REGISTRATION

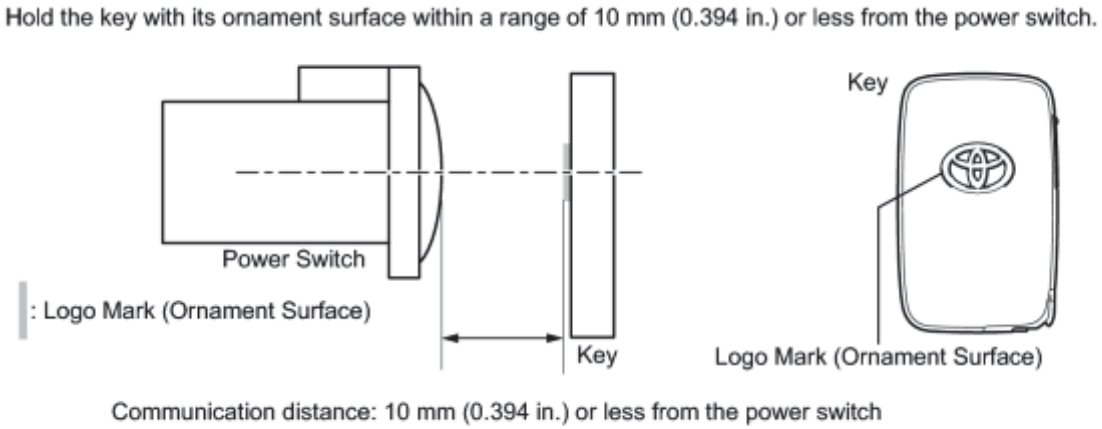
1. DESCRIPTION OF CODE REGISTRATION

HINT:

- The ID codes are the same as recognition codes for the wireless transmitter and engine immobiliser function. Registering an ID code enables the smart key system, the wireless door lock control function and the engine immobiliser function to be operated.
- Code registration is necessary when the certification ECU (smart key ECU assembly), ID code box (immobiliser code ECU)*, transmission control ECU assembly or key is replaced with a new one.

  *: w/ Automatic Light Control System

(a) When registering a key, bring the key close to the power switch as shown in the illustration.



2. KEY REGISTRATION PROCEDURES WHEN ADDING OR REPLACING KEY OR WHEN KEY IS LOST

HINT:

- The following procedures require the use of the Techstream:

  - New key ID registration

- A maximum of 7 keys can be registered.

	Registration Procedure Condition	Procedure	Refer to
Registering an additional key	Customer must bring at least 1 key	1. Register additional keys as necessary (additional key ID registration)	PROCEDURE "C"

	Registration Procedure Condition	Procedure	Refer to
• Replacing a key • Making a lost key unable HINT: After key ID erasure, any remaining keys that are not registered at this time cannot be used. Therefore, after key ID erasure, register all remaining keys.	Customer must bring at least 1 key	1. Using remaining keys, clear all registered keys except one (key ID erasure)	PROCEDURE "D"
		2. Register additional keys as necessary (additional key ID registration)	PROCEDURE "C"
All keys are lost	-	1. Reset all keys (all keys ID erasure (key code reset))	PROCEDURE "E"
		2. Register all keys (new key ID registration)	PROCEDURE "A"

3. PART REPLACEMENT AND KEY REGISTRATION PROCEDURES

(a) The following table shows ECU replacement and key registration procedures for cases in which a malfunctioning ECU has been identified through the troubleshooting of the smart key system.

HINT:

- The following procedures can be performed:
  - New key ID registration
  - Additional key ID registration
  - Key ID erasure
  - All key ID erasure
  - ECU code registration
- If the customer has not brought all the registered keys, replacement of the transmission control ECU assembly*1 or ID code box (immobiliser code ECU)*2 is also required.
  - *1: w/o Automatic Light Control System
  - *2: w/ Automatic Light Control System
- A maximum of 7 keys can be registered.

w/o Automatic Light Control System

Malfunctioning ECU	Condition		Procedure	Reference
Certification ECU (Smart key ECU assembly)	Customer has brought all keys		1. Replace certification ECU (smart key ECU assembly)	-
			2. Reregister all keys (new key ID registration)	PROCEDURE "B"
			3. Register ECU communication ID	PROCEDURE "G"
	Some keys are lost	Key ID codes can be registered and erased	1. Erase key codes (key ID erasure)	PROCEDURE "D"
			2. Perform additional key registration	PROCEDURE

Malfunctioning ECU	Condition		Procedure	Reference
			procedure (additional key ID registration)	"C"
			3. Replace certification ECU (smart key ECU assembly)	-
			4. Reregister all keys (new key ID registration) HINT: If some keys are not registered during the above steps, they will be disabled because they cannot be registered later.	PROCEDURE "B"
			5. Register ECU communication ID	PROCEDURE "G"
		Key ID codes cannot be either registered or erased	1. Replace certification ECU (smart key ECU assembly)	-
			2. Replace transmission control ECU assembly	-
			3. Reregister all keys (new key ID registration) HINT: If some keys are not registered during the above steps, they will be disabled because they cannot be registered later.	PROCEDURE "A"
			4. Register ECU communication ID	PROCEDURE "G"
Certification ECU (Smart key ECU assembly)	All keys are lost		1. Replace certification ECU (smart key ECU assembly)	-
			2. Replace transmission control ECU assembly	-
			3. Reregister all keys (new key ID registration) HINT: If some keys are not registered during the above steps, they will be disabled because they cannot be registered later.	PROCEDURE "A"
			4. Register ECU communication ID	PROCEDURE "G"
Transmission control ECU assembly	Customer has brought at least 1 key		1. Replace transmission control ECU assembly	-
			2. Register additional keys as necessary	PROCEDURE

Malfunctioning ECU	Condition	Procedure	Reference
		(additional key ID registration)	"C"
	All keys are lost	1. Replace transmission control ECU assembly	-
		2. Replace certification ECU (smart key ECU assembly)	-
		3. Reregister all keys (new key ID registration) HINT: If some keys are not registered during the above steps, they will be disabled because they cannot be registered later.	PROCEDURE "A"
		4. Register ECU communication ID	PROCEDURE "G"
Power management control ECU	No condition required	Replace power management control ECU	-

w/ Automatic Light Control System

Malfunctioning ECU	Condition		Procedure	Reference
Certification ECU (Smart key ECU assembly)	Customer has brought all keys		1. Replace certification ECU (smart key ECU assembly)	-
			2. Reregister all keys (new key ID registration)	PROCEDURE "B"
	Some keys are lost	Key ID codes can be registered and erased	1. Erase key codes (key ID erasure)	PROCEDURE "D"
			2. Perform additional key registration procedure (additional key ID registration)	PROCEDURE "C"
			3. Replace certification ECU (smart key ECU assembly)	-
			4. Reregister all keys (new key ID registration) HINT: If some keys are not registered during the above steps, they will be disabled because they cannot be registered later.	PROCEDURE "B"
		Key ID codes cannot be either registered or erased	1. Replace certification ECU (smart key ECU assembly)	-
			2. Replace ID code box (immobiliser code ECU)	-
			3. Reregister all keys (new key ID	PROCEDURE "A"

Malfunctioning ECU	Condition	Procedure	Reference
		registration) HINT: If some keys are not registered during the above steps, they will be disabled because they cannot be registered later.	
		4. Register ECU communication ID	PROCEDURE "G"
Certification ECU (Smart key ECU assembly)	All keys are lost	1. Replace certification ECU (smart key ECU assembly)	-
		2. Replace ID code box (immobiliser code ECU)	-
		3. Reregister all keys (new key ID registration) HINT: If some keys are not registered during the above steps, they will be disabled because they cannot be registered later.	PROCEDURE "A"
		4. Register ECU communication ID	PROCEDURE "G"
ID code box (Immobiliser code ECU)	Customer has brought at least 1 key	1. Replace ID code box (immobiliser code ECU)	-
		2. Register recognition codes in ECUs (ECU code registration)	PROCEDURE "F"
		3. Register ECU communication ID	PROCEDURE "G"
	All keys are lost	1. Replace ID code box (immobiliser code ECU)	-
		2. Replace certification ECU (smart key ECU assembly)	-
		3. Reregister all keys (new key ID registration) HINT: If some keys are not registered during the above steps, they will be disabled because they cannot be registered later.	PROCEDURE "A"
		4. Register ECU communication ID	PROCEDURE "G"
Transmission control ECU assembly	Customer has brought at least 1 key	1. Replace transmission control ECU assembly	-

Malfunctioning ECU	Condition	Procedure	Reference
		2. Register recognition codes in ECUs (ECU code registration)	PROCEDURE "F"
	All keys are lost	1. Replace transmission control ECU assembly	-
		2. Replace certification ECU (smart key ECU assembly)	-
		3. Replace ID code box (immobiliser code ECU)	-
		4. Reregister all keys (new key ID registration) HINT: If some keys are not registered during the above steps, they will be disabled because they cannot be registered later.	PROCEDURE "A"
		4. Register ECU communication ID	PROCEDURE "G"
Power management control ECU	No condition required	Replace power management control ECU	-

4. KEY REGISTRATION

(a) PROCEDURE "A"

New key ID registration (when replacing the certification ECU (smart key ECU assembly) and transmission control ECU assembly*1, or certification ECU (smart key ECU assembly) and ID code box (immobiliser code ECU)*2, or when replacing the certification ECU (smart key ECU assembly), ID code box (immobiliser code ECU) and transmission control ECU assembly*2)

- *1: w/o Automatic Light Control System
- *2: w/ Automatic Light Control System

Process	Procedure
1. Start of registration	1. Connect the Techstream to DLC3 2. Turn the power switch on (IG) 3. Enter the following menus: Body Electrical / Smart Key / Utility / Smart Code Registration HINT: The power switch cannot be turned on (IG) more than 10 times. After connecting the Techstream, turn the Techstream on while turning the driver door courtesy light switch on and off repeatedly at 1.5-second intervals or less to continue key registration procedure.
2. Confirmation of ECU code	• Perform operation according to prompts on the Techstream screen

Process	Procedure
	HINT: Mode is automatically selected by the Techstream (new registration mode or add mode).
3. Verification of unregistered key*1	1. Hold the unregistered key close to the power switch (for details, refer to Description of Code Registration) 2. Confirm that the wireless door lock buzzer sounds once (short beep) 3. Place the unregistered key on the driver seat 4. Confirm that the wireless door lock buzzer sounds once (short beep)
4. Registration of ID code	• Perform operation according to prompts on the Techstream screen
5. End of registration	• Finish new key ID code registration

- *1: Repeat this process for each key which is to be registered for the vehicle. Finish the procedure for each key within 30 seconds. If the procedure for any of the keys has not been finished within the specified time, perform the registration procedures again from process 1. Make sure that only 1 key is in the cabin during the registration procedures. If 2 or more keys are in the cabin simultaneously, electric waves will interfere with each other, preventing normal registration.

