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|---|---------------------------|--------------------------------------|
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| <b>Model Year Start:</b> 2023   | <b>Model:</b> Prius Prime | <b>Prod Date Range:</b> [12/2022 - ] |
| <b>Title:</b> THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): Power Source Mode does not Change to ON (IG); 2023 - 2024 MY Prius Prius Prime [12/2022 - ] |                           |                                      |

**Power Source Mode does not Change to ON (IG)**

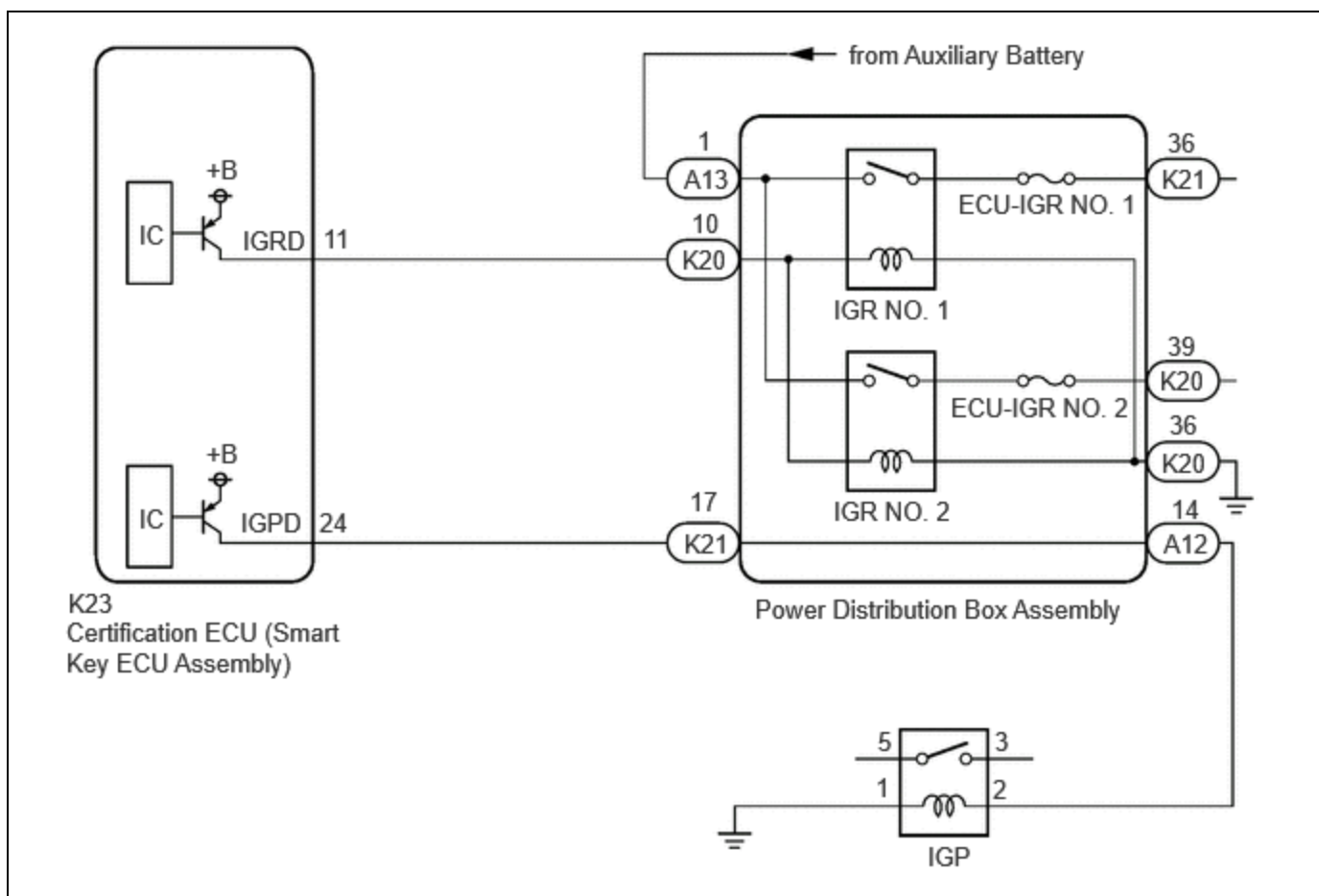
## DESCRIPTION

If the power switch is pressed with the electrical key transmitter sub-assembly in the cabin, the certification ECU (smart key ECU assembly) receives a signal and changes the power source mode.

### Related Data List and Active Test Items

| PROBLEM SYMPTOM  | DATA LIST AND ACTIVE TEST   |
|--|---|
| Power source mode does not change to ON but does change to ACC | <p><b>Power Source Control</b></p> <ul style="list-style-type: none"> <li>• Power Supply Condition</li> <li>• IGP Relay Circuit (Outside) Monitor</li> <li>• IGP Relay Circuit (Inside) Monitor</li> <li>• IGR Relay Circuit (Outside) Monitor</li> <li>• IGR Relay Circuit (Inside) Monitor</li> </ul> |

## WIRING DIAGRAM



## CAUTION / NOTICE / HINT

### NOTICE:

- When using the GTS with the ignition switch off, perform lock and unlock operations using the door control switch of the multiplex network master switch assembly at intervals of 1.5 seconds or less until communication between the GTS and the vehicle begins, and then select the vehicle model manually.

Then select Model Code "KEY REGIST" under manual mode and enter the following menus: Body Electrical / Smart Key(CAN). While using the GTS, periodically perform lock and unlock operations using the door control switch of the multiplex network master switch assembly at intervals of 1.5 seconds or less to maintain communication between the GTS and the vehicle.

