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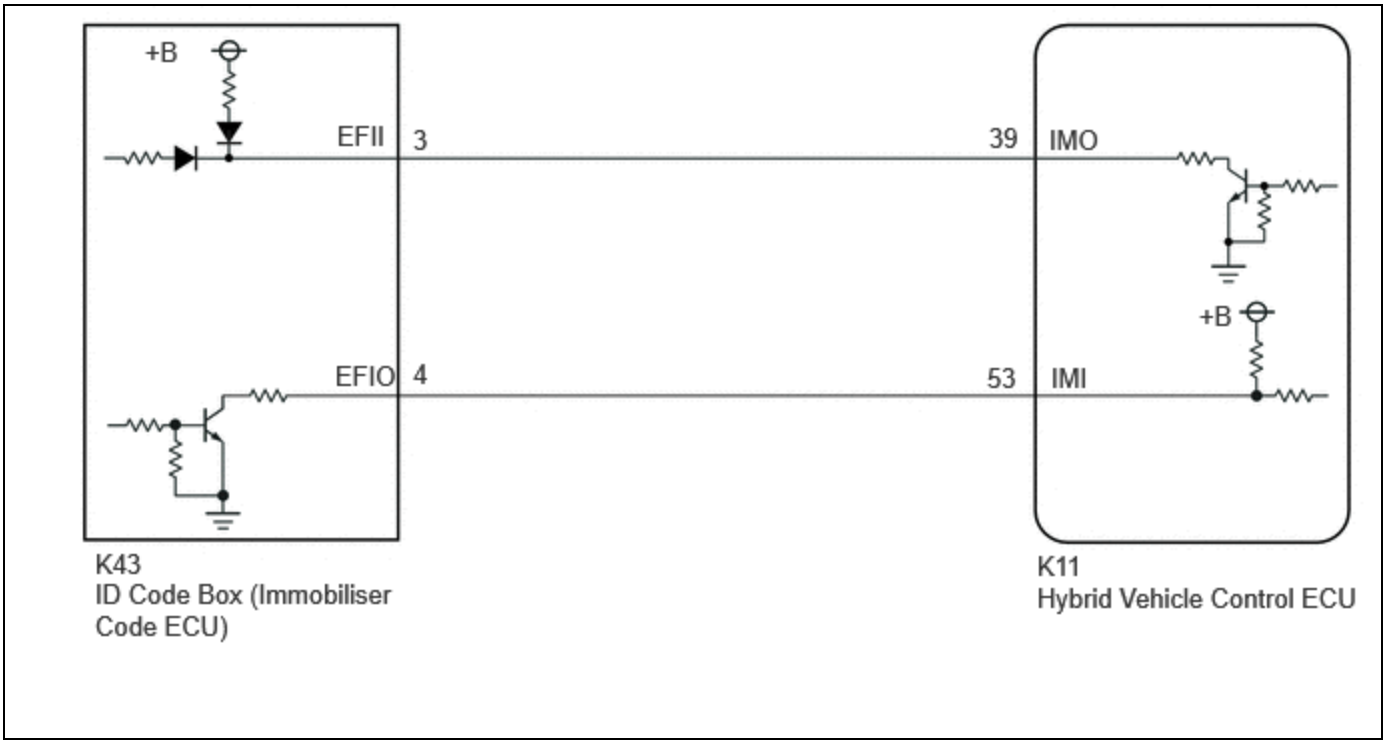
Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [12/2022 -]
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): Immobiliser System does not Operate Properly; 2023 - 2024 MY Prius Prius Prime [12/2022 -]		

Immobiliser System does not Operate Properly

DESCRIPTION

The immobiliser function compares the ID code that is registered in the certification ECU (smart key ECU assembly) with the ID code of the transponder chip that is embedded in the electrical key transmitter sub-assembly.

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

- Before replacing the hybrid vehicle control ECU or certification ECU (smart key ECU assembly), refer to Registration.

  Click here INFO
- After repair, confirm that no DTCs are output by performing "DTC Output Confirmation Operation".

HINT:

If an immobiliser function or hybrid control system DTC is output, first perform troubleshooting for the immobiliser function or hybrid control system DTC.

PROCEDURE

1.	**CHECK FOR DTC**

(a) Check for DTCs.