(b) PROCEDURE "B"

New key ID registration (when replacing the certification ECU (smart key ECU assembly))

Process	Procedure
1. Start of registration	1. Connect the Techstream to DLC3 2. Turn the power switch on (IG) 3. Enter the following menus: Body Electrical / Smart Key / Utility / Smart Code Registration HINT: The power switch cannot be turned on (IG) more than 10 times. After connecting the Techstream, turn the Techstream on while turning the driver door courtesy light switch on and off repeatedly at 1.5-second intervals or less to continue key registration procedure.
2. Confirmation of ECU code	• Perform operation according to prompts on the Techstream screen HINT: Mode is automatically selected by the Techstream (new registration mode or add mode).
3. Confirmation of all registered keys*1	1. Hold the registered key close to the power switch (for details, refer to Description of Code Registration) 2. Confirm that wireless door lock buzzer sounds once (short beep)
4. Confirmation of ECU code	• Perform operation according to prompts on the Techstream screen
5. Verification of unregistered key*2	1. Hold the unregistered key close to the power switch (for details, refer to Description of Code Registration) 2. Confirm that the wireless door lock buzzer sounds once (short beep)

Process	Procedure
	3. Place the unregistered key on the driver seat 4. Confirm that the wireless door lock buzzer sounds once (short beep)
6. Registration of ID code	• Perform operation according to prompts on the Techstream screen
7. End of registration	• Finish new key ID code registration

• *1: Repeat this process for each key which is not to be registered for the vehicle. Finish the procedure for each key within 30 seconds. If the procedure for any of the keys has not been finished within the specified time, perform the registration procedures again from process 1. If the key confirmation procedure for a key is performed, the security indicator light comes on and remains on until all the keys are confirmed.

• *2: Repeat this process for each key which is to be registered for the vehicle. Finish the procedure for each key within 30 seconds. If the procedure for any of the keys has not been finished within the specified time, perform the registration procedures again from process 1. Make sure that only 1 key is in the cabin during the registration procedures. If 2 or more keys are in the cabin simultaneously, electric waves will interfere with each other, preventing normal registration.

(c) PROCEDURE "C"

Additional key ID registration

Process	Procedure
1. Start of registration	1. Connect the Techstream to DLC3 2. Turn the power switch on (IG) 3. Enter the following menus: Body Electrical / Smart Key / Utility / Smart Code Registration
2. Confirmation of registered key*1	1. Perform operation according to prompts on the Techstream screen HINT: Mode is automatically selected by the Techstream (new registration mode or add mode) 2. Hold the registered key close to the power switch (for details, refer to Description of Code Registration) 3. Confirm that the wireless door lock buzzer sounds once (short beep)
3. Confirmation of ECU code	• Perform operation according to prompts on the Techstream screen
4. Verification of unregistered key*2	1. Hold the unregistered key close to the power switch (for details, refer to Description of Code Registration) 2. Confirm that the wireless door lock buzzer sounds once (short beep) 3. Place the unregistered key on driver seat 4. Confirm that the wireless door lock buzzer sounds once (short beep)

Process	Procedure
5. Registration of ID code	• Perform operation according to prompts on the Techstream screen
6. End of registration	• Finish additional key ID code registration

• *1: Perform this process for one of the keys which are to be registered for the vehicle. Finish the procedure within 30 seconds. If the procedure has not been finished within the specified time, perform the registration procedures again from process 1.

• *2: Repeat this process for each key which is to be registered for the vehicle. Finish the procedure for each key within 30 seconds. If the procedure for any of the keys has not been finished within the specified time, perform the registration procedures again from process 1. Make sure that only 1 key is in the cabin during the registration procedures. If 2 or more keys are in the cabin simultaneously, electric waves will interfere with each other, preventing normal registration.

(d) PROCEDURE "D"

Key ID erasure

HINT:

Procedure "D" erases all registered key codes except one.

Process	Procedure
1. Start of erasure	1. Connect the Techstream to DLC3 2. Turn the power switch on (IG) 3. Enter the following menus: Body Electrical / Smart Key / Utility / Smart Code Erasure
2. Confirmation of registered key*1 HINT: Select the key that will not be erased.	1. Perform operation according to prompts on the Techstream screen 2. Hold the registered key close to the power switch (for details, refer to Description of Code Registration) 3. Confirm that the wireless door lock buzzer sounds once (short beep)
3. Confirmation of ECU code	• Perform operation according to prompts on the Techstream screen
4. Erasure of ID code	• Perform operation according to prompts on the Techstream screen
5. End of erasure	• Finish key ID code erasure

• *1: Perform this process for one of the keys which are to be registered for the vehicle. Finish the procedure within 30 seconds. If the procedure has not been finished within the specified time, perform the erasure procedure again from process 1.

(e) PROCEDURE "E"

All key ID erasure

HINT:

Procedure "E" erases all the key codes registered in the vehicle.

Process	Procedure
1. Start of erasure	1. Connect the Techstream to DLC3 2. Turn the power switch on (IG) 3. Turn the Techstream on while turning driver door courtesy light switch on and off repeatedly at 1.5-second intervals or less 4. Enter the following menus: Body Electrical / Smart Key / Utility / Smart Code Rest 5. Read the "Seed Number" of the Techstream screen and input into TIS 6. Input the "Pass-Code Number" sent from TIS according to the Techstream screen
2. Confirmation of ECU code	• Perform operation according to prompts on the Techstream screen
3. Erasure of ID code	• Perform operation according to prompts on the Techstream screen Wait for 15 minutes
4. End of erasure	• Finish key ID code erasure

(f) PROCEDURE "F"

ECU code registration

Process	Procedure
1. Start of registration	1. Connect the Techstream to DLC3 2. Turn the power switch on (IG) 3. Enter the following menus: Body Electrical / Smart Key / Utility / ECU Communication ID Registration / ID Code Box and Steering Lock
2. Confirmation of registered key*1	1. Hold the registered key close to the power switch (for details, refer to Description of Code Registration) 2. Confirm that the wireless door lock buzzer sounds once (short beep)
3. Registration of ECU code	• Perform operation according to prompts on the Techstream screen
4. End of registration	• Finish ECU code registration

• *1: Perform this process for one of the keys which are to be registered for the vehicle. Finish the procedure within 30 seconds. If the procedure has not been finished within the specified time, perform the erasure procedures again from process 1.

(g) PROCEDURE "G"

ECU communication ID registration

NOTICE:

- The ECU communication ID should be registered when the certification ECU (smart key ECU assembly)*1 or ID code box (immobiliser code ECU)*2 is replaced in order to match these ECU communication IDs.
    - *1: w/o Automatic Light Control System
    - *2: w/ Automatic Light Control System
- The hybrid vehicle control system cannot be started unless the ECU communication IDs match.
- After the registration, pressing the power switch may not start the hybrid vehicle control system on the first try. If so, press the power switch again.
- Clear DTC B2799 (code for power management control ECU (HV CPU) immobiliser communication error) by either of the following:

  - Use the Techstream.

  - Disconnect the cable from the negative (-) battery terminal for 30 seconds.

(1) Using SST, connect terminals TC and CG of the DLC3.

SST: 09843-18040

(2) Turn the power switch on (IG) and leave it as is for 30 minutes.

HINT:

Do not start the hybrid vehicle control system.

(3) Turn the power switch off and disconnect terminals TC and CG.

(4) Check that the hybrid vehicle control system starts and remains READY for more than 3 seconds.

PROBLEM SYMPTOMS TABLE

HINT:

- Use the table below to help determine the cause of problem symptoms. If multiple suspected areas are listed, the potential causes of the symptoms are listed in order of probability in the "Suspected Area" column of the table. Check each symptom by checking the suspected areas in the order they are listed. Replace parts as necessary.
- Inspect the fuses and relays related to this system before inspecting the suspected areas below.

Engine Immobiliser System

Symptom	Suspected Area	See page
Engine does not start.	Key	INFO
	Smart key system (for start function)	INFO
	Hybrid vehicle control system	INFO
Security indicator light does not blinking.	Certification ECU (smart key ECU assembly)	INFO
	Wire harness or connector	-
	No. 3 meter circuit plate	-

TERMINALS OF ECU

1. CHECK POWER SWITCH

(a) Disconnect the L43 power switch connector.

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

HINT:

Measure the values on the wire harness side with the connector disconnected.

Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
L43-8 (AGND) - Body ground	P - Body ground	Ground	Always	Below 1 Ω

If the result is not as specified, there may be a malfunction in the wire harness.

(c) Reconnect the L43 power switch connector.

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

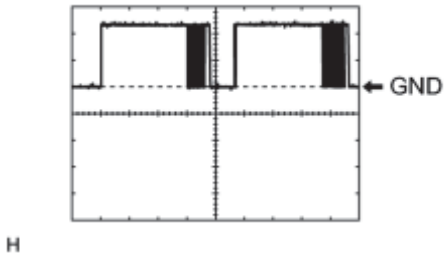
Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
L43-9 (TXCT) - L43-8 (AGND)	V - P	Key code output signal	• Power switch off • 30 seconds after door opened and closed • Brake pedal not depressed	Below 1 V
L43-9 (TXCT) - L43-8 (AGND)	V - P	Key code output signal	• Power switch off • Key not in cabin • Power switch pressed within 30 seconds	Pulse generation (See waveform 1)
L43-10 (CODE) - L43-8 (AGND)	L - P	Demodulated signal of key code data	• Power switch off • 30 seconds after door opened and closed	Below 1 V

Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
			• Brake pedal not depressed	
L43-10 (CODE) - L43-8 (AGND)	L - P	Demodulated signal of key code data	• Power switch off • Key battery removed • Power switch touched with key and pressed	Pulse generation (See waveform 2)
L43-14 (VC5) - L43-8 (AGND)	Y - P	Power supply	• Power switch off • 30 seconds after door opened and closed • Brake pedal not depressed	Below 1 V
L43-14 (VC5) - L43-8 (AGND)	Y - P	Power supply	• Power switch off • Key not in cabin • Power switch pressed within 30 seconds	Pulse generation (See waveform 3)

If the result is not as specified, the power switch may have a malfunction.

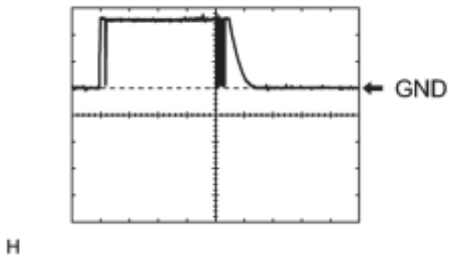
(e) Inspect using an oscilloscope.

