Last Modified: 12-04-2024	6.11:8.1.0	**Doc ID:** RM1000000028X1C
Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [12/2022 -]
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: ELECTRONICALLY CONTROLLED BRAKE SYSTEM: ON-VEHICLE INSPECTION; 2023 - 2024 MY Prius Prius Prime [12/2022 -]		

ON-VEHICLE INSPECTION

PROCEDURE

1. WARNING LIGHT AND INDICATOR LIGHT INITIAL CHECK

(a) When the ignition switch is turned to ON, check that the ABS warning light, brake system warning light (red indicator), brake system warning light (yellow indicator), VSC OFF indicator light, slip indicator light, brake hold standby indicator light and brake hold operated indicator light come on for approximately 3 seconds.

HINT:

- When the brake fluid level is low, the brake system warning light (red indicator) comes on.
- If the skid control ECU stores any DTCs, the ABS warning light, brake system warning light (red indicator), brake system warning light (yellow indicator) and slip indicator light will come on. Also, in this state, if the vehicle is under the following conditions and the brake hold switch (electric parking brake switch assembly) is turned on, the brake hold operated indicator light blinks.

  Vehicle Conditions:

  i. The driver door is closed.
  ii. The driver seat belt is fastened.

- If the warning lights and indicator lights do not illuminate or illuminate for more than approximately 3 seconds, perform troubleshooting for the electronically controlled brake system.

Click here INFO

2. INSPECT BRAKE FLUID LEVEL WARNING SWITCH

Pre-procedure1

(a) Remove the brake master cylinder reservoir filler cap assembly.

(b) Disconnect the brake fluid level warning switch connector.

Procedure1

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

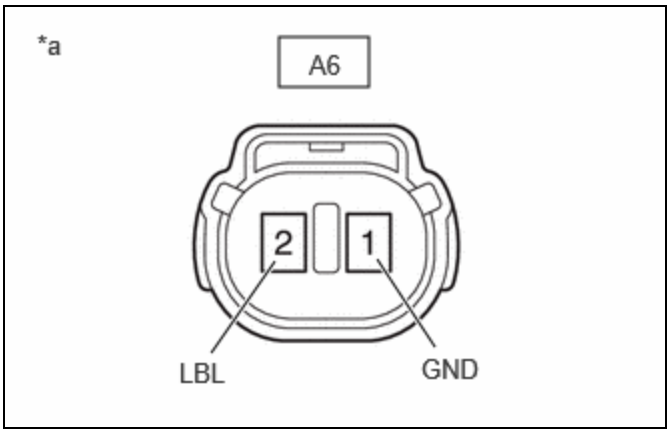
HINT:

A float is located inside the brake master cylinder reservoir assembly. Its position changes according to the level of brake fluid.

Standard Resistance:

EWD INFO

Click Location & Routing(A6)
Click Connector(A6)



*a	Component without harness connected (Brake Fluid Level Warning Switch)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
A6-1 (GND) - A6-2 (LBL)	Brake fluid level warning switch off (float up)	1.84 to 2.16 kΩ	kΩ
A6-1 (GND) - A6-2 (LBL)	Brake fluid level warning switch on (float down)	Below 1 Ω	Ω

Post-procedure1

(d) If there are no problems after completing the preceding inspection, adjust the brake fluid to the MAX level with the ignition switch turned to ON.

3. BRAKE SYSTEM ON-VEHICLE INSPECTION

If no DTCs are output but the problem still occurs, use the following procedure to inspect the pressure sensor, brake booster with master cylinder assembly and stroke simulator.

NOTICE:

DTCs may be stored during the inspection procedure. Be sure to clear the DTCs and check that no DTCs are output after the inspection is finished.

