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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: C05A100,...,C14C017; Brake Pressure Sensor "E" Malfunction; 2023 - 2024 MY Prius Prius Prime [12/2022 -]		

DTC	**C05A100**	**Brake Pressure Sensor "E" Malfunction**
DTC	**C05A11F**	**Brake Pressure Sensor "E" Circuit Intermittent**
DTC	**C05A131**	**Brake Pressure Sensor "E" No Signal**
DTC	**C05A196**	**Brake Pressure Sensor "E" Component Internal Failure**
DTC	**C063900**	**Brake Pressure Sensor "H" Malfunction**
DTC	**C06391F**	**Brake Pressure Sensor "H" Circuit Intermittent**
DTC	**C063931**	**Brake Pressure Sensor "H" No Signal**
DTC	**C063996**	**Brake Pressure Sensor "H" Component Internal Failure**
DTC	**C116916**	**Brake Pressure Sensor "H" Supply Voltage Circuit Voltage Below Threshold**
DTC	**C116917**	**Brake Pressure Sensor "H" Supply Voltage Circuit Voltage Above Threshold**
DTC	**C14C016**	**Servo Pressure Sensor Power Supply Voltage Circuit Voltage Below Threshold**
DTC	**C14C017**	**Servo Pressure Sensor Power Supply Voltage Circuit Voltage Above Threshold**

DESCRIPTION

If the No. 1 skid control ECU (brake booster with master cylinder assembly) detects an internal sensor (stroke simulator pressure sensor or servo pressure sensor) malfunction during self-diagnosis, DTCs are stored.

HINT:

- Brake pressure sensor "E": Servo pressure sensor
- Brake pressure sensor "H": Stroke simulator pressure sensor

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	DTC OUTPUT FROM	PRIORITY	NOTE
C05A100	Brake Pressure Sensor "E" Malfunction	Data from the sensor is invalid for 0.2 seconds or more.	No. 1 skid control ECU (brake booster with master cylinder assembly)	Comes on	Brake/EPB	A	• SAE Code: C05A1 (Case 3) • Output ECU: Both skid control ECUs
C05A11F	Brake Pressure Sensor "E" Circuit Intermittent	Fluctuation of the sensor signal exceeds the threshold (7.5 MPa (76.5 kgf/cm ^{2} , 1088 psi) or more from the previous value) for 0.1 seconds or more.	No. 1 skid control ECU (brake booster with master cylinder assembly)	Comes on	Brake/EPB	A	• SAE Code: C14C4 • Output ECU: Both skid control ECUs
C05A131	Brake Pressure Sensor "E" No Signal	Communication with the sensor is invalid for 0.05 seconds or more.	No. 1 skid control ECU (brake booster with master cylinder assembly)	Comes on	Brake/EPB	A	• SAE Code: C05A1 (Case 1) • Output ECU: Both skid control ECUs

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	DTC OUTPUT FROM	PRIORITY	NOTE
C05A196	Brake Pressure Sensor "E" Component Internal Failure	Sensor self-diagnosis function reports an abnormal value for 0.05 seconds or more.	No. 1 skid control ECU (brake booster with master cylinder assembly)	Comes on	Brake/EPB	A	• SAE Code: C05A1 (Case 2) • Output ECU: Both skid control ECUs
C063900	Brake Pressure Sensor "H" Malfunction	Data from the sensor is invalid for 0.2 seconds or more.	No. 1 skid control ECU (brake booster with master cylinder assembly)	Comes on	Brake/EPB	A	• SAE Code: C0639 (Case 3) • Output ECU: Both skid control ECUs
C06391F	Brake Pressure Sensor "H" Circuit Intermittent	Fluctuation of the sensor signal exceeds the threshold (7.5 MPa (76.5 kgf/cm^2 , 1088 psi) or more from the previous value) for 0.1 seconds or more.	No. 1 skid control ECU (brake booster with master cylinder assembly)	Comes on	Brake/EPB	A	• SAE Code: C1168 • Output ECU: Both skid control ECUs
C063931	Brake Pressure Sensor "H" No Signal	Communication with the sensor is invalid for 0.05 seconds or more.	No. 1 skid control ECU (brake booster with master cylinder assembly)	Comes on	Brake/EPB	A	• SAE Code: C0639 (Case 1) • Output ECU: Both skid control ECUs