(1) Waveform 1 (Reference)



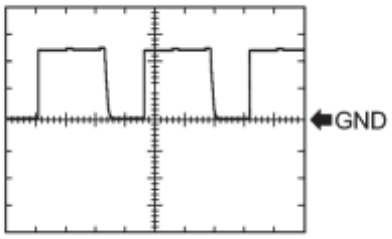
Item	Content
Tester Connection	L43-9 (TXCT) - L43-8 (AGND)
Tool Setting	2 V/DIV., 50 ms./DIV.
Condition	• Power switch off • Key not in cabin • Power switch pressed within 30 seconds

(2) Waveform 2 (Reference)



Item	Content
Tester Connection	L43-10 (CODE) - L43-8 (AGND)
Tool Setting	2 V/DIV., 50 ms./DIV.
Condition	• Power switch off • Key battery removed • Power switch touched with key and pressed

(3) Waveform 3 (Reference)



Item	Content
Tester Connection	L43-14 (VC5) - L43-8 (AGND)
Tool Setting	2 V/DIV., 200 ms./DIV.
Condition	• Power switch off • Key not in cabin • Power switch pressed within 30 seconds

2. CHECK CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

(a) Disconnect the L62 certification ECU (smart key ECU assembly) connector.

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

HINT:

Measure the values on the wire harness side with the connector disconnected.

Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
L62-1 (+B) - L62-15 (E)	B - W-B	+B power supply	Power switch off	11 to 14 V
L62-15 (E) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
L62-17 (CUTB) - L62-15 (E)	Y - W-B	Dark current cut fuse pin input signal	Power switch off	11 to 14 V

If the result is not as specified, there may be a malfunction in the wire harness.

(c) Reconnect the L62 certification ECU (smart key ECU assembly) connector.

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

Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
L62-2 (IND) -	B - Body	Security indicator	• Power switch on (IG)	Below 2 V

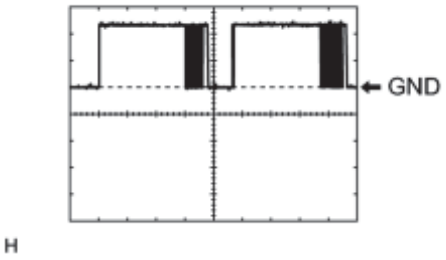
Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
Body ground	ground	light signal	• Security indicator light off	
L62-2 (IND) - Body ground	B - Body ground	Security indicator light signal	• Power switch off • Security indicator light blinks	Pulse generation
L62-12 (TXCT) - L62-36 (AGND)	V - P	Power switch TXCT output	• Power switch off • 30 seconds after door opened and closed • Brake pedal not depressed	Below 1 V
L62-12 (TXCT) - L62-36 (AGND)	V - P	Power switch TXCT output	• Power switch off • Key not in cabin • Power switch pressed within 30 seconds	Pulse generation (See waveform 1)
L62-13 (CODE) - L62-36 (AGND)	L - P	Power switch CODE input	• Power switch off • 30 seconds after door opened and closed • Brake pedal not depressed	Below 1 V
L62-13 (CODE) - L62-36 (AGND)	L - P	Power switch CODE input	• Power switch off • Key battery removed • Power switch touched with key and pressed	Pulse generation (See waveform 2)
L62-16 (IG) - L62-15 (E)	BE - W-B	IG power supply	Power switch off	Below 1 V
L62-16 (IG) - L62-15 (E)	BE - W-B	IG power supply	Power switch on (IG)	11 to 14 V
L62-28 (VC5) - L62-36 (AGND)	Y - P	Power switch power supply	• Power switch off • 30 seconds after door opened and closed • Brake pedal not depressed	Below 1 V
L62-28 (VC5) - L62-36 (AGND)	Y - P	Power switch power supply	• Power switch off • Key not in cabin • Power switch pressed within 30 seconds	Pulse generation (See waveform 3)
L62-34 (EFII) - L62-15 (E)*	L - W-B	Power management control ECU (HV CPU) output signal	Power switch off	11 to 14 V
L62-34 (EFII) - L62-15 (E)*	L - W-B	Power management control ECU (HV CPU) output signal	Within 3 seconds after power switch on (READY), or within 3 seconds after power switch first turned on (IG) after battery	Pulse generation (See waveform

Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
			disconnected and connected	4)
L62-35 (EFIO) - L62-15 (E)*	R - W-B	Power management control ECU (HV CPU) input signal	Power switch off	Below 1 V
L62-35 (EFIO) - L62-15 (E)*	R - W-B	Power management control ECU (HV CPU) input signal	Power switch on (IG)	Pulse generation (See waveform 5)
L62-36 (AGND) - Body ground	P - Body ground	Power switch ground	Always	Below 1 Ω

- *: w/o Automatic Light Control System
- If the result is not as specified, the certification ECU (smart key ECU assembly) may have a malfunction.

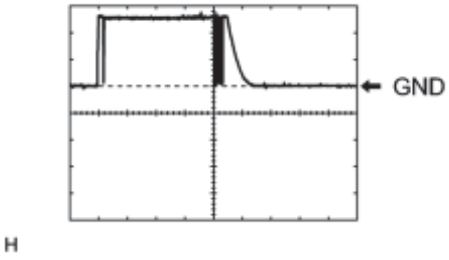
(e) Inspect using an oscilloscope.

(1) Waveform 1 (Reference)



Item	Content
Tester Connection	L62-12 (TXCT) - L62-36 (AGND)
Tool Setting	2 V/DIV., 50 ms./DIV.
Condition	• Power switch off • Key not in cabin • Power switch pressed within 30 seconds

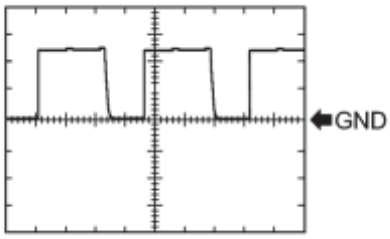
(2) Waveform 2 (Reference)



Item	Content
Tester Connection	L62-13 (CODE) - L62-36 (AGND)
Tool Setting	2 V/DIV., 50 ms./DIV.
Condition	• Power switch off • Key battery removed • Power switch touched with key and pressed

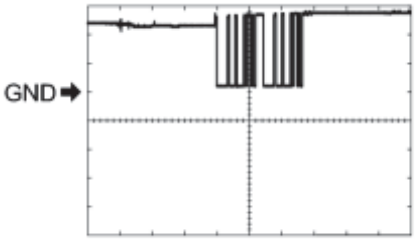
(3) Waveform 3 (Reference)

Item	Content
Tester Connection	L62-28 (VC5) - L62-36 (AGND)
Tool Setting	2 V/DIV., 200 ms./DIV.



Condition	• Power switch off • Key not in cabin • Power switch pressed within 30 seconds

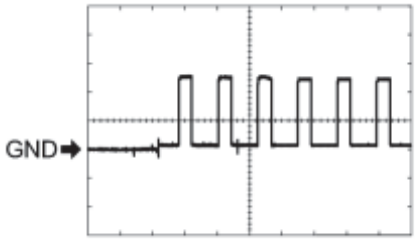
(4) Waveform 4 (Reference)



H

Item	Content
Tester Connection	L62-34 (EFII) - L62-15 (E)
Tool Setting	5 V/DIV., 500 ms./DIV.
Condition	Within 3 seconds after power switch on (READY), or within 3 seconds after power switch first turned on (IG) after battery disconnected and connected

(5) Waveform 5 (Reference)

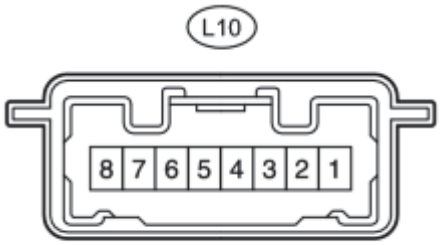


H

Item	Content
Tester Connection	L62-35 (EFIO) - L62-15 (E)
Tool Setting	5 V/DIV., 50 ms./DIV.
Condition	Power switch on (IG)

3. CHECK ID CODE BOX (IMMOBILISER CODE ECU) (w/ Automatic Light Control System)

(a) Disconnect the L10 ID code box (immobiliser code ECU) connector.



P

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

HINT:

Measure the values on the wire harness side with the connector disconnected.

Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
L10-1 (+B) - L10-8 (GND)	B - W-B	+B power supply	Power switch off	11 to 14 V
L10-8 (GND) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω

- If the result is not as specified, there may be a malfunction in the wire harness.

(c) Reconnect the L10 ID code box (immobiliser code ECU) connector.

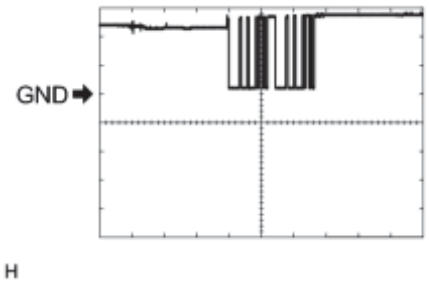
(d) Measure the voltage according to the value(s) in the table below.

Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
L10-5 (EFII) - L10-8 (GND)	L - W-B	Power management control ECU (HV CPU) output signal	Power switch off	11 to 14 V
L10-5 (EFII) - L10-8 (GND)	L - W-B	Power management control ECU (HV CPU) output signal	Within 3 seconds after power switch on (READY), or within 3 seconds after power switch first turned on (IG) after battery disconnected and connected	Pulse generation (See waveform 1)
L10-6 (EFIO) - L10-8 (GND)	R - W-B	Power management control ECU (HV CPU) input signal	Power switch off	Below 1 V
L10-6 (EFIO) - L10-8 (GND)	R - W-B	Power management control ECU (HV CPU) input signal	Power switch on (IG)	Pulse generation (See waveform 2)

- If the result is not as specified, the ID code box (immobiliser code ECU) may have a malfunction.

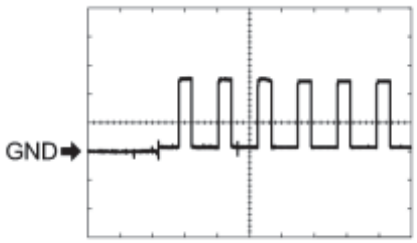
(e) Inspect using an oscilloscope.

(1) Waveform 1 (Reference)



Item	Content
Tester Connection	L10-5 (EFII) - L10-8 (GND)
Tool Setting	5 V/DIV., 500 ms./DIV.
Condition	Within 3 seconds after power switch on (READY), or within 3 seconds after power switch first turned on (IG) after battery disconnected and connected

(2) Waveform 2 (Reference)

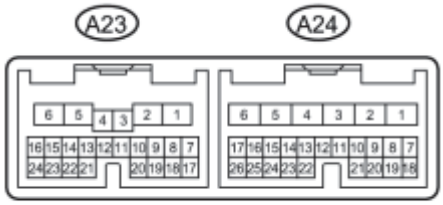


Item	Content
Tester Connection	L10-6 (EFIO) - L10-8 (GND)
Tool Setting	5 V/DIV., 50 ms./DIV.
Condition	Power switch on (IG)

H

4. CHECK TRANSMISSION CONTROL ECU ASSEMBLY

(a) Disconnect the A23 and A24 transmission control ECU assembly connectors.