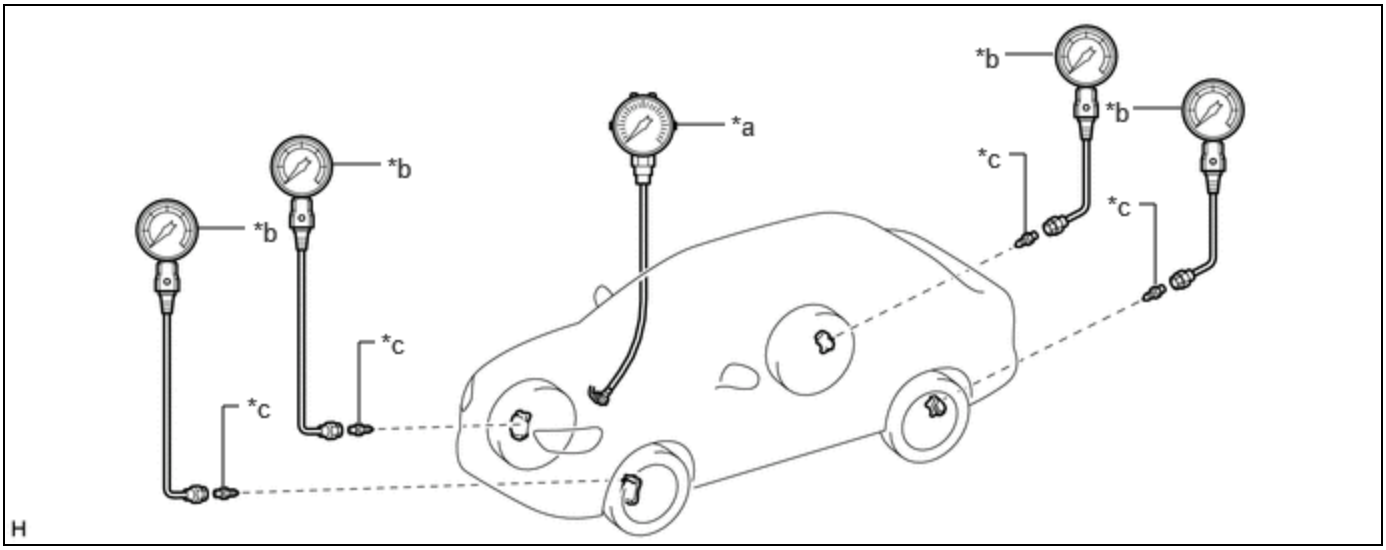
(a) INSPECT PRESSURE SENSOR

(1) Check the auxiliary battery voltage.

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
Auxiliary battery	Ignition switch off	11 to 14 V	V

(2) Set a pedal effort gauge and SST.



*a	Pedal Effort Gauge	*b	SST (LSPV Gauge)
*c	SST (No. 1 Nipple)	-	-

HINT:

Simultaneously measure the brake fluid pressure of all 4 wheels, or 2 wheels at a time.

(1) Set a pedal effort gauge and SST.

SST: 09709-29018

09709-00060

(2) Park (P) selected and parking brake applied.

(3) Bleed air from SST (LSPV gauge).

HINT:

Click here INFO

(3) Inspect the master cylinder sensor 1, gap hold chamber oil pressure and servo pressure.

(1) Check the value output from "Master Cylinder Sensor 1", "Gap Hold Chamber Oil Pressure" and "Servo Pressure" by depressing the brake pedal.

Chassis > Brake Booster > Data List

TESTER DISPLAY
Servo Pressure
Gap Hold Chamber Oil Pressure

Chassis > Brake/EPB > Data List

TESTER DISPLAY
Master Cylinder Sensor 1

Standard Result:

PEDAL EFFORT	GAP HOLD CHAMBER OIL PRESSURE	SERVO PRESSURE	MASTER CYLINDER SENSOR 1	FRONT WHEELS HYDRAULIC PRESSURE	REAR WHEELS HYDRAULIC PRESSURE
50 N (5 kgf, 11.2 lbf)	0.00 to 0.75 MPa	0.41 to 6.07 MPa	0.11 to 5.77 MPa	0.11 to 5.77 MPa (1.12 to 58.88 kgf/cm^2, 16 to 837 psi)	0.41 to 6.07 MPa (4.18 to 61.94 kgf/cm^2, 59 to 880 psi)
100 N (10 kgf, 22.5 lbf)	0.63 to 1.43 MPa	3.31 to 8.93 MPa	3.01 to 8.63 MPa	3.01 to 8.63 MPa (30.71 to 88.06 kgf/cm^2, 436 to 1251 psi)	3.31 to 8.93 MPa (33.78 to 91.12 kgf/cm^2, 480 to 1295 psi)
150 N (15 kgf, 33.7 lbf)	1.33 to 2.13 MPa	5.62 to 11.44 MPa	5.32 to 11.14 MPa	5.32 to 11.44 MPa (54.29 to 113.67 kgf/cm^2, 771 to 1659 psi)	5.62 to 11.44 MPa (57.35 to 116.73 kgf/cm^2, 815 to 1659 psi)
200 N (20 kgf, 45.0 lbf)	2.03 to 2.83 MPa	7.10 to 12.60 MPa	6.80 to 12.30 MPa	6.80 to 12.30 MPa (69.39 to 125.51 kgf/cm^2, 986 to 1784 psi)	7.10 to 12.60 MPa (72.45 to 128.57 kgf/cm^2, 1030 to 1827 psi)

(4) Remove the pedal effort gauge and SST.

