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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 Entry Function): B27A113; Driver Side Electrical Antenna Circuit Open; 2023 - 2024 MY Prius Prius Prime [12/2022 -]		

DTC	**B27A113**	**Driver Side Electrical Antenna Circuit Open**

DESCRIPTION

The certification ECU (smart key ECU assembly) generates a request signal and transmits the signal to the front door outside handle assembly (for driver door) (electrical key antenna) at intervals of 0.25 seconds. For the front door outside handle assembly (for driver door) (electrical key antenna) to detect when the electrical key transmitter sub-assembly is brought close to the vehicle, a signal requesting a response from the electrical key transmitter sub-assembly is transmitted within approximately 1 m (3.28 ft.) of the driver door at intervals of 0.25 seconds. DTC B27A113 is stored by the certification ECU (smart key ECU assembly) when an open is detected between the certification ECU (smart key ECU assembly) and front door outside handle assembly (for driver door) (electrical key antenna).

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	DTC OUTPUT FROM	PRIORITY	NOTE
B27A113	Driver Side Electrical Antenna Circuit Open	An open is detected in the circuit between the certification ECU (smart key ECU assembly) and front door outside handle assembly (for driver door) (This is detected by the malfunction detection circuit in the certification ECU (smart key ECU assembly)) (1 trip detection logic*).	• Certification ECU (smart key ECU assembly) • Front door outside handle assembly (for driver door) • Harness or connector	Smart Key	A	**DTC Output Confirmation Operation:** Any time

*: Only output while a malfunction is present.

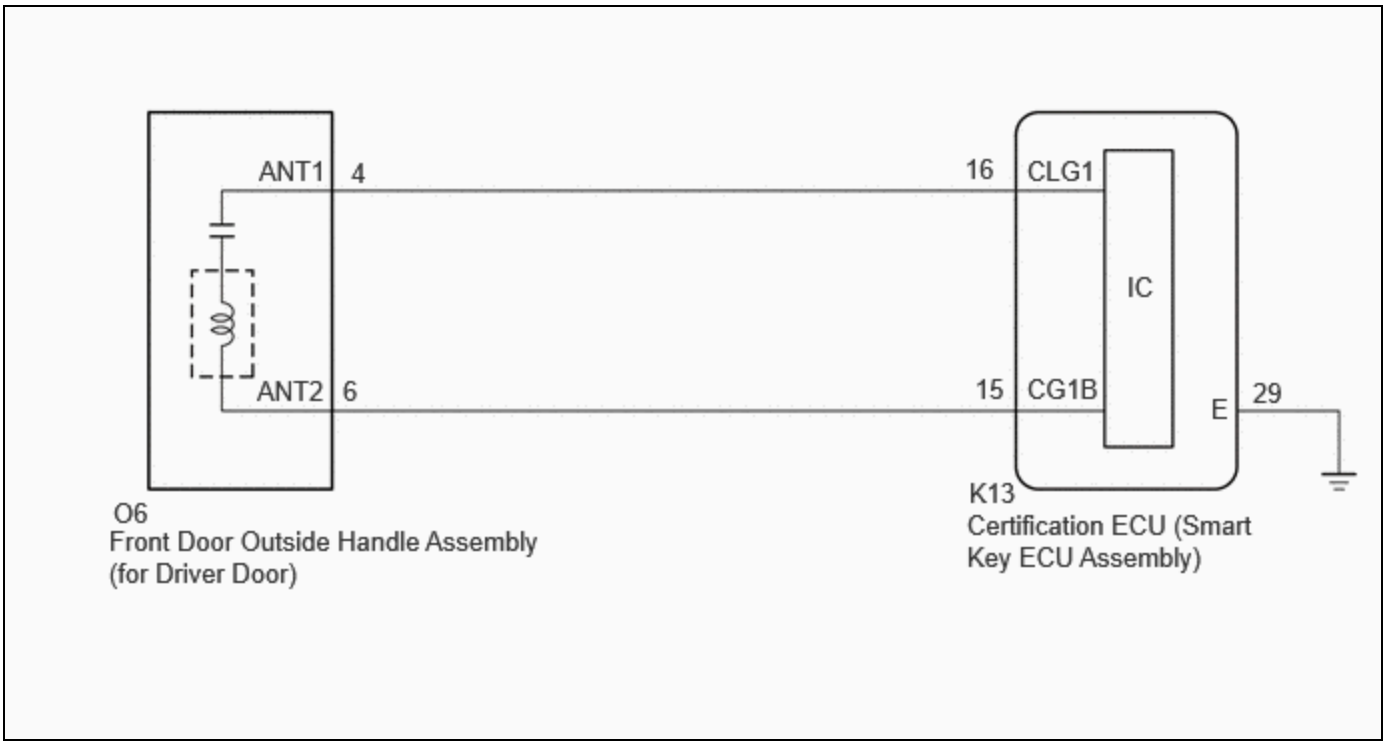
Vehicle Condition and Fail-safe Operation when Malfunction Detected