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	DTC OUTPUT FROM	PRIORITY	NOTE
C063996	Brake Pressure Sensor "H" Component Internal Failure	Sensor self-diagnosis function reports an abnormal value for 0.05 seconds or more.	No. 1 skid control ECU (brake booster with master cylinder assembly)	Comes on	Brake/EPB	A	• SAE Code: C0639 (Case 2) • Output ECU: Both skid control ECUs
C116916	Brake Pressure Sensor "H" Supply Voltage Circuit Voltage Below Threshold	The supplied voltage to the sensor is less than a certain value for 0.05 seconds or more.	No. 1 skid control ECU (brake booster with master cylinder assembly)	Comes on	Brake/EPB	A	• SAE Code: C116A • Output ECU: Both skid control ECUs
C116917	Brake Pressure Sensor "H" Supply Voltage Circuit Voltage Above Threshold	The supplied voltage to the sensor is a certain value or more for 0.05 seconds or more.	No. 1 skid control ECU (brake booster with master cylinder assembly)	Comes on	Brake/EPB	A	• SAE Code: C116B • Output ECU: Both skid control ECUs
C14C016	Servo Pressure Sensor Power Supply Voltage Circuit Voltage Below Threshold	The supplied voltage to the sensor is less than a certain value for 0.05 seconds or more.	No. 1 skid control ECU (brake booster with master cylinder assembly)	Comes on	Brake/EPB	A	• SAE Code: C1498 • Output ECU: Both skid control ECUs

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	DTC OUTPUT FROM	PRIORITY	NOTE
C14C017	Servo Pressure Sensor Power Supply Voltage Circuit Voltage Above Threshold	The supplied voltage to the sensor is a certain value or more for 0.05 seconds or more.	No. 1 skid control ECU (brake booster with master cylinder assembly)	Comes on	Brake/EPB	A	• SAE Code: C1499 • Output ECU: Both skid control ECUs

MONITOR DESCRIPTION

C05A1 (Case 1) and C0639 (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 a DTC.

C05A1 (Case 2) and C0639 (Case 2):

When the pressure or temperature of a brake fluid 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 a DTC. 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 a DTC.

C05A1 (Case 3) and C0639 (Case 3):

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

C1168 and C14C4:

When the difference between the previous value and current value of each brake fluid pressure sensor is excessively large, the No. 2 skid control ECU (brake actuator assembly) judges that the sensor output is invalid, the MIL is illuminated and a DTC is stored.

C116A and C1498:

When the master cylinder pressure sensor voltage is a certain value or less, the No. 2 skid control ECU (brake actuator assembly) judges that there is a malfunction, the MIL is illuminated and a DTC is stored.

C116B and C1499:

When the supply voltage of the master cylinder pressure sensor is a certain value or more, the No. 2 skid control ECU (brake actuator assembly) judges that there is a malfunction, the MIL is illuminated and a DTC is stored.

MONITOR STRATEGY

Related DTCs	C05A1 (Case 1): Servo pressure sensor lost communication C05A1 (Case 2): Servo pressure sensor internal malfunction C05A1 (Case 3): Servo pressure sensor invalid data C0639 (Case 1): Stroke simulator pressure sensor lost communication

	C0639 (Case 2): Stroke simulator pressure sensor internal malfunction C0639 (Case 3): Stroke simulator pressure sensor invalid data C1168: Stroke simulator pressure sensor intermittent/erratic C116A: Stroke simulator pressure sensor voltage circuit low C116B: Stroke simulator pressure sensor voltage circuit high C1498: Servo pressure sensor voltage circuit low C1499: Servo pressure sensor voltage circuit high C14C4: Servo pressure sensor intermittent/erratic
Required Sensors/Components(Main)	No. 2 skid control ECU (brake actuator assembly) Brake actuator (brake booster with master cylinder assembly) Brake actuator assembly
Required Sensors/Components(Related)	No. 2 skid control ECU (brake actuator assembly) Brake actuator (brake booster with master cylinder assembly) Brake actuator assembly
Frequency of Operation	Continuous
Duration	0.054 seconds: C05A1 (Case 1 and 2), C0639 (Case 1 and 2), C116A, C116B, C1498, and C1499 0.096 seconds: C1168 and C14C4 0.198 seconds: C05A1 (Case 3) and C0639 (Case 3)
MIL Operation	Immediately
Sequence of Operation	None

