

Last Modified: 12-04-2024	6.11:8.1.0	Doc ID: RM1000000290BW
Model Year Start: 2023	Model: Prius Prime	Prod Date Range: [12/2022 -]
Title: THEFT DETERRENT / KEYLESS ENTRY: DIGITAL KEY SYSTEM: TERMINALS OF ECU; 2023 - 2024 MY Prius Prius Prime [12/2022 -]		

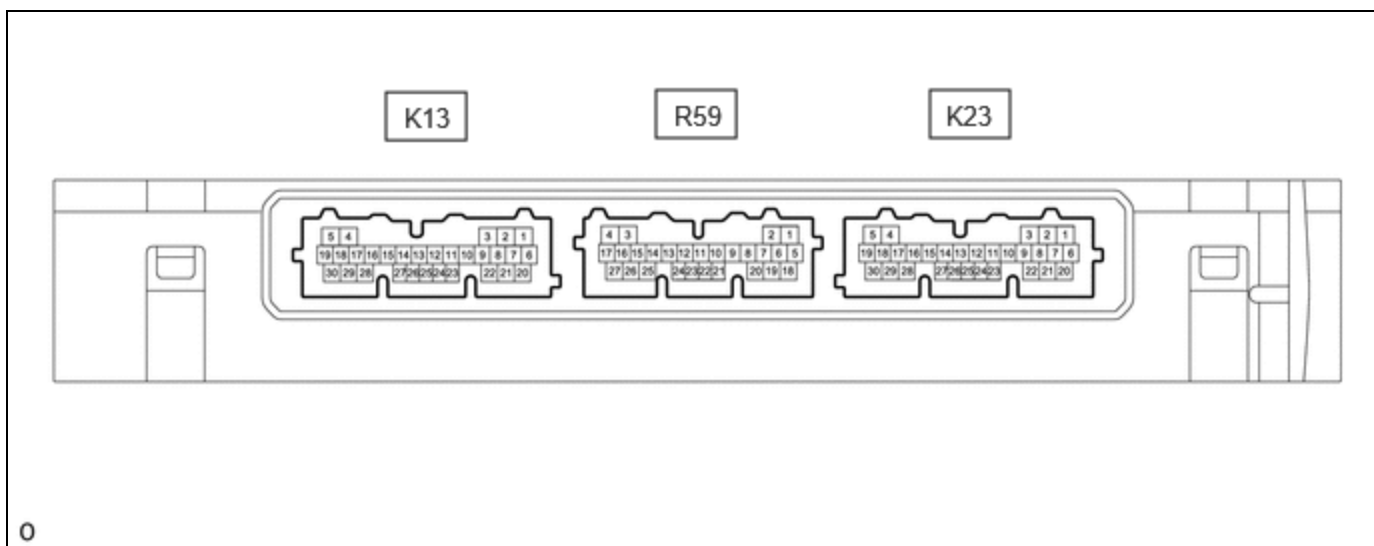
TERMINALS OF ECU

HINT:

Make sure to cancel power saving mode when measuring the standard values.

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CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)



(a) Disconnect the K23 and K13 certification ECU (smart key ECU assembly) connectors.

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

TESTER CONNECTION	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
K13-6 (+B) - K13-29 (E)	Power source	Ignition switch off	11 to 14 V
K23-22 (CUTB) - Body ground	Dark current cut pin*	Ignition switch off	11 to 14 V
K13-29 (E) - Body ground	GND	Always	Below 1 Ω

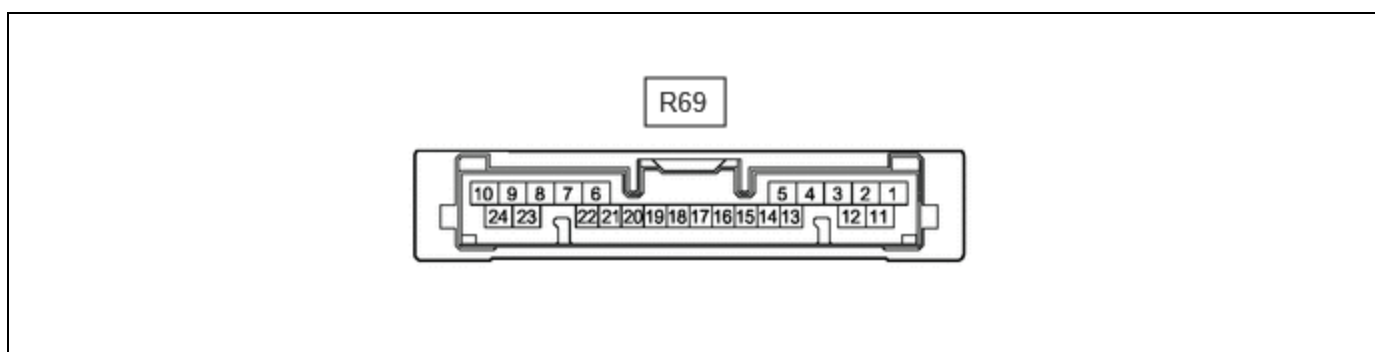
*: In order to prevent the vehicle auxiliary battery from being depleted when the vehicle is shipped long distances, a fuse that cuts unnecessary electrical load while the vehicle is being shipped is installed in the circuit. If the fuse is removed, the circuit becomes open. If the fuse that is between the vehicle auxiliary battery and terminal CUTB is removed and the circuit is open, the certification ECU (smart key ECU assembly) changes to a certain control mode (example: the transmission of radio waves every 0.25 seconds, which form the detection area, stops).

