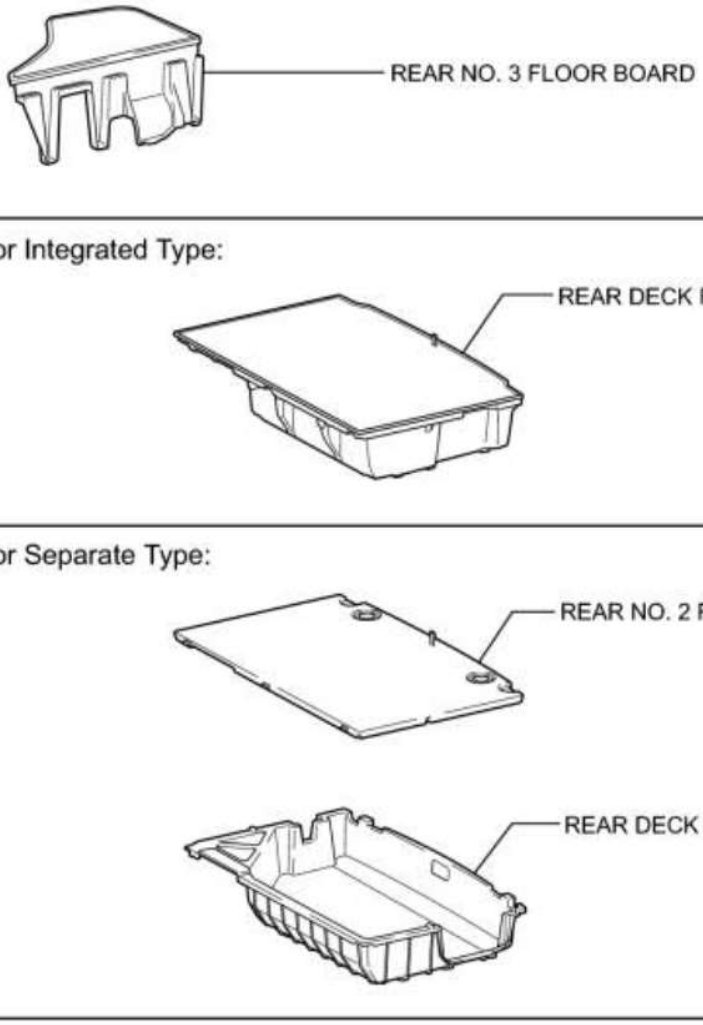
COMPONENTS

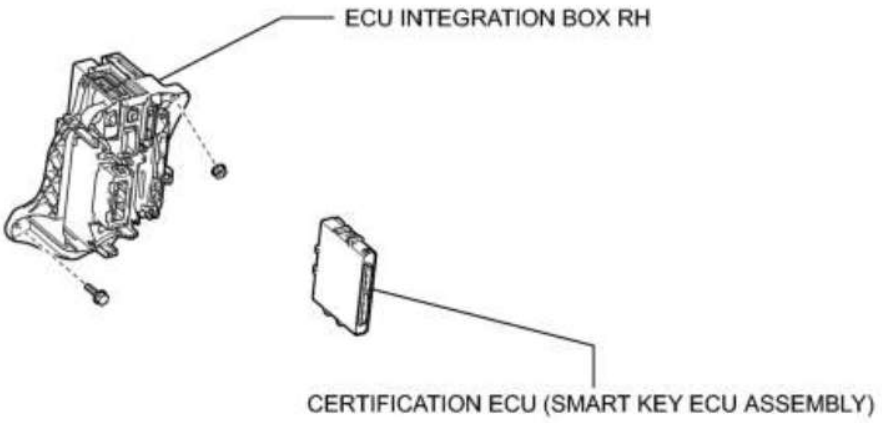
ILLUSTRATION

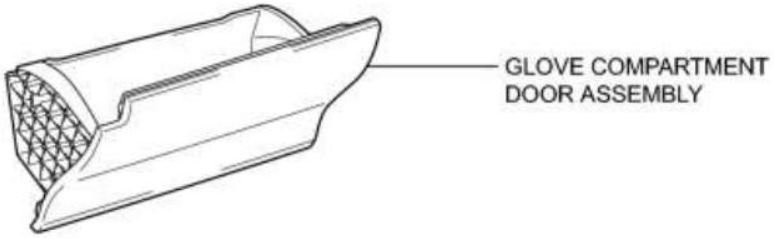


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ILLUSTRATION

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REMOVAL

1. REMOVE REAR NO. 2 FLOOR BOARD (for Separate Type) INFO

2. REMOVE REAR DECK FLOOR BOX INFO

3. REMOVE REAR NO. 3 FLOOR BOARD INFO

4. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

NOTICE:

When disconnecting the cable, some systems need to be initialized after the cable is reconnected INFO.

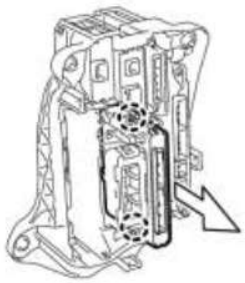
5. REMOVE NO. 2 INSTRUMENT PANEL UNDER COVER SUB-ASSEMBLY INFO

6. REMOVE GLOVE COMPARTMENT DOOR ASSEMBLY INFO

7. REMOVE ECU INTEGRATION BOX RH INFO

8. REMOVE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

P



(a) Disengage the 2 craws and remove the certification ECU (smart key ECU assembly).

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INSTALLATION

1. INSTALL CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)



P

(a) Engage the 2 craws and install the certification ECU (smart key ECU assembly).

2. INSTALL ECU INTEGRATION BOX RH INFO

3. INSTALL GLOVE COMPARTMENT DOOR ASSEMBLY INFO

4. INSTALL NO. 2 INSTRUMENT PANEL UNDER COVER SUB-ASSEMBLY INFO

5. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL

NOTICE:

When disconnecting the cable, some systems need to be initialized after the cable is reconnected INFO.

6. INSTALL REAR NO. 3 FLOOR BOARD INFO

7. INSTALL REAR DECK FLOOR BOX INFO

8. INSTALL REAR NO. 2 FLOOR BOARD (for Separate Type) INFO

9. REGISTER KEY

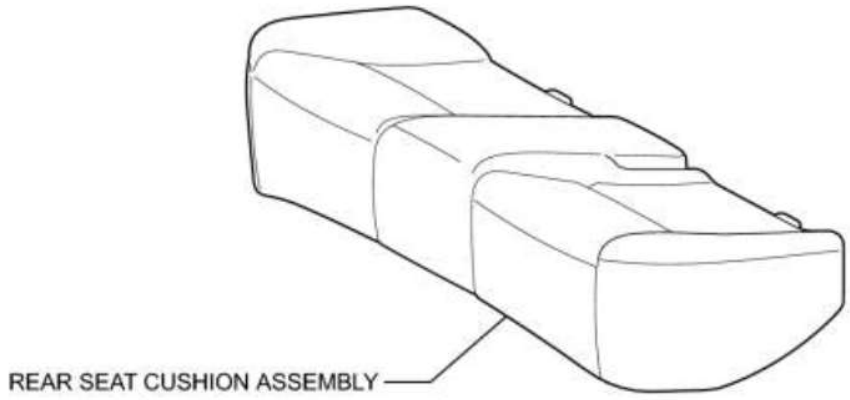
NOTICE:

If the certification ECU (smart key ECU assembly) is replaced, register the key INFO.

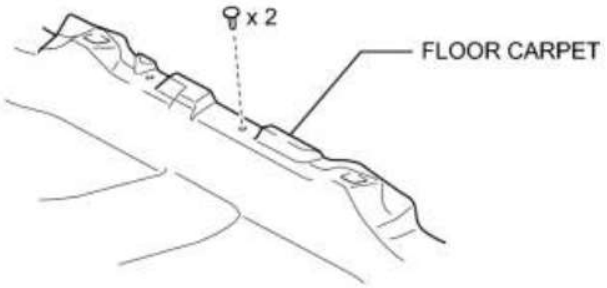
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COMPONENTS

ILLUSTRATION







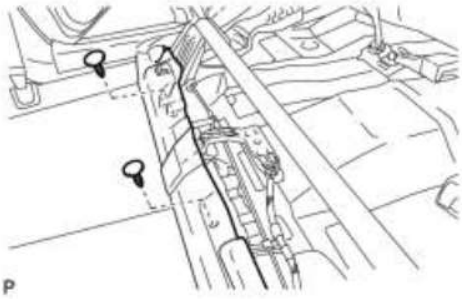
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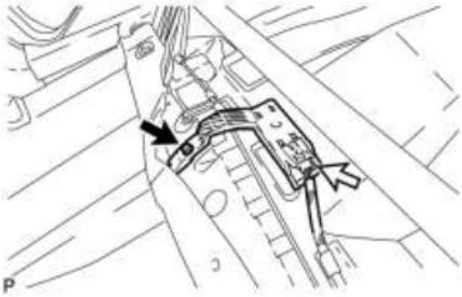
REMOVAL

1. REMOVE REAR SEAT CUSHION ASSEMBLY INFO

2. REMOVE ELECTRICAL KEY OSCILLATOR



(a) Remove the 2 clips from the floor carpet.



(b) Remove the bolt.

(c) Disconnect the connector and remove the electrical key oscillator.

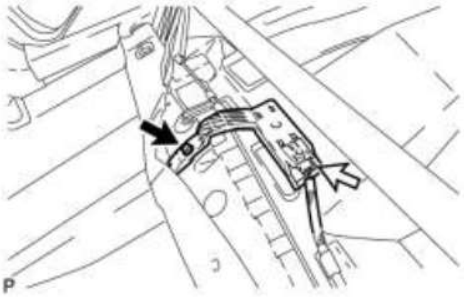
NOTICE:

Be careful when removing the electrical key oscillator. If the oscillator is dropped, replace it with a new one.

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INSTALLATION

1. INSTALL ELECTRICAL KEY OSCILLATOR

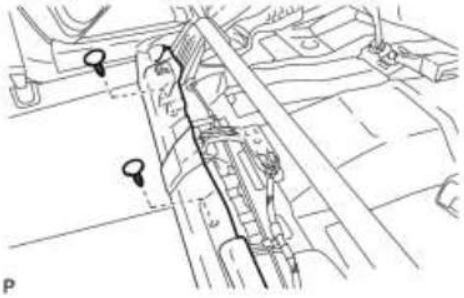


(a) Connect the connector.

(b) Install the electrical key oscillator with the bolt.

NOTICE:

Be careful when installing the electrical key oscillator. If the oscillator is dropped, replace it with a new one.



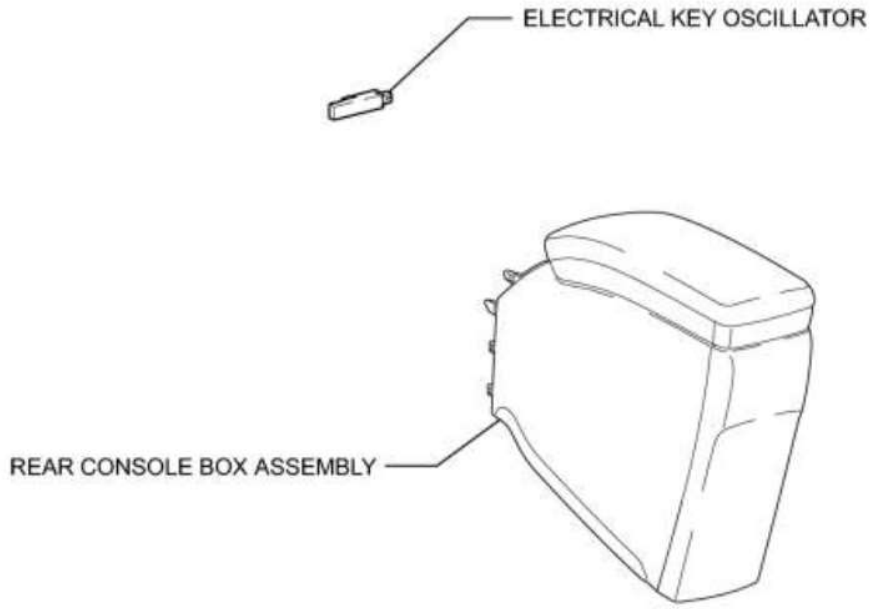
(c) Install the 2 clips to the floor carpet.

2. INSTALL REAR SEAT CUSHION ASSEMBLY INFO

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COMPONENTS

ILLUSTRATION



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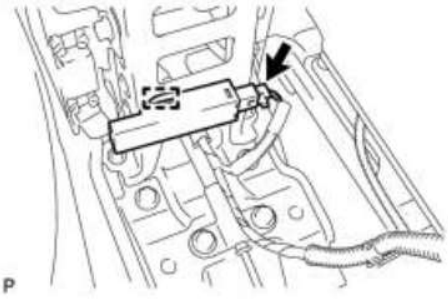
REMOVAL

1. REMOVE REAR CONSOLE BOX ASSEMBLY

HINT:

Refer to the procedure up to Remove Rear Console Box Assembly INFO.

2. REMOVE ELECTRICAL KEY OSCILLATOR



(a) Disconnect the connector.

(b) Disengage the clamp and remove the electrical key oscillator.

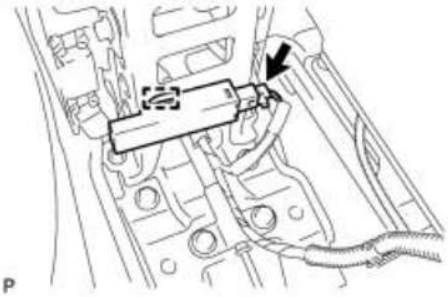
NOTICE:

Be careful when removing the electrical key oscillator. If the oscillator is dropped, replace it with a new one.

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INSTALLATION

1. INSTALL ELECTRICAL KEY OSCILLATOR



(a) Engage the clamp and install the electrical key oscillator.

NOTICE:

Be careful when installing the electrical key oscillator. If the oscillator is dropped, replace it with a new one.

(b) Connect the connector.

2. INSTALL REAR CONSOLE BOX ASSEMBLY

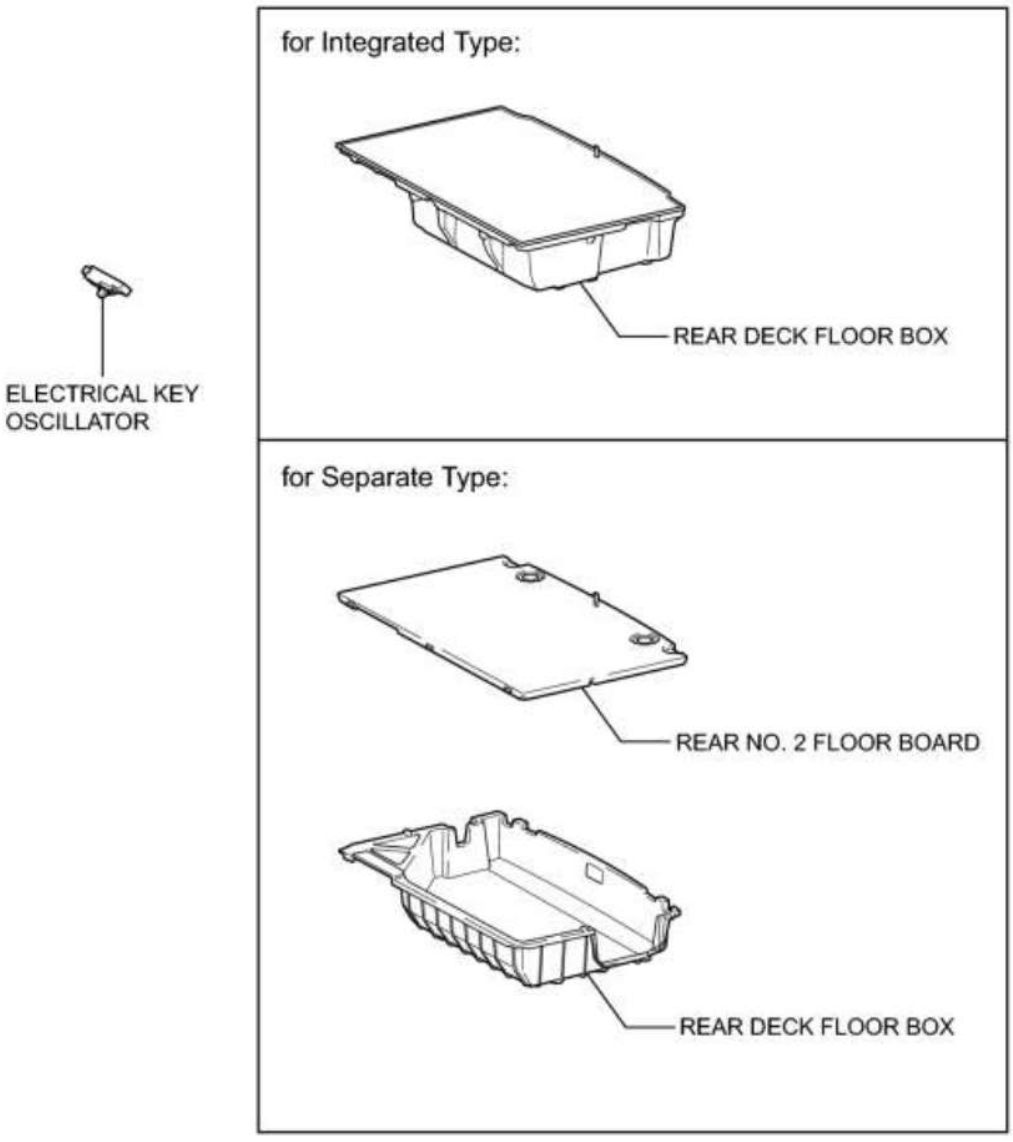
HINT:

Refer to the procedure from Install Rear Console Box Assembly INFO.

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COMPONENTS

ILLUSTRATION



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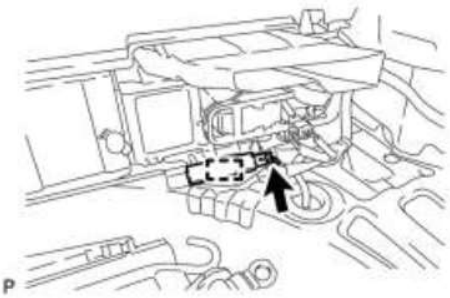
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REMOVAL

1. REMOVE REAR NO. 2 FLOOR BOARD (for Separate Type) INFO

2. REMOVE REAR DECK FLOOR BOX INFO

3. REMOVE ELECTRICAL KEY OSCILLATOR



(a) Disconnect the connector.

(b) Disengage the clamp and remove the electrical key oscillator.

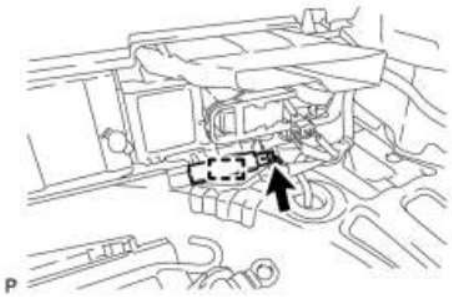
NOTICE:

Be careful when removing the electrical key oscillator. If the oscillator is dropped, replace it with a new one.

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INSTALLATION

1. INSTALL ELECTRICAL KEY OSCILLATOR



(a) Engage the clamp and install the electrical key oscillator.

NOTICE:

Be careful when installing the electrical key oscillator. If the oscillator is dropped, replace it with a new one.

(b) Connect the connector.