VEHICLE CONDITION WHEN MALFUNCTION DETECTED	FAIL-SAFE OPERATION WHEN MALFUNCTION DETECTED
Entry lock/unlock operation cannot be performed for driver door	-

Related Data List and Active Test

DTC NO.	DATA LIST AND ACTIVE TEST
B27A113	Key diagnostic mode can be used to perform troubleshooting

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

  Click here INFO
- Before replacing the certification ECU (smart key ECU assembly), refer to Precaution.

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

PROCEDURE

1.	**CHECK CONNECTOR CONNECTION**

(a) Check that the connectors are properly connected to the certification ECU (smart key ECU assembly) and front door outside handle assembly (for driver door).

OK:

Connectors are properly connected.

NG ▶ **CONNECT CONNECTORS PROPERLY**

OK ▼

2.	**CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU (SMART KEY ECU ASSEMBLY) - FRONT DOOR OUTSIDE HANDLE ASSEMBLY (FOR DRIVER DOOR))**

Pre-procedure1

(a) Disconnect the K13 certification ECU (smart key ECU assembly) connector.

(b) Disconnect the O6 front door outside handle assembly (for driver door) connector.

Procedure1

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

Standard Resistance:

EWD INFO

Click Location & Routing(K13,O6)
Click Connector(K13)
Click Connector(O6)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
K13-16 (CLG1) - O6-4 (ANT1)	Always	Below 1 Ω	Ω
K13-15 (CG1B) - O6-6 (ANT2)	Always	Below 1 Ω	Ω

