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Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [12/2022 -]
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: ELECTRONICALLY CONTROLLED BRAKE SYSTEM: C054016,...,C122D17; Brake Pressure Sensor "A" Circuit Voltage Below Threshold; 2023 - 2024 MY Prius Prius Prime [12/2022 -]		

DTC	**C054016**	**Brake Pressure Sensor "A" Circuit Voltage Below Threshold**

DTC	**C05401F**	**Brake Pressure Sensor "A" Circuit Intermittent**

DTC	**C054029**	**Brake Pressure Sensor "A" Signal Invalid**

DTC	**C054031**	**Brake Pressure Sensor "A" No Signal**

DTC	**C054096**	**Brake Pressure Sensor "A" Component Internal Failure**

DTC	**C122D16**	**Brake Pressure Sensor "A" Supply Voltage Circuit Voltage Below Threshold**

DTC	**C122D17**	**Brake Pressure Sensor "A" Supply Voltage Circuit Voltage Above Threshold**

DESCRIPTION

HINT:

Brake pressure sensor "A": Master cylinder pressure sensor

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	DTC OUTPUT FROM	PRIORITY	NOTE
C054016	Brake Pressure Sensor "A" Circuit Voltage Below Threshold	Master cylinder pressure value is below -0.744 MPa (-7.6 kgf/cm^2, -107 psi) for 5 seconds or more.	No. 2 skid control ECU (brake actuator assembly)	Comes on	Brake/EPB	A	• SAE Code: C053D (Case 2) • 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
C05401F	Brake Pressure Sensor "A" Circuit Intermittent	Fluctuation of the sensor signal exceeds the threshold (15 MPa (153.0 kgf/cm^2, 2175 psi) or more from the previous value) for 0.1 seconds or more.	No. 2 skid control ECU (brake actuator assembly)	Comes on	Brake/EPB	A	• SAE Code: C056B • Output ECU: No. 2 skid control ECU (brake actuator assembly)
C054029	Brake Pressure Sensor "A" Signal Invalid	Data from the sensor is invalid for 0.2 seconds or more.	No. 2 skid control ECU (brake actuator assembly)	Comes on	Brake/EPB	A	• SAE Code: C0540 (Case 3) • Output ECU: No. 2 skid control ECU (brake actuator assembly)
C054031	Brake Pressure Sensor "A" No Signal	Communication with the sensor is invalid for 0.1 seconds or more.	No. 2 skid control ECU (brake actuator assembly)	Comes on	Brake/EPB	A	• SAE Code: C0540 (Case 1) • Output ECU: No. 2 skid control ECU (brake actuator assembly)
C054096	Brake Pressure Sensor "A" Component Internal Failure	A malfunction is detected by self-diagnosis function of the sensor.	No. 2 skid control ECU (brake actuator assembly)	Comes on	Brake/EPB	A	• SAE Code: C0540 (Case 2) • 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
C122D16	Brake Pressure Sensor "A" Supply Voltage Circuit Voltage Below Threshold	The supplied voltage to the sensor is less than a certain value for 1 second or more.	No. 2 skid control ECU (brake actuator assembly)	Comes on	Brake/EPB	A	• SAE Code: C122E • Output ECU: No. 2 skid control ECU (brake actuator assembly)
C122D17	Brake Pressure Sensor "A" Supply Voltage Circuit Voltage Above Threshold	The supplied voltage to the sensor is a certain value or more for 1 second or more.	No. 2 skid control ECU (brake actuator assembly)	Comes on	Brake/EPB	A	• SAE Code: C122F • Output ECU: No. 2 skid control ECU (brake actuator assembly)

MONITOR DESCRIPTION

C053D (Case 2):

When no abnormal pressure value is output and the master cylinder pressure sensor output is less than a certain value, the No. 2 skid control ECU (brake actuator assembly) judges that the master cylinder pressure sensor zero point is abnormal, the MIL is illuminated and a DTC is stored.

C0540 (Case 1):

When an invalid serial communication signal is detected, the No. 2 skid control ECU (brake actuator assembly) judges that communication is abnormal and illuminates the MIL and stores this DTC.

C0540 (Case 2):

When the pressure or temperature of a master cylinder pressure sensor exceeds a certain value, the No. 2 skid control ECU (brake actuator assembly) judges that the internal data is abnormal and illuminates the MIL and stores this DTC.

C0540 (Case 3):

When the master cylinder pressure sensor data is invalid, the No. 2 skid control ECU (brake actuator assembly) judges that the sensor is invalid, the MIL is illuminated and a DTC is stored.