(c) Connect the K23 and K13 certification ECU (smart key ECU assembly) connectors.

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

TESTER CONNECTION	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
K13-17 (UAT2) - K13-29 (E)	UART communication line	All of the following conditions are met: <ul style="list-style-type: none"> Ignition switch off Door lock/unlock operation has been not performed via digital key Digital key is not being operated 	11 to 14 V

DIGITAL KEY ECU ASSEMBLY



- (a) Disconnect the R69 Digital key ECU assembly connector.
- (b) Measure the voltage and resistance according to the value(s) in the table below.

TESTER CONNECTION	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
R69-1 (+B) - R69-10 (GND)	Power source	Ignition switch off	11 to 14 V
R69-10 (GND) - Body ground	GND	Always	Below 1 Ω

- (c) Connect the R69 Digital key ECU assembly connector.
- (d) Measure the voltage and check for pulses according to the value(s) in the table below.

TESTER CONNECTION	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
R69-4 (PWI1) - R69-10 (GND)	BLE digital key receiver power source	Digital key is in BLE connection range.	8.5 to 14 V
R69-12 (PWO1) - R69-10 (GND)	BLE digital key receiver power source	Digital key is in BLE connection range.	8.5 to 14 V
R69-14 (LIN1) - R69-10 (GND)	LIN communication line	Digital key is in driver door digital key detection range.	Pulse generation
R69-15 (LIN2) - R69-10 (GND)	LIN communication line	Digital key is in front passenger door digital key detection range.	Pulse generation
R69-20 (LIN3) - R69-10 (GND)	LIN communication line	Digital key is in back door digital key detection range.	Pulse generation
R69-21 (LIN4) - R69-10 (GND)	LIN communication line	Digital key is in in-vehicle operating range.	Pulse generation
R69-23 (UART) - R69-10 (GND)	UART communication line	All of the following conditions are met: <ul style="list-style-type: none"> Ignition switch off 	Pulse generation

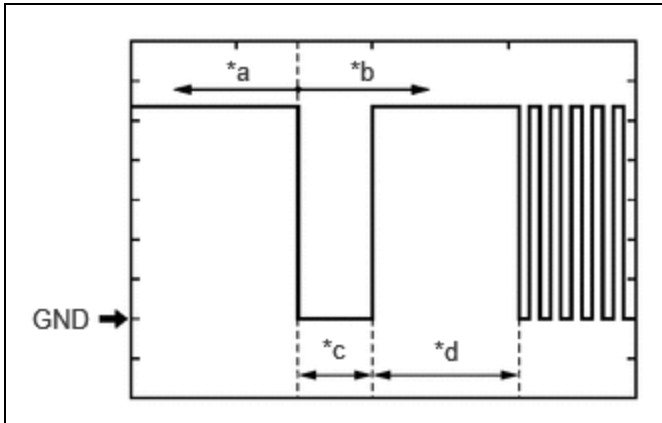
TESTER CONNECTION	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
		<ul style="list-style-type: none"> Door lock/unlock operation has been not performed via digital key → performed 	(See waveform)

(e) Using an oscilloscope, check the waveform of the ECU.

NOTICE:

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

(1) Waveform



*a	Before door lock/unlock operation using digital key
*b	After door lock/unlock operation using digital key
*c	Approximately 15 ms.
*d	15 to 50 ms.

ITEM	CONTENT
Tester Connection	R69-23 (UART) - R69-10 (GND)
Tool Setting	2 V/DIV., 20 ms./DIV.
Condition	All of the following conditions are met: <ul style="list-style-type: none"> Ignition switch off Door lock/unlock operation has been not performed via digital key → performed