Post-procedure1

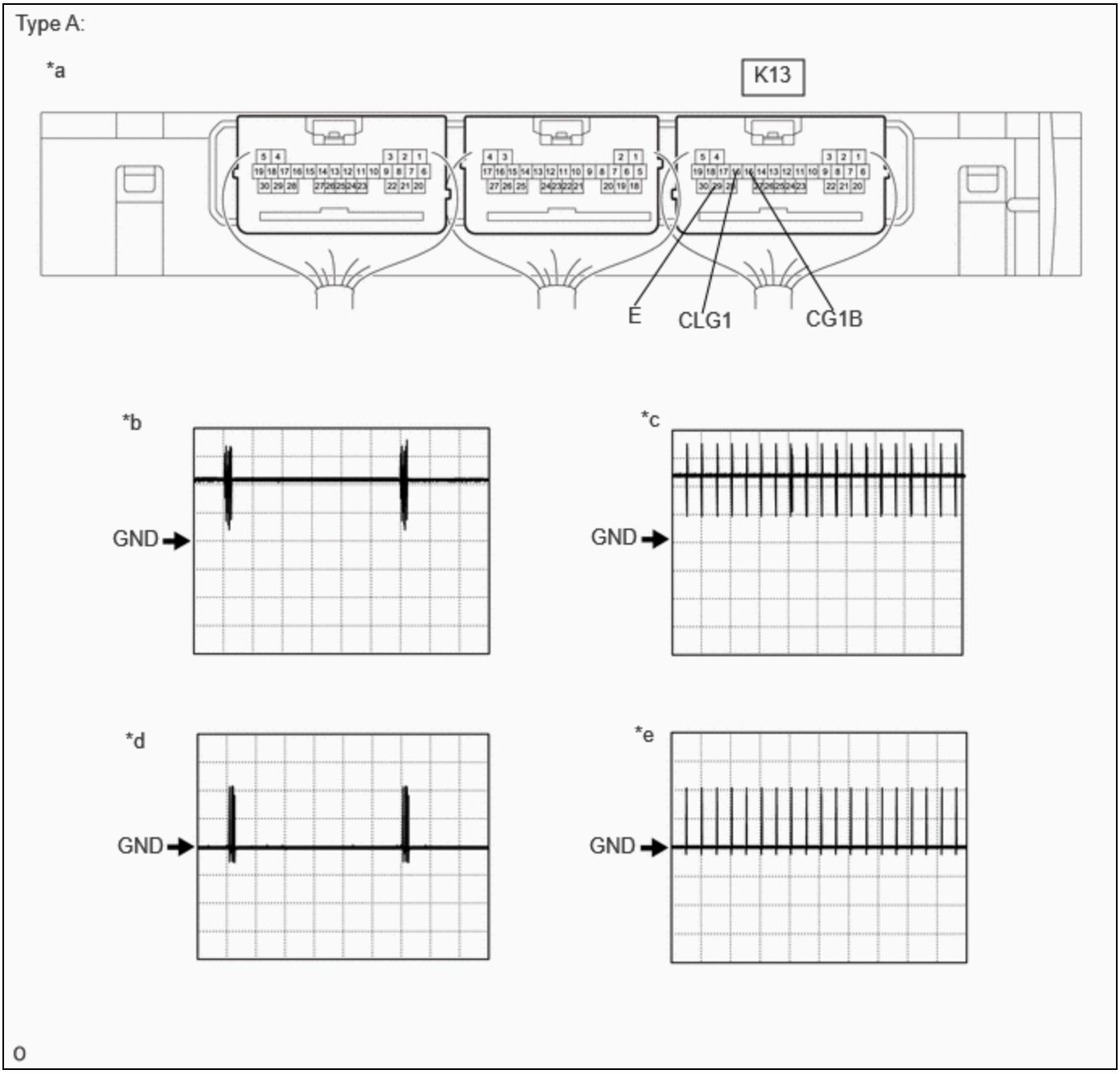
(d) Connect the K13 certification ECU (smart key ECU assembly) connector.