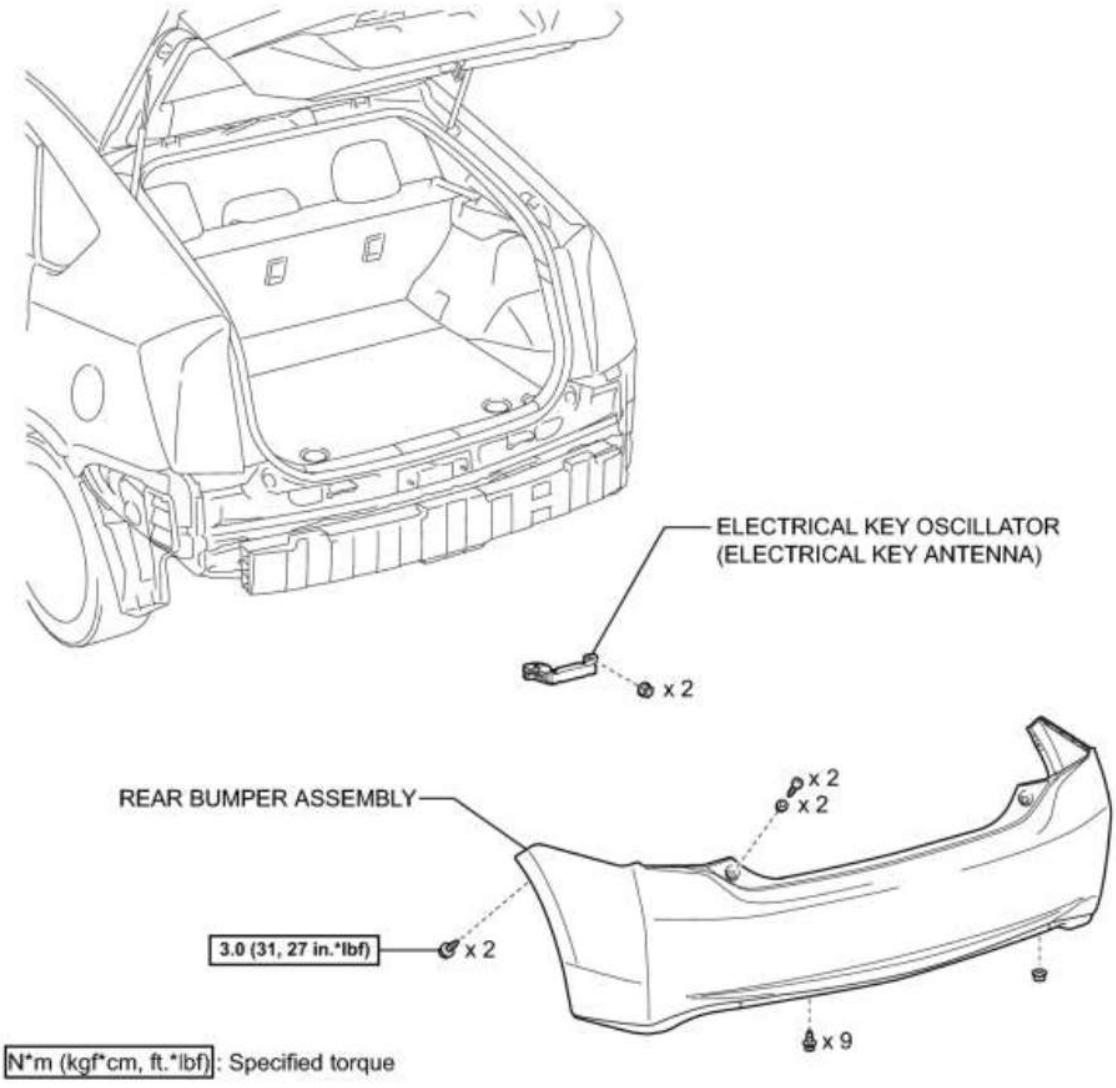
2. INSTALL REAR DECK FLOOR BOX INFO

3. INSTALL REAR NO. 2 FLOOR BOARD (for Separate Type) INFO

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COMPONENTS

ILLUSTRATION



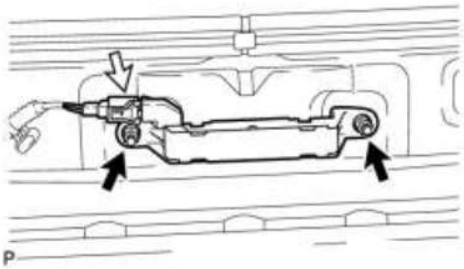
P

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REMOVAL

1. REMOVE REAR BUMPER ASSEMBLY INFO

2. REMOVE ELECTRICAL KEY OSCILLATOR (ELECTRICAL KEY ANTENNA)



(a) Disconnect the connector.

(b) Remove the 2 nuts and electrical key oscillator (electrical key antenna).

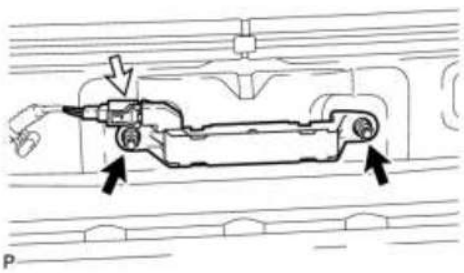
NOTICE:

Be careful when removing the electrical key oscillator (electrical key antenna). If the oscillator is dropped, replace it with a new one.

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INSTALLATION

1. INSTALL ELECTRICAL KEY OSCILLATOR (ELECTRICAL KEY ANTENNA)



(a) Install the electrical key oscillator (electrical key antenna) with the 2 nuts.

NOTICE:

Be careful when installing the electrical key oscillator (electrical key antenna). If the oscillator is dropped, replace it with a new one.

(b) Connect the connector.

2. INSTALL REAR BUMPER ASSEMBLY INFO

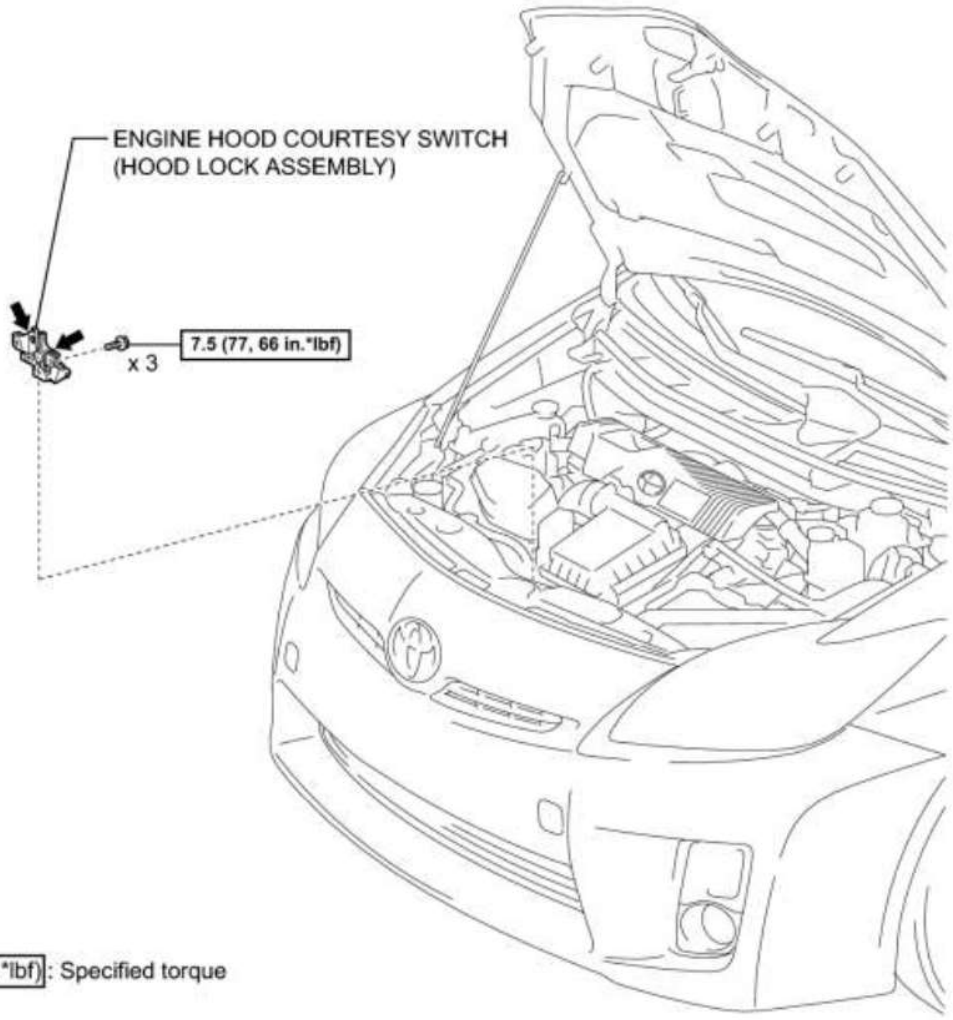
3. BUMPER POSITION SETTING (w/ Advanced Parking Guidance System)

INFO

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COMPONENTS

ILLUSTRATION

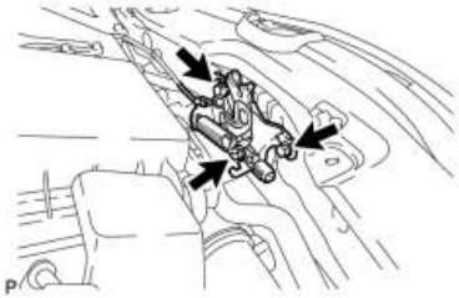


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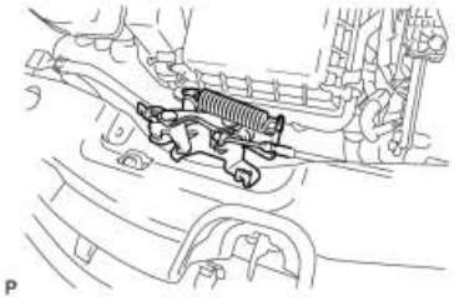
REMOVAL

1. REMOVE ENGINE HOOD COURTESY SWITCH (HOOD LOCK ASSEMBLY)

(a) Disconnect the connector.



(b) Remove the 3 bolts.

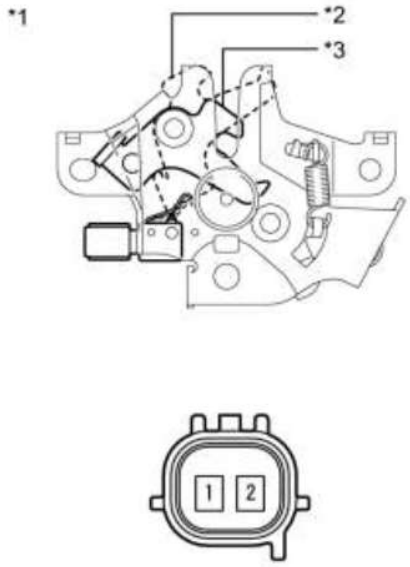


(c) Disconnect the hood lock control cable and remove the hood lock assembly.

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INSPECTION

1. INSPECT ENGINE HOOD COURTESY SWITCH



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

Standard Resistance:

Tester Connection	Switch Condition	Specified Condition
1 - 2	Locked	Below 1 Ω
1 - 2	Unlocked	10 kΩ or higher

Text in illustration

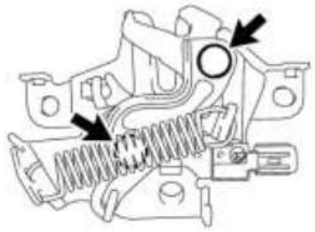
*1	Component without harness connected (Hood Lock Assembly (Engine Hood Courtesy Switch))
*2	Unlock
*3	Lock

If the result is not as specified, replace the hood lock assembly.

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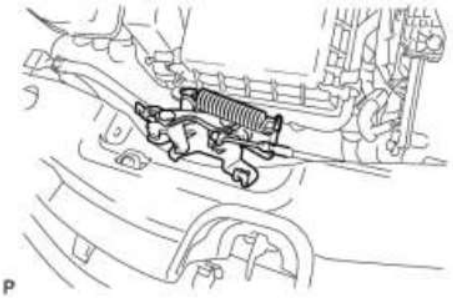
INSTALLATION

1. INSTALL ENGINE HOOD COURTESY SWITCH (HOOD LOCK ASSEMBLY)



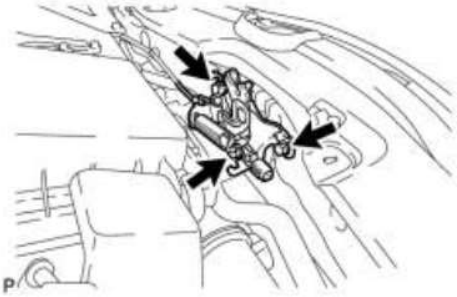
P

(a) Apply MP grease to the sliding areas of the hood lock assembly.



P

(b) Connect the hood lock control cable assembly.



P

(c) Install the hood lock assembly with the 3 bolts.

Torque: **7.5 N·m (77 kgf·cm, 66in·lbf)**

(d) Connect the connector.

2. INSPECT HOOD SUB-ASSEMBLY INFO

3. ADJUST HOOD SUB-ASSEMBLY INFO

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PRECAUTION

1. PRECAUTION FOR DISCONNECTING CABLE FROM NEGATIVE BATTERY TERMINAL

NOTICE:

When disconnecting the cable from the negative (-) battery terminal, initialize the following systems after the cable is reconnected:

System Name	See Procedure
Advanced Parking Guidance System	INFO

2. PRECAUTIONS WHEN USING TECHSTREAM

(a) When using the Techstream to troubleshoot the engine immobiliser system:

Connect the Techstream to the DLC3 while the power switch is off, and turn a door courtesy light switch on and off at 1.5-second intervals until communication between the Techstream and vehicle begins.

3. PRECAUTIONS FOR EACH FUNCTION

(a) Precautions for the key:

The key is a precision instrument. Be sure to observe the following:

(1) Do not drop the key, subject it to strong shocks or bend it.

(2) Do not keep the key in a high temperature area for a long time.

(3) Do not get the key wet or wash it in an ultrasonic washer etc.

(4) Keep the key away from magnets or magnetized items during use.

(5) Do not disassemble the key except when replacing the battery.

(6) Do not place the key near objects that produce magnetic fields such as TVs, audio systems and electrical ranges, or electrical medical equipment such as low-frequency therapy instruments.

(b) Precautions for the engine immobiliser system inspection:

(1) Make sure to carry the key.

(2) All registered keys for the vehicle should be available when repairing or diagnosing the engine immobiliser system.

4. PRECAUTIONS FOR BATTERY

(a) Immediately after removing and reinstalling the battery, doors may not be unlocked by the smart key system. In this case, lock and unlock the doors using the door control transmitter. Then, it will be possible to unlock doors using the smart key system.

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(b) When the battery is fully depleted and it is recharged using another vehicle battery, start the hybrid vehicle control system by performing the following:

(1) Push the P position switch.

(2) Turn the power switch off, open and close the driver door once.

(3) Start the hybrid vehicle control system (turn the power switch on (READY)).

(c) When starting the hybrid vehicle control system after removing and installing the battery, open and close the driver door and wait 10 seconds before starting the system.

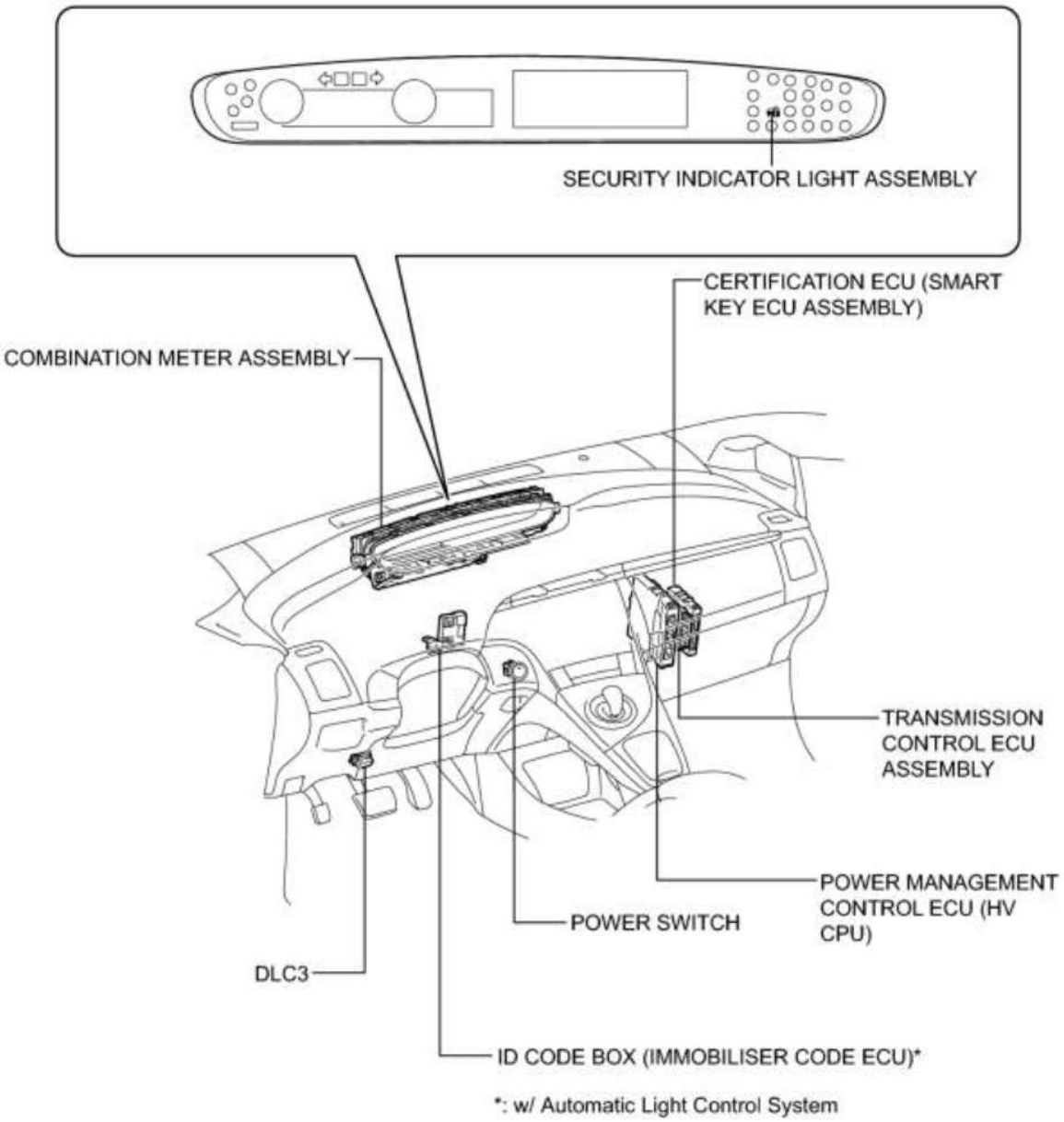
HINT:

If the hybrid vehicle control system does not start the first time after removing and installing the battery, the hybrid vehicle control system will start normally from the second time onward.

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PARTS LOCATION

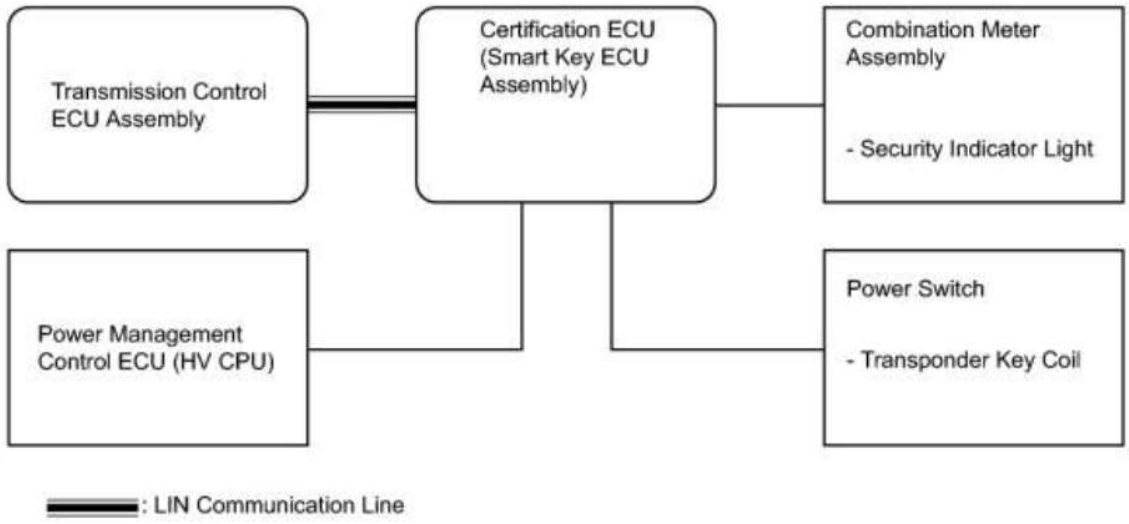
ILLUSTRATION



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SYSTEM DIAGRAM

1. w/o Automatic Light Control System

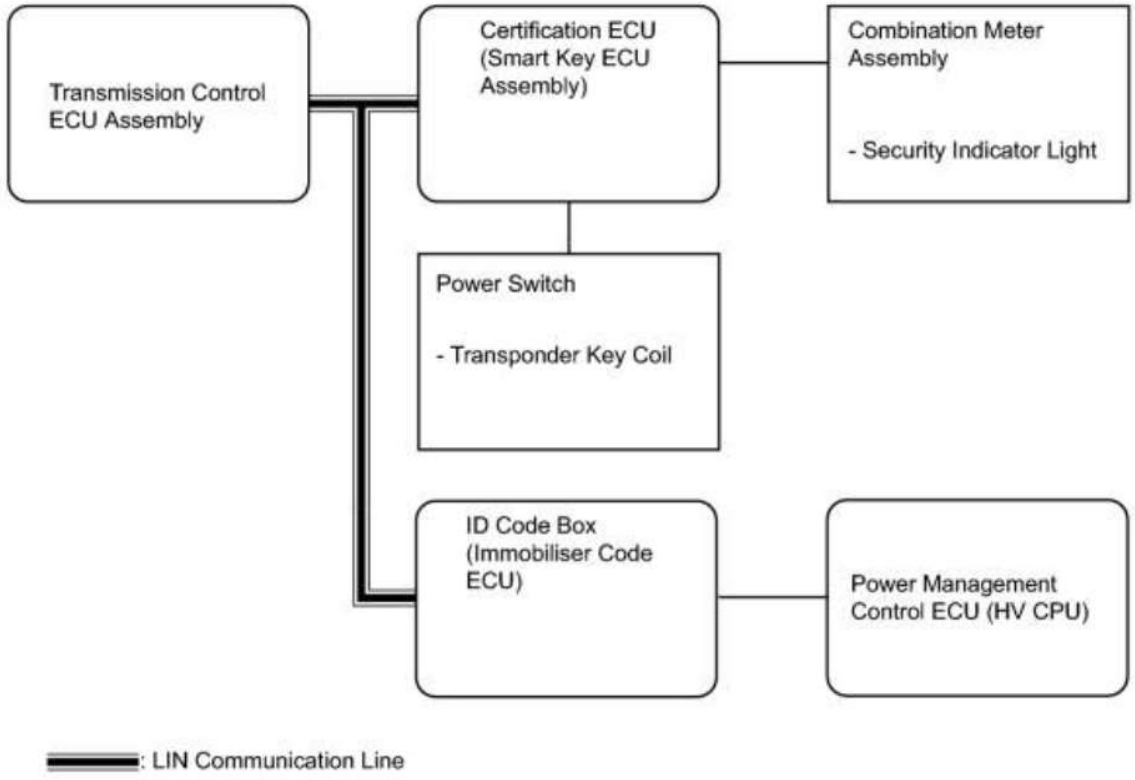


Communication Table

Transmitting ECU (Transmitter)	Receiving ECU (Receiver)	Signal	Communication Method
Certification ECU (Smart key ECU assembly)	Transmission control ECU assembly	L code registration mode signal	LIN
Transmission control ECU assembly	Certification ECU (Smart key ECU assembly)	L code registration condition signal	LIN
		L code certification condition signal	
		Engine start condition signal	