H

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

HINT:

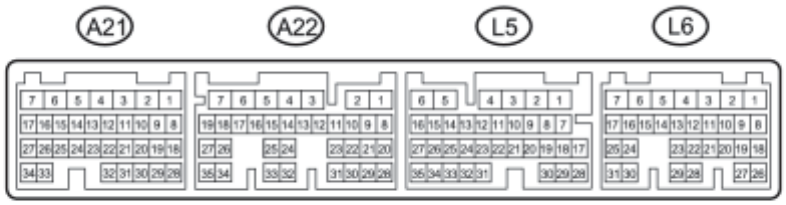
Measure the values on the wire harness side with the connectors disconnected.

Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
A23-15 (BATT) - Body ground	SB - Body ground	Battery power supply	Power switch off	11 to 14 V
A24-1 (E1) - Body ground	BR - Body ground	Ground	Always	Below 1 Ω
A24-5 (E02) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
A24-6 (E01) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω

If the result is not as specified, there may be a malfunction in the wire harness.

5. CHECK POWER MANAGEMENT CONTROL ECU (HV CPU)

(a) Disconnect the L5 power management control ECU (HV CPU) connector.



H

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

HINT:

Measure the values on the wire harness side with the connector disconnected.

Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
L5-6 (E1) - Body ground	BR - Body ground	Ground	Always	Below 1 Ω

If the result is not as specified, there may be a malfunction in the wire harness.

(c) Reconnect the L5 power management control ECU (HV CPU) connector.

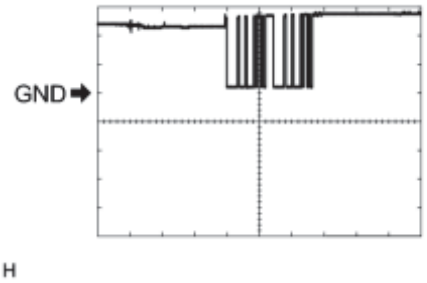
(d) Measure the voltage according to the value(s) in the table below.

Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
L6-20 (IMO) - L5-6 (E1)	L - BR	Certification ECU (smart key ECU assembly)*1 or ID code box (immobiliser code ECU)*2 input signal	Power switch off	11 to 14 V
L6-20 (IMO) - L5-6 (E1)	L - BR	Certification ECU (smart key ECU assembly)*1 or ID code box (immobiliser code ECU)*2 input signal	Within 3 seconds after power switch on (READY), or within 3 seconds after power switch first turned on (IG) after battery disconnected and connected	Pulse generation (See waveform 1)
L6-21 (IMI) - L5-6 (E1)	R - BR	Certification ECU (smart key ECU assembly)*1 or ID code box (immobiliser code ECU)*2 output signal	Power switch off	Below 1 V
L6-21 (IMI) - L5-6 (E1)	R - BR	Certification ECU (smart key ECU assembly)*1 or ID code box (immobiliser code ECU)*2 output signal	Power switch on (IG)	Pulse generation (See waveform 2)

- *1: w/o Automatic Light Control System
- *2: w/ Automatic Light Control System
- If the result is not as specified, the power management control ECU (HV CPU) may have a malfunction.

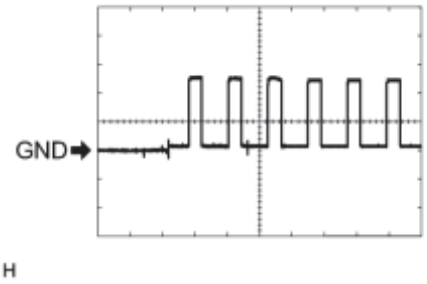
(e) Waveform:

(1) Waveform 1 (Reference)



Item	Content
Tester Connection	L6-20 (IMO) - L5-6 (E1)
Tool Setting	5 V/DIV., 500 ms./DIV.
Condition	Within 3 seconds after power switch on (READY), or within 3 seconds after power switch first turned on (IG) after battery disconnected and connected

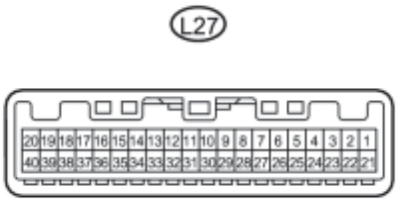
(2) Waveform 2 (Reference)



Item	Content
Tester Connection	L6-21 (IMI) - L5-6 (E1)
Tool Setting	5 V/DIV., 50 ms./DIV.
Condition	Power switch on (IG)

6. COMBINATION METER ASSEMBLY

(a) Disconnect the L27 combination meter assembly connector.



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

HINT:

Measure the values on the wire harness side with the connector disconnected.

Terminal No. (Symbol)	Wiring Color	Terminal Description	Condition	Specified Condition
L27-18 (B) - Body ground	R - Body ground	Battery	Power switch off	11 to 14 V

Terminal No. (Symbol)	Wiring Color	Terminal Description	Condition	Specified Condition
L27-30 (ES) - Body ground	BR - Body ground	Ground (Signal ground)	Always	Below 1 Ω

If the result is not as specified, there may be a malfunction in the wire harness.

(c) Reconnect the L27 combination meter assembly connector.

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

Terminal No. (Symbol)	Wiring Color	Terminal Description	Condition	Specified Condition
L27-19 (IG+) - Body ground	L - Body ground	Power switch signal	Power switch off	Below 1 V
L27-19 (IG+) - Body ground	L - Body ground	Power switch signal	Power switch on (IG)	11 to 14 V
L27-22 (LP) - Body ground	B - Body ground	Security indicator light signal	• Power switch on (IG) • Security indicator light off	Below 2 V
L27-22 (LP) - Body ground	B - Body ground	Security indicator light signal	• Power switch off • Security indicator light blinks	Pulse generation

If the result is not as specified, the combination meter assembly may have a malfunction.

DIAGNOSIS SYSTEM

1. DESCRIPTION

(a) The certification ECU (smart key ECU assembly) and power management control ECU (HV CPU) control the vehicle engine immobiliser system functions. Engine immobiliser system data and Diagnostic Trouble Codes (DTCs) can be read through the vehicle Data Link Connector 3 (DLC3).

In some cases, a malfunction may be occurring in the engine immobiliser system even though the security indicator light is not illuminated.

When the system seems to be malfunctioning, use the Techstream to check for malfunctions and perform repairs.

2. CHECK DLC3

(a) Check the DLC3 INFO.

3. INSPECT BATTERY VOLTAGE

(a) Measure the battery voltage with the power switch off.

Standard Voltage:

11 to 14 V

If the voltage is below 11 V, recharge or replace the battery.

DTC CHECK / CLEAR

1. CHECK FOR CERTIFICATION ECU (SMART KEY ECU ASSEMBLY) DTC

(a) Connect the Techstream to the DLC3.

(b) Turn the power switch on (IG).

(c) Turn the Techstream on.

(d) Enter the following menus: Body Electrical / Smart Key / Trouble Codes.

(e) Check the details of the DTC(s) INFO.

2. CHECK FOR POWER MANAGEMENT CONTROL ECU (HV CPU) DTC

(a) Connect the Techstream to the DLC3.

(b) Turn the power switch on (IG).

(c) Turn the Techstream on.

(d) Enter the following menus: Powertrain / HV Control / Trouble Codes.

(e) Check the details of the DTC(s).

INFO for engine immobiliser system)

INFO for hybrid vehicle control system)

3. CLEAR CERTIFICATION ECU (SMART KEY ECU ASSEMBLY) DTC

(a) Connect the Techstream to the DLC3.

(b) Turn the power switch on (IG).

(c) Turn the Techstream on.

(d) Enter the following menus: Body Electrical / Smart Key / Trouble Codes.

(e) Clear the DTCs.

4. CLEAR POWER MANAGEMENT CONTROL ECU (HV CPU) DTC

(a) Connect the Techstream to the DLC3.

(b) Turn the power switch on (IG).

(c) Turn the Techstream on.

(d) Enter the following menus: Powertrain / HV Control / Trouble Codes.

(e) Clear the DTCs.

DATA LIST / ACTIVE TEST

1. DATA LIST

HINT:

Using the Techstream to read the Data List allows the values or states of switches, sensors, actuators and other items to be read without removing any parts. This non-intrusive inspection can be very useful because intermittent conditions or signals may be discovered before parts or wiring is disturbed. Reading the Data List information early in troubleshooting is one way to save diagnostic time.

NOTICE:

In the table below, the values listed under "Normal Condition" are reference values. Do not depend solely on these reference values when deciding whether a part is faulty or not.

(a) Connect the Techstream to the DLC3.

(b) Turn the power switch on (IG).

(c) Turn the Techstream on.

(d) Enter the following menus: Body Electrical / Smart Key / Data List.

(e) Read the Data List according to the display on the Techstream.

Smart Key (Certification ECU (Smart Key ECU Assembly))

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Ignition Switch	Power switch on (IG) signal/ON or OFF	ON: Power switch on (IG) or hybrid vehicle control system started OFF: Power switch off	-
Immobilizer when IG=ON	Immobiliser system status when power switch on (IG)l/UNSET or SET	SET: Power switch off UNSET: Power switch on (IG) or hybrid vehicle control system started	-
Immobiliser	Immobiliser system status/Set or Unset	Set: Power switch off Unset: Power switch on (IG) or hybrid vehicle control system started	-
Master Key	Master key code signal/Match or NoMatch	Match: Master key code sent NoMatch: Unmatched master key code sent	-
Sub Key	Sub-key (master key) code	Match: Sub-key (master key) code	-

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
	signal/Match or NoMatch	sent NoMatch: Unmatched sub-key (master key) code sent	
BCC Malfunction	Transponder chip signal/OK or NG	OK: Correct data sent NG: Incorrect data sent	-
Abnormal Status	Transponder chip data/OK or NG	OK: Data OK NG: Data error	-
Different Encrypt Code	Transponder chip signal/OK or NG	OK: Correct data sent NG: Incorrect data sent	-
Different Serial Number	Transponder chip signal/OK or NG	OK: Correct data sent NG: Incorrect data sent	-
Frame Error	Transponder chip signal/OK or NG	OK: Correct data sent NG: Incorrect data sent	-
Response	Transponder chip signal/OK or NG	OK: Correct data sent NG: Incorrect data sent	-
Wireless C Code	Wireless C Code/No Regd or Regd	No Regd: Wireless C Code not registered Regd: Wireless C Code registered	-
ID-BOX Sleep Condition	ID code box (immobiliser code ECU) condition/Yes or No	Yes: ID code box (immobiliser code ECU) in sleep condition No: ID code box (immobiliser code ECU) not in sleep condition	-
ID-BOX Start Condition	ID code box (immobiliser code ECU) condition/Yes or No	Yes: ID code box (immobiliser code ECU) sends wake up signal No: ID code box (immobiliser code ECU) not send wake up signal	-
Engine Start Request	ID code box (immobiliser code ECU) start request condition/OK or NG	OK: Start request condition signal received NG: Start request condition signal not received	-
3bit Code Request	3bit code reception status/OK or NG	OK: 3bit code received NG: 3bit code not received	

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
S Code Check	S code verification result/OK or NG	OK: Verification confirmed NG: Verification not confirmed	-
L Code Check	L code verification result/OK or NG	OK: Verification confirmed NG: Verification not confirmed	-
Unlock Request Receive	Unlock command reception status/OK or NG	OK: Unlock request received NG: Unlock request not received	-
Lock Request Receive	Lock command reception status/OK or NG	OK: Lock request received NG: Lock request not received	-
S Code Check (Past)	S code verification result (past)/OK or NG(Past)	OK: Verification confirmed (past) NG(Past): Verification not confirmed (past)	-
L Code Check (Past)	L code verification result (past)/OK or NG(Past)	OK: Verification confirmed (past) NG(Past): Verification not confirmed (past)	-
EFI Code Receive	HV code receive (when DTC stored)/OK or NG	OK: HV code received NG: HV code not received	-
EFI Communication	HV communication/OK or NG	OK: HV communication normal NG: HV communication abnormal	-
# Codes	Number of trouble codes/Min.: 0 or Max.: 255	Number of DTCs will be displayed	-

2. ACTIVE TEST

HINT:

Using the Techstream to perform Active Tests allows relays, VSVs, actuators and other items to be operated without removing any parts. This non-intrusive functional inspection can be very useful because intermittent operation may be discovered before parts or wiring is disturbed. Performing Active Tests early in troubleshooting is one way to save diagnostic time. Data List information can be displayed while performing Active Tests.