TYPICAL ENABLING CONDITIONS

C05A1 (Case 1)

Monitor runs whenever the following DTCs are not stored	C1498: Servo pressure sensor voltage circuit low C1499: Servo pressure sensor voltage circuit high
All of the following conditions are met	A, B, C, D and E
A. Following condition is met	More than 0.024 seconds
Servo pressure sensor power supply	On
B. Servo pressure sensor power supply voltage high signal (IC Data)	Off
C. Servo pressure sensor overcurrent signal (IC Data)	Off
D. Servo pressure sensor overtemperature signal (IC Data)	Off
E. Servo pressure sensor power supply voltage low signal (IC Data)	Off

C05A1 (Case 2) and C14C4

Monitor runs whenever the following DTCs are not stored	C05A1 (Case 1): Servo pressure sensor lost communication C1498: Servo pressure sensor voltage circuit low C1499: Servo pressure sensor voltage circuit high

All of the following conditions are met	A, B, C, D, E and F
A. Communication with servo pressure sensor	Valid
B. Following condition is met	More than 0.024 seconds
Servo pressure sensor power supply	On
C. Servo pressure sensor power supply voltage high signal (IC Data)	Off
D. Servo pressure sensor overcurrent signal (IC Data)	Off
E. Servo pressure sensor overtemperature signal (IC Data)	Off
F. Servo pressure sensor power supply voltage low signal (IC Data)	Off

C05A1 (Case 3)

Monitor runs whenever the following DTCs are not stored	C05A1 (Case 1): Servo pressure sensor lost communication C05A1 (Case 2): Servo pressure sensor internal malfunction C05A1 (Case 3): Servo pressure sensor invalid data C1498: Servo pressure sensor voltage circuit low C1499: Servo pressure sensor voltage circuit high C14C4: Servo pressure sensor intermittent/erratic
All of the following conditions are met	A, B and C
A. Both of the following conditions are met	More than 0.198 seconds
+BS cut MOS	Valid
+BS cut MOS voltage	Higher than 7.8 V
B. Following condition is met	More than 0.024 seconds
Servo pressure sensor power supply	On
C. Servo pressure sensor power supply voltage low signal (IC Data)	Off

C0639 (Case 1)

Monitor runs whenever the following DTCs are not stored	C116A: Stroke simulator pressure sensor voltage circuit low C116B: Stroke simulator pressure sensor voltage circuit high
All of the following conditions are met	A, B, C, D and E
A. Following condition is met	More than 0.024 seconds
Stroke simulator pressure sensor power supply	On
B. Stroke simulator pressure sensor power supply voltage high signal (IC Data)	Off
C. Stroke simulator pressure sensor overtemperature signal (IC Data)	Off

D. Stroke simulator pressure sensor overcurrent signal (IC Data)	Off
E. Stroke simulator pressure sensor power supply voltage low signal (IC Data)	Off

C0639 (Case 2) and C1168

Monitor runs whenever the following DTCs are not stored	C0639 (Case 1): Stroke simulator pressure sensor lost communication C116A: Stroke simulator pressure sensor voltage circuit low C116B: Stroke simulator pressure sensor voltage circuit high
All of the following conditions are met	A, B, C, D, E and F
A. Communication with pgap sensor	Valid
B. Following condition is met	More than 0.024 seconds
Stroke simulator pressure sensor power supply	On
C. Stroke simulator pressure sensor power supply voltage high signal (IC Data)	Off
D. Stroke simulator pressure sensor overtemperature signal (IC Data)	Off
E. Stroke simulator pressure sensor overcurrent signal (IC Data)	Off
F. Stroke simulator pressure sensor power supply voltage low signal (IC Data)	Off

C0639 (Case 3)