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

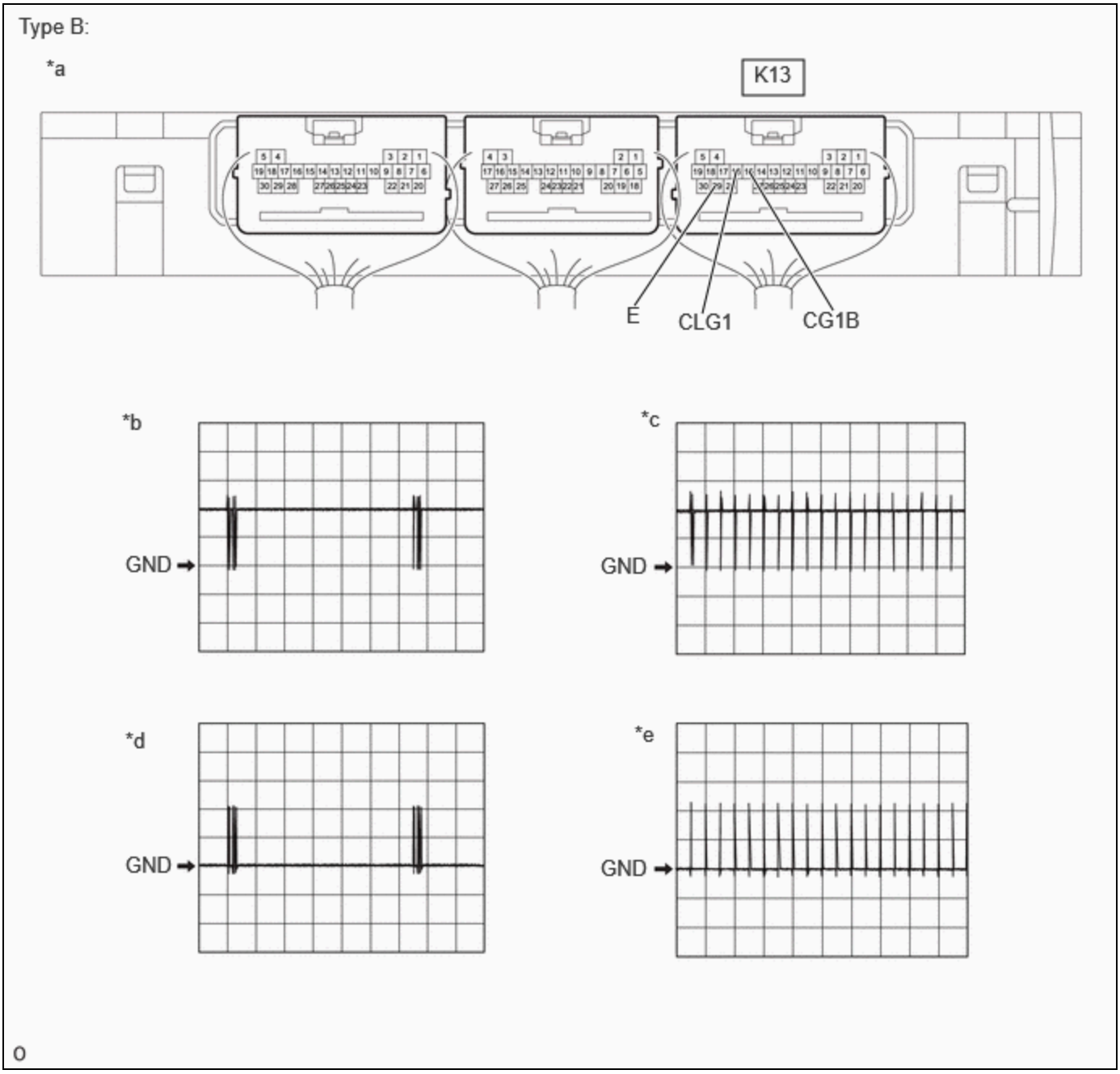
OK ▼

3.	**CHECK CERTIFICATION ECU (SMART KEY ECU ASSEMBLY) (OUTPUT TO FRONT DOOR OUTSIDE HANDLE ASSEMBLY (FOR DRIVER DOOR))**

(a) Using an oscilloscope, check the waveform.



*a	Component with harness connected (Certification ECU (Smart Key ECU Assembly))	*b	Waveform 1
*c	Waveform 2	*d	Waveform 3
*e	Waveform 4	-	-



*a	Component with harness connected (Certification ECU (Smart Key ECU Assembly))	*b	Waveform 1
*c	Waveform 2	*d	Waveform 3
*e	Waveform 4	-	-

OK:

EWD INFO

Click Location & Routing(K13)
Click Connector(K13)

TESTER CONNECTION	CONDITION	TOOL SETTING	SPECIFIED CONDITION
K13-16 (CLG1) - K13-29 (E)	Procedure: 1. Ignition switch off 2. All doors closed 3. Electrical key transmitter sub-assembly not inside vehicle 4. All doors locked through wireless operation (electrical key transmitter sub-assembly brought inside detection area*)	5 V/DIV., 500 ms./DIV.	Pulse generation (See waveform 1)
	Procedure: 1. Ignition switch off 2. All doors closed 3. Electrical key transmitter sub-assembly not inside vehicle 4. All doors locked through wireless operation (electrical key transmitter sub-assembly brought outside detection area*)	5 V/DIV., 500 ms./DIV.	Pulse generation (See waveform 2)
K13-15 (CG1B) - K13-29 (E)	Procedure: 1. Ignition switch off 2. All doors closed 3. Electrical key transmitter sub-assembly not inside vehicle 4. All doors locked through wireless operation (electrical key transmitter sub-assembly brought inside detection area*)	5 V/DIV., 500 ms./DIV.	Pulse generation (See waveform 3)
	Procedure: 1. Ignition switch off 2. All doors closed 3. Electrical key transmitter sub-assembly not inside vehicle 4. All doors locked through wireless operation (electrical key transmitter sub-assembly brought outside detection area*)	5 V/DIV., 500 ms./DIV.	Pulse generation (See waveform 4)

HINT:

*: For details about the entry function detection area, refer to Operation Check.

Click here INFO

OK ▶ **REPLACE FRONT DOOR OUTSIDE HANDLE ASSEMBLY (FOR DRIVER DOOR)**

Click here INFO

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

Click here INFO