2. w/ Automatic Light Control System

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Communication Table

Transmitting ECU (Transmitter)	Receiving ECU (Receiver)	Signal	Communication Method
Certification ECU (Smart key ECU assembly)	ID code box (Immobiliser code ECU)	3 bit code transmit request signal	LIN
		S code registration mode signal	
		S code certification condition signal	
	Transmission control ECU assembly	L code registration mode signal	LIN
ID code box (Immobiliser code ECU)	Certification ECU (Smart key ECU assembly)	Engine start permission receive condition signal	LIN
		3 bit code transmit request receive condition signal	
		S code certification result signal	
		L code certification result	

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Transmitting ECU (Transmitter)	Receiving ECU (Receiver)	Signal	Communication Method
		signal	
		S code registration mode signal	
		S code registration condition signal	
	Transmission control ECU assembly	L code registration condition signal	LIN
	• Certification ECU (Smart key ECU assembly) • Transmission control ECU assembly	L code registration mode signal	LIN
Transmission control ECU assembly	Certification ECU (Smart key ECU assembly)	L code registration condition signal	LIN
		Engine start condition signal	
	ID code box (Immobiliser code ECU)	L code certification condition signal	LIN

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SYSTEM DESCRIPTION

1. ENGINE IMMOBILISER SYSTEM DESCRIPTION

The immobiliser system is a theft deterrent system that determines whether to disable starting of the hybrid vehicle control system based on a comparison of the key ID code and vehicle pre-registered code. The immobiliser system compares the certification ECU (smart key ECU assembly) preregistered ID code with the ID of the key-embedded transponder chip. If the ID codes do not match, the immobiliser system is activated and the hybrid vehicle control system cannot be started.

2. FUNCTION OF MAIN COMPONENTS

Component	Outline
Power switch	Informs the driver of any power source or system abnormality through the illumination stage of the indicator light.
Transponder key coil (built into the power switch)	Receives the ID code and transmits it to the certification ECU (smart key ECU assembly) when the key battery is too weak to respond to the tuner based on signals from the room oscillators.
Key	Receives the signals from the oscillators and returns the ID code to the door control receiver.
Certification ECU (smart key ECU assembly)	• Certifies the ID code received from the door control receiver. • Transmits the engine immobiliser set/unset request signals. • Certifies immobiliser disengage signals, and transmits each disengage signal to the hybrid vehicle control system.*1
ID code box (immobiliser code ECU)*2	Receives the immobiliser disengage signals from the certification ECU (smart key ECU assembly), certifies them, and transmits each disengage signal to the hybrid vehicle control system.
Power management control ECU (HV CPU)	Receives the signal from the certification ECU (smart key ECU assembly), and performs hybrid vehicle control system.
Transmission control ECU Assembly	Registers the ID verification code. Outputs the P position signal or Not P position signal to the power management control ECU.
Indoor electrical key oscillator • Front, Center, Rear	Transmits key detection signals within the detection area in the cabin upon receiving a transmission request signal from the certification ECU (smart key ECU assembly). A certification ECU (smart key ECU assembly) request signal is activated when the key is brought into the cabin and the power switch is pushed or brake pedal is depressed.
Door control receiver	Receives an ID code from the key in the detection area and transmits it to the certification ECU (smart key ECU assembly).
Combination meter assembly • Security indicator	Illuminates or flashes. Illumination is controlled by the certification ECU (smart key ECU assembly).

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Component	Outline
light	

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

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HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

- Use the following procedure to troubleshoot the engine immobiliser system.
- *: Using the Techstream.

1.	VEHICLE BROUGHT TO WORKSHOP

NEXT

2.	CUSTOMER PROBLEM ANALYSIS

HINT:

- When troubleshooting, confirm that the problem symptoms have been accurately identified. Preconceptions should be discarded in order to make an accurate judgment. To clearly understand what the problem symptoms are, it is extremely important to ask the customer about the problem and the conditions at the time the malfunction occurred.
- Gather as much information as possible for reference. Past problems that seem unrelated may also help in some cases.
- The following 5 items are important points in the problem analysis:

What	Vehicle model, system name
When	Date, time, occurrence frequency
Where	Road conditions
Under what conditions?	Driving conditions, weather conditions
How did it happen?	Problem symptoms

NEXT

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 before proceeding to the next step.

NEXT

4.	POWER SWITCH ON (IG)

NEXT

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5.	INSPECT COMMUNICATION FUNCTION OF CAN COMMUNICATION SYSTEM*

(a) Use the Techstream to check if the CAN communication system is functioning normally.

Result:

Result	Proceed to
ECU is connected, communication is normal	A
ECU is connected, communication is abnormal	B

B ▶ INFO GO TO CAN COMMUNICATION SYSTEM

A ▼

6.	INSPECT COMMUNICATION FUNCTION OF LIN COMMUNICATION SYSTEM*

(a) Use the Techstream to check if the LIN communication system is functioning normally.

Result:

Result	Proceed to
No DTC is output	A
DTC is output (DTC B2287, B2785, B2786, B2789 or B278C)	B

B ▶ INFO GO TO LIN COMMUNICATION SYSTEM

A ▼

7.	CHECK FOR DTCS (ENGINE IMMOBILISER SYSTEM)*

(a) Check for DTCs and note any codes that are output.

(b) Clear the DTCs INFO.

(c) Recheck for DTCs. Based on the DTCs output above, try to duplicate the engine immobiliser system DTC by simulating the symptoms indicated by the DTCs.

Result:

Result	Proceed to
No DTCs are output	A
Engine immobiliser system DTC is output	B

B ▶ INFO GO TO DIAGNOSTIC TROUBLE CODE CHART

A ▼

8.	CHECK FOR DTCS (HYBRID VEHICLE CONTROL SYSTEM)*

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(a) Clear the DTCs INFO.

(b) Recheck for DTCs.

HINT:

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

Result:

Result	Proceed to
No DTCs are output	A
Engine immobiliser system DTC is output (DTC B2799, B279A or B279C)	B
Hybrid vehicle control system DTC is output (except DTC B2799, B279A and B279C)	C

B ▶ INFO GO TO DIAGNOSTIC TROUBLE CODE CHART
C ▶ INFO GO TO HYBRID VEHICLE CONTROL SYSTEM

A ▼

9.	PROBLEM SYMPTOMS TABLE

(a) Refer to Problem Symptoms Table INFO.

Result:

Result	Proceed to
Fault is not listed in Problem Symptoms Table	A
Fault is listed in Problem Symptoms Table	B

B ▶ Go to step 11

A ▼

10.	OVERALL ANALYSIS AND TROUBLESHOOTING*

(a) Data List / Active Test INFO

(b) Terminals of ECU INFO

NEXT ▼

11.	REPAIR OR REPLACE

NEXT ▼

12.	CONFIRMATION TEST

NEXT ▶ **END**

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REGISTRATION

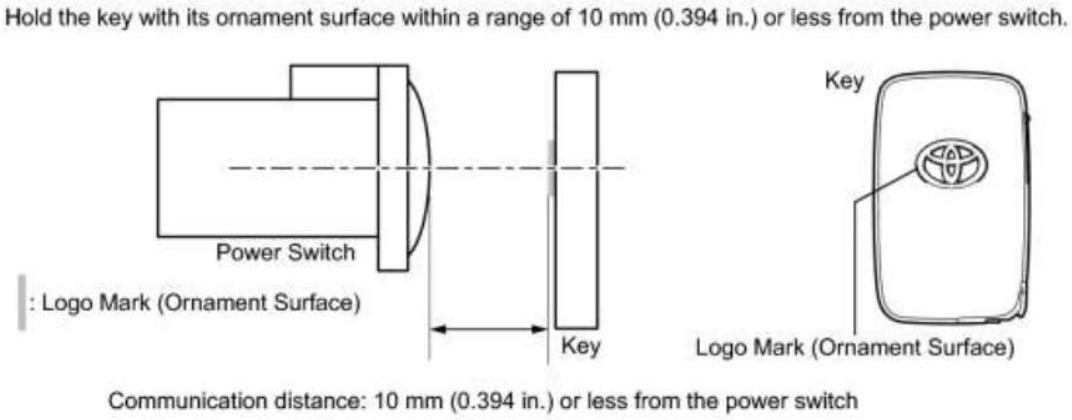
1. DESCRIPTION OF CODE REGISTRATION

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"

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	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

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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

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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"

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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	-

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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

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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)

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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)

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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"

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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

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NOTICE:

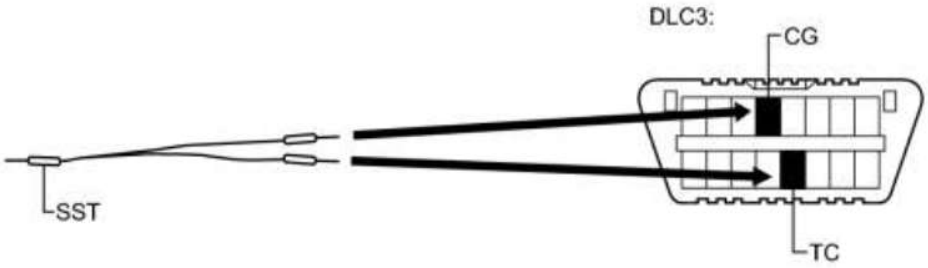
- The ECU communication ID should be registered when the certification ECU (smart key ECU assembly)*1 or ID code box (immobiliser code ECU)*2 is replaced in order to match these ECU communication IDs.
  - *1: w/o Automatic Light Control System
  - *2: w/ Automatic Light Control System
- The hybrid vehicle 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.

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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	-

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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

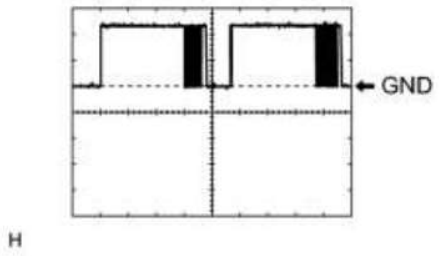
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Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
			• Brake pedal not depressed	
L43-10 (CODE) - L43-8 (AGND)	L - P	Demodulated signal of key code data	• Power switch off • Key battery removed • Power switch touched 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.

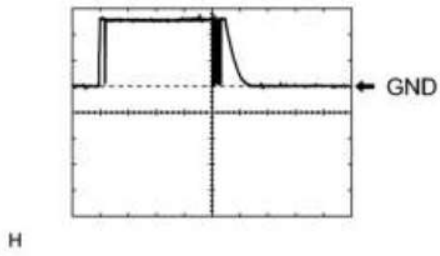
(e) Inspect using an oscilloscope.

(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

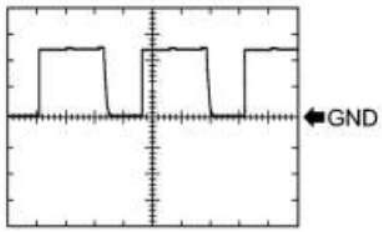
(2) Waveform 2 (Reference)



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)

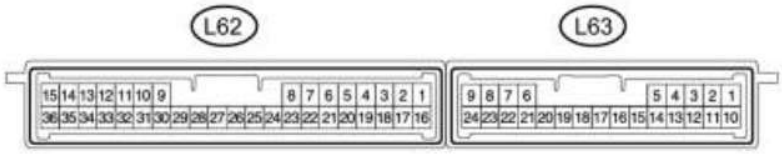
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Item	Content
Tester Connection	L43-14 (VC5) - L43-8 (AGND)
Tool Setting	2 V/DIV., 200 ms./DIV.
Condition	• Power switch off • Key not in cabin • Power switch pressed within 30 seconds

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

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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

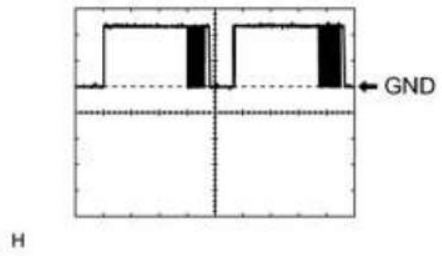
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Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
			disconnected and connected	4)
L62-35 (EFIO) - L62-15 (E)*	R - W-B	Power management control ECU (HV CPU) input signal	Power switch off	Below 1 V
L62-35 (EFIO) - L62-15 (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.

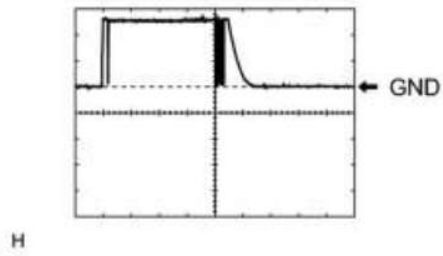
(e) Inspect using an oscilloscope.

(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)

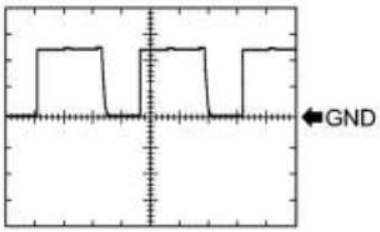


Item	Content
Tester Connection	L62-13 (CODE) - L62-36 (AGND)
Tool Setting	2 V/DIV., 50 ms./DIV.
Condition	• Power switch off • Key battery removed • Power switch touched with key and pressed

(3) Waveform 3 (Reference)

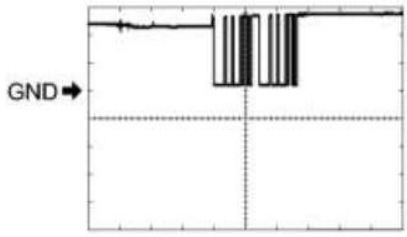
Item	Content
Tester Connection	L62-28 (VC5) - L62-36 (AGND)
Tool Setting	2 V/DIV., 200 ms./DIV.

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

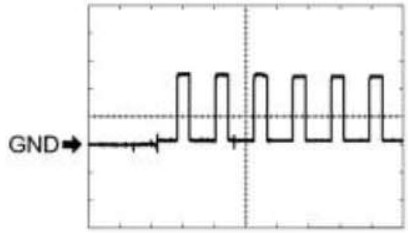
(4) Waveform 4 (Reference)



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)

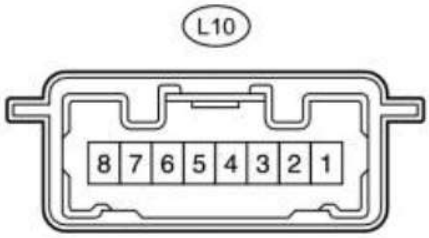


H

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.

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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.

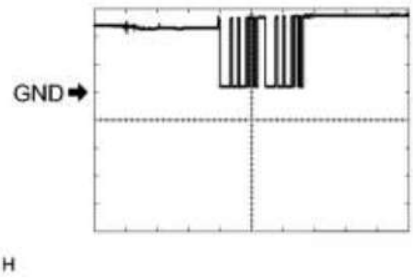
(d) Measure the voltage according to the value(s) in the table below.

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.

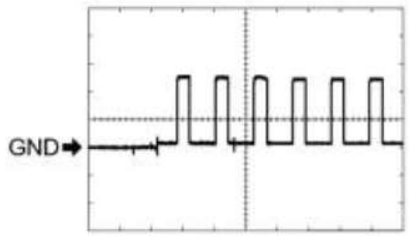
(1) Waveform 1 (Reference)



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)

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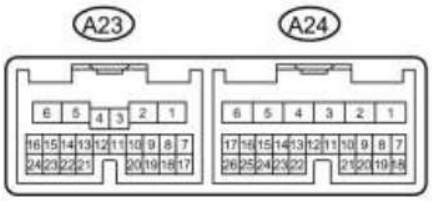


Item	Content
Tester Connection	L10-6 (EFIO) - L10-8 (GND)
Tool Setting	5 V/DIV., 50 ms./DIV.
Condition	Power switch on (IG)

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.

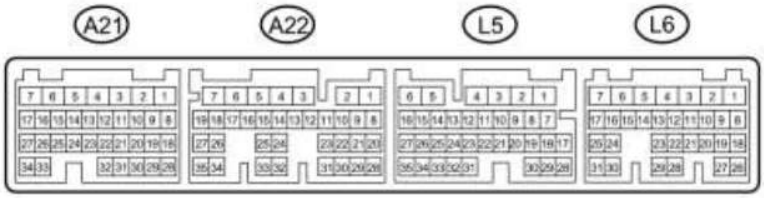
Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
A23-15 (BATT) - Body ground	SB - Body ground	Battery power supply	Power switch off	11 to 14 V
A24-1 (E1) - Body ground	BR - Body ground	Ground	Always	Below 1 Ω
A24-5 (E02) - Body ground	W-B - Body ground	Ground	Always	Below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

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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.

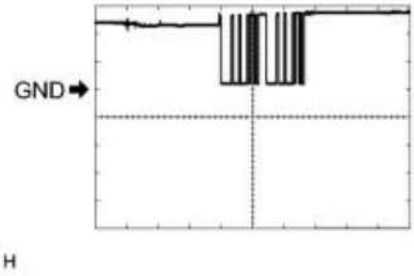
Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
L6-20 (IMO) - L5-6 (E1)	L - BR	Certification ECU (smart key ECU assembly)*1 or ID code box (immobiliser code ECU)*2 input signal	Power switch off	11 to 14 V
L6-20 (IMO) - L5-6 (E1)	L - BR	Certification ECU (smart key ECU 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)

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- *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:

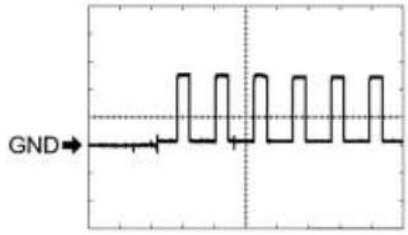
(1) Waveform 1 (Reference)



H

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)

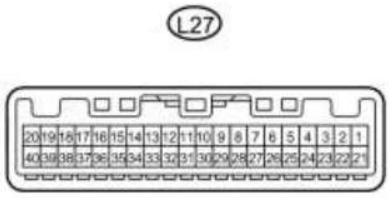


H

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.



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 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

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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.

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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.

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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.

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

(e) Clear the DTCs.

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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	-

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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	

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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.

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(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	-

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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

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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

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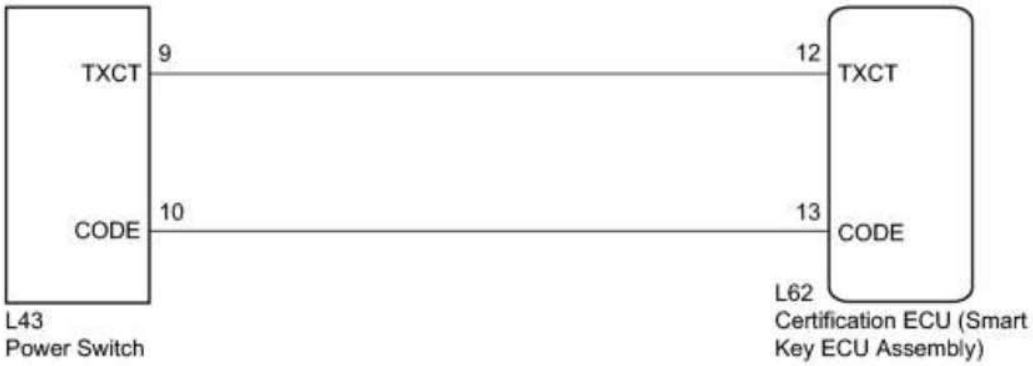
DTC	B2784	Antenna Coil Open / Short

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.

