Last Modified: 12-04-2024	6.11:8.1.0	**Doc ID:** RM100000002909Q
Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [12/2022 -]
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): B228231,B228262; Vehicle Speed Signal Circuit Open; 2023 - 2024 MY Prius Prius Prime [12/2022 -]		

DTC	**B228231**	**Vehicle Speed Signal Circuit Open**

DTC	**B228262**	**Vehicle Speed Signal Compare Failure**

DESCRIPTION

DTC B228231 is stored when the vehicle speed signal sent by the skid control ECU via direct line and the vehicle speed signal sent via CAN communication do not match.

DTC B228262 is stored when a malfunction in the vehicle speed sensor is detected.

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	DTC OUTPUT FROM	PRIORITY	NOTE
B228231	Vehicle Speed Signal Circuit Open	Vehicle speed signal malfunction is detected (excessive deceleration is detected). (1-trip detection logic*)	• Electronically controlled brake system • Certification ECU (smart key ECU assembly) • Wire harness or connector	Power Source Control	A	**DTC Output Confirmation Operation:** Drive the vehicle at a vehicle speed of 25 km/h (16 mph) or more for 20 seconds, and then drive the vehicle at a vehicle speed of less than 5 km/h (3 mph) for 20 seconds.
B228262	Vehicle Speed Signal Compare Failure	The vehicle speed signal sent by the skid control ECU via direct line and the vehicle speed signal sent via CAN communication do not match. (1-trip detection logic*)	• Electronically controlled brake system • Certification ECU (smart key ECU assembly) • Wire harness or connector	Power Source Control	A	**DTC Output Confirmation Operation:** Drive the vehicle at a vehicle speed of 50 km/h (31 mph) or more for 10 seconds, and then drive the vehicle at a vehicle speed of less than 50

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	DTC OUTPUT FROM	PRIORITY	NOTE
						km/h (31 mph).

*: Only detected while a malfunction is present and the ignition switch is ON.

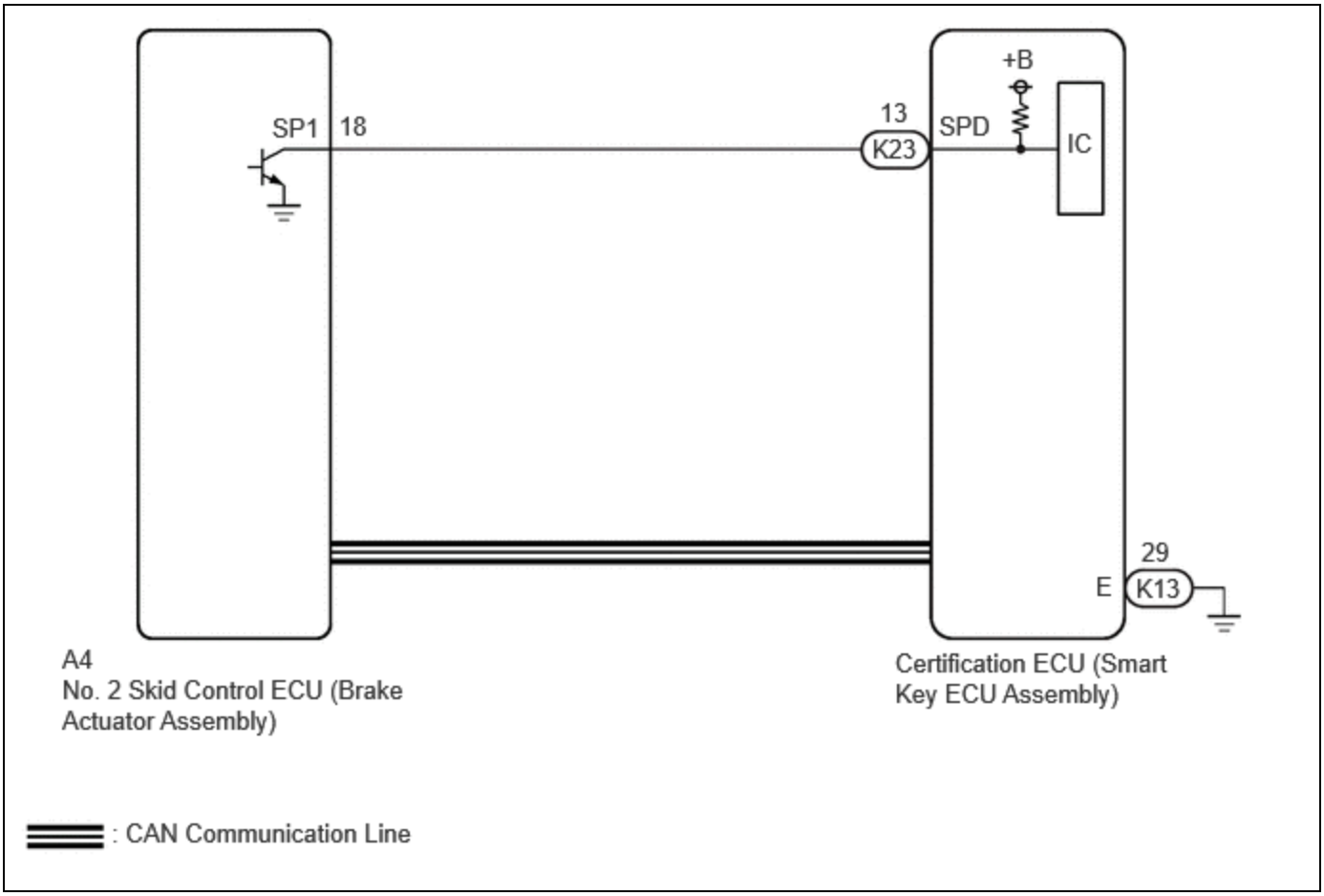
Vehicle Condition and Fail-safe Function when Malfunction Detected