(1) Remove the pedal effort gauge and SST, and bleed the brake line.

HINT:

Click here INFO

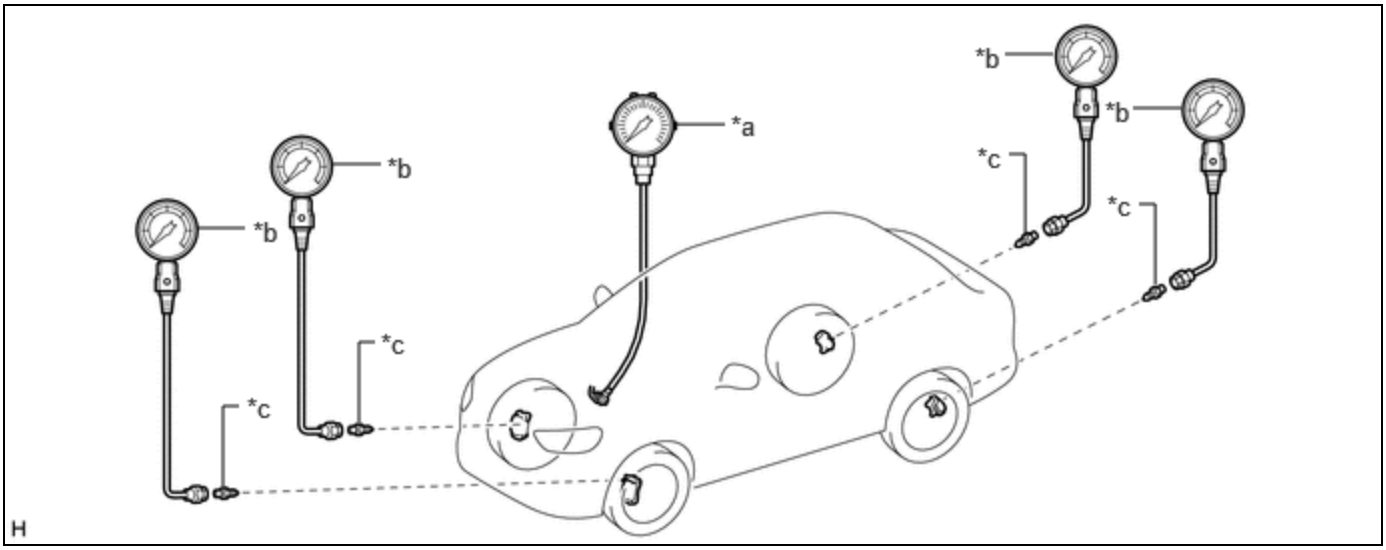
(b) INSPECT BRAKE BOOSTER WITH MASTER CYLINDER ASSEMBLY

(1) Check the auxiliary battery voltage.

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
Auxiliary battery	Ignition switch off	11 to 14 V	V

(2) Set a pedal effort gauge and SST.



*a	Pedal Effort Gauge	*b	SST (LSPV Gauge)
*c	SST (No. 1 Nipple)	-	-

HINT:

Simultaneously measure the brake fluid pressure of all 4 wheels, or 2 wheels at a time.

(1) Set a pedal effort gauge and SST.

SST: 09709-29018

09709-00060

(2) Park (P) selected and parking brake applied.

(3) Clear the DTCs.

Chassis > Brake Booster > Clear DTCs
Chassis > Brake/EPB > Clear DTCs

(4) Bleed air from SST (LSPV gauge).

