Last Modified: 12-04-2024	6.11:8.1.0	**Doc ID:** RM100000002909V
Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [12/2022 -]
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): B27841C; Antenna Coil Circuit Voltage Out of Range; 2023 - 2024 MY Prius Prius Prime [12/2022 -]		

DTC	**B27841C**	**Antenna Coil Circuit Voltage Out of Range**

DESCRIPTION

When an open or short circuit is detected in the transponder key amplifier coil built into the power switch, the certification ECU (smart key ECU assembly) stores this DTC. This DTC is also stored as a history DTC.

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	DTC OUTPUT FROM	PRIORITY	NOTE
B27841C	Antenna Coil Circuit Voltage Out of Range	The transponder key amplifier coil built into the power switch is open (see below) or shorted (determined by communication with certification ECU (smart key ECU assembly)). (1 trip detection logic*)	• Power switch • Certification ECU (smart key ECU assembly) • Wire harness or connector	Smart Key	A	**DTC output confirmation operation:** With the shift position in P and the electrical key transmitter sub-assembly held near the power switch, a hybrid control system start operation is performed by pressing and holding the power switch when the transmitter battery is depleted.

*: Only output while a malfunction is present.

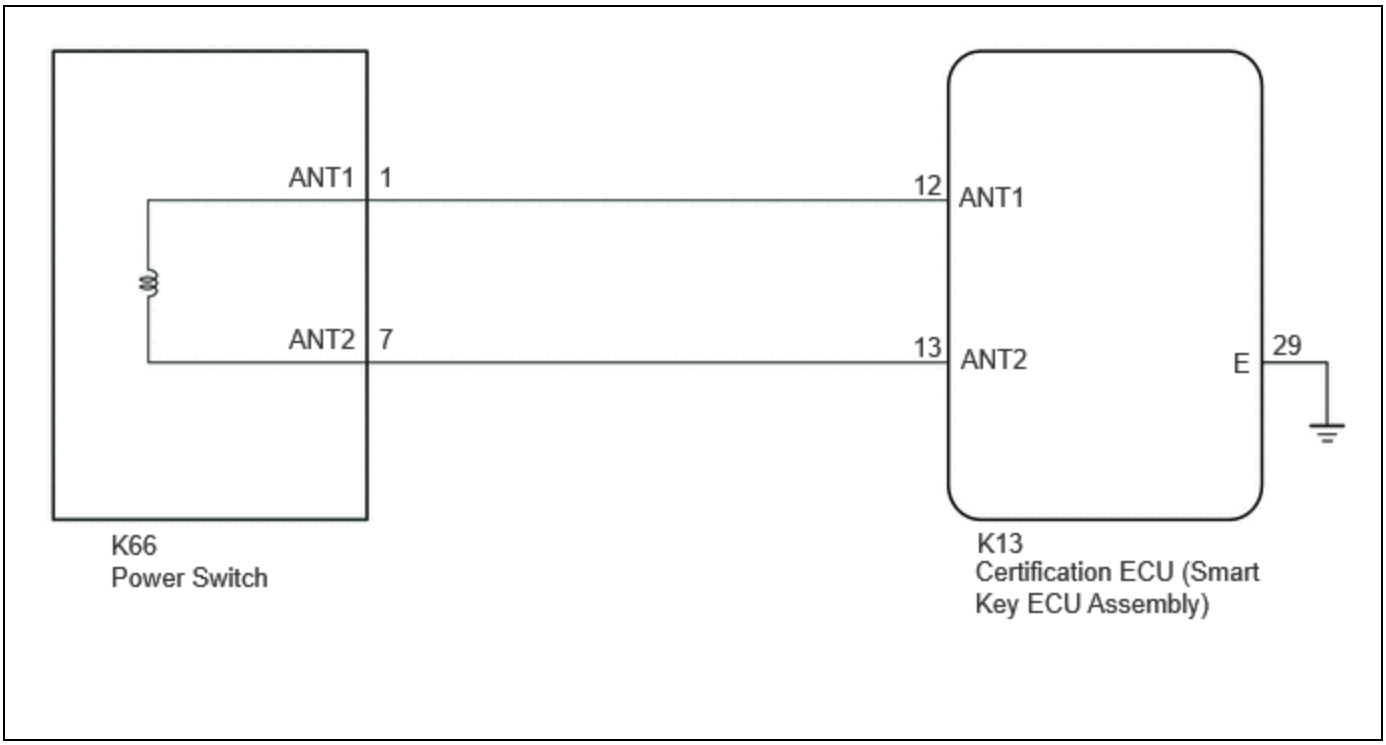
Vehicle Condition and Fail-safe Operation when Malfunction Detected