(a) Connect the Techstream to the DLC3.

(b) Turn the power switch on (IG).

(c) Turn the Techstream on.

(d) Enter the following menus: Body Electrical / Smart Key / Active Test.

(e) Perform the Active Test according to the display on the Techstream.

Smart Key (Certification ECU (Smart Key ECU Assembly))

Tester Display	Test Part	Control Range	Diagnostic Note
Immobiliser Indicator	Security indicator light	ON or OFF	-

DIAGNOSTIC TROUBLE CODE CHART

HINT:

If a trouble code is stored during the DTC check, inspect the trouble areas listed for that code. For details of the code, refer to the "See page" below.

1. CERTIFICATION ECU (SMART KEY ECU ASSEMBLY) DIAGNOSTIC TROUBLE CODE CHART

Certification ECU (Smart Key ECU Assembly)

DTC Code	Detection Item	Trouble Area	See page
B2784	Antenna Coil Open / Short	1. Wire harness or connector 2. Power switch 3. Certification ECU (Smart key ECU assembly)	INFO
B278A	Short to GND in Immobiliser System Power Source Circuit	1. Wire harness or connector 2. Power switch 3. Certification ECU (Smart key ECU assembly)	INFO
B2790 *2	ID BOX EEPROM Malfunction	1. ID code box (Immobiliser code ECU) 2. Certification ECU (Smart key ECU assembly)	INFO

*2: w/ Automatic Light Control System

2. POWER MANAGEMENT CONTROL ECU (HV CPU) DIAGNOSTIC TROUBLE CODE CHART

HINT:

The DTCs for the engine immobiliser system are specified above. If the other codes are output, check the DTC chart for the hybrid vehicle control system.

Power Management Control ECU (HV CPU)

DTC Code	Detection Item	Trouble Area	See page
B2799	Engine Immobiliser System Malfunction	1. Wire harness or connector 2. Power management control ECU (HV CPU) 3. Certification ECU (Smart key ECU	INFO

DTC Code	Detection Item	Trouble Area	See page
		assembly)*1 4. ID code box (Immobiliser code ECU)*2	
B279A	Theft Deterrent System Communication Line High Fixation	1. Wire harness or connector 2. Power management control ECU (HV CPU) 3. Certification ECU (Smart key ECU assembly)*1 4. ID code box (Immobiliser code ECU)*2	INFO
B279C	Theft Deterrent System Presence Detection	Power management control ECU (HV CPU)	INFO

- *1: w/o Automatic Light Control System
- *2: w/ Automatic Light Control System

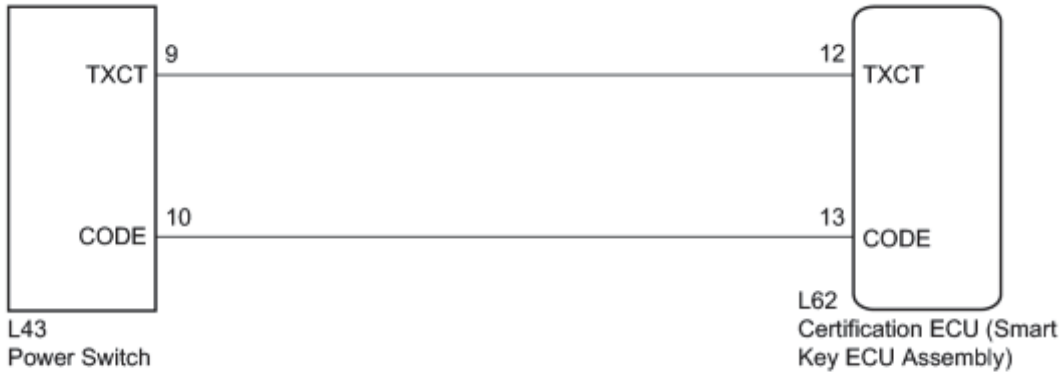
DTC	B2784	Antenna Coil Open / Short

DESCRIPTION

This DTC is stored when there is an open or short in the transponder key coil (built into the power switch).

DTC No.	DTC Detection Condition	Trouble Area
B2784	Transponder key coil is open or shorted.	• Wire harness or connector • Power switch • Certification ECU (Smart key ECU assembly)

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- If the certification ECU (smart key ECU assembly) is replaced, register all the keys and ECU communication ID INFO.*1
- If the certification ECU (smart key ECU assembly) is replaced, register all the keys INFO.*2
  - *1: w/o Automatic Light Control System
  - *2: w/ Automatic Light Control System

PROCEDURE

1.	CHECK DTC OUTPUT

(a) Clear the DTCs INFO.

(b) Recheck for DTCs INFO.

OK:

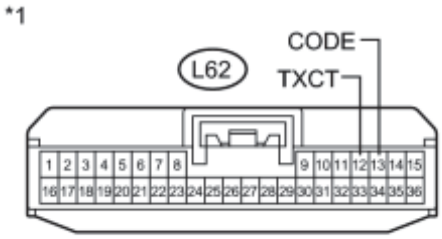
DTC B2784 is not output.

NG CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - POWER SWITCH)

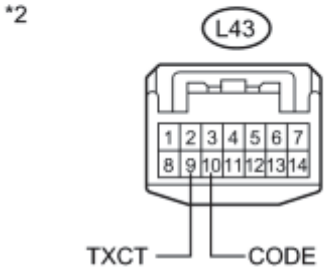
OK **USE SIMULATION METHOD TO CHECK**

2.	CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - POWER SWITCH)

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



(b) Disconnect the power switch connector.



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

Standard Resistance:

Tester Connection	Condition	Specified Condition
L62-12 (TXCT) - L43-9 (TXCT)	Always	Below 1 Ω
L62-13 (CODE) - L43-10 (CODE)	Always	Below 1 Ω
L62-12 (TXCT) - Body ground	Always	10 kΩ or higher
L62-13 (CODE) - Body ground	Always	10 kΩ or higher

Text in Illustration

*1	Front view of wire harness connector (to Certification ECU (Smart Key ECU Assembly))
*2	Front view of wire harness connector

	(to Power Switch)

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

▼

3.	REPLACE POWER SWITCH

(a) Replace the power switch INFO.

NEXT

▼

4.	CHECK DTC OUTPUT

(a) Clear the DTCs INFO.

(b) Recheck for DTCs INFO.

OK:

DTC B2784 is not output.

NG → REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

OK → **END (POWER SWITCH WAS DEFECTIVE)**

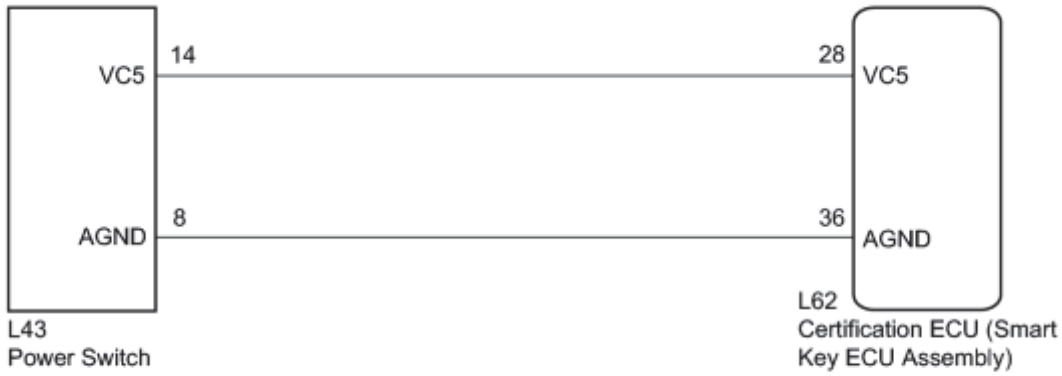
DTC	B278A	Short to GND in Immobiliser System Power Source Circuit

DESCRIPTION

This DTC is stored when the power switch power source supply line is open or shorted.

DTC No.	DTC Detection Condition	Trouble Area
B278A	Power switch power source supply line is open or shorted.	• Wire harness or connector • Power switch • Certification ECU (Smart key ECU assembly)

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- If the certification ECU (smart key ECU assembly) is replaced, register all the keys and ECU communication ID INFO.*1
- If the certification ECU (smart key ECU assembly) is replaced, register all the keys INFO.*2
  - *1: w/o Automatic Light Control System
  - *2: w/ Automatic Light Control System

PROCEDURE

1.	CHECK DTC OUTPUT

(a) Clear the DTCs INFO.

(b) Recheck for DTCs INFO.

OK:

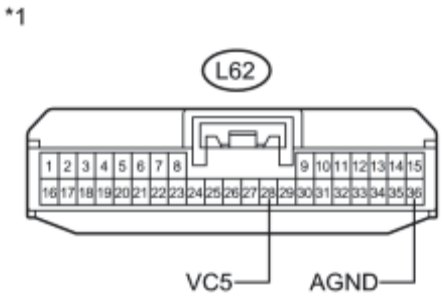
DTC B278A is not output.

NG CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - POWER SWITCH)

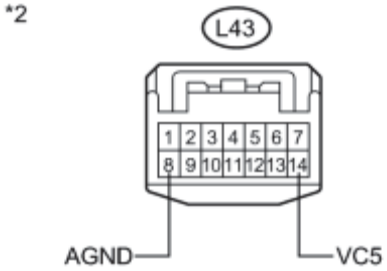
OK **USE SIMULATION METHOD TO CHECK**

2.	CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - POWER SWITCH)

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



(b) Disconnect the power switch connector.



