Last Modified: 12-04-2024	6.11:8.1.0	**Doc ID:** RM1000000028X3D
Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [12/2022 -]
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: ELECTRONICALLY CONTROLLED BRAKE SYSTEM: C051214; Right Rear Wheel Speed Sensor Circuit Short to Ground or Open; 2023 - 2024 MY Prius Prius Prime [12/2022 -]		

DTC	**C051214**	**Right Rear Wheel Speed Sensor Circuit Short to Ground or Open**

DESCRIPTION

Refer to DTC C051212.

Click here INFO

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	DTC OUTPUT FROM	PRIORITY	NOTE
C051214	Right Rear Wheel Speed Sensor Circuit Short to Ground or Open	An open in the speed sensor signal circuit continues for 0.5 seconds or more.	• Rear speed sensor RH*1 • Rear speed sensor RH (rear axle hub and bearing assembly RH)*2 • Skid control sensor wire RH (No. 1 parking brake wire assembly) • Wire harness and connector • No. 2 skid control ECU (brake actuator assembly)	Comes on	Brake/EPB	A	• SAE Code: C0514 • Output ECU: No. 2 skid control ECU (brake actuator assembly)

*1: for AWD
*2: for 2WD

MONITOR DESCRIPTION

The No. 2 skid control ECU (brake actuator assembly) monitors the output of the speed sensor. When the output current of the speed sensor is excessively low, the MIL is illuminated and a DTC is stored.

MONITOR STRATEGY

Related DTCs	C0514: Wheel speed sensor (RR) voltage circuit open
Required Sensors/Components(Main)	Speed sensor
Required Sensors/Components(Related)	No. 2 skid control ECU (brake actuator assembly)
Frequency of Operation	Continuous
Duration	0.528 seconds
MIL Operation	Immediately
Sequence of Operation	None

TYPICAL ENABLING CONDITIONS

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 3): Wheel speed sensor (FL) range/performance (correlation B) C0501 (Case 4): Wheel speed sensor (FL) range/performance (pulse output high) C0503: Wheel speed sensor (FL) voltage circuit high 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) C0509: Wheel speed sensor (FR) voltage circuit high 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) C050F: Wheel speed sensor (RL) voltage circuit high 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) C0515: Wheel speed sensor (RR) voltage circuit high 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. Following condition is met	More than 0.22 seconds
+BS voltage	17.4 V or less
B. Following condition is met	More than 0.22 seconds
+BS voltage	8.5 V or higher
C. Command to wheel speed sensor power supply	On
D. Following condition is met	More than 0.204 seconds
Wheel speed sensor power supply voltage low signal (IC Data)	Off
E. Wheel speed sensor overcurrent signal (IC Data)	Off
F. +BS voltage	9.5 V or higher
G. IGR voltage	Higher than 10 V
H. IGP voltage	Higher than 10 V

TYPICAL MALFUNCTION THRESHOLDS

Wheel speed sensor open circuit signal (IC Data)	On

COMPONENT OPERATING RANGE

Wheel speed sensor open circuit signal (IC Data)	Off

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. Wait for 2 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 C051212.

Click here INFO

PROCEDURE

1.	**READ VALUE USING GTS (MOMENTARY INTERRUPTION)**

Pre-procedure1

(a) Select the line graph display on the GTS.

Procedure1

(b) Check for any momentary interruption in the wire harness and connector.

Chassis > Brake/EPB > Data List

TESTER DISPLAY	MEASUREMENT ITEM	RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
RR Speed Open	Rear speed sensor RH open detection	Normal / Under intermittent	Normal: Normal Under intermittent: Momentary interruption	-
RR Speed Sensor Voltage Open	Rear speed sensor RH voltage open detection	Normal / Under intermittent	Normal: Normal Under intermittent: Momentary interruption	-

Chassis > Brake/EPB > Data List

TESTER DISPLAY
RR Speed Open
RR Speed Sensor Voltage Open

OK:

Normal (There are no momentary interruptions.)

NOTICE:

Perform the above inspection before removing the sensor and connector.

Post-procedure1

(c) None

OK ▶ **USE SIMULATION METHOD TO CHECK**

NG

▼

2.	**CHECK VEHICLE**

RESULT	PROCEED TO
for 2WD	A
for AWD	B

B ▶ **GO TO STEP 6**

A

▼

3.	**INSPECT NO. 1 PARKING BRAKE WIRE 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 r2 and rR2 skid control sensor wire RH (No. 1 parking brake wire assembly) connector.