C056B:

When the master cylinder pressure sensor is normal, the difference between the previous value and current value exceeds a certain value, the No. 2 skid control ECU (brake actuator assembly) judges that there is sensor noise, the MIL is illuminated and a DTC is stored.

C122E:

When the supply voltage of the master cylinder pressure sensor is a certain value or less, the No. 2 skid control ECU (brake actuator assembly) judges that the power supply voltage of sensor is excessively low, the

MIL is illuminated and a DTC is stored.

C122F:

If any of the following conditions are met for a certain amount of time, the No. 2 skid control ECU (brake actuator assembly) judges that the power supply voltage of sensor is excessively high, and illuminates the MIL and stores this DTC.

- The power supply voltage of the master cylinder pressure sensor is more than a certain value.
- The temperature of the master cylinder pressure sensor is more than a certain value.
- The supply current of the master cylinder pressure sensor is more than a certain value.

MONITOR STRATEGY

Related DTCs	C053D (Case 2): 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 C056B: Pressure sensor intermittent/erratic C122E: Pressure sensor voltage circuit low C122F: Pressure sensor voltage circuit high
Required Sensors/Components(Main)	No. 2 skid control ECU (brake actuator assembly)
Required Sensors/Components(Related)	No. 2 skid control ECU (brake actuator assembly)
Frequency of Operation	Continuous
Duration	0.084 seconds: C0540 (Case 1) 0.096 seconds: C0540 (Case 2) and C056B 0.198 seconds: C0540 (Case 3) 1 second: C122E and C122F 5 seconds: C053D (Case 2)
MIL Operation	Immediately
Sequence of Operation	None

TYPICAL ENABLING CONDITIONS

C053D (Case 2)

Monitor runs whenever the following DTCs are not stored	C0540 (Case 1): Pressure sensor lost communication C0540 (Case 2): Pressure sensor internal check C0540 (Case 3): Pressure sensor invalid data C056B: Pressure sensor intermittent/erratic C122E: Pressure sensor voltage circuit low C122F: Pressure sensor voltage circuit high

C0540 (Case 1)

Monitor runs whenever the following DTCs are not stored	C122E: Pressure sensor voltage circuit low C122F: Pressure sensor voltage circuit high
Both of the following conditions are met	-

Master cylinder pressure sensor power supply	Valid
Master cylinder pressure sensor power supply voltage low signal (IC Data)	Off

C0540 (Case 2)

Monitor runs whenever the following DTCs are not stored	C0540 (Case 1): Pressure sensor lost communication C122E: Pressure sensor voltage circuit low C122F: Pressure sensor voltage circuit high
All of the following conditions are met	-
Communication with master cylinder pressure sensor	Valid
Master cylinder pressure sensor power supply	Valid
Master cylinder pressure sensor power supply voltage low signal (IC Data)	Off

C0540 (Case 3)

Monitor runs whenever the following DTCs are not stored	C0540 (Case 1): Pressure sensor lost communication C0540 (Case 2): Pressure sensor internal check C0540 (Case 3): Pressure sensor invalid data C056B: Pressure sensor intermittent/erratic C122E: Pressure sensor voltage circuit low C122F: Pressure sensor voltage circuit high
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	8.5 V or higher
B. Master cylinder pressure sensor power supply voltage low signal (IC Data)	Off
C. Master cylinder pressure sensor power supply voltage high signal (IC Data)	Off
D. Master cylinder pressure sensor overtemperature signal (IC Data)	Off
E. Master cylinder pressure 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

C056B

Monitor runs whenever the following DTCs are not stored	C0540 (Case 1): Pressure sensor lost communication C122E: Pressure sensor voltage circuit low

	C122F: Pressure sensor voltage circuit high
All of the following conditions are met	-
Communication with master cylinder pressure sensor	Valid
Master cylinder pressure sensor power supply	Valid
Master cylinder pressure sensor power supply voltage low signal (IC Data)	Off
Master cylinder pressure sensor power supply voltage high signal (IC Data)	Off

C122E

Monitor runs whenever the following DTCs are not stored	C122E: Pressure sensor voltage circuit low
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	8.5 V or higher
B. Master cylinder pressure sensor overcurrent signal (IC Data)	Off
C. Master cylinder pressure sensor overtemperature signal (IC Data)	Off
D. +BS voltage	9.5 V or higher
E. IGR voltage	Higher than 10 V
F. IGP voltage	Higher than 10 V

C122F

Master cylinder pressure sensor power supply output	On

TYPICAL MALFUNCTION THRESHOLDS

C053D (Case 2)

Master cylinder pressure sensor	Higher than 1.764 MPa (18.0 kgf/cm^2, 256 psi)

C0540 (Case 1)

Communication with master cylinder pressure sensor	Invalid

C0540 (Case 2)

