamometer mode	Off
B. Following condition is met	More than 0.012 seconds
IGR voltage	3.5 V or higher
C. Command to all ABS hold solenoids	Off
D. Command to all ABS release solenoids	Off
E. Following condition is met	More than 0.22 seconds
+BS voltage	17.4 V or less
F. Brake pedal operation	Off
G. Parking brake	Off
H. Difference between the highest speed sensor output value and the second lowest speed sensor output value	Less than 2 km/h (1.24 mph)
I. BM voltage	6 V or higher

Case 5

Monitor runs whenever the following DTCs are not stored	C0501 (Case 4): Wheel speed sensor (FL) range/performance (pulse output high)

	C0502: Wheel speed sensor (FL) voltage circuit open C0503: Wheel speed sensor (FL) voltage circuit high C0504 (Case 1): Wheel speed sensor (FL) intermittent/erratic (moment open) C0504 (Case 2): Wheel speed sensor (FL) intermittent/erratic (a piece of metal noise) C0504 (Case 3): Wheel speed sensor (FL) intermittent/erratic (a piece of metal rotor noise) C0507 (Case 4): Wheel speed sensor (FR) range/performance (pulse output high) C0508: Wheel speed sensor (FR) voltage circuit open C0509: Wheel speed sensor (FR) voltage circuit high C050A (Case 1): Wheel speed sensor (FR) intermittent/erratic (moment open) C050A (Case 2): Wheel speed sensor (FR) intermittent/erratic (a piece of metal noise) C050A (Case 3): Wheel speed sensor (FR) intermittent/erratic (a piece of metal rotor noise) C050D (Case 4): Wheel speed sensor (RL) range/performance (pulse output high) C050E: Wheel speed sensor (RL) voltage circuit open C050F: Wheel speed sensor (RL) voltage circuit high C0510 (Case 1): Wheel speed sensor (RL) intermittent/erratic (moment open) C0510 (Case 2): Wheel speed sensor (RL) intermittent/erratic (a piece of metal noise) C0510 (Case 3): Wheel speed sensor (RL) intermittent/erratic (a piece of metal rotor noise) C0513 (Case 4): Wheel speed sensor (RR) range/performance (pulse output high) C0514: Wheel speed sensor (RR) voltage circuit open C0515: Wheel speed sensor (RR) voltage circuit high C0516 (Case 1): Wheel speed sensor (RR) intermittent/erratic (moment open) C0516 (Case 2): Wheel speed sensor (RR) intermittent/erratic (a piece of metal noise) C0516 (Case 3): Wheel speed sensor (RR) intermittent/erratic (a piece of metal rotor noise) C137D: Brake system voltage circuit high C14E1 (Case 1): Wheel speed sensor (FL) voltage circuit low C14E1 (Case 2): Wheel speed sensor (FL) voltage circuit low (continuation) C14E4 (Case 1): Wheel speed sensor (FR) voltage circuit low C14E4 (Case 2): Wheel speed sensor (FR) voltage circuit low (continuation) C14E7 (Case 1): Wheel speed sensor (RL) voltage circuit low C14E7 (Case 2): Wheel speed sensor (RL) voltage circuit low (continuation)

	C14EA (Case 1): Wheel speed sensor (RR) voltage circuit low C14EA (Case 2): Wheel speed sensor (RR) voltage circuit low (continuation)
All of the following conditions are met	-
Chassis dynamometer mode	Off
Command to all ABS hold solenoids	Off
Command to all ABS release solenoids	Off
Difference between the highest speed sensor output value and the lowest speed sensor output value	Less than 10% of the highest speed sensor output value
Lowest speed sensor output value	Higher than 30 km/h (18.64 mph)

TYPICAL MALFUNCTION THRESHOLDS

Case 1

One-seventh of the second lowest speed sensor output value	Higher than the lowest speed sensor output value

Case 2

Second lowest speed sensor output value	0 km/h (0 mph)