- The smart key system (for Start Function) uses the LIN communication system and CAN communication system. Inspect the communication function by following How to Proceed with Troubleshooting. Troubleshoot the smart key system (for Start Function) after confirming that the communication systems are functioning properly.

Click here [INFO](#)

- Make sure that no DTCs are output. If any DTCs are output, proceed to Diagnostic Trouble Code Chart.
- If the smart key system (for Start Function) has been disabled, enable the system before performing troubleshooting.

Click here [INFO](#)

- Inspect the fuses for circuits related to this system before performing the following procedure.
- Before replacing the certification ECU (smart key ECU assembly), refer to Registration.

Click here [INFO](#)

- After completing repairs, confirm that the problem does not recur.
- After performing repairs, confirm that no DTCs are output by performing "DTC Output Confirmation Operation."

### HINT:

- If interior verification is unsuccessful, Vehicle Control History (RoB) may be stored.
- If Vehicle Control History (RoB) has been stored, refer to the Vehicle Control History (RoB) List to determine the detection conditions and narrow down trouble areas.

**Body Electrical > Smart Key > Utility**

|                               |
|-------------------------------|
| TESTER DISPLAY                |
| Vehicle Control History (RoB) |

**PROCEDURE**

|           |                      |
|-----------|----------------------|
| <b>1.</b> | <b>CHECK FOR DTC</b> |
|-----------|----------------------|

(a) Using the GTS, check for certification ECU (smart key ECU assembly) DTCs.

**Body Electrical > Power Source Control > Trouble Codes**

**Body Electrical > Smart Key > Trouble Codes**

| RESULT  | PROCEED TO |
|---|------------|
| DTCs are not output                                   | A          |
| Smart key system (for Start Function) DTCs are output | B          |

**B ▶ GO TO DIAGNOSTIC TROUBLE CODE CHART**

Click here [INFO](#)

**A**  
▼

|           |   |
|-----------|---|
| <b>2.</b> | <b>CHECK HARNESS AND CONNECTOR (POWER DISTRIBUTION BOX ASSEMBLY - CERTIFICATION ECU (SMART KEY ECU ASSEMBLY) AND BODY GROUND)</b> |
|-----------|---|

(a) Disconnect the K23 certification ECU (smart key ECU assembly) connector.