DTC CODE	VEHICLE CONDITION WHEN MALFUNCTION DETECTED	FAIL-SAFE FUNCTION WHEN MALFUNCTION DETECTED
B228231	• The power source mode is changed to off (the hybrid control system is stopped) by pressing the power switch while the vehicle is being driven. • With the electrical key transmitter sub-assembly in the cabin, even if a hybrid control system start operation is performed, the hybrid control system will not start.	-
B228262	• When the signal sent via either direct line or CAN communication is malfunctioning and indicates that the vehicle speed is 0 km/h (0 mph), there is no effect on vehicle behavior. • When the signal sent via either direct line or CAN communication is malfunctioning and indicates that the vehicle is moving, the ignition switch cannot be turned from ON to off.	-

Related Data List and Active Test Items

DTC NO.	DATA LIST AND ACTIVE TEST
B228231 B228262	**Power Source Control** • Vehicle Running Condition (Line) • Power Supply Condition **Brake/EPB** • Vehicle Speed

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 repair, confirm that no DTCs are output by performing "DTC Output Confirmation Operation".

PROCEDURE

1.	**READ VALUE USING GTS (VEHICLE SPEED)**

(a) Read the Data List according to the display on the GTS.

Chassis > Brake/EPB > Data List

TESTER DISPLAY	MEASUREMENT ITEM	RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Vehicle Speed	Vehicle speed	Min.: 0.0 km/h (0 mph) Max.: 6553.5 km/h (4072 mph)	Vehicle stopped: 0.0 km/h (0 mph)	When driving at constant speed: No large fluctuations

Chassis > Brake/EPB > Data List

TESTER DISPLAY
Vehicle Speed

OK:
Vehicle speed displayed on the GTS is almost the same as the actual vehicle speed measured using a speedometer tester.

NG ▶ **GO TO ELECTRONICALLY CONTROLLED BRAKE SYSTEM** INFO

OK ▼

2.	**READ VALUE USING GTS (VEHICLE RUNNING CONDITION (LINE))**

(a) Read the Data List according to the display on the GTS.

Body Electrical > Power Source Control > Data List

TESTER DISPLAY	MEASUREMENT ITEM	RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Vehicle Running Condition (Line)	Vehicle being driven or stopped	Stop or Running	Stop: Vehicle stopped	-

Body Electrical > Power Source Control > Data List

TESTER DISPLAY
Vehicle Running Condition (Line)

OK:
The GTS display changes correctly in response to the vehicle condition.

RESULT	PROCEED TO
The value of Vehicle Running Condition (Line) is Stop	A
The value of Vehicle Running Condition (Line) is not Stop	B

B ▶ **GO TO STEP 4**

A ▼

3.	**READ VALUE USING GTS (VEHICLE RUNNING CONDITION (LINE))**

(a) Read the Data List according to the display on the GTS.

Body Electrical > Power Source Control > Data List

TESTER DISPLAY	MEASUREMENT ITEM	RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Vehicle Running Condition (Line)	Vehicle being driven or stopped	Stop or Running	Running: Vehicle being driven at 5 km/h (3 mph) or more	-

Body Electrical > Power Source Control > Data List

TESTER DISPLAY
Vehicle Running Condition (Line)

OK:
The GTS display changes correctly in response to the vehicle condition.

RESULT	PROCEED TO
The value of Vehicle Running Condition (Line) is Running	A
The value of Vehicle Running Condition (Line) is not Running	B

A ▶ **GO TO ELECTRONICALLY CONTROLLED BRAKE SYSTEM**
INFO

B

4.	**CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU (SMART KEY ECU ASSEMBLY) - NO. 2 SKID CONTROL ECU (BRAKE ACTUATOR ASSEMBLY))**

Pre-procedure1

(a) Disconnect the A4 No. 2 skid control ECU (brake actuator assembly) connector.

