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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: C12B471; Electronic Brake Booster Motor "A" Actuator Stuck; 2023 - 2024 MY Prius Prius Prime [12/2022 - ] | | |

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| **DTC** | **C12B471** | **Electronic Brake Booster Motor "A" Actuator Stuck** |

# DESCRIPTION

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

| DTC NO. | DETECTION ITEM | DTC DETECTION CONDITION | TROUBLE AREA | MIL | DTC OUTPUT FROM | PRIORITY | NOTE |
|---|---|---|---|---|---|---|---|
| C12B471 | Electronic Brake Booster Motor "A" Actuator Stuck | When the rotation angle sensor condition is normal, the brake booster with master cylinder assembly motor is not rotating normally for 0.3 seconds or more. | No. 1 skid control ECU (brake booster with master cylinder assembly) | Comes on | Brake/EPB | A | • SAE Code: C12B4 (Case 1)<br>• Output ECU: Both skid control ECUs |

# MONITOR DESCRIPTION

The rotation angle sensor is built into the No. 1 skid control ECU (brake booster with master cylinder assembly).

The rotation angle sensor consists of hall sensors positioned at the U, V and W phases. With IGR on, if the rotation angle sensor U, V or W phase current value continues to exceed 160 A, the No. 2 skid control ECU (brake actuator assembly) determines an overcurrent, the MIL is illuminated and a DTC is stored.

# MONITOR STRATEGY

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| Related DTCs | C12B4 (Case 1): Brake booster motor not rotate |
| Required Sensors/Components(Main) | No. 2 skid control ECU (brake actuator assembly)<br>Brake booster with master cylinder assembly |
| Required Sensors/Components(Related) | Stop light switch assembly |
| Frequency of Operation | Continuous |
| Duration | 0.36 seconds |
| MIL Operation | Immediately |
| Sequence of Operation | None |

# TYPICAL ENABLING CONDITIONS

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| Monitor runs whenever the following DTCs are not stored | C05C0: Brake pedal position sensor learning not complete<br>C05C1: Brake pedal position sensor learning not complete<br>C0639 (Case 1): Stroke simulator pressure sensor Lost communication<br>C0639 (Case 2): Stroke simulator pressure sensor internal check<br>C0639 (Case 3): Stroke simulator pressure sensor invalid data<br>C063C: Stroke simulator pressure sensor exceeded learning limit<br>C1100 (Case 1): Brake pedal position sensor voltage circuit/open<br>C1100 (Case 2): Brake pedal position sensor invalid data<br>C1103 (Case 1): Brake pedal position sensor voltage circuit/open<br>C1103 (Case 2): Brake pedal position sensor invalid data<br>C1168: Stroke simulator pressure sensor intermittent/erratic<br>C116A: Stroke simulator pressure sensor voltage circuit low<br>C116B: Stroke simulator pressure sensor voltage circuit high<br>C116C: Brake position / stroke simulator pressure correlation<br>C116D: Brake pressure control solenoid (SLM1) stuck on<br>C121F: Brake system voltage performance<br>C129B: Rotation angle sensor range/performance<br>C12B4 (Case 2): Brake booster motor performance (motor current)<br>C12BF (Case 1 to 4): Brake booster motor performance (motor upper circuit)<br>C12BF (Case 5 to 9): Brake booster motor performance (motor drive circuit)<br>C12FA: Brake system voltage power supply relay open circuit<br>C12FB: Brake system voltage power supply relay circuit high<br>C1345: Brake pressure control solenoid open current learning not complete<br>C13BB: Brake booster motor range/performance<br>C13D9: Brake pressure too low<br>C14CE: High pressure hydraulic tube air bleeding not complete<br>C14F3 (Case 1 to 3): Brake pressure control solenoid (SLM1) circuit open<br>C14F3 (Case 4 to 5): Brake pressure control solenoid (SLM1) circuit low<br>C14F4 (Case 1 to 2): Brake pressure control solenoid (SLM2) circuit high (solenoid OFF current)<br>C14F4 (Case 3 to 6): Brake pressure control solenoid (SLM2) circuit high (IC data)<br>C14F4 (Case 7 to 8): Brake pressure control solenoid (SLM2) circuit high (solenoid ON current)<br>C14FC (Case 1 to 3) Brake pressure control solenoid (SLM2) circuit open<br>C14FC (Case 4 to 5) Brake pressure control solenoid (SLM2) circuit low<br>C14FD (Case 1 to 2): Brake pressure control solenoid (SLM1) circuit high (solenoid OFF current)<br>C14FD (Case 3 to 6): Brake pressure control solenoid (SLM1) circuit high (IC data)<br>C14FD (Case 7 to 8): Brake pressure control solenoid (SLM1) circuit high (solenoid ON current)<br>C1509: Brake pressure control solenoid SSA circuit low<br>C1510: Brake pressure control solenoid SGH circuit high<br>C150A: Brake pressure control solenoid SSA circuit high<br>C150F: Brake pressure control solenoid SGH circuit low |

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| | P057A: Brake pedal position sensor invalid data<br>P057C: Brake pedal position sensor open circuit<br>P057D: Brake pedal position sensor circuit high<br>P057E: Brake pedal position sensor intermittent/erratic<br>P05DB: Brake pedal position sensor invalid data<br>P05DD: Brake pedal position sensor open circuit<br>P05DE: Brake pedal position sensor circuit high<br>P05E0: Brake pedal position sensor "A"/"B" correlation<br>U0129: Lost communication with BSCM (CH1)<br>U025E: Lost communication with BSCM2 (CH1) |
| All of the following conditions are met | - |
| Motor angle sensor | Valid |
| Brake | On |
| Required motor rotation speed | 430 rpm or more |

## TYPICAL MALFUNCTION THRESHOLDS

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| Motor rotation speed | Less than 100 rpm |

## COMPONENT OPERATING RANGE

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| All of the following conditions are met | - |
| Motor angle sensor | Valid |
| Brake | On |
| Required motor rotation speed | 430 rpm or more |
| BSCM2 fail (C121F) | Not detected |
| Brake system voltage fail (C12FA, C12FB) | Not detected |
| Brake pedal position sensor fail (C05C0, C05C1, C1100, C1103, P057A, P057C, P057D, P057E, P05DB, P05DD, P05DE, P05DF, P05E0) | Not detected |
| Pressure sensor fail (C05A1, C05A2, C1498, C1499, C14C4, C116A, C116B, C0639, C063C, C1168, C116C) | Not detected |
| CAN communication fail (U0129, U025E) | Not detected |
| Brake pressure control solenoid fail (C1345, C14F4, C14FD, C150A, C1510, C14F3, C14FC, C1509, C150F, C116D, C13D9, C14CE) | Not detected |
| Brake booster motor performance (motor current) fail (C12B4) | Not detected |
| Brake booster motor fail (C12BF, C13BB) | Not detected |
| Rotation angle sensor fail (C129B) | Not detected |
| Motor rotation speed | 100 rpm or more |

## 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

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

**HINT:**

Click here INFO

**NEXT** ▶ **END**