VEHICLE CONDITION WHEN MALFUNCTION DETECTED	FAIL-SAFE OPERATION WHEN MALFUNCTION DETECTED
Hybrid control system cannot be started when transmitter battery is depleted by holding electrical key transmitter sub-assembly near power switch and pressing and holding power switch with shift position in P	-

Related Data List and Active Test

DTC NO.	DATA LIST AND ACTIVE TEST
B27841C	-

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 certification ECU (smart key ECU assembly), refer to Registration.

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

PROCEDURE

1.	**CHECK CONNECTION OF CONNECTOR**

(a) Check that the connectors are properly connected to the power switch and certification ECU (smart key ECU assembly).

OK:

Connectors are properly connected.

NG ▶ **CONNECT CONNECTORS PROPERLY**

OK ▼

2.	**CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU (SMART KEY ECU ASSEMBLY) - POWER SWITCH AND BODY GROUND)**

Pre-procedure1

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

(b) Disconnect the K66 power switch connector.

Procedure1

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

Standard Resistance:

EWD INFO

Click Location & Routing(K13,K66)
Click Connector(K13)
Click Connector(K66)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
K13-12 (ANT1) - K66-1 (ANT1)	Always	Below 1 Ω	Ω
K13-12 (ANT1) or K66-1 (ANT1) - Other terminals and body ground	Always	10 kΩ or higher	kΩ
K13-13 (ANT2) - K66-7 (ANT2)	Always	Below 1 Ω	Ω
K13-13 (ANT2) or K66-7 (ANT2) - Other terminals and body ground	Always	10 kΩ or higher	kΩ