Body Electrical > Smart Key > Trouble Codes

Powertrain > Hybrid Control > Trouble Codes

RESULT	PROCEED TO
DTCs are not output	A
DTCs are output	B

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

A ▼

2.	**CHECK WHETHER HYBRID CONTROL SYSTEM STARTS**

(a) Check that the hybrid control system starts within 5 seconds of the ignition switch being turned ON (READY).

OK:

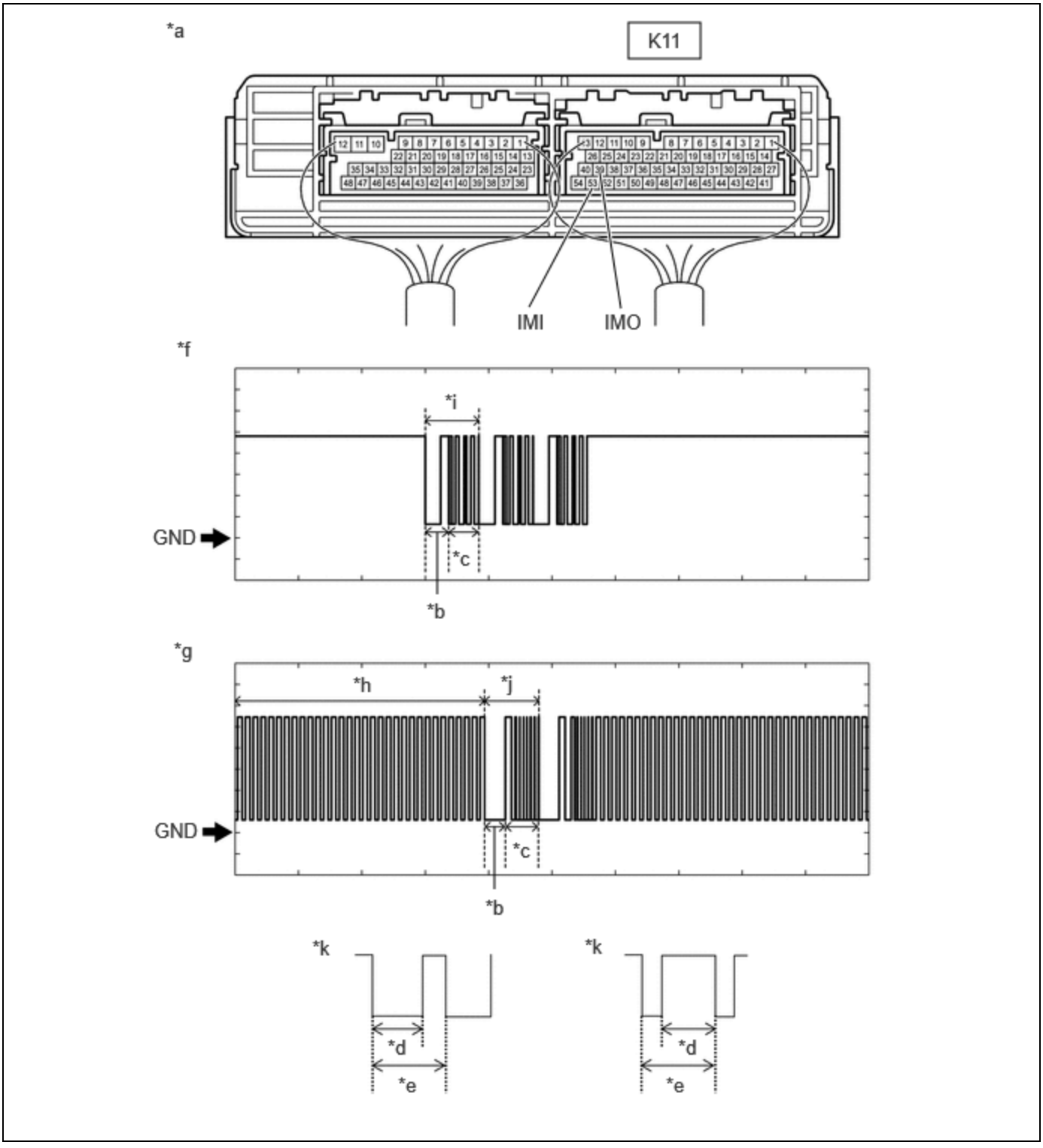
Hybrid control system starts normally.