HINT:

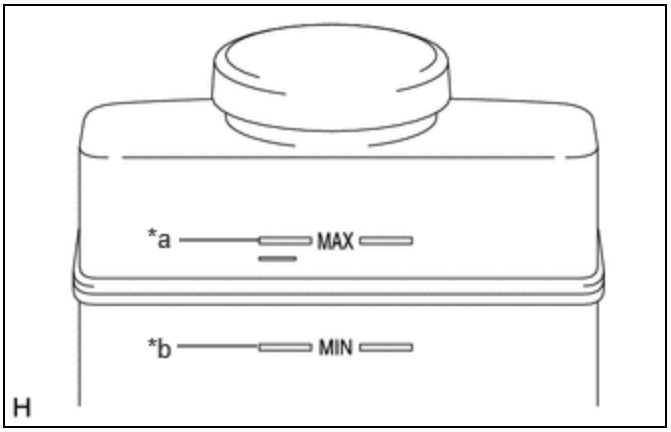
Click here INFO

(3) Check operation without brake boost.

(1) Inspect and adjust the brake pedal height.

(2) Adjust the brake fluid level of the reservoir so that it is between the MIN line and MAX line.

(3) Select "Motor Deactivate" on the "ECB Utility" screen.



*a	MAX Line
*b	MIN Line

Chassis > Brake/EPB > Utility

TESTER DISPLAY
ECB Utility

(4) Perform "Motor Deactivate" according to the display on the GTS.

(5) Depress the brake pedal 10 times or more.

(6) Check that the brake pedal is firm.

(7) Check the values output from "Stroke Sensor" and "Stroke Sensor2" by depressing the brake pedal.

Chassis > Brake Booster > Data List

TESTER DISPLAY
Stroke Sensor

Chassis > Brake/EPB > Data List

TESTER DISPLAY
Stroke Sensor2

Standard Result:

PEDAL EFFORT	STROKE SENSOR	STROKE SENSOR2	FRONT LEFT WHEEL HYDRAULIC PRESSURE	FRONT RIGHT WHEEL HYDRAULIC PRESSURE
200 N (20 kgf, 45.0 lbf)	0.90 to 1.67 V	3.33 to 4.10 V	0.00 to 3.44 MPa (0.00 to 35.10 kgf/cm^2, 0 to 499 psi)	0.00 to 3.44 MPa (0.00 to 35.10 kgf/cm^2, 0 to 499 psi)

PEDAL EFFORT	STROKE SENSOR	STROKE SENSOR2	FRONT LEFT WHEEL HYDRAULIC PRESSURE	FRONT RIGHT WHEEL HYDRAULIC PRESSURE
500 N (51 kgf, 112.4 lbf)	1.16 to 1.99 V	3.01 to 3.84 V	3.12 to 7.17 MPa (31.84 to 73.16 kgf/cm^2, 452 to 1040 psi)	3.12 to 7.17 MPa (31.84 to 73.16 kgf/cm^2, 452 to 1040 psi)

HINT:

Check the performance of the brake booster with master cylinder assembly by comparing the pedal force with the value of the LSPV gauge and each stroke sensor. If there is a problem, determine the state of the brake booster with master cylinder assembly by using these results together with the results from inspecting the brake pedal stroke sensor.

(8) Remove the pedal effort gauge and SST, and bleed the brake system.

HINT:

Click here INFO

(c) INSPECT STROKE SIMULATOR (BRAKE BOOSTER WITH MASTER CYLINDER ASSEMBLY)

(1) Check the auxiliary battery voltage.

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
Auxiliary battery	Ignition switch off	11 to 14 V	V

(2) Set a pedal effort gauge.

(1) Set a pedal effort gauge.

(2) Park (P) selected and parking brake applied.

(3) Clear the DTCs.

Chassis > Brake Booster > Clear DTCs
Chassis > Brake/EPB > Clear DTCs

(3) Check operation with brake boost.

(1) Depress the brake pedal 4 or 5 times.

(2) Check the values output from "Stroke Sensor" and "Stroke Sensor2" by depressing the brake pedal.

Chassis > Brake Booster > Data List

TESTER DISPLAY
Stroke Sensor

Chassis > Brake/EPB > Data List

TESTER DISPLAY
Stroke Sensor2

Standard Voltage:

PEDAL EFFORT	STROKE SENSOR	STROKE SENSOR2
50 N (5 kgf, 11.2 lbf)	0.96 to 1.67 V	3.33 to 4.04 V
100 N (10 kgf, 22.5 lbf)	1.14 to 1.86 V	3.14 to 3.86 V
150 N (15 kgf, 33.7 lbf)	1.23 to 1.95 V	3.05 to 3.77 V