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

Standard Resistance:

Tester Connection	Condition	Specified Condition
L62-28 (VC5) - L43-14 (VC5)	Always	Below 1 Ω
L62-36 (AGND) - L43-8 (AGND)	Always	Below 1 Ω
L62-28 (VC5) - Body ground	Always	10 kΩ or higher
L62-36 (AGND) - Body ground	Always	10 kΩ or higher

Text in Illustration

*1	Front view of wire harness connector (to Certification ECU (Smart Key ECU Assembly))

*2	Front view of wire harness connector (to Power Switch)

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

▼

3.	CHECK CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

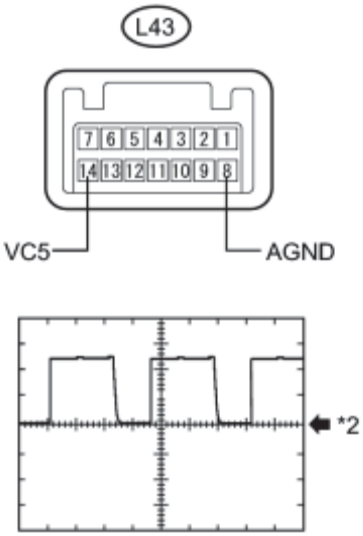
(a) Reconnect the certification ECU (smart key ECU assembly) connector.

(b) Reconnect the power switch connector.

(c) Using an oscilloscope, check the waveform.

Waveform (Reference):

*1



Item	Content
Tester Connection	L43-14 (VC5) - L43-8 (AGND)
Tool Setting	2 V/DIV., 200 ms./DIV.
Condition	• Power switch off • Key not in cabin • Power switch pressed within 30 seconds

OK:

Waveform is output normally (see illustration)

Text in Illustration

*1	Component with harness connected (Power Switch)
*2	GND

NG ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

OK ▶ **REPLACE POWER SWITCH**

DTC	B2790	ID BOX EEPROM Malfunction

DESCRIPTION

This DTC is stored when the ID code box (immobiliser code ECU) detects an internal malfunction.

DTC No.	DTC Detection Condition	Trouble Area
B2790	ID code box (immobiliser code ECU) detects internal malfunction	• ID code box (Immobiliser code ECU) • Certification ECU (Smart key ECU assembly)

INSPECTION PROCEDURE

NOTICE:

- If the certification ECU (smart key ECU assembly) is replaced, register all the keys INFO.
- If the ID code box (immobiliser code ECU) is replaced, register the ECU code and ECU communication ID INFO.

PROCEDURE

1.	REPLACE ID CODE BOX (IMMOBILISER CODE ECU)

(a) Replace the ID code box (immobiliser code ECU) INFO.

NEXT

2.	ECU CODE REGISTRATION

(a) Register the ECU code INFO.

NEXT

3.	ECU COMMUNICATION ID REGISTRATION

(a) Register the ECU communication ID INFO.

NEXT

4.	CHECK DTC OUTPUT

(a) Clear the DTCs INFO.

(b) Recheck for DTCs INFO.

OK:

DTC B2790 is not output.

NG ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)
OK ▶ **END (ID CODE BOX (IMMOBILISER CODE ECU) WAS DEFECTIVE)**

DTC	B2799	Engine Immobiliser System Malfunction

DESCRIPTION

This DTC is stored when one of the following occurs: 1) the power management control ECU (HV CPU) detects an error in its own communication with the certification ECU assembly (smart key ECU assembly)*1 or ID code box (immobiliser code ECU)*2; 2) the power management control ECU (HV CPU) detects an error in the communication lines; or 3) the ECU communication ID between the certification ECU assembly (smart key ECU assembly)*1 or ID code box (immobiliser code ECU)*2 and power management control ECU (HV CPU) is different and a hybrid vehicle control system start is attempted.

- *1: w/o Automatic Light Control System
- *2: w/ Automatic Light Control System

HINT:

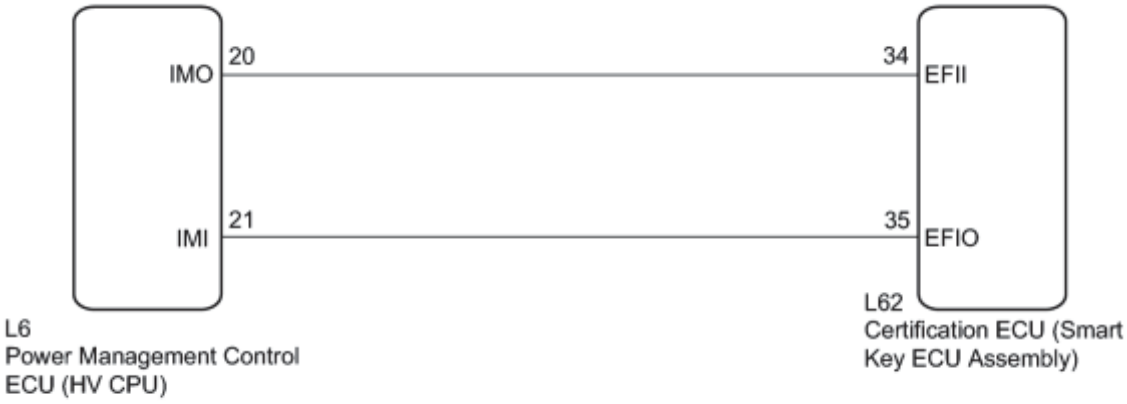
Before troubleshooting this DTC, make sure that no certification ECU (smart key ECU assembly) DTCs are present. If present, troubleshoot the certification ECU (smart key ECU assembly) DTCs first.

DTC No.	DTC Detection Condition	Trouble Area
B2799	One of the following conditions is met: • Error in communication between power management control ECU (HV CPU) and certification ECU assembly (smart key ECU assembly)*1 or ID code box (immobiliser code ECU)*2 • Error in communication lines • Communication ID is different between certification ECU assembly (smart key ECU assembly)*1 or ID code box (immobiliser code ECU)*2 and power management control ECU (HV CPU) during communication	• Wire harness or connector • Power management control ECU (HV CPU) • Certification ECU (Smart key ECU assembly)*1 • ID code box (Immobiliser code ECU)*2

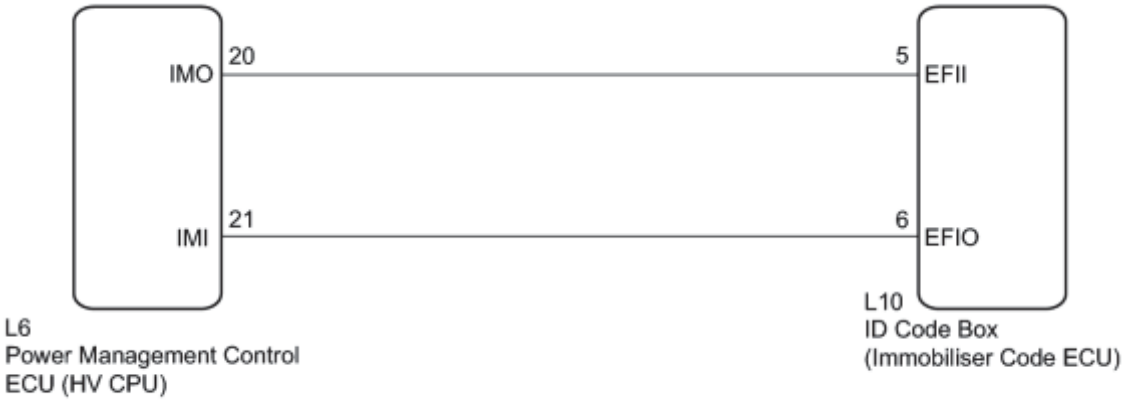
- *1: w/o Automatic Light Control System
- *2: w/ Automatic Light Control System

WIRING DIAGRAM

1. w/o Automatic Light Control System



2. w/ Automatic Light Control System



INSPECTION PROCEDURE

NOTICE:

- If the certification ECU (smart key ECU assembly) is replaced, register all the keys and ECU communication ID INFO .*1
- If the ID code box (immobiliser code ECU) is replaced, register the ECU code and ECU communication ID INFO .*2
    - *1: w/o Automatic Light Control System
    - *2: w/ Automatic Light Control System

PROCEDURE

1.	CHECK DTC OUTPUT

(a) Clear the DTCs INFO.

(b) Recheck for DTCs INFO.

OK:

DTC B2799 is not output.

NG RE-REGISTER ECU COMMUNICATION ID

OK **USE SIMULATION METHOD TO CHECK**

2.	RE-REGISTER ECU COMMUNICATION ID

(a) Re-register the ECU communication ID INFO.

NEXT

3.	CHECK DTC OUTPUT

(a) Clear the DTCs INFO.

(b) Recheck for DTCs INFO.

OK:

DTC B2799 is not output.

NG CHECK CONNECTOR CONNECTION CONDITION

OK **END (ECU COMMUNICATION ID WAS NOT REGISTERED CORRECTLY)**

4.	CHECK CONNECTOR CONNECTION CONDITION

(a) Turn the power switch off.

(b) Check that the connectors are properly connected to the power management control ECU (HV CPU) and certification ECU (smart key ECU assembly)*1 or ID code box (immobiliser code ECU)*2.

- *1: w/o Automatic Light Control System
- *2: w/ Automatic Light Control System

OK:

Connectors are properly connected.

NG CONNECT CONNECTORS PROPERLY

OK

5.	SYSTEM CHECK

(a) Check the vehicle specification.

Result:

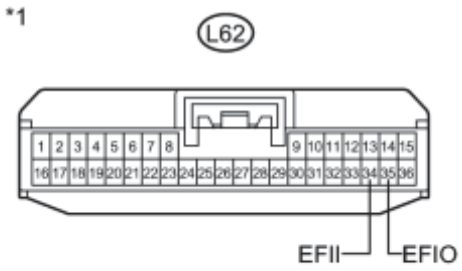
Result	Proceed to
w/o Automatic Light Control System	A
w/ Automatic Light Control System	B

B CHECK HARNESS AND CONNECTOR (ID CODE BOX - POWER MANAGEMENT CONTROL ECU (HV CPU))

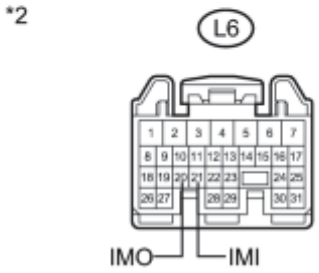
A

6.	CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - POWER MANAGEMENT CONTROL ECU (HV CPU))

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



(b) Disconnect the power management control ECU (HV CPU) connector.



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

Standard Resistance:

Tester Connection	Condition	Specified Condition
L62-34 (EFII) - L6-20 (IMO)	Always	Below 1 Ω
L62-35 (EFIO) - L6-21 (IMI)	Always	Below 1 Ω
L6-20 (IMO) - Body ground	Always	10 kΩ or higher
L6-21 (IMI) - Body ground	Always	10 kΩ or higher

Standard Voltage:

Tester Connection	Condition	Specified Condition
L6-20 (IMO) - Body ground	Always	Below 1 V
L6-21 (IMI) - Body ground	Always	Below 1 V

Text in Illustration

*1	Front view of wire harness connector (to Certification ECU (Smart Key ECU Assembly))
*2	Front view of wire harness connector (to Power Management Control ECU (HV CPU))

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

▼

7.	REPLACE POWER MANAGEMENT CONTROL ECU (HV CPU)

(a) Replace the power management control ECU (HV CPU) INFO.