Monitor runs whenever the following DTCs are not stored	C0639 (Case 1): Stroke simulator pressure sensor lost communication C1168: Stroke simulator pressure sensor intermittent/erratic C116A: Stroke simulator pressure sensor voltage circuit low C116B: Stroke simulator pressure sensor voltage circuit high
All of the following conditions are met	A, B and C
A. Both of the following conditions are met	More than 0.198 seconds
+BS cut MOS	Valid
+BS cut MOS voltage	Higher than 7.8 V
B. Following condition is met	More than 0.024 seconds
Stroke simulator pressure sensor power supply	On
C. Stroke simulator pressure sensor power supply voltage high signal (IC Data)	Off

C116A

Monitor runs whenever the following DTCs are not stored	C116B: Stroke simulator pressure sensor voltage circuit high
All of the following conditions are met	A and B
A. Following condition is met	More than 0.024 seconds
Stroke simulator pressure sensor power supply	On
B. Both of the following conditions are met	More than 0.198 seconds
+BS cut MOS	Valid
+BS cut MOS voltage	Higher than 7.8 V

C116B and C1499

Monitor runs whenever the following DTCs are not stored	-

C1498

Monitor runs whenever the following DTCs are not stored	C1499: Servo pressure sensor voltage circuit high
All of the following conditions are met	A and B
A. Following condition is met	More than 0.024 seconds
Stroke simulator pressure sensor power supply	On
B. Both of the following conditions are met	More than 0.198 seconds
+BS cut MOS	Valid
+BS cut MOS voltage	Higher than 7.8 V

TYPICAL MALFUNCTION THRESHOLDS

C05A1 (Case 1)

Communication with psrv sensor	Invalid

C05A1 (Case 2)

Either of the following conditions is met	-
Servo pressure sensor value	Higher than 23.328 MPa (237.9 kgf/cm ^{2} , 3383 psi)
Servo pressure sensor temp value	Higher than 438°C (820°F)

C05A1 (Case 3) and C0639 (Case 3)

Either of the following conditions is met	More than 0.009 seconds
Servo pressure sensor power supply voltage high signal (IC Data)	On
Servo pressure sensor overcurrent signal (IC Data)	On
Servo pressure sensor overtemperature signal (IC Data)	On
Communication with servo pressure sensor	Invalid

Absolute value of the change in servo pressure sensor value during 3millisec	Higher than 7.5 MPa (76.5 kgf/cm ^{2} , 1088 psi)
Servo pressure sensor temp value	Higher than 438°C (820°F)
Servo pressure sensor value	Higher than 23.328 MPa (237.9 kgf/cm ^{2} , 3383 psi)

C0639 (Case 1)

Communication with stroke simulator pressure sensor	Invalid

C0639 (Case 2)

Either of the following conditions is met	-
Stroke simulator pressure sensor value	Higher than 23.328 MPa (237.9 kgf/cm ^{2} , 3383 psi)
Stroke simulator pressure sensor temp value	Higher than 438°C (820°F)

C1168 and C14C4

Absolute value of the change in servo pressure sensor value during 3millisec	Higher than 7.5 MPa (76.5 kgf/cm ^{2} , 1088 psi)

C116A and C1498

Stroke simulator pressure sensor power supply voltage low signal (IC Data)	On

C116B and C1499

Either of the following conditions is met	More than 0.012 seconds
Servo pressure sensor power supply voltage high signal (IC Data)	On
Servo pressure sensor overtemperature signal (IC Data)	On
Servo pressure sensor overcurrent signal (IC Data)	On

COMPONENT OPERATING RANGE

C05A1 (Case 1)

All of the following conditions are met	A, B, C, D, E and F
A. Following condition is met	More than 0.024 seconds
Servo pressure sensor power supply	On
B. Servo pressure sensor power supply voltage high signal (IC Data)	Off
C. Servo pressure sensor overcurrent signal (IC Data)	Off
D. Servo pressure sensor overtemperature signal (IC Data)	Off
E. Servo pressure sensor power supply voltage low signal (IC Data)	Off
F. Communication with servo pressure sensor	Valid

C05A1 (Case 2)