(b) Disconnect the K20 and K21 power distribution box assembly connectors.

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

Standard Resistance:



[Click Location & Routing\(K21,K23,K20\).](#)

[Click Connector\(K21\).](#)

[Click Connector\(K23\).](#)

[Click Connector\(K20\).](#)

| TESTER CONNECTION   | CONDITION | SPECIFIED CONDITION |
|---|-----------|---------------------|
| K21-17 - K23-24 (IGPD)                                    | Always    | Below 1 Ω           |
| K20-10 - K23-11 (IGRD)                                    | Always    | Below 1 Ω           |
| K20-36 - Body ground                                      | Always    | Below 1 Ω           |
| K21-17 or K23-24 (IGPD) - Other terminals and body ground | Always    | 10 kΩ or higher     |
| K20-10 or K23-11 (IGRD) - Other terminals and body ground | Always    | 10 kΩ or higher     |

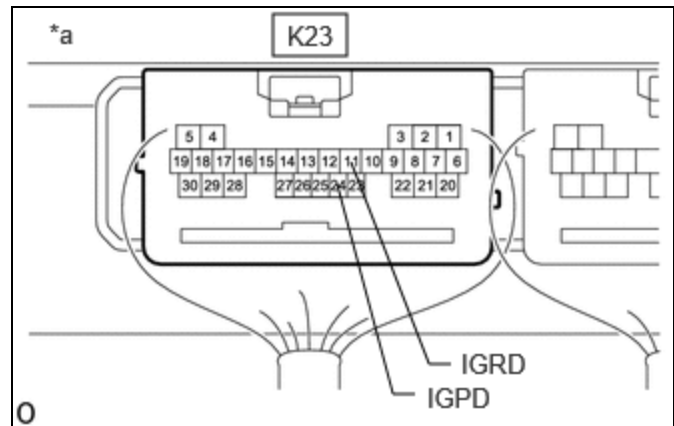
**NG**  **REPAIR OR REPLACE HARNESS OR CONNECTOR**

**OK**



**3. CHECK CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)**

(a) Connect the K23 certification ECU (smart key ECU assembly) connector.



|    |   |
|----|---|
| *a | Component with harness connected (Certification ECU (Smart Key ECU Assembly)) |
|----|---|

(b) Measure the voltage according to the value(s) in the table below.

Standard Voltage:



[Click Location & Routing\(K23\)](#)

[Click Connector\(K23\)](#)

| TESTER CONNECTION           | CONDITION                                | SPECIFIED CONDITION         |
|-----------------------------|--|-----------------------------|
| K23-11 (IGRD) - Body ground | Ignition switch ACC → Ignition switch ON | 1 V or less → 9 V or higher |
| K23-24 (IGPD) - Body ground | Ignition switch ACC → Ignition switch ON | 1 V or less → 9 V or higher |

**NG**  **REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)**

Click here 

**OK**



|           |   |
|-----------|---|
| <b>4.</b> | <b>CHECK HARNESS AND CONNECTOR (POWER DISTRIBUTION BOX ASSEMBLY - POWER SOURCE)</b> |
|-----------|---|

- (a) Disconnect the K23 certification ECU (smart key ECU assembly) connector.
- (b) Disconnect the A13, A12, K20 and K21 power distribution box assembly connectors.
- (c) Measure the voltage according to the value(s) in the table below.