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OK:

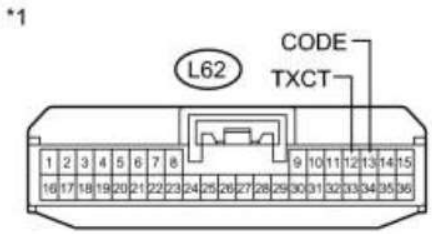
DTC B2784 is not output.

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

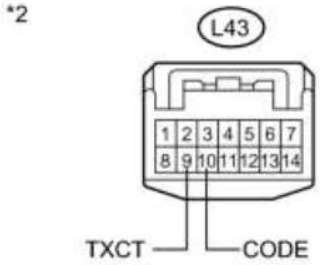
OK ▶ **USE SIMULATION METHOD TO CHECK**

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

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	(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)**

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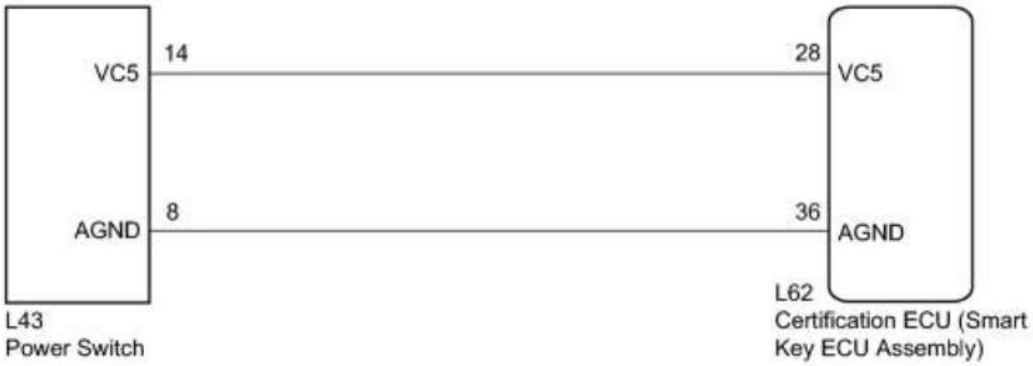
DTC	B278A	Short to GND in Immobiliser System Power Source Circuit

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 .

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(b) Recheck for DTCs INFO.

OK:

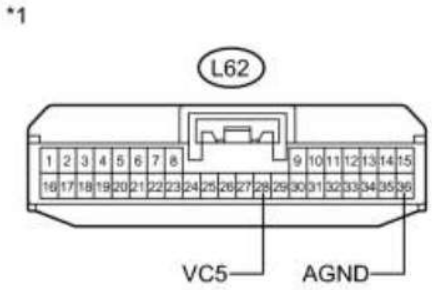
DTC B278A is not output.

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

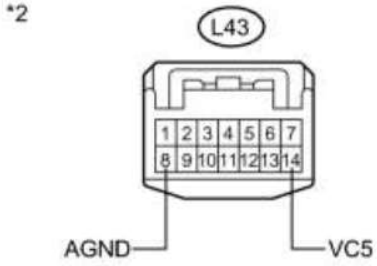
OK **USE SIMULATION METHOD TO CHECK**

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))

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*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)

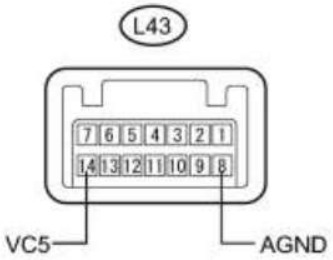
(a) Reconnect the certification ECU (smart key ECU assembly) connector.

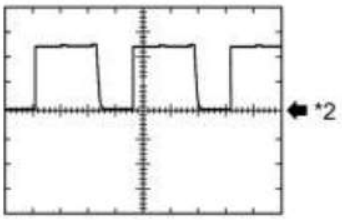
(b) Reconnect the power switch connector.

(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**

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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.

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(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)**

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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.

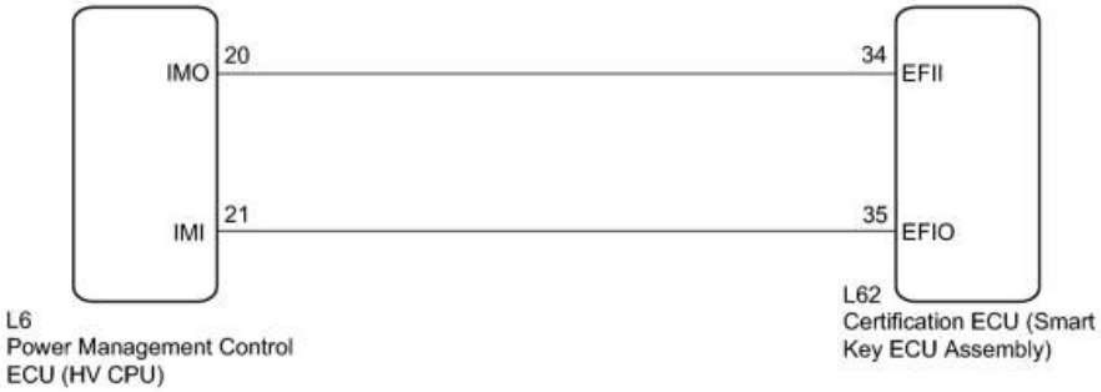
DTC No.	DTC Detection Condition	Trouble Area
B2799	One of the following conditions is met: • Error in communication between power management control ECU (HV CPU) and certification ECU assembly (smart key ECU assembly)*1 or ID code box (immobiliser code ECU)*2 • Error in communication lines • Communication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

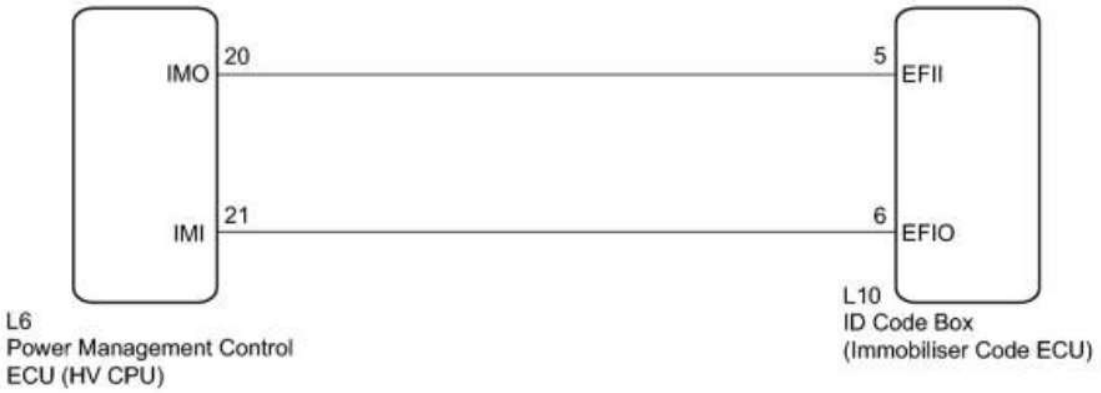
WIRING DIAGRAM

1. w/o Automatic Light Control System

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2. w/ Automatic Light Control System



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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

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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

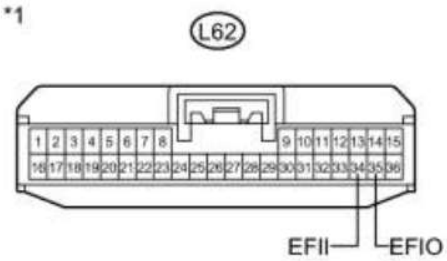
B ▶ CHECK HARNESS AND CONNECTOR (ID CODE BOX - POWER MANAGEMENT CONTROL ECU (HV CPU))

A

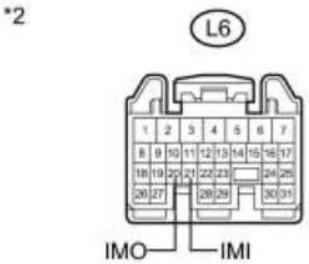
▼

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:

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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.

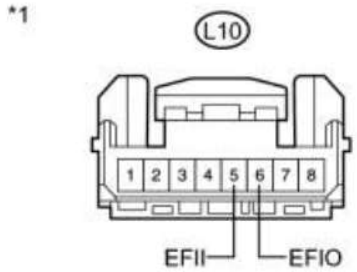
NG ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

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

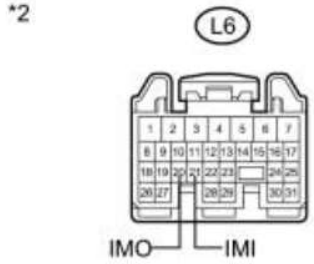
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9.	CHECK HARNESS AND CONNECTOR (ID CODE BOX - POWER MANAGEMENT CONTROL ECU (HV CPU))

(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))

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*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)**

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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.

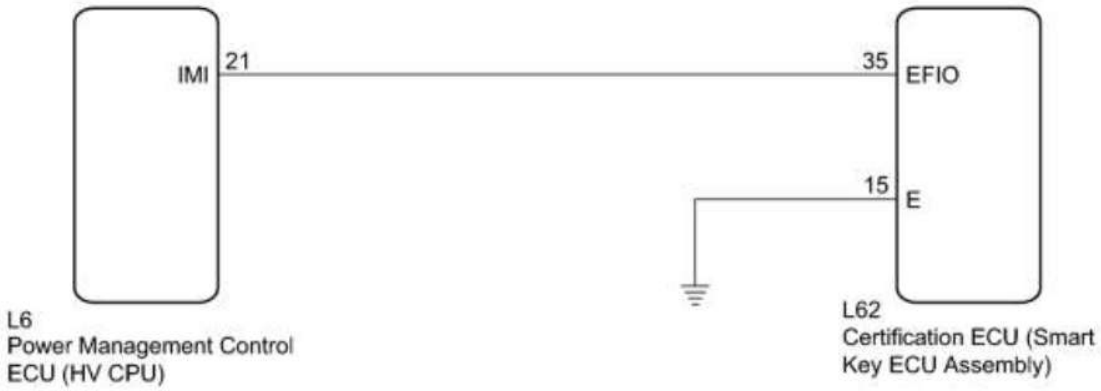
- *1: w/o Automatic Light Control System
- *2: w/ Automatic Light Control System

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

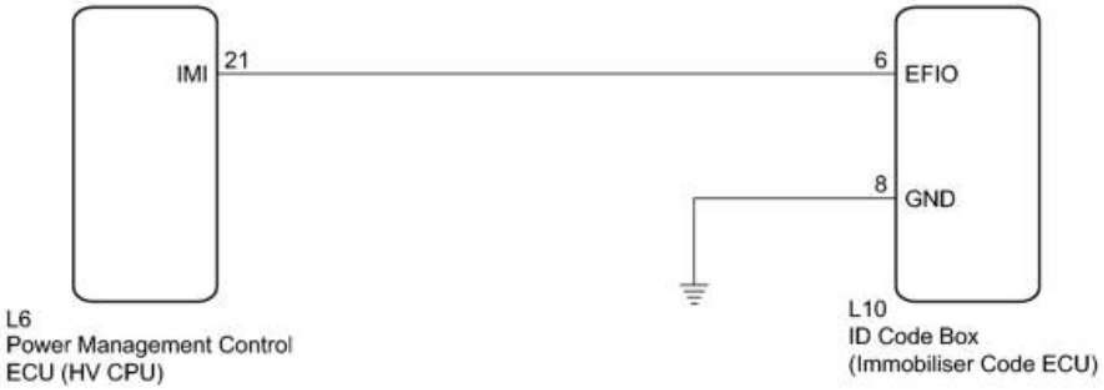
WIRING DIAGRAM

1. w/o Automatic Light Control System



2. w/ Automatic Light Control System

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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

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2.	SYSTEM CHECK

(a) Check the vehicle specification.

Result:

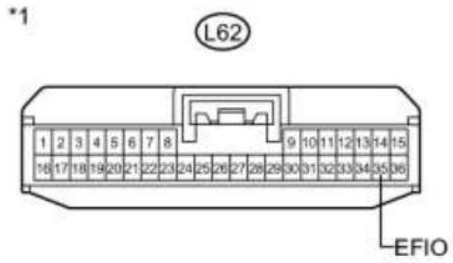
Result	Proceed to
w/o Automatic Light Control System	A
w/ Automatic Light Control System	B

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

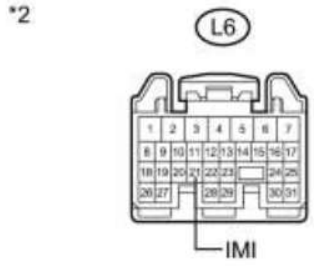
A

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

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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

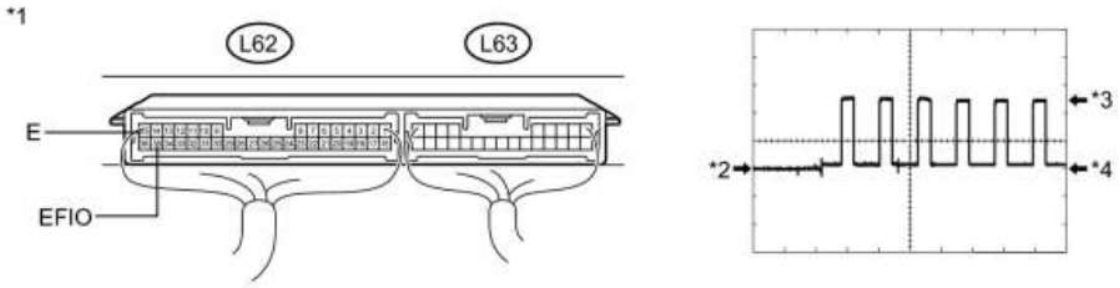
OK

▼

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)

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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.

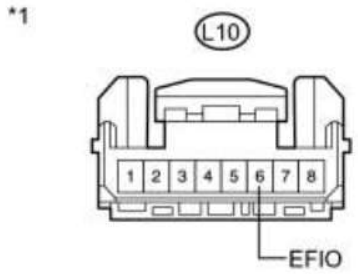
NG ▶ REPLACE POWER MANAGEMENT CONTROL ECU (HV CPU)

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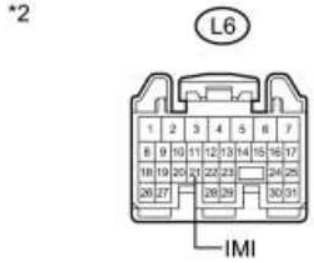
OK ▶ **END (CERTIFICATION ECU (SMART KEY ECU ASSEMBLY) WAS DEFECTIVE)**

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))

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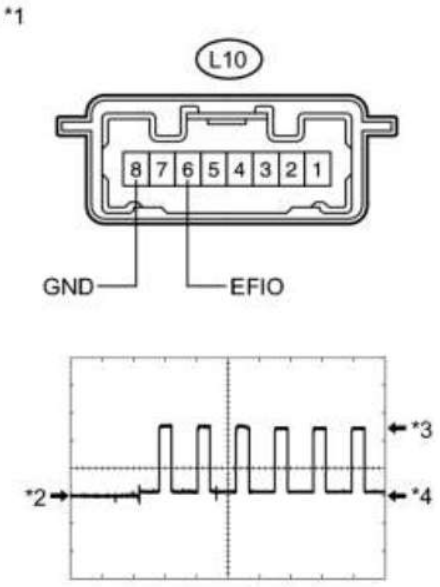
NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

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

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*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)**

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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**

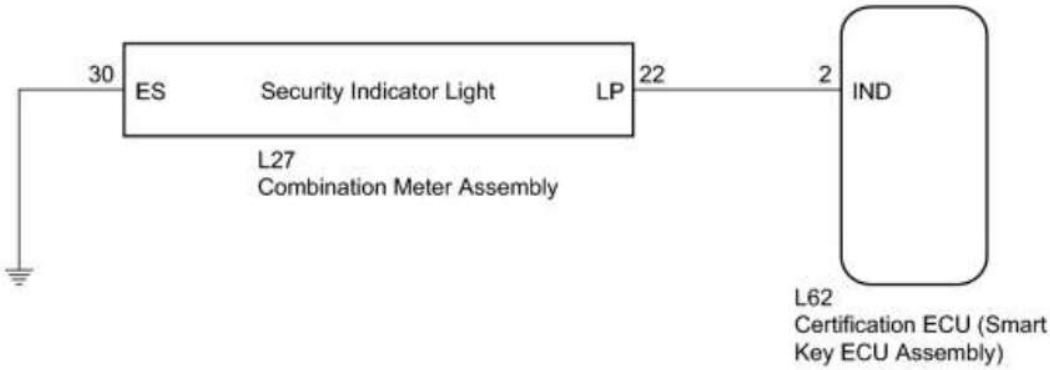
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Security Indicator Light Does not Blinking

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.

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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)**

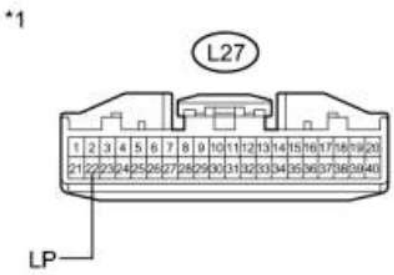
2.	INSPECT COMBINATION METER ASSEMBLY

(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



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

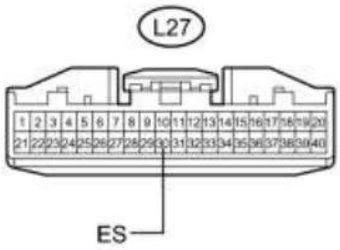
▼

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

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

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*1



Standard Resistance:

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

Text in Illustration

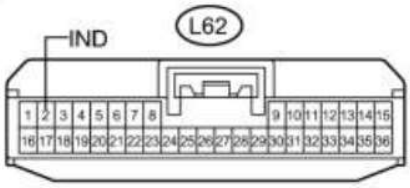
*1	Front view of wire harness connector (to Combination Meter Assembly)

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

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

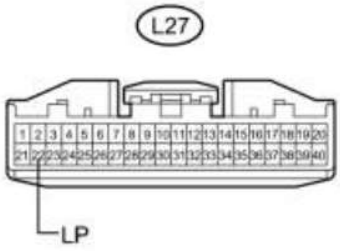
4.	CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - COMBINATION METER ASSEMBLY)

*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

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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)

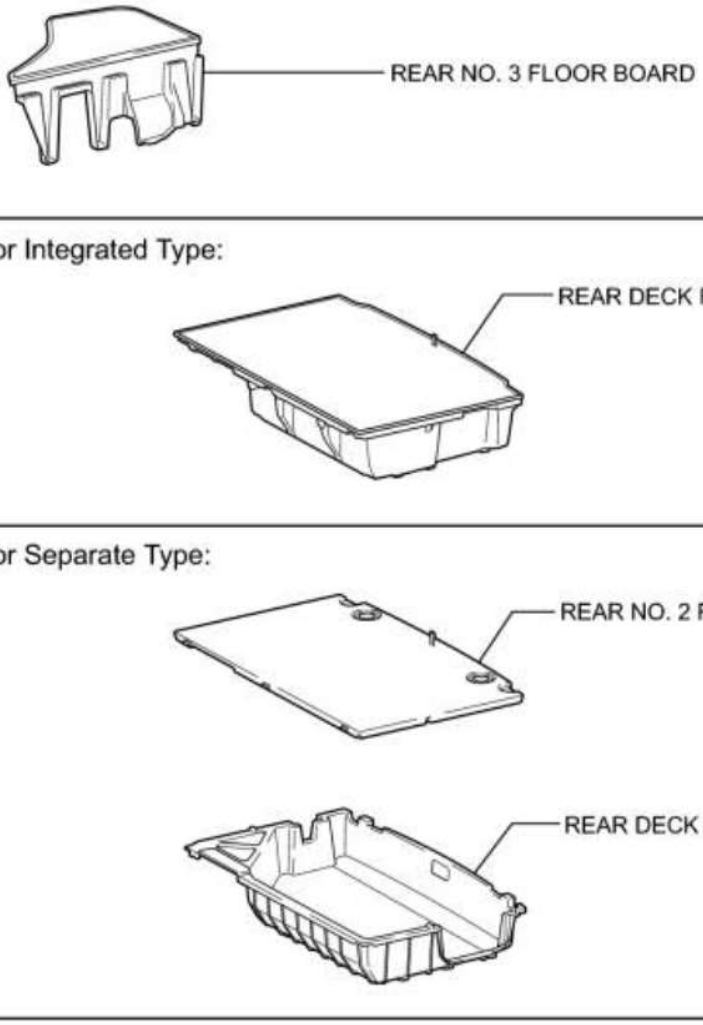
NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