All of the following conditions are met	A, B, C, D, E, F, G and H
A. Communication with servo pressure sensor	Valid
B. Following condition is met	More than 0.024 seconds
Servo pressure sensor power supply	On
C. Servo pressure sensor power supply voltage high signal (IC Data)	Off
D. Servo pressure sensor overcurrent signal (IC Data)	Off
E. Servo pressure sensor overtemperature signal (IC Data)	Off
F. Servo pressure sensor power supply voltage low signal (IC Data)	Off
G. Servo pressure sensor value	23.328 MPa (237.9 kgf/cm ^{2} , 3383 psi) or less
H. Servo pressure sensor temp value	438°C (820°F) or less

C05A1 (Case 3)

All of the following conditions are met	A, B and C
A. Both of the following conditions are met	More than 0.198 seconds
+BS cut MOS	Valid
+BS cut MOS voltage	Higher than 7.8 V
B. Following condition is met	More than 0.024 seconds
Servo pressure sensor power supply	On
C. Servo pressure sensor power supply voltage low signal (IC Data)	Off
D. All of the following conditions are met	More than 0.012 seconds
Servo pressure sensor power supply voltage high signal (IC Data)	Off
Servo pressure sensor overcurrent signal (IC Data)	Off
Servo pressure sensor overtemperature signal (IC Data)	Off
Communication with servo pressure sensor	Valid
Absolute value of the change in servo pressure sensor value during 3millisec	7.5 MPa (76.5 kgf/cm ^{2} , 1088 psi) or less
Servo pressure sensor temp value	438°C (820°F) or less
Servo pressure sensor value	23.328 MPa (237.9 kgf/cm ^{2} , 3383 psi) or less

C0639 (Case 1 and 3)

All of the following conditions are met	A, B, C, D. E and F
A. Following condition is met	More than 0.024 seconds
Stroke simulator pressure sensor power supply	On

B. Stroke simulator pressure sensor power supply voltage high signal (IC Data)	Off
C. Stroke simulator pressure sensor overtemperature signal (IC Data)	Off
D. Stroke simulator pressure sensor overcurrent signal (IC Data)	Off
E. Stroke simulator pressure sensor power supply voltage low signal (IC Data)	Off
F. Communication with stroke simulator pressure sensor	Valid

C0639 (Case 2)

All of the following conditions are met	A, B, C, D, E, F, G and H
A. Communication with pgap sensor	Valid
B. Following condition is met	More than 0.024 seconds
Stroke simulator pressure sensor power supply	On
C. Stroke simulator pressure sensor power supply voltage high signal (IC Data)	Off
D. Stroke simulator pressure sensor overtemperature signal (IC Data)	Off
E. Stroke simulator pressure sensor overcurrent signal (IC Data)	Off
F. Stroke simulator pressure sensor power supply voltage low signal (IC Data)	Off
G. Stroke simulator pressure sensor value	23.328 MPa (237.9 kgf/cm ^{2} , 3383 psi) or less
H. Stroke simulator pressure sensor temp value	438°C (820°F) or less

C1168 and C14C4

All of the following conditions are met	A, B, C, D, E, F and G
A. Communication with pgap sensor	Valid
B. Following condition is met	More than 0.024 seconds
Stroke simulator pressure sensor power supply	On
C. Stroke simulator pressure sensor power supply voltage high signal (IC Data)	Off
D. Stroke simulator pressure sensor overtemperature signal (IC Data)	Off
E. Stroke simulator pressure sensor overcurrent signal (IC Data)	Off
F. Stroke simulator pressure sensor power supply voltage low signal (IC Data)	Off
G. Absolute value of the change in servo pressure sensor value during 3millisec	7.5 MPa (76.5 kgf/cm ^{2} , 1088 psi) or less

C116A, C116B, C1498 and C1499

All of the following conditions are met	A, B, C, D and E
A. Following condition is met	More than 0.024 seconds

Stroke simulator pressure sensor power supply	On
B. Stroke simulator pressure sensor power supply voltage high signal (IC Data)	Off
C. Stroke simulator pressure sensor overtemperature signal (IC Data)	Off
D. Stroke simulator pressure sensor overcurrent signal (IC Data)	Off
E. Stroke simulator pressure sensor power supply voltage low 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 5 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.

PROCEDURE

1.	**REPLACE BRAKE BOOSTER WITH MASTER CYLINDER ASSEMBLY**

HINT:

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