OK ▶ **USE SIMULATION METHOD TO CHECK**

NG ▼

3.	**CHECK HYBRID VEHICLE CONTROL ECU (TERMINAL IMI AND IMO)**

(a) Using an oscilloscope, check the waveform.



*a	Component with harness connected (Hybrid Vehicle Control ECU)	*b	Approximately 160 ms.
*c	Approximately 270 ms.	*d	Approximately 40 ms.
*e	Approximately 60 ms.	*f	Terminal IMO
*g	Terminal IMI	*h	Waveform 1
*i	Waveform 2	*j	Waveform 3
*k	Waveform 1 (detail)	-	-

NOTICE:

The waveform shown in the illustration is an example for reference only. Noise, chattering, etc. are not shown.

OK:

EWD INFO

Click Location & Routing(K11)
Click Connector(K11)

TESTER CONNECTION	CONDITION	TOOL SETTING	SPECIFIED CONDITION
K11-39 (IMO) - Body ground	Within 3 seconds of hybrid control system start or within 3 seconds of ignition switch turned to ON after auxiliary battery cable disconnected and reconnected	2 V/DIV., 500 ms./DIV.	Pulse generation (See waveform 2)
K11-53 (IMI) - Body ground	Within 3 seconds of hybrid control system start or within 3 seconds of ignition switch turned to ON after auxiliary battery cable disconnected and reconnected	2 V/DIV., 500 ms./DIV.	Pulse generation (See waveform 1 and 3)

RESULT	PROCEED TO
Normal waveform	A
Waveform 1 is not output, or has abnormal wavelength or shape	B
Waveform 2 is not output, or has abnormal wavelength or shape	C
Waveform 3 is not output, or has abnormal wavelength or shape	D

B ▶ **GO TO STEP 6**

C ▶ **REPLACE HYBRID VEHICLE CONTROL ECU** INFO

D ▶ **GO TO STEP 7**

A ▼

4.	**REGISTER ECU COMMUNICATION ID**

(a) Register the ECU communication ID codes.

Click here INFO

NEXT

5.	**CHECK WHETHER HYBRID CONTROL SYSTEM STARTS**

(a) Check that the hybrid control system starts.

OK:
Hybrid control system starts normally.

OK ▶ **END (COMMUNICATION ID REGISTRATION WAS DEFECTIVE)**

NG ▶ **REPLACE ID CODE BOX (IMMOBILISER CODE ECU)**
INFO

6.	**CHECK HARNESS AND CONNECTOR (ID CODE BOX (IMMOBILISER CODE ECU) - HYBRID VEHICLE CONTROL ECU)**

(a) Disconnect the K43 ID code box (immobiliser code ECU) connector.

(b) Disconnect the K11 hybrid vehicle control ECU connector.

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

Standard Resistance:

EWD INFO

Click Location & Routing(K43,K11)
Click Connector(K43)
Click Connector(K11)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
K43-3 (EFII) - K11-39 (IMO)	Always	Below 1 Ω
K43-3 (EFII) or K11-39 (IMO) - Other terminals and body ground	Always	10 kΩ or higher
K43-4 (EFIO) - K11-53 (IMI)	Always	Below 1 Ω
K43-4 (EFIO) or K11-53 (IMI) - Other terminals and body ground	Always	10 kΩ or higher

OK ▶ **GO TO STEP 7**

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

7.	**REPLACE ID CODE BOX (IMMOBILISER CODE ECU)**

(a) Replace the ID code box (immobiliser code ECU) with a new one.

Click here INFO

NEXT

8.	**REGISTER RECOGNITION CODE**

(a) Register the recognition codes to the ECUs.

Click here INFO

NEXT

9.	**REGISTER ECU COMMUNICATION ID**

(a) Register the ECU communication ID codes.

Click here INFO

NEXT

10.	**CHECK WHETHER HYBRID CONTROL SYSTEM STARTS**

(a) Check that the hybrid control system starts.

OK:
Hybrid control system starts normally.

OK ▶ **END (ID CODE BOX (IMMOBILISER CODE ECU) WAS DEFECTIVE)**

NG ▶ **GO TO HYBRID CONTROL SYSTEM**