Last Modified: 12-04-2024	6.11:8.1.0	**Doc ID:** RM1000000028X25
Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [12/2022 -]
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: ELECTRONICALLY CONTROLLED BRAKE SYSTEM: C13BA2B; Electronic Brake Booster Motor "A" Current Sensor Signal Cross Coupled ; 2023 - 2024 MY Prius Prius Prime [12/2022 -]		

DTC	**C13BA2B**	**Electronic Brake Booster Motor "A" Current Sensor Signal Cross Coupled**

DESCRIPTION

The No. 1 skid control ECU (brake booster with master cylinder assembly) uses the motor current monitor circuit to monitor the three-phase current.

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	DTC OUTPUT FROM	PRIORITY	NOTE
C13BA2B	Electronic Brake Booster Motor "A" Current Sensor Signal Cross Coupled	When three-phase current malfunction status continues.	No. 1 skid control ECU (brake booster with master cylinder assembly)	Comes on	Brake/EPB	A	• SAE Code: C13BB • Output ECU: Both skid control ECUs

MONITOR DESCRIPTION

Case 1:

The pump motor is built into the No. 1 skid control ECU (brake booster with master cylinder assembly).

With the vehicle power source voltage normal, voltage applied normally to the motor power source terminal and the No. 1 skid control ECU (brake booster with master cylinder assembly) started, if the current monitor U, V or W phase current value continues to be abnormally high or repeatedly switches between abnormally high and normal, the No. 2 skid control ECU (brake actuator assembly) determines that there is a pump motor drive circuit malfunction, the MIL is illuminated and a DTC is stored.

Case 2:

The pump motor is built into the No. 1 skid control ECU (brake booster with master cylinder assembly).

With voltage applied normally to the motor power source terminal and the motor stopped (current not flowing) during the ECU self-check immediately before the No. 1 skid control ECU (brake booster with master cylinder assembly) stops, if the current monitor value is the value during motor operation (current is flowing), the No. 2 skid control ECU (brake actuator assembly) determines that there is a pump motor drive circuit malfunction, the MIL is illuminated and a DTC is stored.

MONITOR STRATEGY

Related DTCs	C13BB (Case 1): Brake booster motor range/performance

Required Sensors/Components(Main)	No. 2 skid control ECU (brake actuator assembly) Brake booster with master cylinder assembly
Required Sensors/Components(Related)	-
Frequency of Operation	Continuous
Duration	0.072 seconds: Case 2 -: Case 1
MIL Operation	Immediately
Sequence of Operation	None

TYPICAL ENABLING CONDITIONS

Case 1

Monitor runs whenever the following DTCs are not stored	C129B: Rotation angle sensor range/performance C12B4 (Case 2): Brake booster motor performance (motor current) C12BF (Case 1 to 4): Brake booster motor performance (motor upper circuit) C12BF (Case 5 to 9): Brake booster motor performance (motor drive circuit) C14C8: Brake system voltage circuit high
All of the following conditions are met	A, B, C, D or E
A. Both of the following conditions are met	More than 0.198 seconds
+BS cut MOS	Valid
+BS cut MOS voltage	Below 23.2 V
B. Both of the following conditions are met	More than 0.198 seconds
+BS cut MOS	Valid
+BS cut MOS voltage	Higher than 7.4 V
C. Following condition is met	More than 0.198 seconds
BM voltage	7.1 V or higher
D. Command to motor failsafe relay	On
E. +BS cut MOS voltage	Higher than 7.8 V

Case 2

Monitor runs whenever the following DTCs are not stored	None
Both of the following conditions are met	A and B
A. Both of the following conditions are met	-
ECU status	Premain
ECU status	Final check
B. Inverter drive signal	Off

TYPICAL MALFUNCTION THRESHOLDS

Case 1

Either of the following conditions is met	A or B
A. Following condition is met	More than 0.072 seconds
Absolute value of the sum of U-phase current, V-phase current, and W-phase current	Higher than 35 A
B. Motor current monitor Valid to Invalid edge count	More than 10 times

Case 2

Either of the following conditions is met	-
SO1 voltage monitor	2 V or less, or 3 V or higher
SO2 voltage monitor	2 V or less, or 3 V or higher
SO3 voltage monitor	2 V or less, or 3 V or higher

COMPONENT OPERATING RANGE

All

Either of the following conditions is met	A, B, C, D or E
A. All of the following conditions are met	a, b, c, d and e
a. Both of the following conditions are met	More than 0.198 seconds
+BS cut MOS	Valid
+BS cut MOS voltage	Below 23.2 V
b. Both of the following conditions are met	More than 0.198 seconds
+BS cut MOS	Valid
+BS cut MOS voltage	Higher than 7.4 V
c. Following condition is met	More than 0.198 seconds
BM voltage	7.1 V or higher
d. Command to motor failsafe relay	On
e. Both of the following conditions are met	1 and 2
1. Following condition is met	More than 1 second
Absolute value of the sum of U-phase current, V-phase current, and W-phase current	35 A or less
2. Following condition is met	More than 1 second
Motor current monitor Valid to Invalid edge count	0 times
B. All of the following conditions are met	a, b and c
a. Either of the following conditions is met	-
ECU status	Premain
ECU status	Final check

b. Inverter drive signal	Off
c. All of the following conditions are met	-
SO1 voltage monitor	Higher than 2 V, and below 3 V
SO2 voltage monitor	Higher than 2 V, and below 3 V
SO3 voltage monitor	Higher than 2 V, and below 3 V

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.

PROCEDURE

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

HINT:

Click here INFO

NEXT **END**