Standard Voltage:



[Click Location & Routing\(A13\)](#)

[Click Connector\(A13\)](#)

| TESTER CONNECTION   | CONDITION           | SPECIFIED CONDITION |
|---------------------|---------------------|---------------------|
| A13-1 - Body ground | Ignition switch off | 11 to 14 V          |

**NG**  **REPAIR OR REPLACE HARNESS OR CONNECTOR**

**OK**

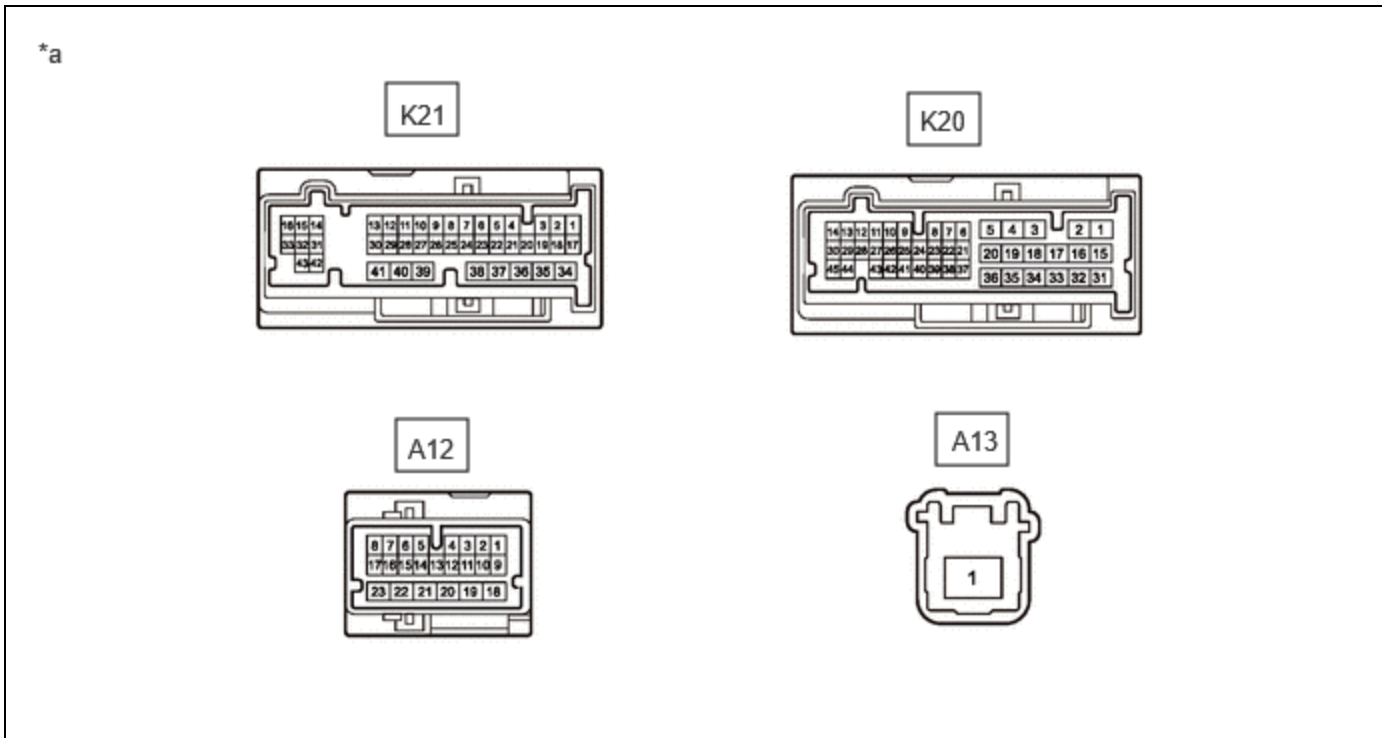


|           |  |
|-----------|--|
| <b>5.</b> | <b>CHECK POWER DISTRIBUTION BOX ASSEMBLY</b> |
|-----------|--|

- (a) Remove the power distribution box assembly.