Case 3

Both of the following conditions are met	-
Lowest speed sensor output value	0 km/h (0 mph)
The lowest speed sensor value changes from less than 60 Hz + 2 km/h (1.24 mph) to 60 Hz + 2 km/h (1.24 mph) or more	-

Case 5

Both of the following conditions are met	-
Direction of 3 wheels	Determined
Direction of 1 wheel	Undetermined

COMPONENT OPERATING RANGE

Case 1 to 3

All of the following conditions are met	-
Chassis dynamometer mode	Off
Wheel speed sensor fail (C0502, C0503, C0508, C0509, C050E, C050F, C0514, C0515)	Not detected
Wheel speed sensor voltage circuit low fail (C14E1, C14E4, C14E7, C14EA)	Not detected
Noise recovery experience	On

A piece of metal rotor noise recovery experience	On
Low speed recovery experience	On

Case 5

All of the following conditions are met	-
Chassis dynamometer mode	Off
Command to all ABS hold solenoids	Off
Command to all ABS release solenoids	Off
Difference between the highest speed sensor output value and the lowest speed sensor output value	Less than 10% of the highest speed sensor output value
Lowest speed sensor output value	Higher than 30 km/h (18.64 mph)
Direction of 4 wheels	Determined

CONFIRMATION DRIVING PATTERN

NOTICE:

When performing the normal judgment procedure, make sure that the driver door is closed and is not opened at any time during the procedure.

HINT:

- After repair has been completed, clear the DTC and then check that the vehicle has returned to normal by performing the following All Readiness check procedure.
- When clearing the permanent DTCs, refer to the "CLEAR PERMANENT DTC" procedure.

1. Connect the GTS to the DLC3.
2. Turn the ignition switch to ON and turn the GTS on.
3. Clear the DTCs (even if no DTCs are stored, perform the clear DTC procedure).
4. Turn the ignition switch off.
5. Turn the ignition switch to ON (READY) and turn the GTS on.
6. Drive the vehicle straight at a speed of 20 km/h (12 mph) or more for 30 seconds or more. [*]

   HINT:

   [*]: Normal judgment procedure.

   The normal judgment procedure is used to complete DTC judgment and also used when clearing permanent DTCs.
7. Enter the following menus: Chassis / Brake/EPB* / Utility / All Readiness.

   *: Electric Parking Brake System
8. Check the DTC judgment result.

   HINT:

   - If the judgment result shows NORMAL, the system is normal.
   - If the judgment result shows ABNORMAL, the system has a malfunction.
   - If the judgment result shows INCOMPLETE, perform driving pattern again.

WIRING DIAGRAM

Refer to DTC C050012.

Click here INFO

PROCEDURE

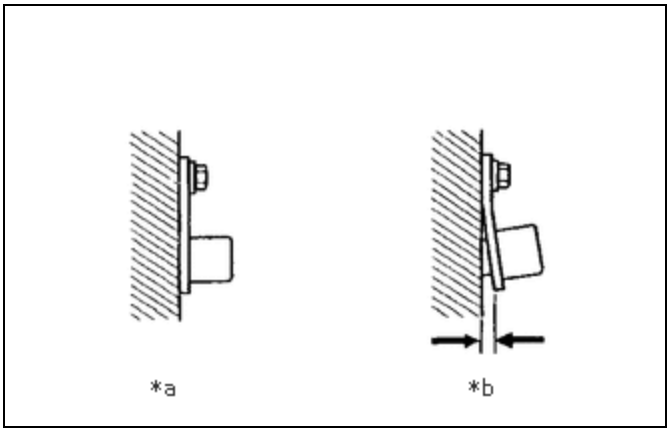
1.	**CHECK FRONT SPEED SENSOR LH INSTALLATION**

(a) Check the front speed sensor LH installation.

OK:

There is no clearance between the front speed sensor LH and front steering knuckle LH.

The installation bolt is tightened properly.



*a	Correct
*b	Incorrect

NG ▶ **REINSTALL OR REPLACE FRONT SPEED SENSOR LH**

OK ▼

2.	**CHECK FRONT SPEED SENSOR LH (CHECK FOR FOREIGN MATTER)**

Pre-procedure1

(a) Remove the front speed sensor LH.