NEXT

▼

8.	CHECK DTC OUTPUT

(a) Clear the DTCs INFO.

(b) Recheck for DTCs INFO.

OK:

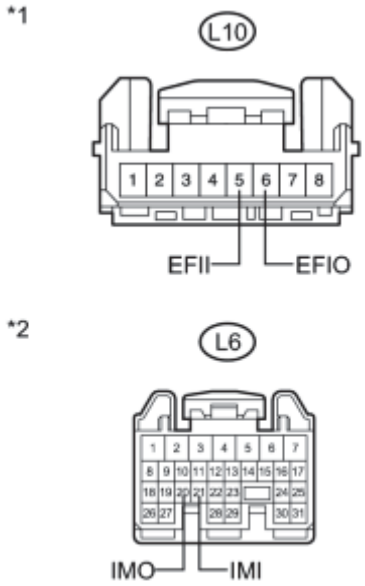
DTC B2799 is not output.

NG ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

OK ▶ **END (POWER MANAGEMENT CONTROL ECU (HV CPU) WAS DEFECTIVE)**

9.	CHECK HARNESS AND CONNECTOR (ID CODE BOX - POWER MANAGEMENT CONTROL ECU (HV CPU))

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



(b) Disconnect the power management control ECU (HV CPU) connector.

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
L10-5 (EFII) - L6-20 (IMO)	Always	Below 1 Ω
L10-6 (EFIO) - L6-21 (IMI)	Always	Below 1 Ω
L6-20 (IMO) - Body ground	Always	10 kΩ or higher
L6-21 (IMI) - Body ground	Always	10 kΩ or higher

Standard Voltage:

Tester Connection	Condition	Specified Condition
L6-20 (IMO) - Body ground	Always	Below 1 V
L6-21 (IMI) - Body ground	Always	Below 1 V

Text in Illustration

*1	Front view of wire harness connector (to ID Code Box (Immobiliser Code ECU))

*2	Front view of wire harness connector (to Power Management Control ECU (HV CPU))

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

▼

10.	REPLACE POWER MANAGEMENT CONTROL ECU (HV CPU)

(a) Replace the power management control ECU (HV CPU) INFO.

NEXT

▼

11.	CHECK DTC OUTPUT

(a) Clear the DTCs INFO.

(b) Recheck for DTCs INFO.

OK:

DTC B2799 is not output.

NG ▶ REPLACE ID CODE BOX (IMMOBILISER CODE ECU)

OK ▶ **END (POWER MANAGEMENT CONTROL ECU (HV CPU) WAS DEFECTIVE)**

DTC	B279A	Theft Deterrent System Communication Line High Fixation

DESCRIPTION

If the communication line (EFIO - IMI) to the certification ECU assembly (smart key ECU assembly)*1 or ID code box (immobiliser code ECU)*2 is stuck high output (e. g. shorted to +B), the power management control ECU (HV CPU) stores this DTC.

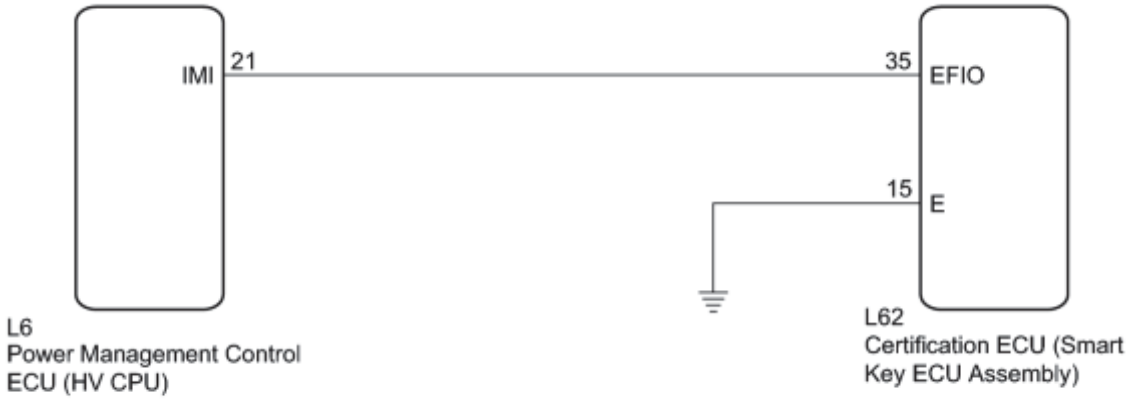
- *1: w/o Automatic Light Control System
- *2: w/ Automatic Light Control System

DTC No.	DTC Detection Condition	Trouble Area
B279A	When the communication line (EFIO - IMI) between power management control ECU (HV CPU) and certification ECU assembly (smart key ECU assembly)*1 or ID code box (immobiliser code ECU)*2 is stuck high output.	• Wire harness or connector • Power management control ECU (HV CPU) • Certification ECU (Smart key ECU assembly)*1 • ID code box (Immobiliser code ECU)*2

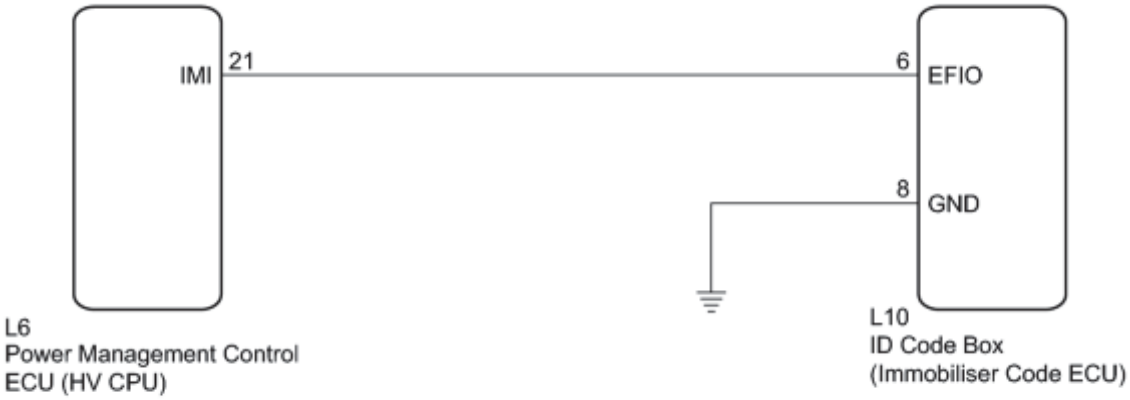
- *1: w/o Automatic Light Control System
- *2: w/ Automatic Light Control System

WIRING DIAGRAM

1. w/o Automatic Light Control System



2. w/ Automatic Light Control System



INSPECTION PROCEDURE

NOTICE:

- If the certification ECU (smart key ECU assembly) is replaced, register all the keys and ECU communication ID INFO.*1
- If the ID code box (immobiliser code ECU) is replaced, register the ECU code and ECU communication ID INFO .*2
  - *1: w/o Automatic Light Control System
  - *2: w/ Automatic Light Control System

PROCEDURE

1.	CHECK DTC OUTPUT

(a) Clear the DTCs INFO.

(b) Recheck for DTCs INFO.

HINT:

If any DTCs other than DTC B279A are output, troubleshoot those DTCs first.

Result:

Result	Proceed to
DTC B279A is output	A
DTC B279A and other DTCs are output	B

B GO TO DIAGNOSTIC TROUBLE CODE CHART

A

2.	SYSTEM CHECK

(a) Check the vehicle specification.

Result:

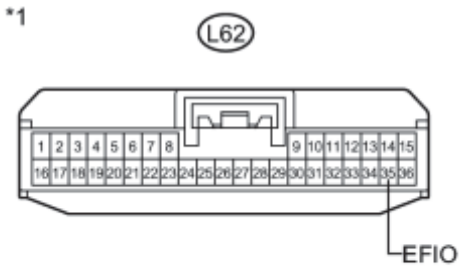
Result	Proceed to
w/o Automatic Light Control System	A
w/ Automatic Light Control System	B

B CHECK HARNESS AND CONNECTOR (ID CODE BOX - POWER MANAGEMENT CONTROL ECU (HV CPU))

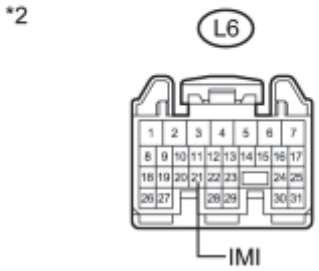
A

3.	CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - POWER MANAGEMENT CONTROL ECU (HV CPU))

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



(b) Disconnect the power management control ECU (HV CPU) connector.



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

Standard Resistance:

Tester Connection	Condition	Specified Condition
L62-35 (EFIO) - L6-21 (IMI)	Always	Below 1 Ω

Tester Connection	Condition	Specified Condition
L6-21 (IMI) - Body ground	Always	10 kΩ or higher

Standard Voltage:

Tester Connection	Condition	Specified Condition
L6-21 (IMI) - Body ground	Always	Below 1 V

Text in Illustration

*1	Front view of wire harness connector (to Certification ECU (Smart Key ECU Assembly))
*2	Front view of wire harness connector (to Power Management Control ECU (HV CPU))

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

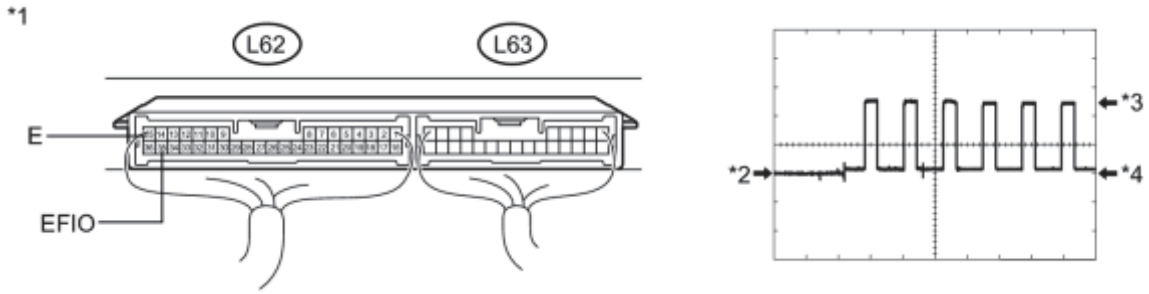
OK

▼

4.	CHECK CERTIFICATION ECU (SMART KEY ECU ASSEMBLY) (WAVEFORM)

(a) Reconnect the certification ECU (smart key ECU assembly) connector.

(b) Reconnect the power management control ECU (HV CPU) connector.



(c) Using an oscilloscope, check the waveform.

Waveform (Reference):

Item	Content
Terminal No. (Symbol)	L62-35 (EFIO) - L62-15 (E)
Tool Setting	5 V/DIV., 50 msec./DIV.
Condition	Power switch on (IG)

OK:

Waveform is output normally (see illustration).