Post-procedure1

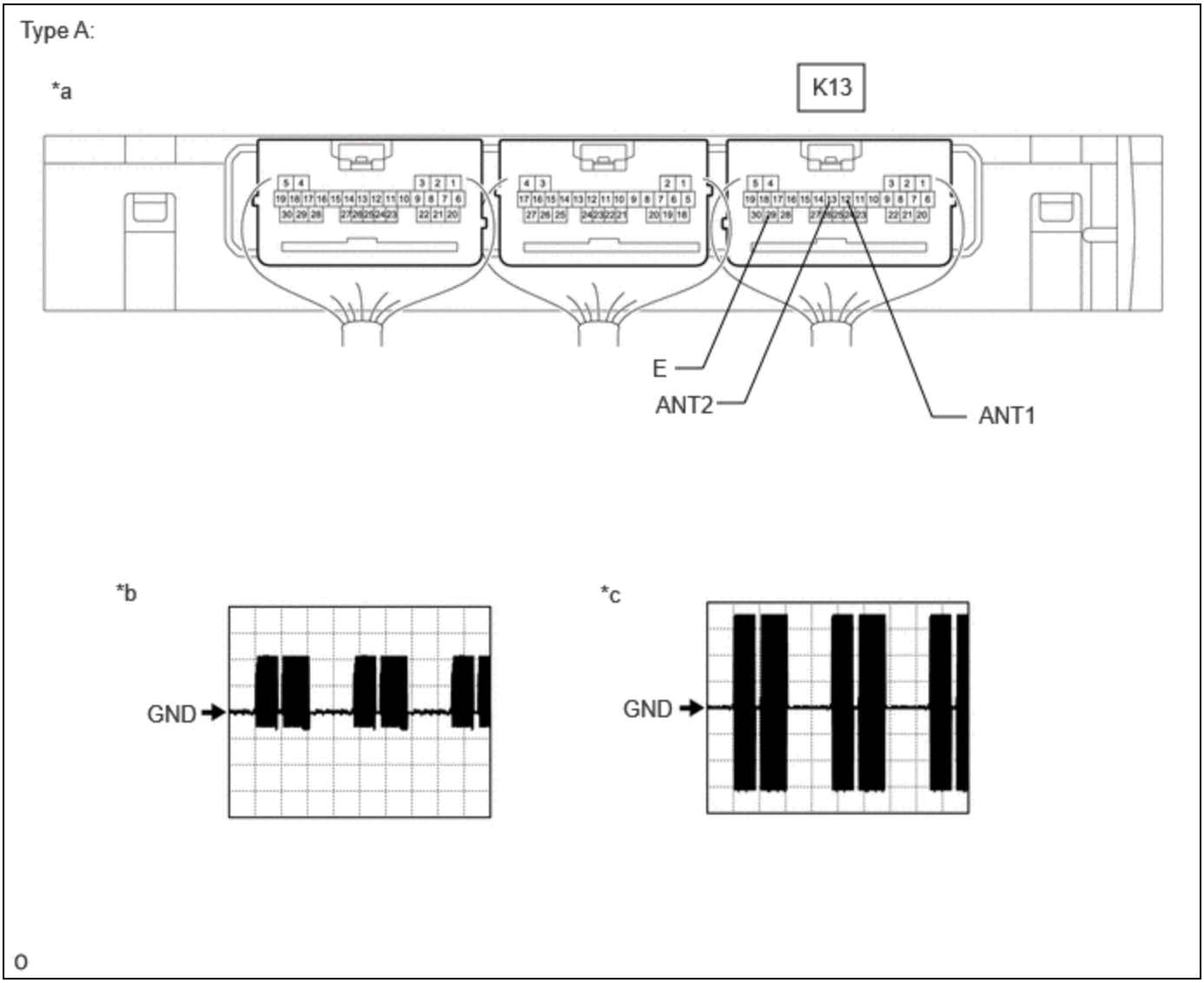
(d) Connect the K13 certification ECU (smart key ECU assembly) connector.

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

OK ▼

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

(a) Using an oscilloscope, check the waveform.