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

Procedure1

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

Standard Resistance:

EWD INFO

Click Location & Routing(K23,A4)
Click Connector(K23)
Click Connector(A4)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
K23-13 (SPD) - A4-18 (SP1)	Always	Below 1 Ω	Ω
K23-13 (SPD) or A4-18 (SP1) - Other terminals and body ground	Always	10 kΩ or higher	kΩ

Post-procedure1

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

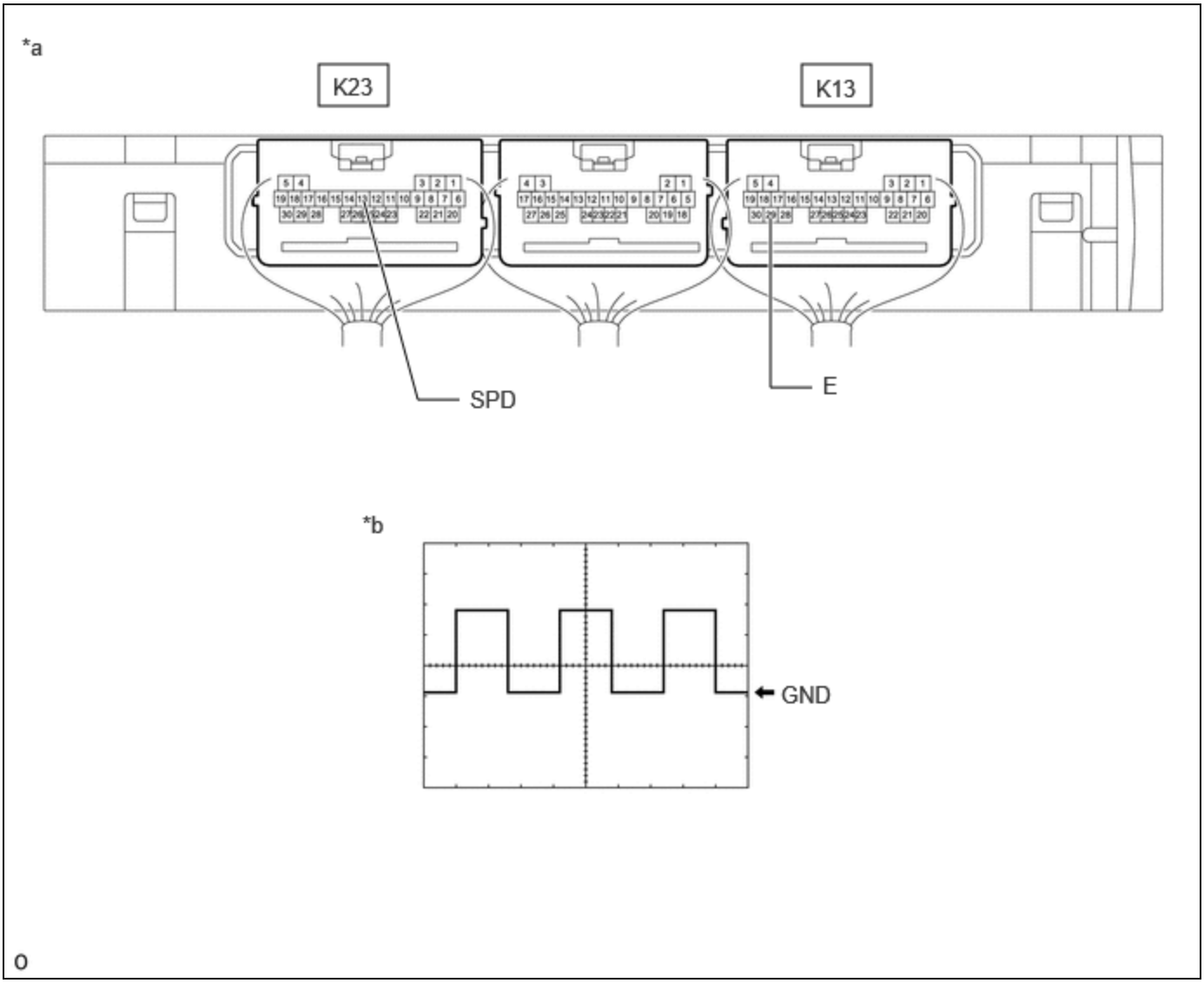
(e) Connect the A4 No. 2 skid control ECU (brake actuator assembly) connector.

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

OK

5.	**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

OK:

EWD INFO

Click Location & Routing(K23,K13)
Click Connector(K23)
Click Connector(K13)

TESTER CONNECTION	CONDITION	TOOL SETTING	SPECIFIED CONDITION
K23-13 (SPD) - K13-29 (E)	Ignition switch ON, vehicle being driven at approx. 5 km/h (3 mph)	5 V/DIV., 20 ms./DIV.	Pulse generation (See waveform)

HINT:

The wavelength becomes shorter as the vehicle speed increases.

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

NG ▶ **GO TO ELECTRONICALLY CONTROLLED BRAKE SYSTEM (HOW TO PROCEED WITH TROUBLESHOOTING)** INFO