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

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COMPONENTS

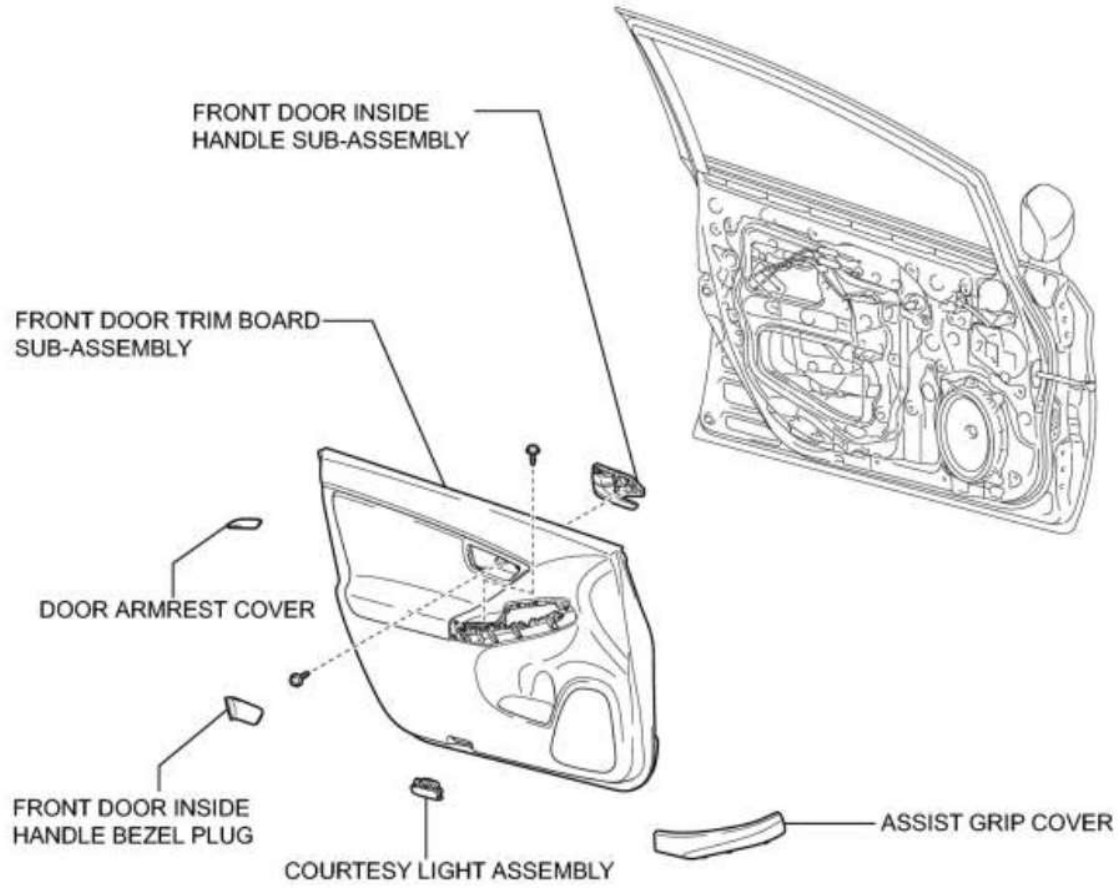
ILLUSTRATION

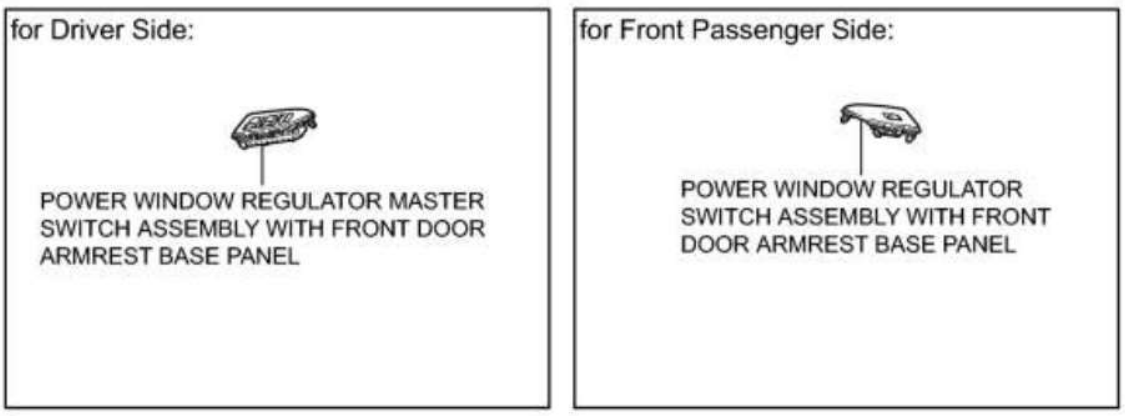


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ILLUSTRATION

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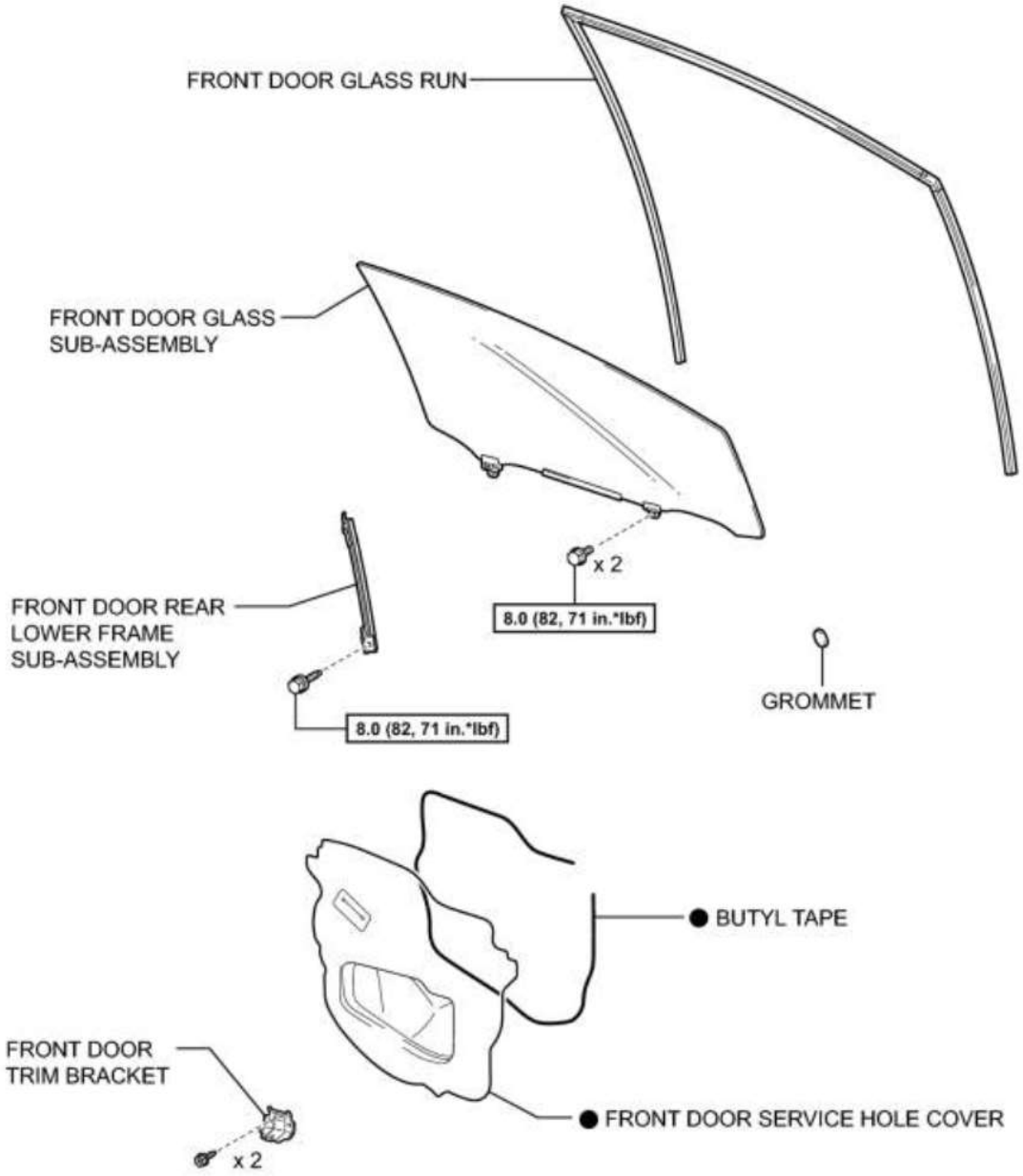




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ILLUSTRATION

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N*m (kgf*cm, ft.*lbf): Specified torque

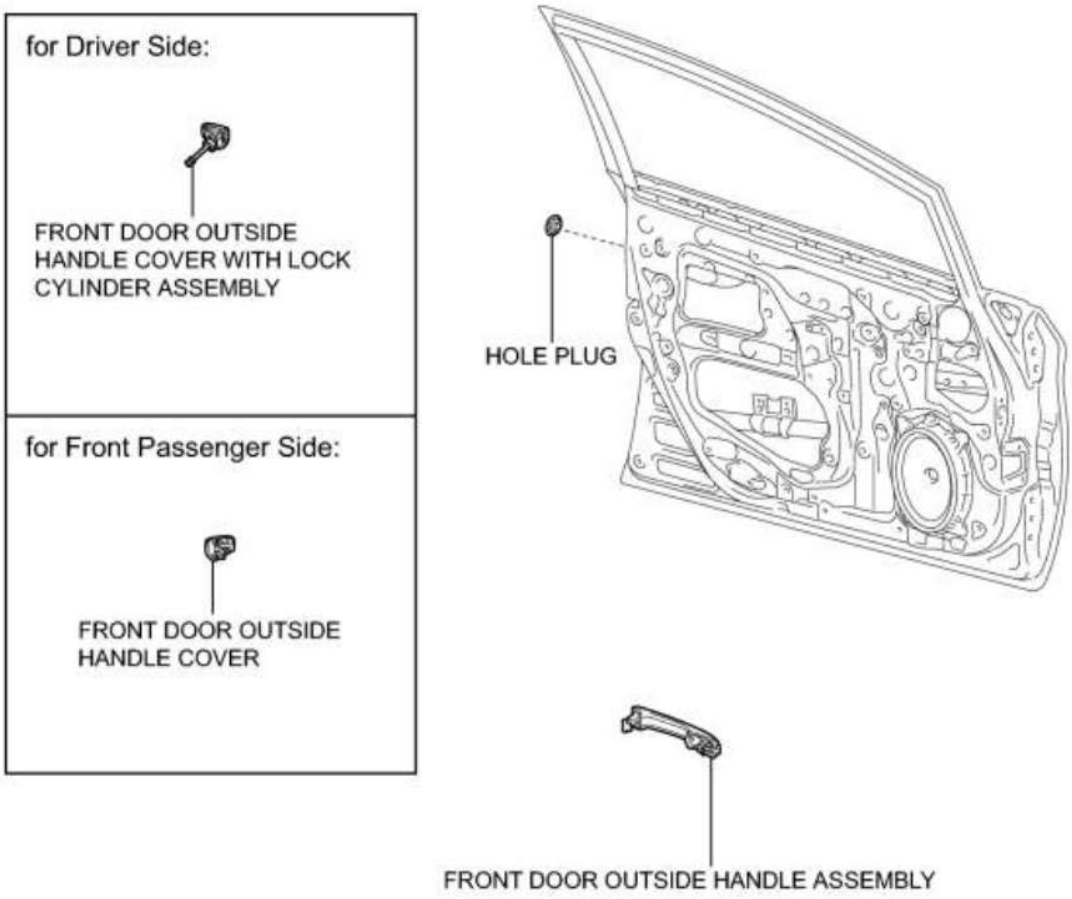
● Non-reusable part

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ILLUSTRATION

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REMOVAL

1. REMOVE REAR NO. 2 FLOOR BOARD (for Separate Type) INFO

2. REMOVE REAR DECK FLOOR BOX INFO

3. REMOVE REAR NO. 3 FLOOR BOARD INFO

4. REMOVE FRONT DOOR INSIDE HANDLE BEZEL PLUG INFO

5. REMOVE ASSIST GRIP COVER INFO

6. REMOVE POWER WINDOW REGULATOR MASTER SWITCH ASSEMBLY WITH FRONT DOOR ARMREST BASE PANEL (for Driver Side) INFO

7. REMOVE POWER WINDOW REGULATOR SWITCH ASSEMBLY WITH FRONT DOOR ARMREST BASE PANEL (for Front Passenger Side) INFO

8. REMOVE DOOR ARMREST COVER INFO

9. REMOVE COURTESY LIGHT ASSEMBLY INFO

10. REMOVE FRONT DOOR TRIM BOARD SUB-ASSEMBLY INFO

11. REMOVE FRONT DOOR INSIDE HANDLE SUB-ASSEMBLY INFO

12. REMOVE FRONT DOOR TRIM BRACKET INFO

13. REMOVE FRONT DOOR SERVICE HOLE COVER INFO

14. REMOVE FRONT DOOR GLASS SUB-ASSEMBLY INFO

15. REMOVE FRONT DOOR GLASS RUN INFO

16. REMOVE FRONT DOOR REAR LOWER FRAME SUB-ASSEMBLY INFO

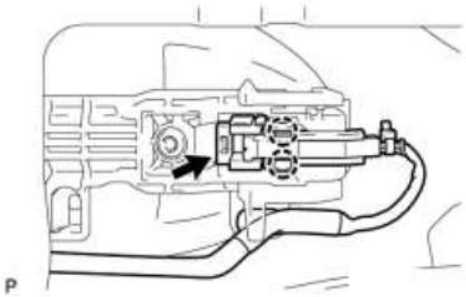
17. REMOVE FRONT DOOR OUTSIDE HANDLE COVER WITH LOCK CYLINDER ASSEMBLY (for Driver Side) INFO

18. REMOVE FRONT DOOR OUTSIDE HANDLE COVER (for Front Passenger Side) INFO

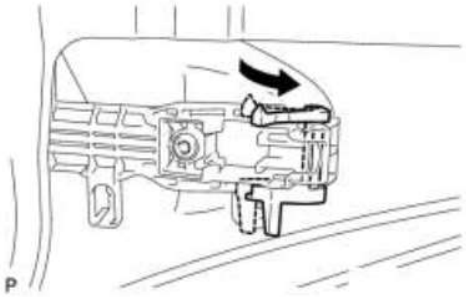
19. REMOVE FRONT DOOR OUTSIDE HANDLE ASSEMBLY

(a) Disengage the 2 claws.

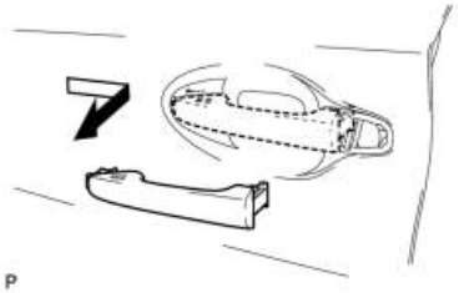
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(b) Disconnect the connector.



(c) Move the lever in the direction indicated by the arrow in the illustration.

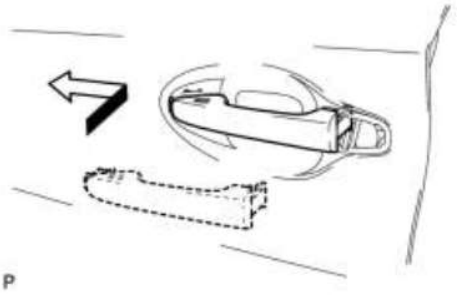


(d) Remove the front door outside handle assembly as shown in the illustration.

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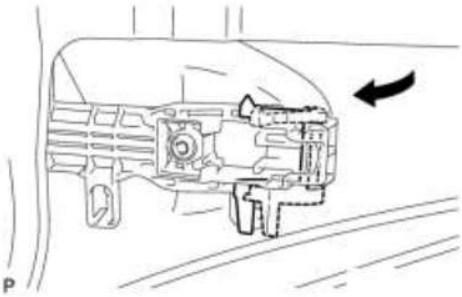
INSTALLATION

1. INSTALL FRONT DOOR OUTSIDE HANDLE ASSEMBLY

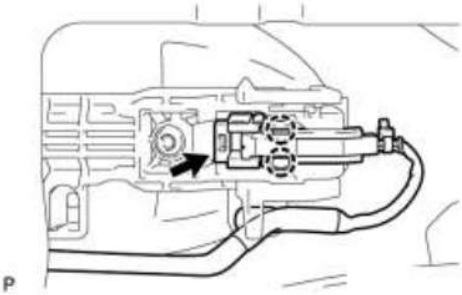


(a) Insert the front end of the front door outside handle assembly into the front door outside handle frame.

(b) Insert the rear end of the front door outside handle assembly into the front door outside handle frame, then slide the front door outside handle assembly toward the front of the vehicle to install it.



(c) Move the lever back in the direction indicated by the arrow in the illustration to lock the door outside handle assembly.



(d) Connect the connector.

(e) Engage the 2 claws.

2. INSTALL FRONT DOOR OUTSIDE HANDLE COVER (for Front Passenger Side) INFO

3. INSTALL FRONT DOOR OUTSIDE HANDLE COVER WITH LOCK CYLINDER ASSEMBLY (for Driver Side) INFO

4. INSTALL FRONT DOOR REAR LOWER FRAME SUB-ASSEMBLY INFO

5. INSTALL FRONT DOOR GLASS RUN INFO

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6. INSTALL FRONT DOOR GLASS SUB-ASSEMBLY INFO

7. INSTALL FRONT DOOR SERVICE HOLE COVER INFO

8. INSTALL FRONT DOOR TRIM BRACKET INFO

9. INSTALL FRONT DOOR INSIDE HANDLE SUB-ASSEMBLY INFO

10. INSTALL FRONT DOOR TRIM BOARD SUB-ASSEMBLY INFO

11. INSTALL COURTESY LIGHT ASSEMBLY INFO

12. INSTALL DOOR ARMREST COVER INFO

13. INSTALL POWER WINDOW REGULATOR MASTER SWITCH ASSEMBLY WITH FRONT DOOR ARMREST BASE PANEL (for Driver Side) INFO

14. INSTALL POWER WINDOW REGULATOR SWITCH ASSEMBLY WITH FRONT DOOR ARMREST BASE PANEL (for Front Passenger Side) INFO

15. INSTALL ASSIST GRIP COVER INFO

16. INSTALL FRONT DOOR INSIDE HANDLE BEZEL PLUG INFO

17. INSTALL REAR NO. 3 FLOOR BOARD INFO

18. INSTALL REAR DECK FLOOR BOX INFO

19. INSTALL REAR NO. 2 FLOOR BOARD (for Separate Type) INFO

20. INITIALIZE POWER WINDOW CONTROL SYSTEM

INFO

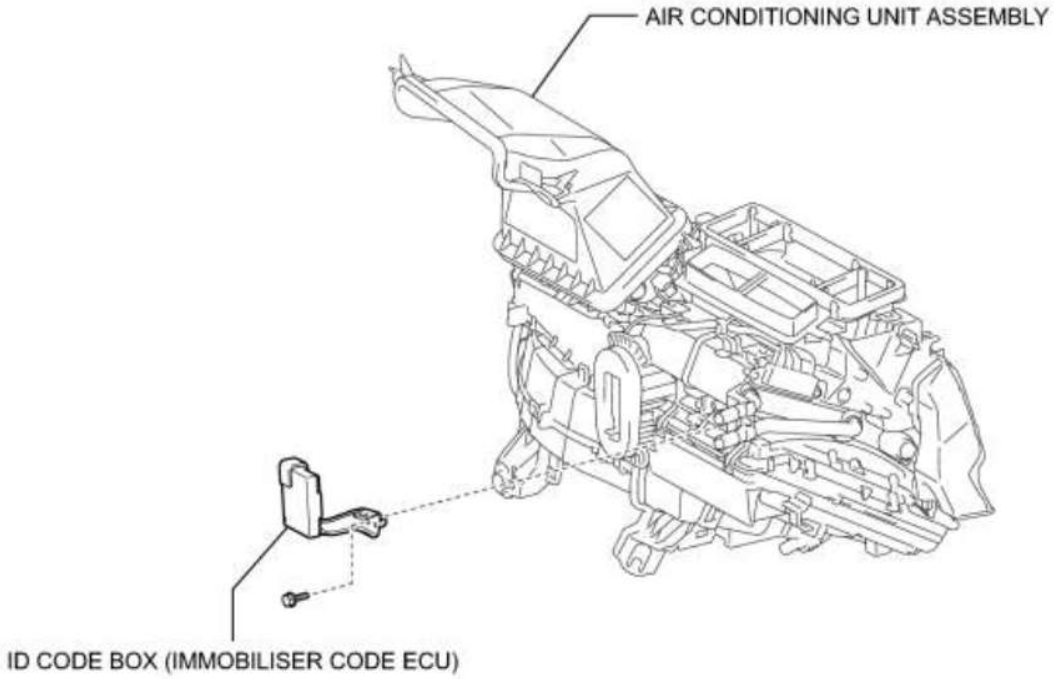
21. CHECK POWER WINDOW CONTROL SYSTEM

INFO

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COMPONENTS

ILLUSTRATION



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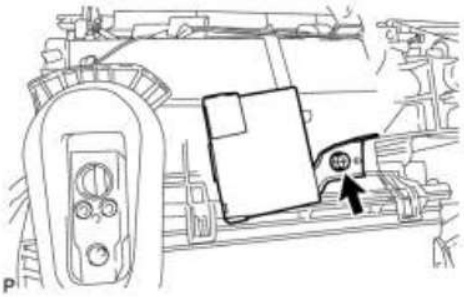
REMOVAL

1. REMOVE AIR CONDITIONING UNIT ASSEMBLY

HINT:

Refer to the procedure up to Remove Air Conditioning Unit Assembly INFO.