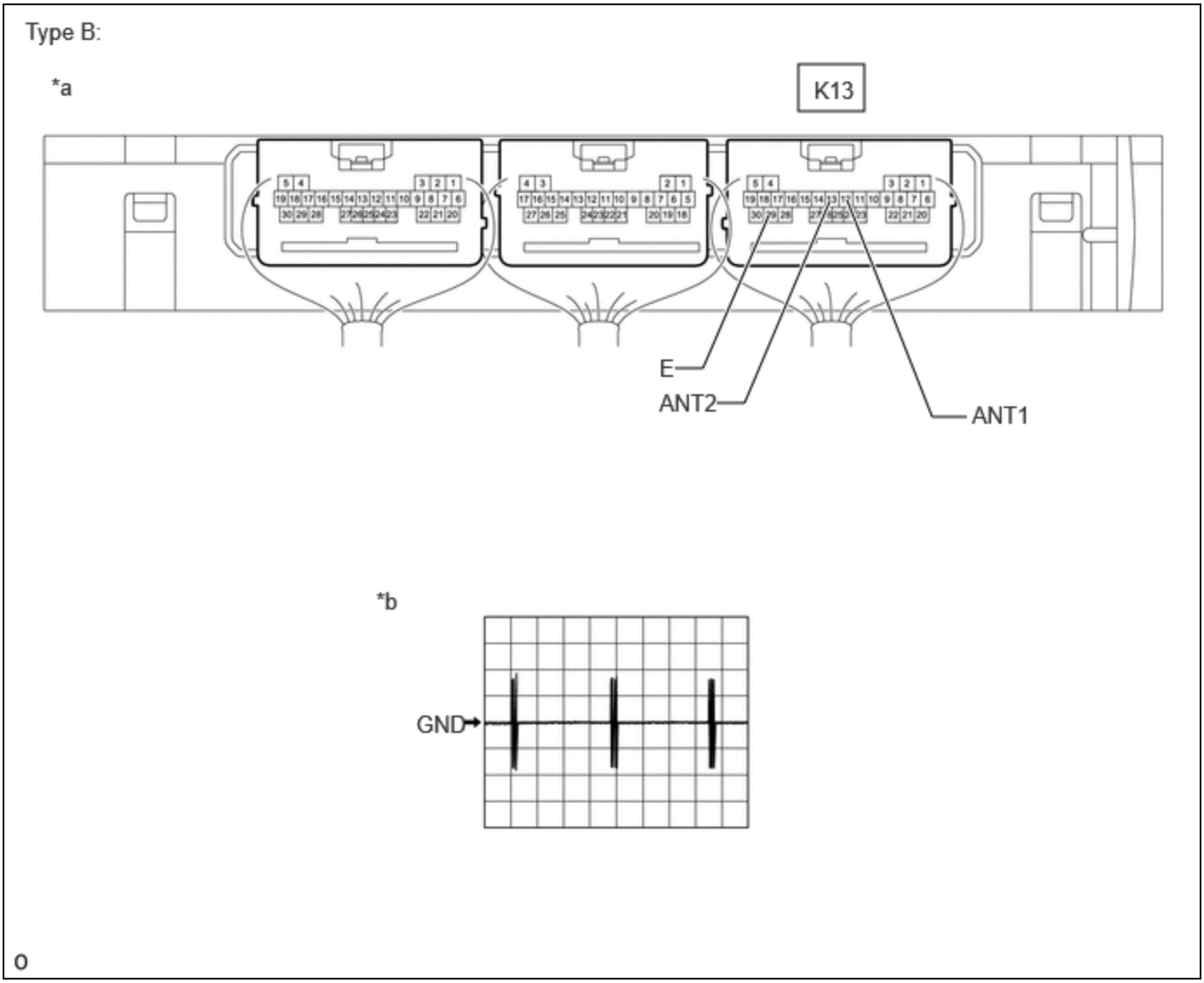
*a	Component with harness connected (Certification ECU (Smart Key ECU Assembly))	*b	Waveform 1
*c	Waveform 2	-	-

OK:

EWD INFO

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

TESTER CONNECTION	CONDITION	TOOL SETTING	SPECIFIED CONDITION
K13-12 (ANT1) - K13-29 (E)	Ignition switch off, electrical key transmitter sub-assembly not in cabin, within 30 seconds of power switch pressed	5 V/DIV., 200 ms./DIV.	Pulse generation (See waveform 1)
K13-13 (ANT2) - K13-29 (E)	Ignition switch off, electrical key transmitter sub-assembly not in cabin, within 30 seconds of power switch pressed	20 V/DIV., 200 ms./DIV.	Pulse generation (See waveform 2)



*a	Component with harness connected (Certification ECU (Smart Key ECU Assembly))	*b	Waveform 1

OK:

EWD INFO

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

TESTER CONNECTION	CONDITION	TOOL SETTING	SPECIFIED CONDITION
K13-12 (ANT1) - K13-29 (E)	Ignition switch off, electrical key transmitter sub-assembly not in cabin, within 30 seconds of power switch pressed	20 V/DIV., 200 ms./DIV.	Pulse generation (See waveform 1)
K13-13 (ANT2) - K13-29 (E)	Ignition switch off, electrical key transmitter sub-assembly not in cabin, within 30 seconds of power switch pressed	20 V/DIV., 200 ms./DIV.	Pulse generation (See waveform 1)

OK ▶ **REPLACE POWER SWITCH**

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