Procedure2

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

OK:

No deformation or corrosion.

Procedure3

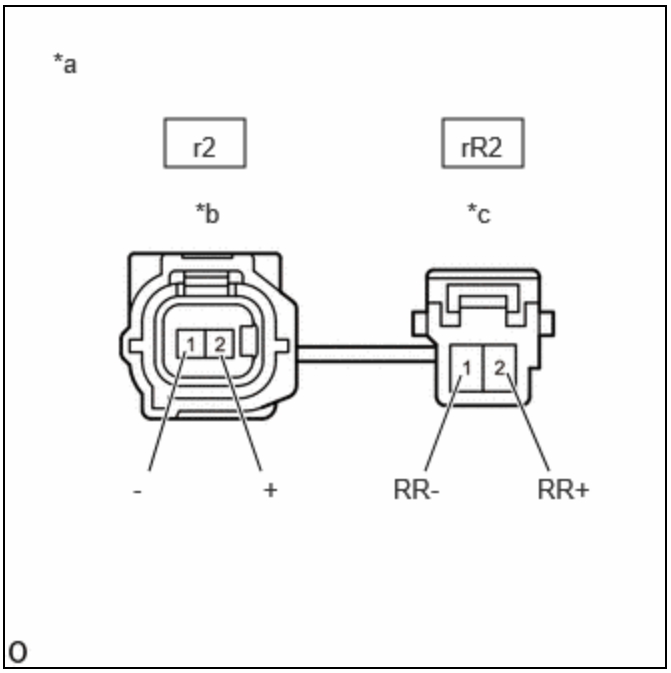
(e) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

EWD INFO

Click Location & Routing(r2,rR2)
Click Connector(r2)
Click Connector(rR2)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
r2-2 (+) - rR2-2 (RR+)	Always	Below 1 Ω	Ω
r2-2 (+) or rR2-2 (RR+) - Body ground and other terminals	Always	10 kΩ or higher	kΩ
r2-1 (-) - rR2-1 (RR-)	Always	Below 1 Ω	Ω
r2-1 (-) or rR2-1 (RR-) - Body ground and other terminals	Always	10 kΩ or higher	kΩ



*a	Front view of skid control sensor wire RH (No. 1 parking brake wire assembly)
*b	to Sensor Side Connector
*c	to Vehicle Side Connector

Result:

PROCEED TO
OK
NG

Post-procedure1

(f) None

NG ▶ **REPLACE NO. 1 PARKING BRAKE WIRE ASSEMBLY**

OK ▼

4.	**CHECK HARNESS AND CONNECTOR (NO. 1 PARKING BRAKE WIRE ASSEMBLY - BRAKE ACTUATOR ASSEMBLY)**

Procedure1

(a) 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-procedure1

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

Procedure2

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

OK:
No deformation or corrosion.

Procedure3

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

Standard Resistance:

EWD INFO

Click Location & Routing(rR2,A4)
Click Connector(rR2)
Click Connector(A4)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
rR2-2 (RR+) - A4-20 (RR+)	Always	Below 1 Ω	Ω
rR2-2 (RR+) or A4-20 (RR+) - Body ground	Always	10 kΩ or higher	kΩ
rR2-1 (RR-) - A4-19 (RR-)	Always	Below 1 Ω	Ω
rR2-1 (RR-) or A4-19 (RR-) - Body ground	Always	10 kΩ or higher	kΩ

Post-procedure1

(e) None

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

OK

5.	**INSPECT BRAKE ACTUATOR ASSEMBLY (SENSOR POWER SOURCE CIRCUIT)**

Pre-procedure1

(a) Reconnect the A4 No. 2 skid control ECU (brake actuator assembly) connector.

(b) Reconnect the rR2 skid control sensor wire RH (No. 1 parking brake wire assembly) connector.

(c) Turn the ignition switch to ON.

Procedure1

(d) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

EWD INFO

Click Location & Routing(r2)
Click Connector(r2)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
r2-2 (+) - Body ground	Ignition switch ON	11 to 14 V	V

HINT:

The rear speed sensor RH and rear speed sensor rotor RH are incorporated into the rear axle hub and bearing assembly RH.

If the rear speed sensor RH and rear speed sensor rotor RH need to be replaced, replace the rear axle hub and bearing assembly RH.