HINT:

Click here INFO

Procedure1

(b) Check the front speed sensor tip LH.

OK:

The front speed sensor tip LH is free of scratches, oil, and foreign matter.

NOTICE:

- If there is oil or foreign matter on the front speed sensor LH, clean the front speed sensor LH.
- If the front speed sensor LH is damaged, replace the front speed sensor LH with a new one.

Post-procedure1

(c) None

NG ▶ **CLEAN OR REPLACE FRONT SPEED SENSOR LH**

OK ▼

3.	**READ VALUE USING GTS (FL WHEEL SPEED)**

Pre-procedure1

(a) Perform a road test.

Procedure1

(b) Check the front speed sensor LH output value.

Chassis > Brake/EPB > Data List

TESTER DISPLAY	MEASUREMENT ITEM	RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
FL Wheel Speed	Front wheel speed sensor LH reading	Min.: 0.0 km/h (0 mph) Max.: 6553.5 km/h (4072 mph)	Vehicle stopped: 0.0 km/h (0 mph)	When driving at constant speed: No large fluctuations

Chassis > Brake/EPB > Data List

TESTER DISPLAY
FL Wheel Speed

OK:
The output value changes in accordance with the vehicle speed.

Post-procedure1

(c) None

OK ▶ **USE SIMULATION METHOD TO CHECK**

NG ▼

4.	**CHECK HARNESS AND CONNECTOR (FRONT SPEED SENSOR LH - BRAKE ACTUATOR ASSEMBLY)**

Pre-procedure1

(a) Turn the ignition switch off.

Procedure1

(b) Make sure that there is no looseness at the locking part and the connecting part of the connectors.

OK:
The connector is securely connected.

Pre-procedure2

(c) Disconnect the A4 No. 2 skid control ECU (brake actuator assembly) connector.

(d) Disconnect the A10 front speed sensor LH connector.

Procedure2

(e) Check both the connector case and the terminals for deformation and corrosion.

OK:
No deformation or corrosion.

Procedure3

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

Standard Resistance:

EWD INFO

Click Location & Routing(A10,A4)
Click Connector(A10)
Click Connector(A4)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
A10-2 (FL+) - A4-22 (FL+)	Always	Below 1 Ω	Ω
A10-2 (FL+) or A4-22 (FL+) - Body ground	Always	10 kΩ or higher	kΩ
A10-1 (FL-) - A4-21 (FL-)	Always	Below 1 Ω	Ω
A10-1 (FL-) or A4-21 (FL-) - Body ground	Always	10 kΩ or higher	kΩ

Post-procedure1

(g) None

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

5.	**CHECK FRONT SPEED SENSOR ROTOR LH (CHECK FOR FOREIGN MATTER)**

Pre-procedure1

(a) Remove the component with the front speed sensor rotor LH.

HINT:

Click here INFO

Procedure1

(b) Check the front speed sensor rotor LH.

OK:

The front speed sensor rotor LH is free of scratches, oil, and foreign matter.

NOTICE:

- If there is oil or foreign matter on the front speed sensor rotor LH, clean the front speed sensor rotor LH.
- Do not use parts cleaner when cleaning the front speed sensor rotor LH.
- If the front speed sensor rotor LH is damaged, replace the front speed sensor rotor LH with a new one.

HINT:

The front speed sensor rotor LH is incorporated into the front axle hub sub-assembly LH.

If the front speed sensor rotor LH needs to be replaced, replace it together with the front axle hub sub-assembly LH.

RESULT	PROCEED TO
OK	A
NG (The front speed sensor rotor LH is damaged.)	B
NG (There is foreign matter on the front speed sensor rotor LH.)	C

Post-procedure1

(c) None

A ▶ **REPLACE FRONT SPEED SENSOR LH**

B ▶ **REPLACE FRONT AXLE HUB SUB-ASSEMBLY LH**

Click here INFO

C ▶ **CLEAN FRONT SPEED SENSOR ROTOR LH**