2. REMOVE ID CODE BOX (IMMOBILISER CODE ECU)

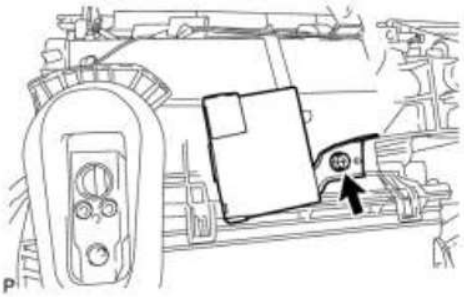


(a) Remove the bolt and ID code box (immobiliser code ECU).

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INSTALLATION

1. INSTALL ID CODE BOX (IMMOBILISER CODE ECU)



(a) Install the ID code box (immobiliser code ECU) with the bolt.

2. INSTALL AIR CONDITIONING UNIT ASSEMBLY

HINT:

Refer to the procedure from Install Air Conditioning Unit Assembly INFO.

3. REGISTER ECU CODE

NOTICE:

If the ID code box (immobiliser code ECU) is replaced, register the ECU code and ECU communication ID INFO.

4. REGISTER ECU COMMUNICATION ID

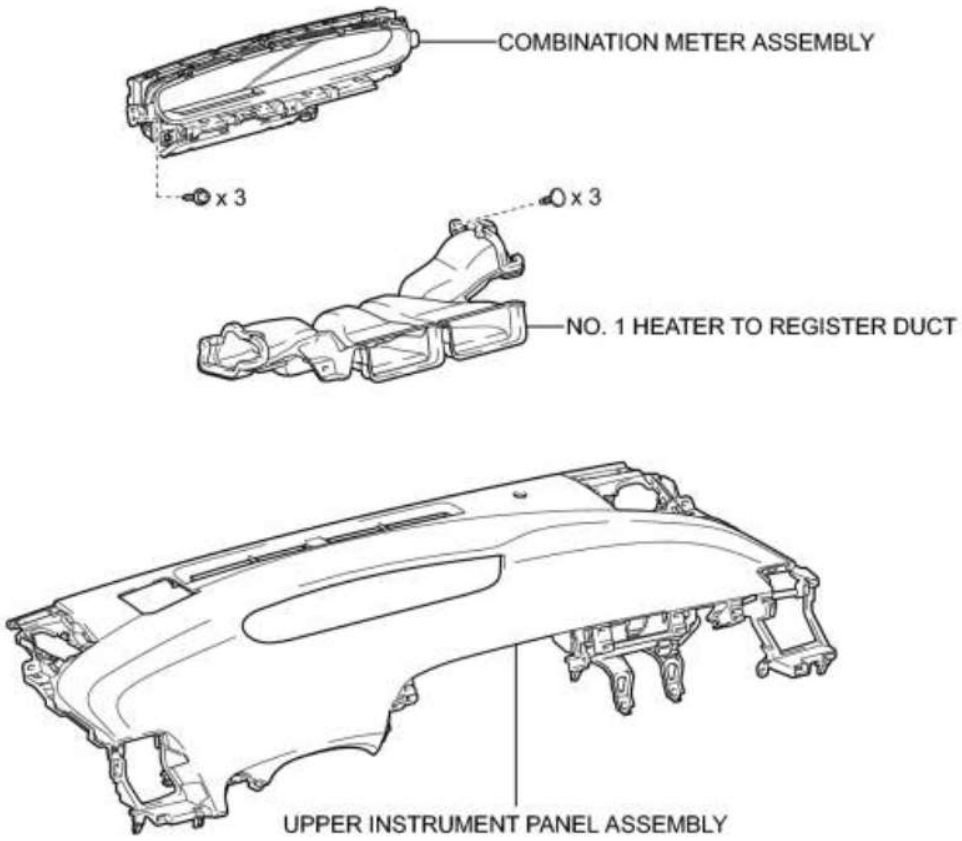
NOTICE:

If the ID code box (immobiliser code ECU) is replaced, register the ECU code and ECU communication ID INFO.

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COMPONENTS

ILLUSTRATION



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REMOVAL

1. REMOVE UPPER INSTRUMENT PANEL ASSEMBLY

HINT:

Refer to the procedure up to Remove Upper Instrument Panel Assembly INFO.

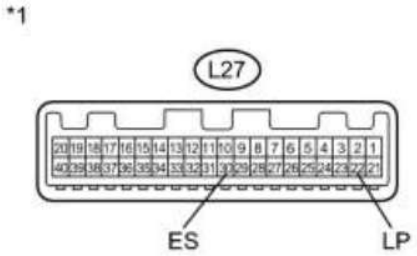
2. REMOVE NO. 1 HEATER TO REGISTER DUCT INFO

3. REMOVE COMBINATION METER ASSEMBLY INFO

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INSPECTION

1. INSPECT SECURITY INDICATOR LIGHT



(a) Apply battery voltage from the wire harness back side between the specified terminals of the indicator, and check the lighting condition of the security indicator.

Standard

Measurement Condition	Specified Condition
Battery positive (+) → Terminals L27-22 (LP) Battery negative (-) → Terminals L27-30 (ES)	Security indicator comes on

Text in illustration

*1	Component with harness connected (Combination Meter Assembly)

If the result is not as specified, replace the No. 3 meter circuit plate.

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INSTALLATION

1. INSTALL COMBINATION METER ASSEMBLY INFO

2. INSTALL NO. 1 HEATER TO REGISTER DUCT INFO

3. INSTALL UPPER INSTRUMENT PANEL ASSEMBLY

HINT:

Refer to the procedure from Install Upper Instrument Panel Assembly INFO.

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PRECAUTION

1. PRECAUTION FOR DISCONNECTING CABLE FROM NEGATIVE BATTERY TERMINAL

NOTICE:

When disconnecting the cable from the negative (-) battery terminal, initialize the following systems after the cable is reconnected:

System Name	See Procedure
Advanced Parking Guidance System	INFO

2. PRECAUTIONS WHEN USING TECHSTREAM

(a) When using the Techstream to troubleshoot the smart key system:

Connect the Techstream to the DLC3 while the power switch is off, and turn a door courtesy light switch on and off at intervals of 1.5 seconds until communication between the Techstream and vehicle begins.

(b) After all DTCs are cleared, check if the malfunction occurs again 6 seconds after the power switch is turned on (IG).

3. PRECAUTION FOR DISCONNECTING AND CONNECTING CABLE OF NEGATIVE BATTERY TERMINAL

(a) Immediately after disconnecting or connecting the cable of the negative (-) battery terminal, the doors may not be unlocked by the smart key system. In this situation, lock and unlock the doors using the wireless function. Then, it will be possible to unlock doors using the smart key system.

4. PRECAUTIONS FOR KEY BATTERY AND VEHICLE BATTERY

(a) When the doors are locked, the vehicle battery is used to transmit radio waves. The battery may discharge if the vehicle remains stopped for a long time. If the vehicle is not to be used for a long time, remove the battery from the vehicle or cancel the smart key system.

(b) When the doors are locked and the key is in the detection area of a door electrical key oscillator, the key battery will be depleted due to regular communication between the key and vehicle. If the vehicle is not to be used, keep the key away from the vehicle (more than 2 m (6.56 ft.)).

5. PRECAUTION FOR KEY

(a) The key is a precision instrument. Be sure to observe the following:

(1) Do not drop the key, subject it to strong shocks or bend it.

(2) Do not keep the key in a high temperature area for a long time.

(3) Do not get the key wet or wash it in an ultrasonic washer etc.

(4) Keep the key away from magnets or magnetized items during use.

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(5) Do not disassemble the key except when replacing the battery.

(6) Do not place the key near objects that produce magnetic fields such as TVs, audio systems and electrical ranges, or electrical medical equipment such as low-frequency therapy instruments.

6. PRECAUTIONS FOR SMART KEY SYSTEM (for Entry Function) INSPECTION

(a) Overall smart key system (for entry function):

(1) Make sure to carry the key.

(2) All registered keys for the vehicle should be available when repairing or diagnosing the smart key system (for entry function).

(b) The smart key system, wireless door lock control system and engine immobiliser system may not operate normally, or the size of the operation area may decrease in the following situations:

HINT:

This is because faint radio waves are used for key detection.

(1) When the key battery is depleted.

(2) When any facilities that generate strong radio waves or electrical noise such as a TV tower, power plant, gas station, broadcast station, video billboard or airport are located near the inspection site.

(3) When the key is located near a wireless device such as a radio, cellular phone or cordless telephone.

(4) When the key is in contact with or covered with a metal object similar to the following:

- Metal or aluminum plated card
- Aluminum film from a cigarette box
- Metallic wallet or bag
- Coins
- Heating pad
- Media such as CDs or DVDs

(5) When a wireless remote is operated near the vehicle.

(6) When the key is carried with following items:

- Electrical key or wireless remote from another vehicle
- PC or similar handheld device (PDA etc.)
- Digital audio player
- Portable game device

(7) When a metallic film is applied to the back window glass.

(c) Precautions for key detection

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(1) When using the key outside the vehicle, do not keep it too close to the vehicle. Depending on the way the key is held, the key may not be detected properly and the system will not operate normally.

HINT:

In this situation, warning buzzer may sound accidentally or key confinement prevention function may not operate.

(2) Even the key is in a detection area, it may not function normally in the following situations:

- When the doors are locked or unlocked with the key too close to a window or door outside handle, near the ground or in a high place
- When the key is on the instrument panel, floor, rear package tray, a door pocket or in the glove box

(d) Precautions specific to the smart key system

(1) If the key is within the vehicle exterior detection area, the doors can be locked or unlocked even when a person other than the person carrying the key holds the door outside handle. However, doors other than the door that detects the key cannot be unlocked.

(2) If a large amount of water is applied to the door outside handle due to a car wash or heavy rain, and the key is within the vehicle exterior detection area, the doors may be locked or unlocked. However, even when the doors are unlocked, the doors will be locked again after approximately 30 seconds if a door is not opened.

(3) If the doors are locked using the wireless remote transmitter when the key is in the cabin or near the vehicle, it may not be possible to unlock the doors using the smart key system. In this situation, use the wireless function of the key to unlock the doors.

HINT:

If the doors are locked from inside the vehicle using the wireless transmitter, it would not be desirable for it to be possible to unlock the vehicle via the touch sensors on the front outside door handles. Thus, unlocking via the touch sensors is disabled because radio waves from the door electrical key oscillator might otherwise leak into the cabin, detect the key, and enable the front door outside handle touch sensors.

7. PRECAUTIONS FOR SMART DOOR UNLOCK FUNCTION

(a) When unlocking the doors, make sure to grasp the door outside handle, ensuring contact with the sensor on the inner part of the handle. Pull the handle after confirming that the door has unlocked.

(b) When attempting to open a door suddenly or immediately after entering the vehicle exterior antenna detection area, the doors may not be unlocked. If the doors are not unlocked, return the door outside handle to its original position. Pull the handle after confirming that the door has unlocked.

HINT:

Due to mechanical reasons the door cannot be unlocked when the handle is being pulled.

(c) If the door outside handle is grasped with gloved hands, unlocking may be delayed or may not occur.

(d) If another key is in the detection area, the unlocking time may be delayed.

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(e) The doors cannot be unlocked within 3 seconds after the door lock operation.

8. PRECAUTIONS FOR SMART DOOR LOCK FUNCTION

(a) Be sure to touch the lock sensor on the door outside handle (depressed portion on the handle) to lock the doors.

(b) If the doors are not locked even when the lock sensor on the door outside handle is touched, touch the both upper and lower lock sensors simultaneously.

(c) If the lock sensor is touched with gloved hands, locking may be delayed or may not occur.

(d) If water is applied to the door outside handle when washing the vehicle and carrying a key, lock and unlock operations may repeat. In this situation, keep the key more than 2 m (6.56 ft.) away from the vehicle and wash the vehicle (be aware of the potential for key theft).

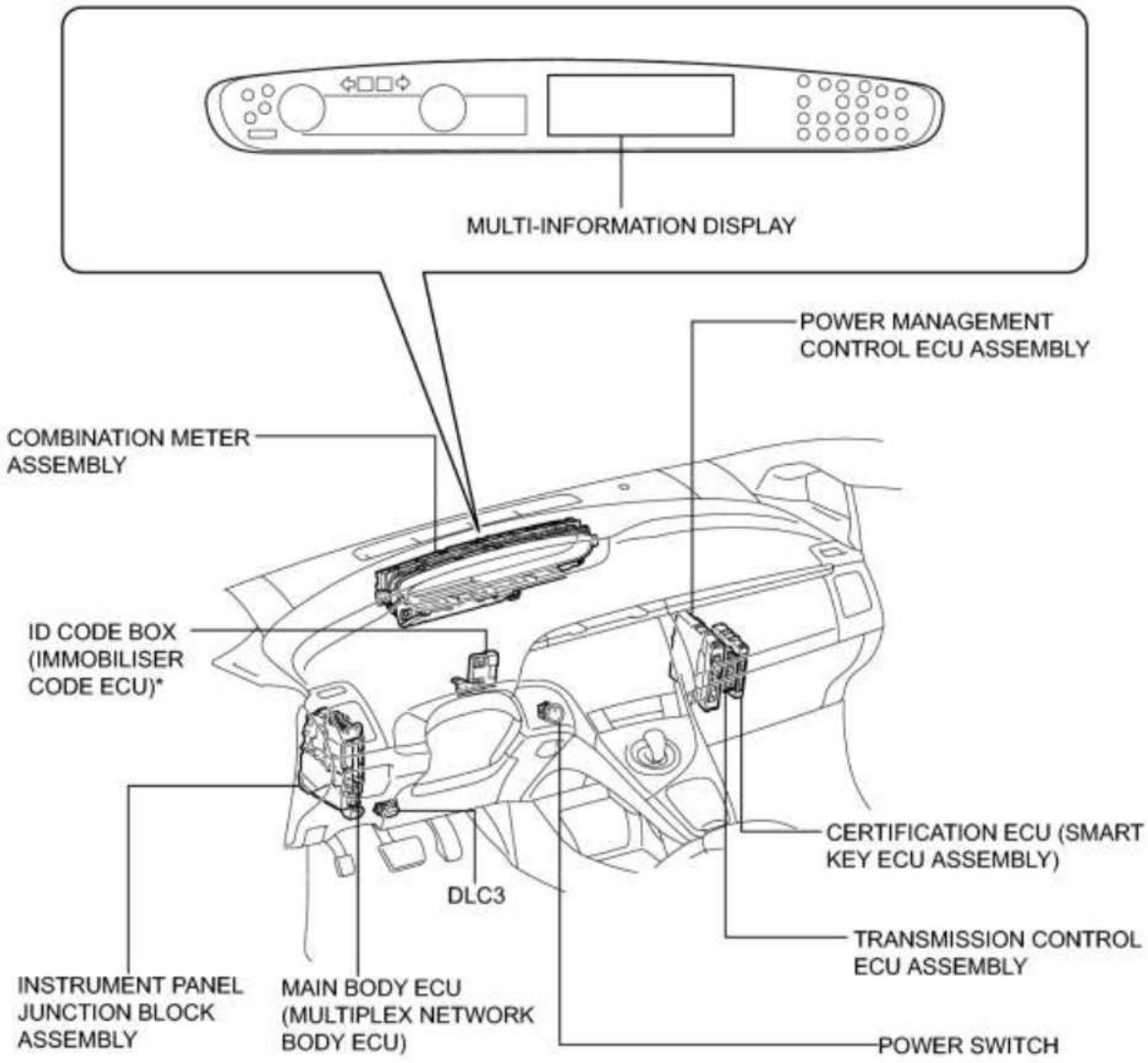
(e) If water is applied to the door outside handle due to a car wash or heavy rain with a key inside the cabin, a warning message "Key not detected" may be displayed and buzzer may sound outside the vehicle. In this situation, the warning message will disappear and buzzer will stop when all the doors are locked.

(f) If ice, snow or dirt adheres to a lock sensor surface, the sensor may not react. In this situation, remove the ice, snow or dirt and touch the sensor again or touch the lock sensor on the lower part of the handle.