Post-procedure1

(e) None

OK ▶ **REPLACE REAR AXLE HUB AND BEARING ASSEMBLY RH**

Click here INFO

NG ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

Click here INFO

6.	**INSPECT NO. 1 PARKING BRAKE WIRE 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 r2 and rR2 skid control sensor wire RH (No. 1 parking brake wire assembly) connector.

Procedure2

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

OK:
No deformation or corrosion.

Procedure3

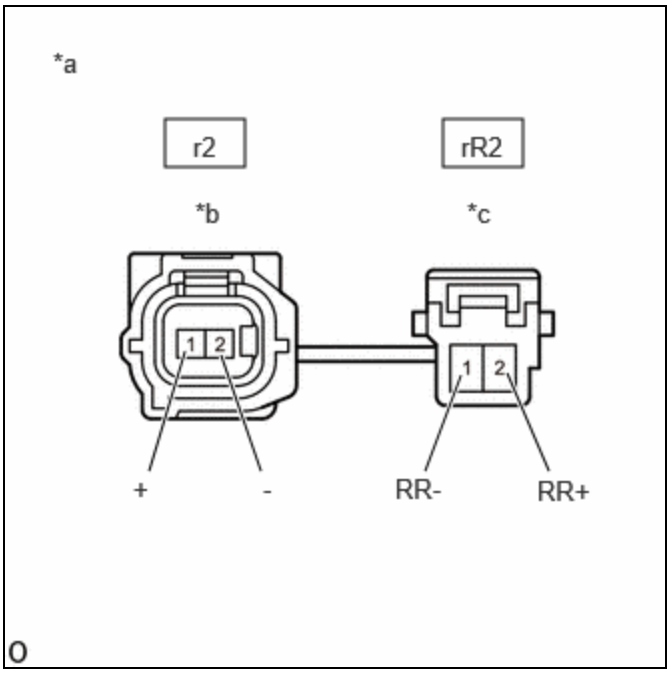
(e) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

EWD INFO

Click Location & Routing(r2,rR2)
Click Connector(r2)
Click Connector(rR2)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
r2-1 (+) - rR2-2 (RR+)	Always	Below 1 Ω	Ω
r2-1 (+) or rR2-2 (RR+) - Body ground and other terminals	Always	10 kΩ or higher	kΩ
r2-2 (-) - rR2-1 (RR-)	Always	Below 1 Ω	Ω
r2-2 (-) or rR2-1 (RR-) - Body ground and other terminals	Always	10 kΩ or higher	kΩ



*a	Front view of skid control sensor wire RH (No. 1 parking brake wire assembly)
*b	to Sensor Side Connector
*c	to Vehicle Side Connector

Result:

PROCEED TO
OK

PROCEED TO
NG

Post-procedure1

(f) None

NG ▶ **REPLACE NO. 1 PARKING BRAKE WIRE ASSEMBLY**

OK ▼

7.	**CHECK HARNESS AND CONNECTOR (NO. 1 PARKING BRAKE WIRE ASSEMBLY - BRAKE ACTUATOR ASSEMBLY)**

Procedure1

(a) 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-procedure1

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

Procedure2

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

OK:

No deformation or corrosion.

Procedure3

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

Standard Resistance:

EWD INFO

Click Location & Routing(rR2,A4)
Click Connector(rR2)
Click Connector(A4)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
rR2-2 (RR+) - A4-20 (RR+)	Always	Below 1 Ω	Ω
rR2-2 (RR+) or A4-20 (RR+) - Body ground	Always	10 kΩ or higher	kΩ
rR2-1 (RR-) - A4-19 (RR-)	Always	Below 1 Ω	Ω

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
rR2-1 (RR-) or A4-19 (RR-) - Body ground	Always	10 kΩ or higher	kΩ

Post-procedure1

(e) None

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

OK ▼

8.	INSPECT BRAKE ACTUATOR ASSEMBLY (SENSOR POWER SOURCE CIRCUIT)

Pre-procedure1

(a) Reconnect the A4 No. 2 skid control ECU (brake actuator assembly) connector.

(b) Reconnect the rR2 skid control sensor wire RH (No. 1 parking brake wire assembly) connector.

(c) Turn the ignition switch to ON.

Procedure1

(d) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

EWD INFO

Click Location & Routing(r2)
Click Connector(r2)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
r2-1 (+) - Body ground	Ignition switch ON	11 to 14 V	V

Post-procedure1

(e) None

OK ▶ **REPLACE REAR SPEED SENSOR RH**

NG ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

Click here INFO