Either of the following conditions is met	-
Master cylinder pressure sensor value	Higher than 23.328 MPa (237.9 kgf/cm^2, 3383 psi)
Master cylinder pressure sensor temp value	Higher than 150°C (302°F)

C0540 (Case 3)

Either of the following conditions is met	-

Master cylinder pressure sensor power supply	Invalid
Communication with master cylinder pressure sensor	Invalid
Absolute value of the change in master cylinder pressure sensor value during 6millisec	Higher than 15 MPa (153.0 kgf/cm^2, 2175 psi)
Master cylinder pressure sensor temp value	Higher than 150°C (302°F)
Master cylinder pressure sensor value	Higher than 23.328 MPa (237.9 kgf/cm^2, 3383 psi)

C056B

Absolute value of the change in master cylinder pressure sensor value during 6millisec	Higher than 15 MPa (153.0 kgf/cm^2, 2175 psi)

C122E

Master cylinder pressure sensor power supply voltage low signal (IC Data)	On

C122F

Either of the following conditions is met	-
Master cylinder pressure sensor power supply voltage high signal (IC Data)	On
Master cylinder pressure sensor overcurrent signal (IC Data)	On
Master cylinder pressure sensor overtemperature signal (IC Data)	On

COMPONENT OPERATING RANGE

C053D (Case 2)

Both of the following conditions are met	-
Pressure sensor fail (C0540,C122E,C122F,C056B)	Not detected
Master cylinder pressure sensor	-0.744 MPa (-7.6 kgf/cm^2, -107 psi) or higher

C0540 (Case 1)

Communication with master cylinder pressure sensor	Valid

C0540 (Case 2)

All of the following conditions are met	-
Communication with master cylinder pressure sensor	Valid
Master cylinder pressure sensor value	23.328 MPa (237.9 kgf/cm^2, 3383 psi) or less
Master cylinder pressure sensor temp value	150°C (302°F) or less

C0540 (Case 3)

All of the following conditions are met	A, B, C, D, E and F
A. Following condition is met	More than 0.22 seconds
+BS voltage	8.5 V or higher
B. Master cylinder pressure sensor power supply voltage low signal (IC Data)	Off
C. Master cylinder pressure sensor power supply voltage high signal (IC Data)	Off
D. Master cylinder pressure sensor overtemperature signal (IC Data)	Off
E. Master cylinder pressure sensor overcurrent signal (IC Data	Off
F. All of the following conditions are met	More than 0.024 seconds
Master cylinder pressure sensor power supply	Valid
Communication with master cylinder pressure sensor	Valid
Absolute value of the change in master cylinder pressure sensor value during 6millisec	15 MPa (153.0 kgf/cm^2, 2175 psi) or less
Master cylinder pressure sensor temp value	150°C (302°F) or less
Master cylinder pressure sensor value	23.328 MPa (237.9 kgf/cm^2, 3383 psi) or less

C056B

All of the following conditions are met	-
Communication with master cylinder pressure sensor	Valid
Master cylinder pressure sensor power supply	Valid
Master cylinder pressure sensor power supply voltage low signal (IC Data)	Off
Master cylinder pressure sensor power supply voltage high signal (IC Data)	Off
Absolute value of the change in Master cylinder pressure sensor value during 6millisec	15 MPa (153.0 kgf/cm^2, 2175 psi) or less

C122E

All of the following conditions are met	-
Master cylinder pressure sensor power supply	Valid
Master cylinder pressure sensor power supply voltage high signal (IC Data)	Off
Master cylinder pressure sensor power supply voltage low signal (IC Data)	Off
Master cylinder pressure sensor overcurrent signal (IC Data)	Off
Master cylinder pressure sensor overtemperature signal (IC Data)	Off

C122F

Master cylinder pressure sensor power supply	Valid
Master cylinder pressure sensor power supply voltage high signal (IC Data)	Off

Master cylinder pressure sensor power supply voltage low signal (IC Data)	Off
Master cylinder pressure sensor overcurrent signal (IC Data)	Off
Master cylinder pressure sensor overtemperature 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. Drive the vehicle at a speed of 20 km/h (12 mph) for 1 minute. [*1]
7. Operate the ABS using a drum tester or equivalent. [*2]

HINT:

[*1] to [*2]: Normal judgment procedure.

The normal judgment procedure is used to complete DTC judgment and also used when clearing permanent DTCs.

8. Enter the following menus: Chassis / Brake/EPB* / Utility / All Readiness.

*: Electric Parking Brake System

9. 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.

PROCEDURE

1.	**REPLACE BRAKE ACTUATOR ASSEMBLY**

HINT:

Click here INFO

NEXT END