Text in Illustration

*1	Component with harness connected (Certification ECU (Smart Key ECU Assembly))	*2	GND
*3	HIGH	*4	LOW

NG ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

OK ▶ **REPLACE POWER MANAGEMENT CONTROL ECU (HV CPU)**

5.	REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

(a) Replace the certification ECU (smart key ECU assembly) INFO.

NEXT

▼

6.	KEY REGISTRATION

(a) Register the key INFO.

NEXT

▼

7.	ECU COMMUNICATION ID REGISTRATION

(a) Register the ECU communication ID INFO.

NEXT

▼

8.	CHECK DTC OUTPUT

(a) Clear the DTCs INFO.

(b) Recheck for DTCs INFO.

OK:

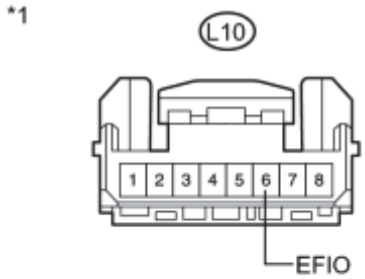
DTC B279A is not output.

NG ▶ REPLACE POWER MANAGEMENT CONTROL ECU (HV CPU)

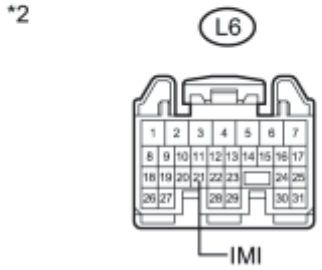
OK → **END (CERTIFICATION ECU (SMART KEY ECU ASSEMBLY) WAS DEFECTIVE)**

9.	CHECK HARNESS AND CONNECTOR (ID CODE BOX - POWER MANAGEMENT CONTROL ECU (HV CPU))

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



(b) Disconnect the power management control ECU (HV CPU) connector.



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

Standard Resistance:

Tester Connection	Condition	Specified Condition
L10-6 (EFIO) - L6-21 (IMI)	Always	Below 1 Ω
L6-21 (IMI) - Body ground	Always	10 kΩ or higher

Standard Voltage:

Tester Connection	Condition	Specified Condition
L6-21 (IMI) - Body ground	Always	Below 1 V

Text in Illustration

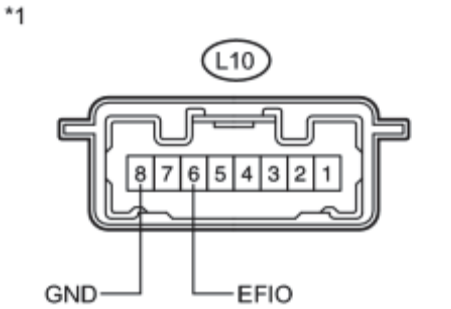
*1	Front view of wire harness connector (to ID Code Box (Immobiliser Code ECU))
*2	Front view of wire harness connector (to Power Management Control ECU (HV CPU))

NG REPAIR OR REPLACE HARNESS OR CONNECTOR

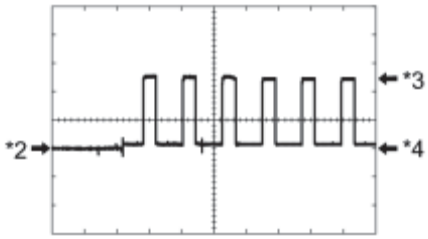
OK

10.	CHECK ID CODE BOX (IMMOBILISER CODE ECU) (WAVEFORM)

(a) Reconnect the ID code box (immobiliser code ECU) connector.



(b) Reconnect the power management control ECU (HV CPU) connector.



(c) Using an oscilloscope, check the waveform.

Waveform (Reference):

Item	Content
Terminal No. (Symbol)	L10-6 (EFIO) - L10-8 (GND)
Tool Setting	5 V/DIV., 50 msec./DIV.
Condition	Power switch on (IG)

OK:

Waveform is output normally (see illustration).

Text in Illustration

*1	Component with harness connected (ID Code Box (Immobiliser Code ECU))
*2	GND

*3	HIGH
*4	LOW

NG ▶ REPLACE ID CODE BOX (IMMOBILISER CODE ECU)

OK ▶ **REPLACE POWER MANAGEMENT CONTROL ECU (HV CPU)**

11.	REPLACE ID CODE BOX (IMMOBILISER CODE ECU)

(a) Replace the ID code box (immobiliser code ECU) INFO.

NEXT

▼

12.	ECU CODE REGISTRATION

(a) Register the ECU code INFO.

NEXT

▼

13.	ECU COMMUNICATION ID REGISTRATION

(a) Register the ECU communication ID INFO.

NEXT

▼

14.	CHECK DTC OUTPUT

(a) Clear the DTCs INFO.

(b) Recheck for DTCs INFO.

OK:

DTC B279A is not output.

NG ▶ REPLACE POWER MANAGEMENT CONTROL ECU (HV CPU)

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

DTC	B279C	Theft Deterrent System Presence Detection

DESCRIPTION

If a power management control ECU (HV CPU) that is incompatible with the engine immobiliser system is installed, the power management control ECU (HV CPU) stores this DTC.

DTC No.	DTC Detection Condition	Trouble Area
B279C	When a power management control ECU (HV CPU) that is incompatible with engine immobiliser system is installed.	Power management control ECU (HV CPU)

INSPECTION PROCEDURE

PROCEDURE

1.	CHECK DTC OUTPUT

(a) Clear the DTCs INFO.

(b) Recheck for DTCs INFO.

OK:

DTC B279C is not output.

NG ▶ REPLACE POWER MANAGEMENT CONTROL ECU (HV CPU)

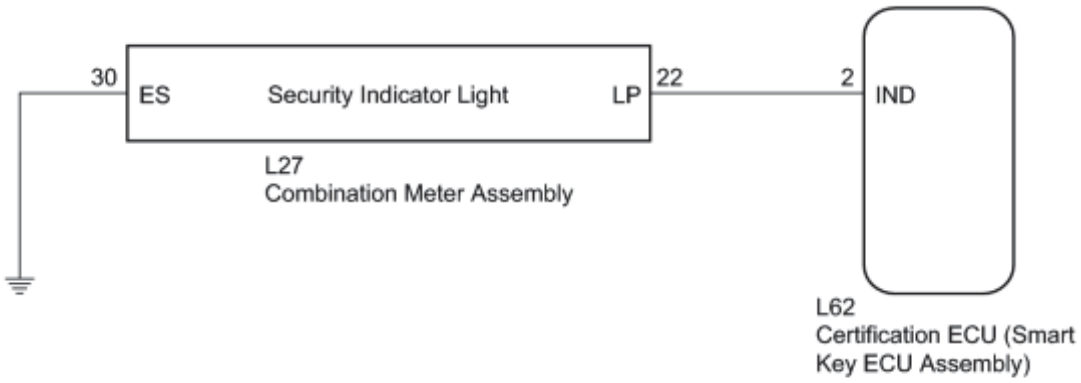
OK ▶ **USE SIMULATION METHOD TO CHECK**

Security Indicator Light Does not Blinking

DESCRIPTION

The security indicator light blinks continuously due to a continuous signal received from the certification ECU (smart key ECU assembly) while the engine immobiliser is set.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- If the certification ECU (smart key ECU assembly) is replaced, register all the keys and ECU communication ID INFO.*1
- If the certification ECU (smart key ECU assembly) is replaced, register all the keys INFO.*2
  - *1: w/o Automatic Light Control System
  - *2: w/ Automatic Light Control System

PROCEDURE

1.	PERFORM ACTIVE TEST USING TECHSTREAM

(a) Connect the Techstream to the DLC3.

(b) Turn the power switch on (IG).

(c) Turn the Techstream on.

(d) Enter the following menus: Body Electrical / Smart Key / Active Test.

(e) Perform the Active Test according to the display on the Techstream.

Smart Key (Certification ECU (Smart Key ECU Assembly))

Tester Display	Test Part	Control Range	Diagnostic Note
Immobiliser Indicator	Security indicator light	ON or OFF	-

OK:

The security indicator light turns on and off according to operation via the Techstream.

NG ▶ INSPECT COMBINATION METER ASSEMBLY

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

2.	INSPECT COMBINATION METER ASSEMBLY

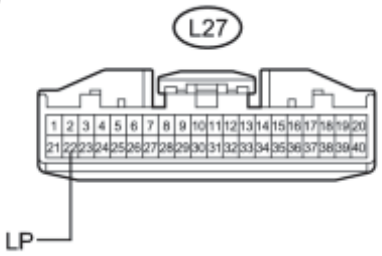
(a) Disconnect the combination meter assembly connector.

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

Standard:

Tester Connection	Condition	Specified Condition
L27-22 (LP) - Body ground	• Power switch on (IG) • Security indicator light off	Below 2 V
L27-22 (LP) - Body ground	• Power switch off • Security indicator light blinks	Pulse generation

*1



Text in Illustration

*1	Front view of wire harness connector (to Combination Meter Assembly)

NG ▶ CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - COMBINATION METER ASSEMBLY)

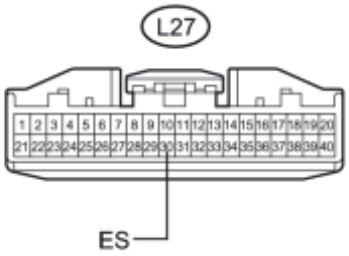
OK

▼

3.	CHECK HARNESS AND CONNECTOR (COMBINATION METER ASSEMBLY - BODY GROUND)

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

*1



Standard Resistance:

Tester Connection	Condition	Specified Condition
L27-30 (ES) - Body ground	Always	Below 1 Ω

Text in Illustration

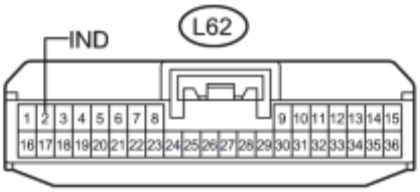
*1	Front view of wire harness connector (to Combination Meter Assembly)

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK ▶ **REPLACE NO. 3 METER CIRCUIT PLATE**

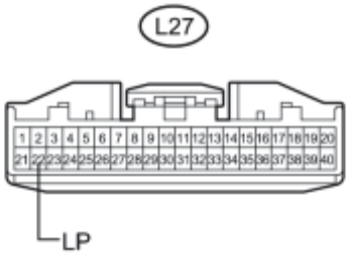
4.	CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - COMBINATION METER ASSEMBLY)

*1



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

*2



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

Standard Resistance:

Tester Connection	Condition	Specified Condition
L62-2 (IND) - L27-22 (LP)	Always	Below 1 Ω
L62-2 (IND) - Body ground	Always	10 kΩ or higher
L27-22 (LP) - Body ground	Always	10 kΩ or higher

Text in Illustration

*1	Front view of wire harness connector (to Certification ECU (Smart Key ECU Assembly))
*2	Front view of wire harness connector (to Combination Meter Assembly)

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

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