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PARTS LOCATION

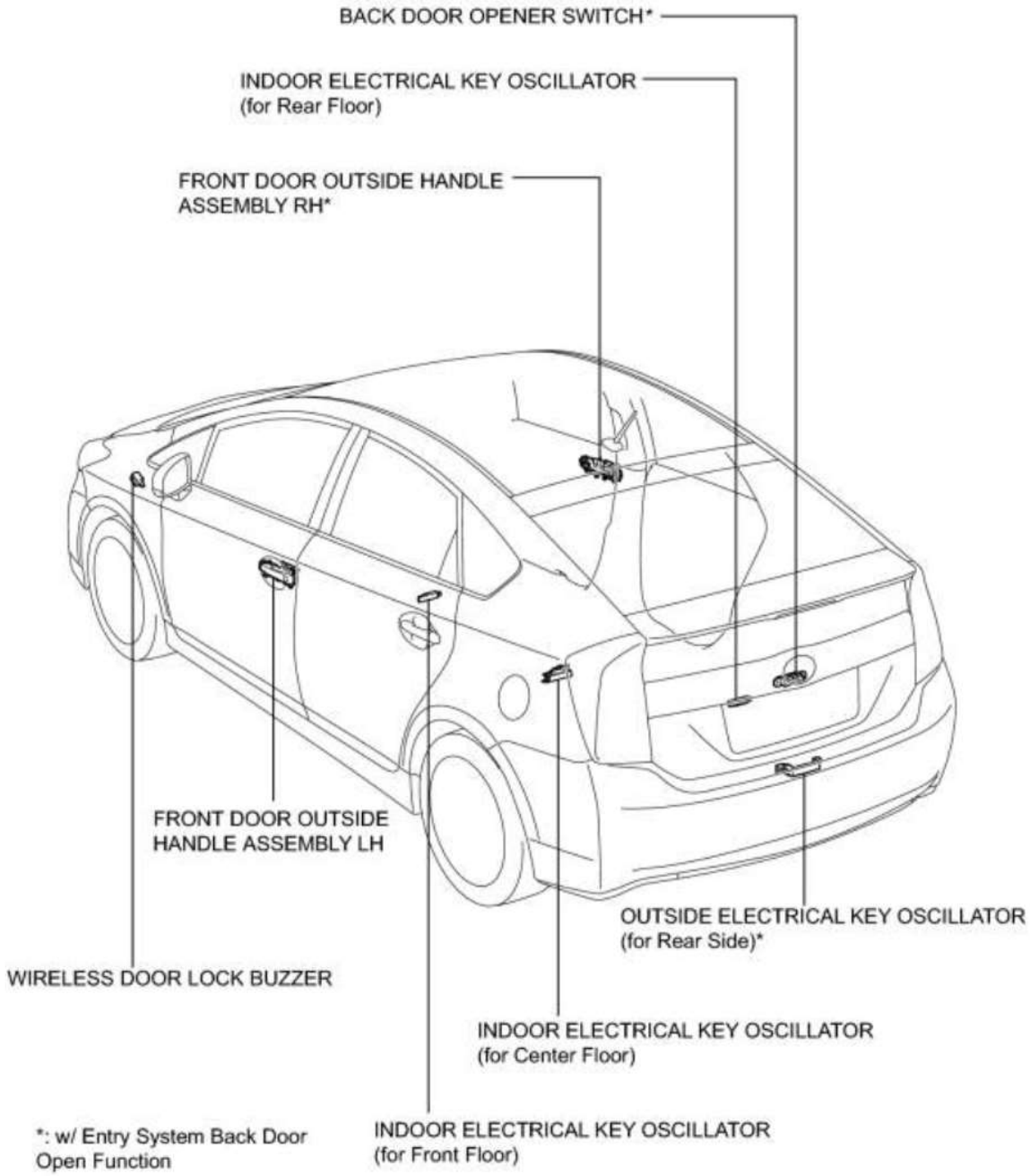
ILLUSTRATION



*: w/ Automatic Light Control System

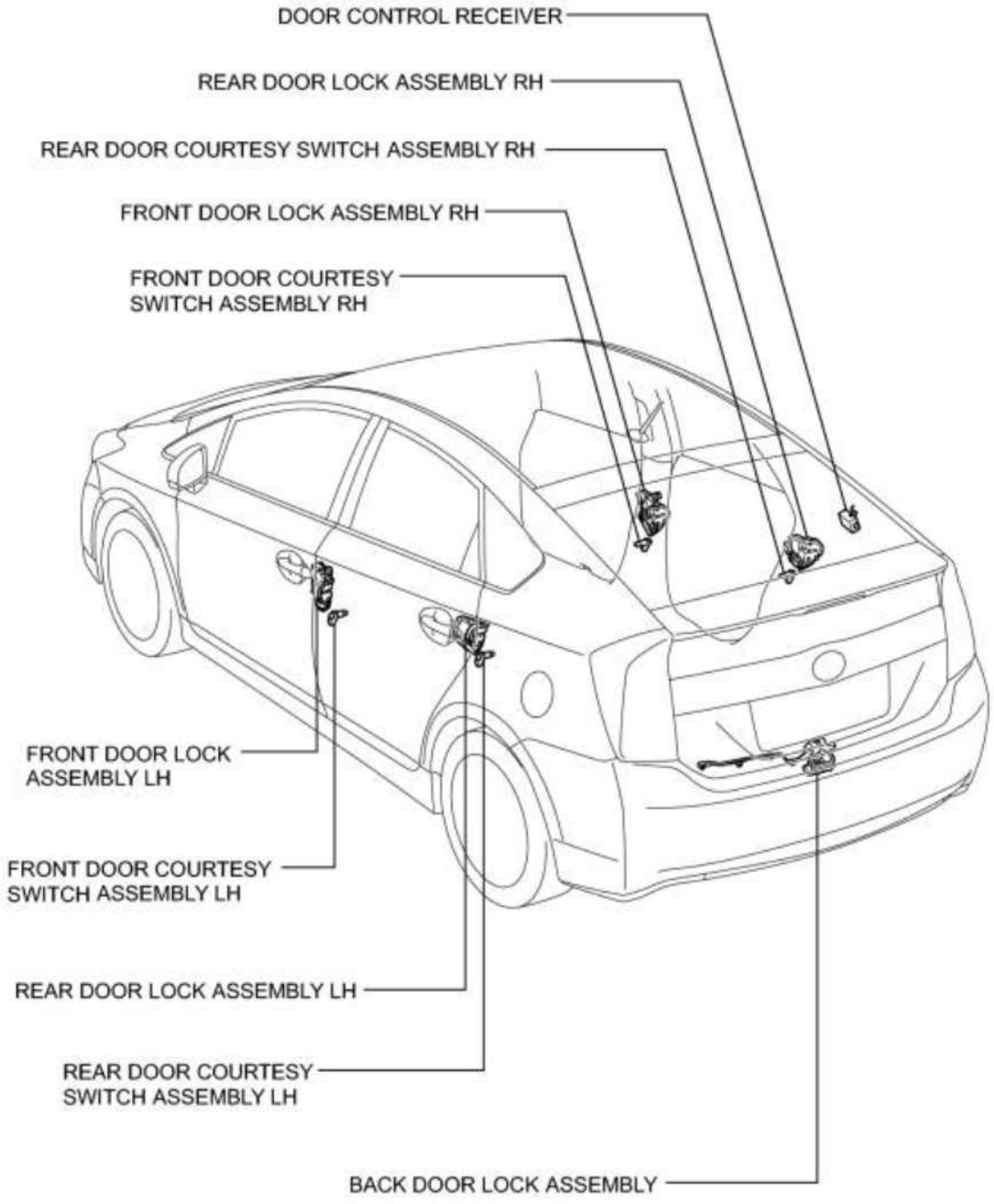
ILLUSTRATION

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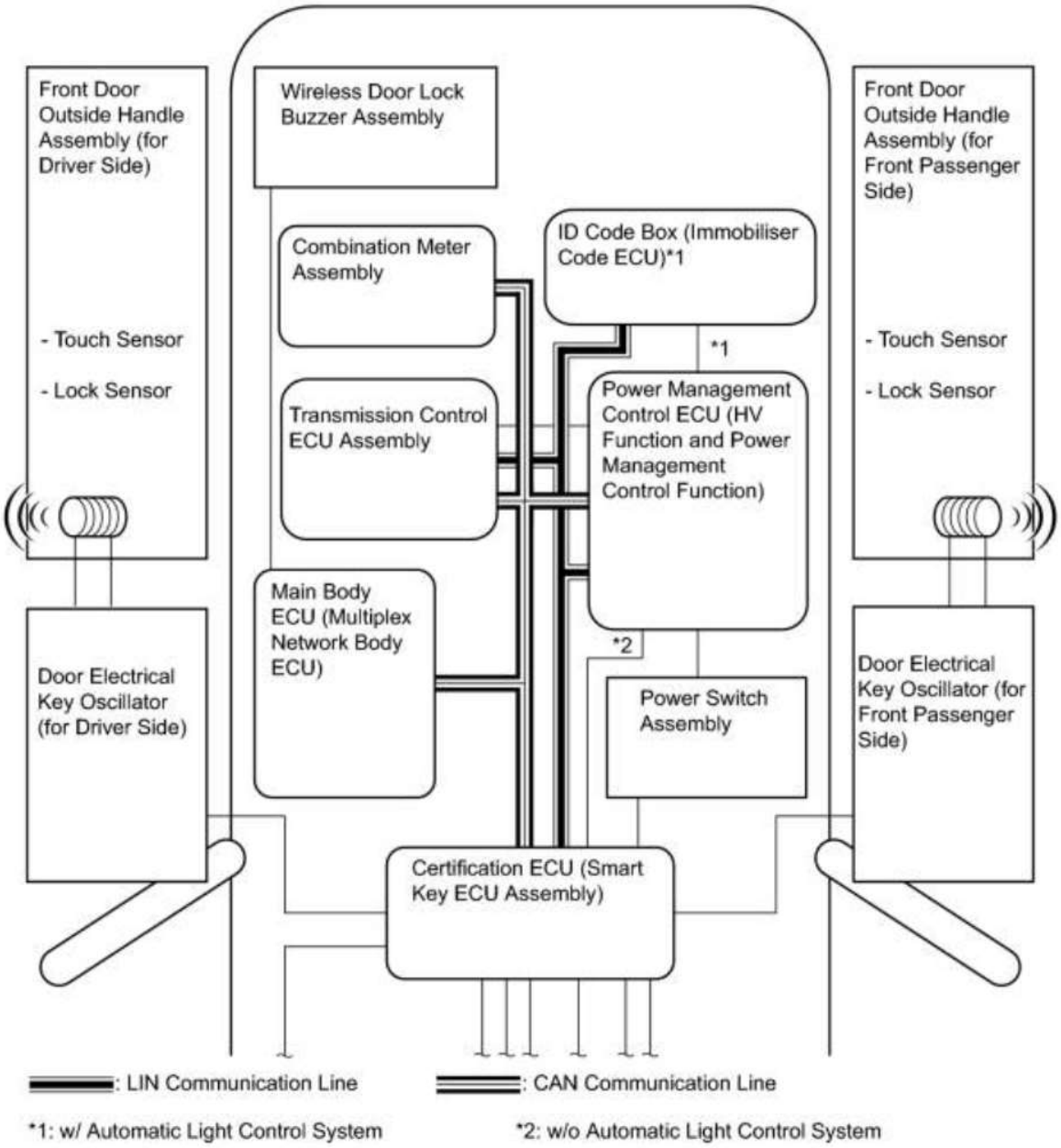
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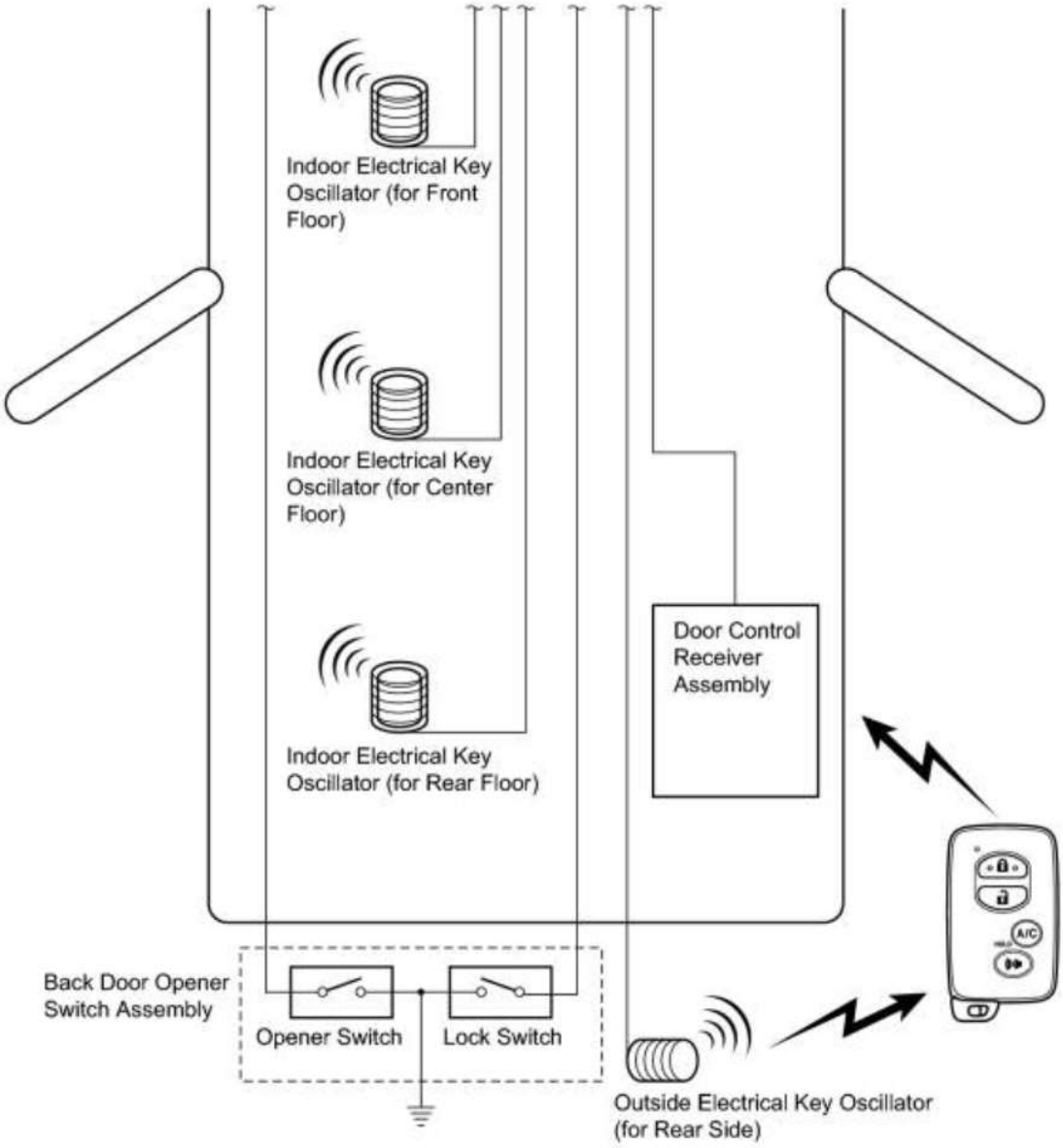
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SYSTEM DIAGRAM

1. w/ Entry System Back Door Open Function:



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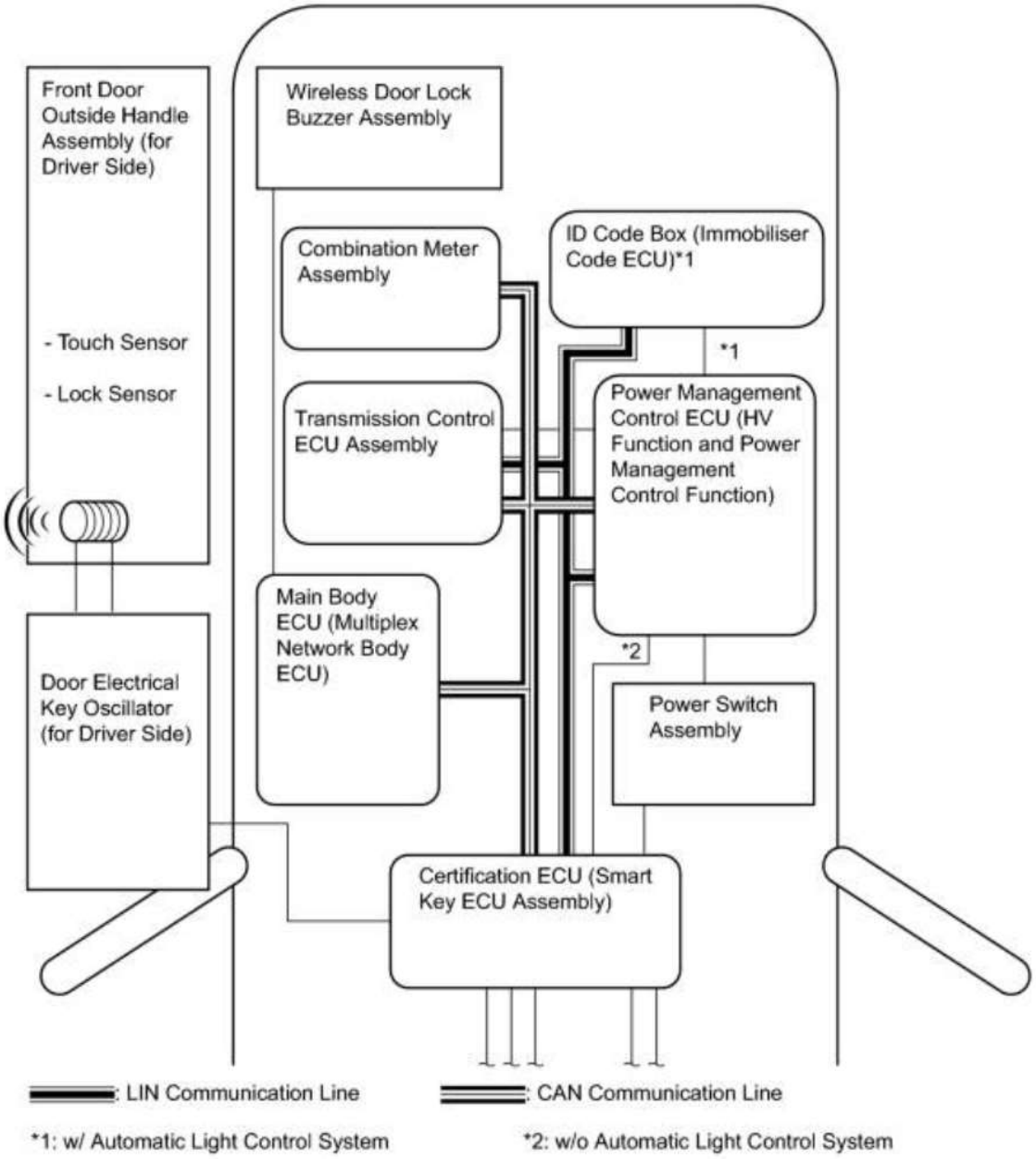
Communication Table

Transmitting ECU (Transmitter)	Receiving ECU	Signal	Communication Method
Main body ECU (multiplex network body ECU)	Certification ECU (smart key ECU assembly)	Courtesy light switch signal	CAN
		Door lock output signal	
		Door lock position switch signal	
		Driver door key operated switch signal	
		IG signal	
		ACC switch signal	

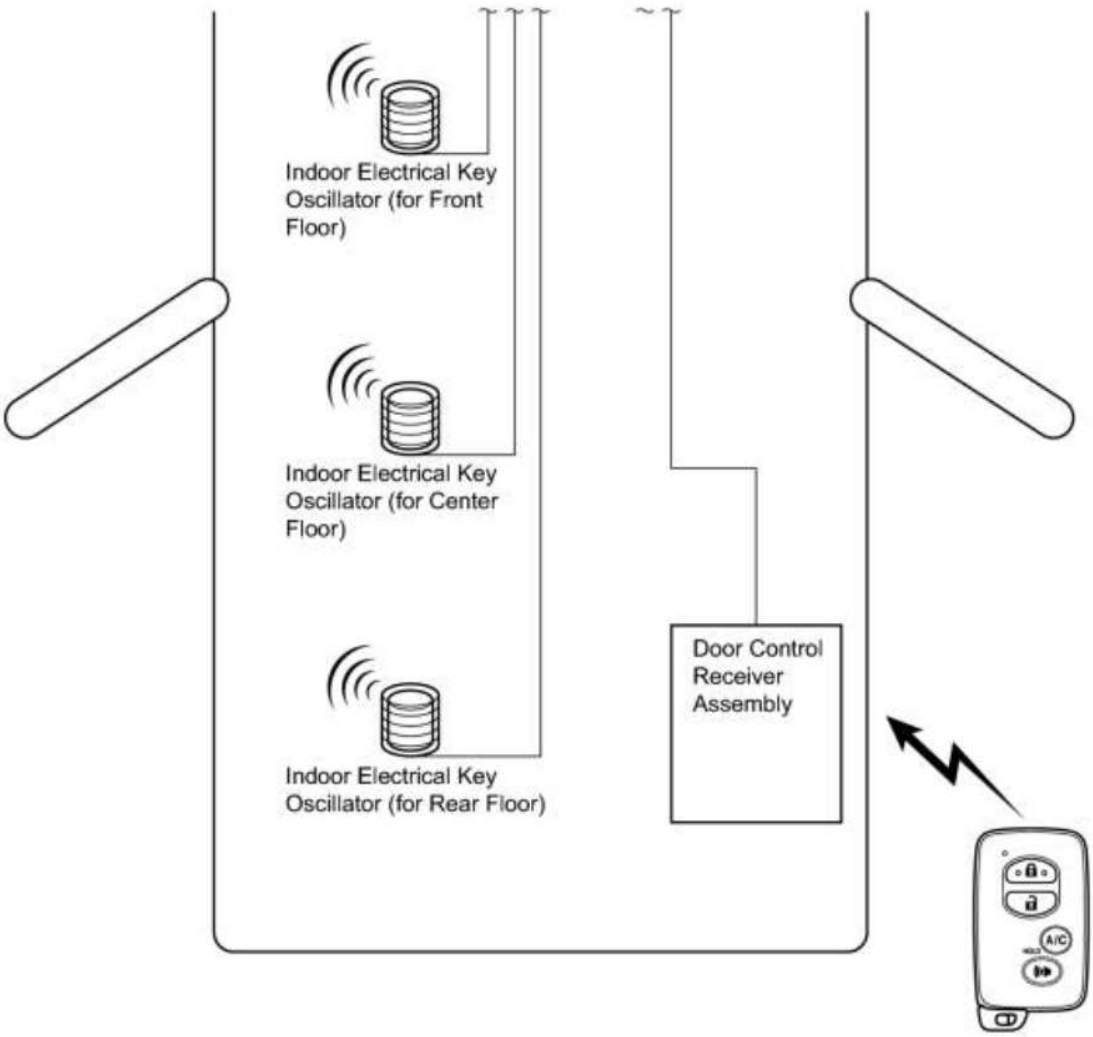
Transmitting ECU (Transmitter)	Receiving ECU	Signal	Communication Method
Certification ECU (smart key ECU assembly)	Main body ECU (multiplex network body ECU)	Illumination light request signal	CAN
		Light answer back signal	
		Door lock/unlock request signal	
		Back door output request signal	
		Wireless door lock buzzer request signal	
Certification ECU (smart key ECU assembly)	Combination meter assembly	Meter buzzer single tone request signal	CAN
		Meter buzzer intermittent tone request signal	
		Meter buzzer continuous tone request signal	
		Key loss warning signal	
		Auto power off operation request signal	
		Key not detected warning signal	
		Low key battery warning signal	
		Shift position warning signal	
		Immobiliser system certification completion signal	
		Emergency operation support display request signal	
		Hybrid vehicle control system start method display request signal	
Combination meter assembly	• Certification ECU (smart key ECU assembly) • Main body ECU (multiplex network body ECU)	Vehicle speed signal	CAN

2. w/o Entry System Back Door Open Function:

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Communication Table

Transmitting ECU (Transmitter)	Receiving ECU	Signal	Communication Method
Main body ECU (multiplex network body ECU)	Certification ECU (smart key ECU assembly)	Courtesy light switch signal	CAN
		Door lock output signal	
		Door lock position switch signal	
		Driver door key operated switch signal	
		IG signal	
		ACC switch signal	
Certification ECU (smart key ECU assembly)	Main body ECU (multiplex network body ECU)	Illumination light request signal	CAN
		Light answer back signal	

Transmitting ECU (Transmitter)	Receiving ECU	Signal	Communication Method
		Door lock/unlock request signal	
		Back door output request signal	
		Wireless door lock buzzer request signal	
Certification ECU (smart key ECU assembly)	Combination meter assembly	Meter buzzer single tone request signal	CAN
		Meter buzzer intermittent tone request signal	
		Meter buzzer continuous tone request signal	
		Key loss warning signal	
		Auto power off operation request signal	
		Key not detected warning signal	
		Low key battery warning signal	
		Shift position warning signal	
		Immobiliser system certification completion signal	
		Emergency operation support display request signal	
		Hybrid vehicle control system start method display request signal	
Combination meter assembly	• Certification ECU (smart key ECU assembly) • Main body ECU (multiplex network body ECU)	Vehicle speed signal	CAN

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SYSTEM DESCRIPTION

CAUTION:

If using a pacemaker, be sure to read the manual of the pacemaker before using the key, as the radio waves of the key may affect the pacemaker.