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- (b) Remove the main body ECU (multiplex network body ECU) from the power distribution box assembly.



|    |  |   |   |
|----|--|---|---|
| *a | Component without harness connected<br>(Power Distribution Box Assembly) | - | - |
|----|--|---|---|

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

Standard Resistance:



[Click Location & Routing\(K21,A12\).](#)

[Click Connector\(K21\).](#)

[Click Connector\(A12\).](#)

| TESTER CONNECTION | CONDITION | SPECIFIED CONDITION |
|-------------------|-----------|---------------------|
| K21-17 - A12-14   | Always    | Below 1 Ω           |

(d) Connect the auxiliary battery terminal (+) to the K20-10 terminal.

(e) Connect the auxiliary battery terminal (-) to the K20-36 terminal.

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

Standard Resistance:



[Click Location & Routing\(A13,K21,K20\).](#)

[Click Connector\(A13\).](#)

[Click Connector\(K20\).](#)

| TESTER CONNECTION | CONDITION   | SPECIFIED CONDITION |
|-------------------|---|---------------------|
| A13-1 - K21-36    | Auxiliary battery voltage applied between terminals K20-10 and K20-36 | Below 1 $\Omega$    |
| A13-1 - K20-39    | Auxiliary battery voltage applied between terminals K20-10 and K20-36 | Below 1 $\Omega$    |

**NG**  **REPLACE POWER DISTRIBUTION BOX ASSEMBLY**

Click here 

**OK**



|           |  |
|-----------|--|
| <b>6.</b> | <b>CHECK HARNESS AND CONNECTOR (POWER DISTRIBUTION BOX ASSEMBLY - IGP RELAY)</b> |
|-----------|--|

- (a) Remove the IGP relay from the No. 1 engine room relay block and No. 1 junction block assembly.
- (b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:



[Click Location & Routing\(A12\)](#)

[Click Connector\(A12\)](#)

| TESTER CONNECTION  | CONDITION | SPECIFIED CONDITION     |
|--|-----------|-------------------------|
| A12-14 - IGP relay terminal 2                                    | Always    | Below 1 $\Omega$        |
| IGP relay terminal 1 - Body ground                               | Always    | Below 1 $\Omega$        |
| A12-14 or IGP relay terminal 2 - Other terminals and body ground | Always    | 10 k $\Omega$ or higher |

**NG**  **REPAIR OR REPLACE HARNESS OR CONNECTOR**

**OK**

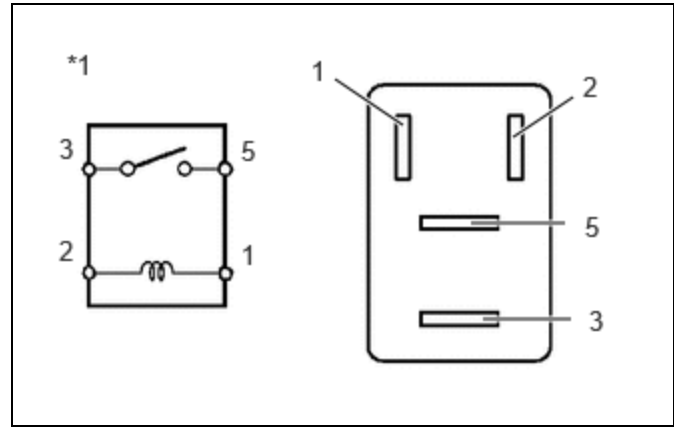


|           |                          |
|-----------|--------------------------|
| <b>7.</b> | <b>INSPECT IGP RELAY</b> |
|-----------|--------------------------|

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

Standard Resistance:

| TESTER CONNECTION | CONDITION   | SPECIFIED CONDITION     |
|-------------------|---|-------------------------|
| 3 - 5             | Auxiliary battery voltage applied between terminals 1 and 2     | Below 1 $\Omega$        |
|                   | Auxiliary battery voltage not applied between terminals 1 and 2 | 10 k $\Omega$ or higher |



\*1 IGP Relay

**OK** ► REPAIR OR REPLACE HARNESS OR CONNECTOR

**NG** ► REPLACE IGP RELAY