1. SMART KEY SYSTEM DESCRIPTION

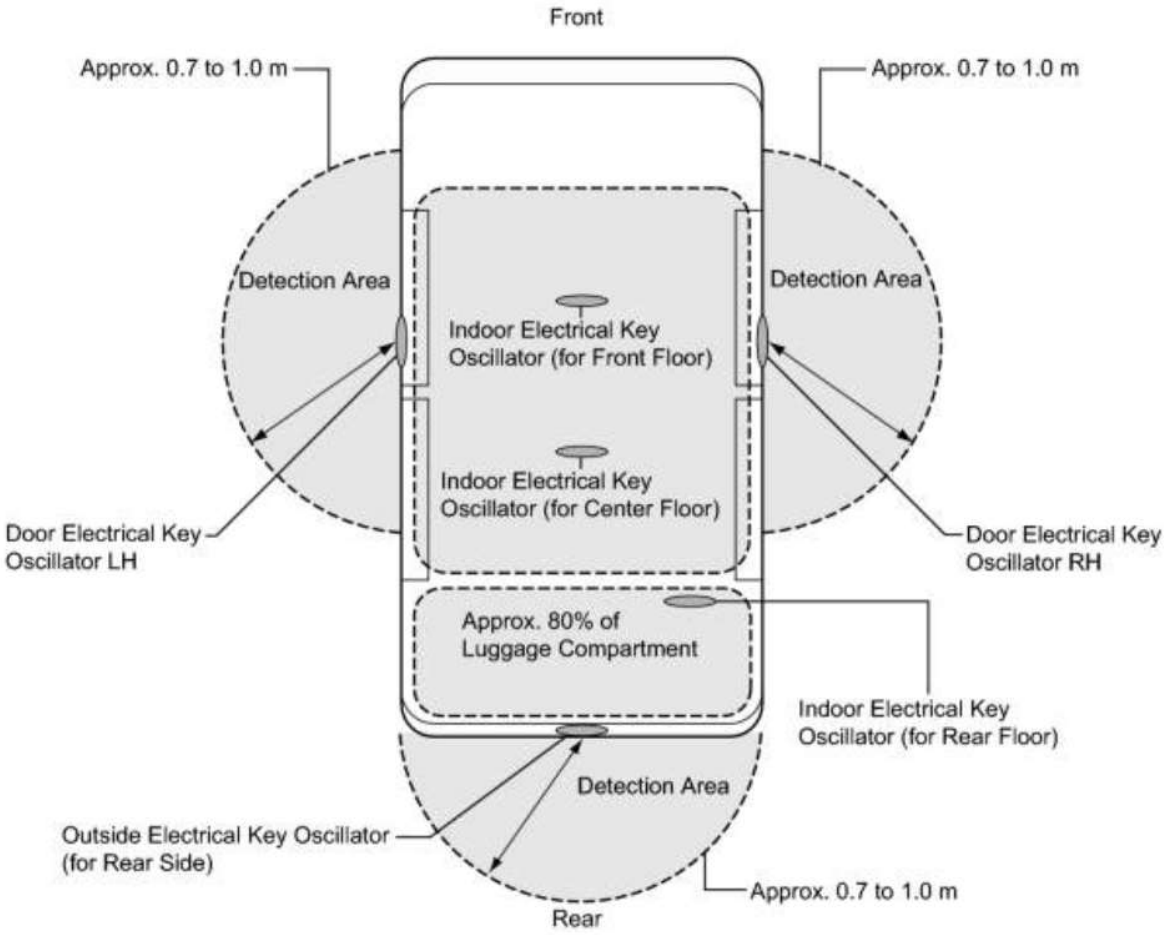
(a) In addition to conventional mechanical key and wireless door lock control functions, the smart key system enables door locking/unlocking and hybrid vehicle control system starting without operating the key. The only requirement is that the key is in the user's possession.

- This system is controlled by the certification ECU (smart key ECU assembly). When the certification ECU (smart key ECU assembly) detects the presence of the smart key system in one of the detection areas, it identifies and checks the ID code, and outputs operation signals to the related ECU in accordance with their functions.
- The detection areas are formed by 6 oscillators (2 door oscillators, 1 outside oscillator and 3 indoor oscillators).

2. DETECTION AREA

(a) w/ Entry System Back Door Open Function

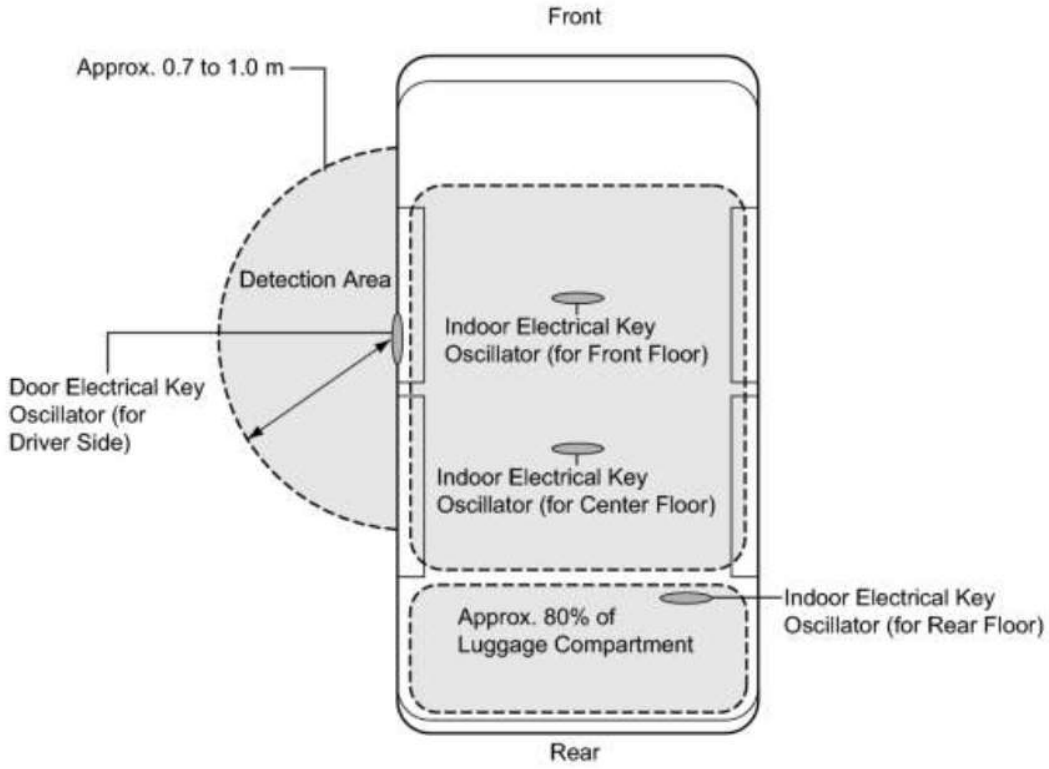
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Actuation Area	Detail
Interior	The interior detection area of the indoor electrical key oscillators (for front, center and rear floor) is formed when the driver door is opened or closed, when the power switch is pushed, when a warning is activated, or when the lock sensor on the door outside handle assembly or lock switch on the back door opener switch assembly is on.
Exterior	The exterior detection area formed by the door electrical key oscillators (for driver side and front passenger side) and outside electrical key oscillator (for rear side) is approximately 0.7 to 1.0 m (2.30 to 3.28 ft.) from the door outside handle assembly of the front doors, or the center of the rear bumper.
Around Front Door	The exterior detection area of the door electrical key oscillator (for driver side or front passenger side) is formed by transmitting a request signal every 0.25 seconds while the power switch is off and each door is locked. In this way it detects the proximity of a key. When locking the door using the lock sensor on the door outside handle assembly, the detection area is formed when the lock sensor is touched.
Around Back Door	The exterior detection area of the outside electrical key oscillator (for rear side) is formed by when the back door opener switch assembly (opener or lock switch) is on.

(b) w/o Entry System Back Door Open Function

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Actuation Area	Detail
Interior	The interior detection area of the indoor electrical key oscillators (for front, center and rear floor) is formed when the driver door is opened or closed, when the power switch is pushed, when a warning is activated, or when the lock sensor on the door outside handle assembly or lock switch on the back door opener switch assembly is on.
Exterior	The exterior detection area formed by the door electrical key oscillators (for driver side) is approximately 0.7 to 1.0 m (2.30 to 3.28 ft.) from the door outside handle assembly of the front doors, or the center of the rear bumper.
Around Front Door	The exterior detection area of the door electrical key oscillator (for driver side) is formed by transmitting a request signal every 0.25 seconds while the power switch is off and each door is locked. In this way it detects the proximity of a key. When locking the door using the lock sensor on the door outside handle assembly, the detection area is formed when the lock sensor is touched.

3. FUNCTION OF MAIN COMPONENTS

Component	Function
Key	• Outputs information such as the key ID and vehicle ID when request signals that are output by the indoor, outside and door oscillators are received. • Outputs a request signal when the lock, unlock, panic or remote A/C*1 button on the key is pushed. • Outputs information such as the key ID and vehicle ID when the radio wave that is output by the transponder key amplifier in the power switch is received. • Has an integrated mechanical key that can be used to

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Component		Function
		unlock the doors when the key battery is weak.
Certification ECU (Smart Key ECU Assembly)		• Certifies the ID code received from the door control receiver and transmits the certification results to the steering lock ECU (steering lock actuator assembly). • Controls the oscillators and touch sensors. • Transmits the door lock/unlock request signals during the entry function.
Main Body ECU (Multiplex Network Body ECU)		• Receives the request signal from the certification ECU (smart key ECU assembly) and actuates the door lock motors to unlock or lock all the doors. • Transmits the condition of each door and, the back door to the certification ECU (smart key ECU assembly).
Front Door Outside Handle Assembly (for Driver Side, Front Passenger Side*2) (touch sensor)		Sends a door unlock request signal to the certification ECU (smart key ECU assembly) when the touch sensor on the inner side of the front door outside handle assembly is touched.
Front Door Outside Handle Assembly (for Driver Side, Front Passenger Side*2) (lock sensor)		Sends a door lock request signal to the certification ECU (smart key ECU assembly) when the lock sensor on the front door outside handle assembly is touched.
Door Electrical Key Oscillator (for Driver Side, Front Passenger Side*2)		Receives the request signal from the certification ECU (smart key ECU assembly), and creates an detection area around the front doors.
Indoor Electrical Key Oscillator (for Front, Center and Rear Floor)		Receives a request signal from the certification ECU (smart key ECU assembly) and forms the interior detection area.
Outside Electrical Key Oscillator (for Rear Side)*2		Receives the request signal from the certification ECU (smart key ECU assembly), and forms an detection area around the back door.
Door Control Receiver Assembly		Receives the ID code from the key and transmits it to the certification ECU (smart key ECU assembly).
Back Door Opener Switch Assembly*2 • Opener Switch		Transmits a back door open request signal to the certification ECU (smart key ECU assembly).
Back Door Opener Switch Assembly*2 • Lock Switch		Transmits a back door lock request signal to the certification ECU (smart key ECU assembly).
Stop Light Switch		Outputs state of the brake pedal to the power management control ECU.
Combination Meter Assembly	Buzzer	Sounds to inform the driver of malfunctions in the smart key system.
	Multi-information Display	The following warning messages appear to alert the driver:

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Component		Function
		• Shift to P Position • Shift to P Position and Push Power Switch Turn Power Off • Key not Detected • Turn Power Off • Key Detected in Vehicle • Key Battery Low • Depress Brake Pedal and Push Power Switch to Start • Depress Brake Pedal, Touch Power Switch with Key • Auto Power Off to Conserve Battery • Shift to P Position to Start
Wireless Door Lock Buzzer Assembly		Sounds to inform the driver of malfunctions in the smart key system.

- *1: w/ Remote Air Conditioning System
- *2: w/ Entry System Back Door Open Function

4. CONSTRUCTION AND OPERATION

(a) Key

The key consists of a mechanical key, transmitter for wireless door lock control and transceiver for the smart key system.

- The transceiver function for the smart key system receives the signals from the oscillators and sends the ID code to the tuner.
- The transmitter function for the wireless door lock control has a lock switch, unlock switch, panic switch and remote A/C switch*.

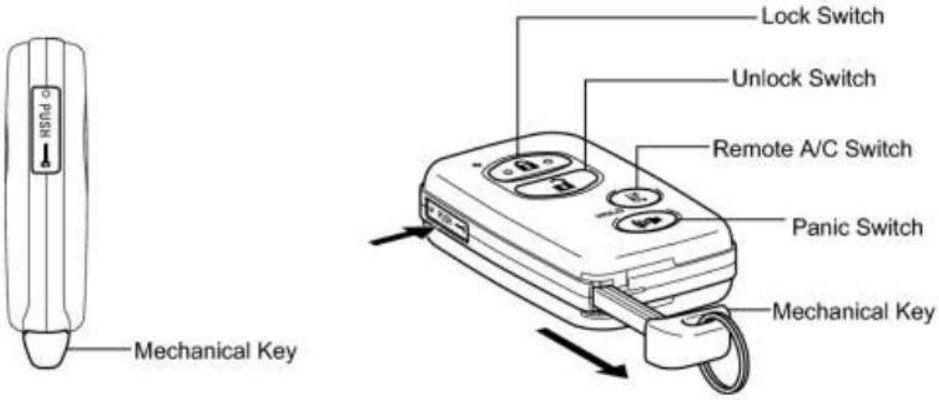
  *: w/ Remote Air Conditioning System

- This mechanical key works for the driver door and glove box, but cannot start the hybrid vehicle control system.

A total of 7 keys can be registered.

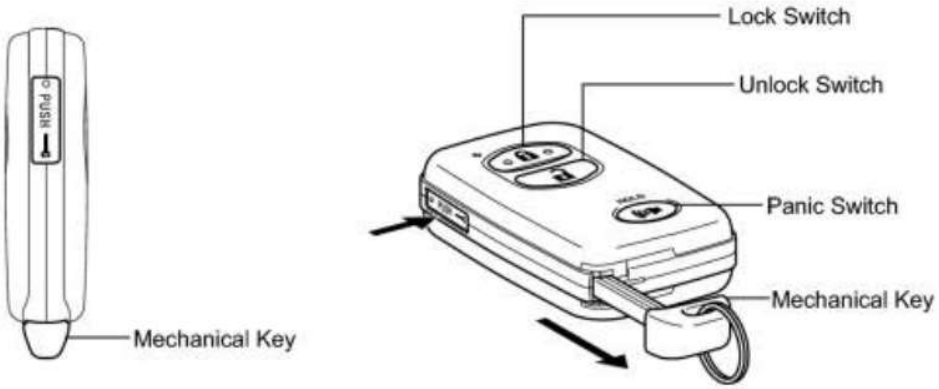
(1) Key (w/ Remote Air Conditioning System):

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H

(2) Key (w/o Remote Air Conditioning System):



H

(b) Oscillator (door electrical key oscillator (for driver side and front passenger side*), indoor electrical key oscillator (for front, center and rear floors) and outside electrical key oscillator (for rear side)*)

Each oscillator transmits the request signal received from the certification ECU (smart key ECU assembly), and forms a key detection area to detect the presence of a key. The detection area formed by door electrical key oscillator (for driver side and front passenger side*) and outside electrical key oscillator (for rear side)* is approximately 0.7 to 1.0 m (2.30 to 3.28 ft.) from the door outside handle assembly of door (for driver side, front passenger side*) or the center of the rear bumper.

*: w/ Entry System Back Door Open Function

- The detection area of the door electrical key oscillators (for driver side and front passenger side*) is formed by transmitting a request signal periodically while the power switch is off and the doors (for driver side and front passenger side*) are locked. In this way, the oscillator detects the proximity of a key. During entry lock, the detection area is formed with the lock sensor on.

  *: w/ Entry System Back Door Open Function

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- The detection area of the outside electrical key oscillator (for rear side)* is formed when the back door opener switch assembly (opener or lock switch) is on.

  *: w/ Entry System Back Door Open Function

- The detection area of the indoor electrical key oscillators (for front, center and rear floor) is formed when any door is opened or closed, during hybrid vehicle control system start, when a warning is activated, or when the lock sensor on the door outside handle assembly or lock switch on the back door opener switch assembly is on.

5. ENTRY FUNCTION OPERATION

(a) The smart key system has the following functions:

Function	Outline
Wireless Door Lock Control	This function is a convenient system for locking and unlocking all the doors and back door at a distance. The operation of this function is the same as that in the wireless door lock control system.
Entry Unlock	When a key is in the exterior detection area of any door electrical key oscillator, the door will unlock after the inner side of either front door outside handle assembly (for driver side or front passenger side*) is touched. • The front door outside handle assembly (for driver side) unlocks the driver door. • The front door outside handle assembly (for front passenger side) unlocks all doors and the back door.
Entry Unlock Mode Switching	This function allows switching between 2 modes that can be operated with the entry unlock function. • Driver Door Mode (Default Setting) • All Door Mode
Entry Lock	• When a key is in the exterior detection area of a door electrical key oscillator (driver side or front passenger side*) and the power switch is off, all doors can be locked by simply touching the lock sensor on the door outside handle assembly. • When a key is in the exterior detection area of the outside electrical key oscillator (for rear side) and the power switch is off, all doors can be locked by simply pressing the lock switch on the back door opener switch assembly.*
Entry System Back Door Open Function*	When a key is in the exterior detection area of the outside electrical key oscillator (for rear side), the back door opens manually by simply pressing the back door opener switch assembly (opener switch).
Prevention of Key Confinement	The key confinement prevention function prevents the vehicle from being locked with a key left inside.
Warning	When any of the situations below occur, the smart key system causes the certification ECU (smart key ECU assembly) to sound the buzzer in the combination meter assembly and wireless door lock buzzer assembly, and indicate a warning on the multi-information

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Function	Outline
	display in order to alert the driver: • The hybrid vehicle control system is left running and the shift lever is in R, N, D or B when the driver gets out of the vehicle. • The key reminder sounds. • The hybrid vehicle control system is left running and park (P) is selected when the driver gets out of the vehicle. • A door is ajar. • The hybrid vehicle control system is left running when a passenger gets out of the vehicle while holding the key. • The key is not in the detection areas. • The key is left in the vehicle. • The key battery is weak. • The power management control ECU is malfunctioning. • The hybrid vehicle control system cannot be started (driver error). • The hybrid vehicle control system cannot be started (system error). • An attempt is made to turn off the vehicle with the shift lever in a R, D or B. • Auto power off operation occurs. • Immobiliser system certification completion occurs. • The vehicle is driven without a key.
Battery Saving	If the key remains within the exterior detection area of any electrical key oscillator (for driver, front passenger or rear side), the system maintains periodic communication with the key. Therefore, if the vehicle remains parked in that state for a long time, the key battery and the vehicle battery could be drained.
Key Cancel INFO	The following key functions can be cancelled by following certain procedures: • Entry Unlock/Lock • Entry Hybrid Vehicle Control System Start • Entry System Back Door Open Function* • Key Lock-in Prevention • Warning
Key Code Registration	A total of 7 keys can be registered. This function enables the registration (writing and storing) of transmitter recognition codes in the EEPROM that is contained in the certification ECU (smart key ECU assembly).

*: w/ Entry System Back Door Open Function

6. WIRELESS DOOR LOCK CONTROL SYSTEM FUNCTION

Push the lock/unlock/panic/remote A/C* switch on the key to operate each function. For details, INFO.

*: w/ Remote Air Conditioning System

7. ENTRY UNLOCK FUNCTION

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(a) When the key enters any exterior detection area of a front door, the certification ECU (smart key ECU assembly) judges and certifies the key ID code received from the door control receiver assembly.

(b) After the key certification OK is confirmed, the certification ECU (smart key ECU assembly) transmits an unlock stand-by signal to the touch sensor of the relevant door.

(c) If a touch sensor is touched in this condition, the certification ECU (smart key ECU assembly) transmits a door unlock request signal to the main body ECU (multiplex network body ECU), and unlocks either the driver door or all doors.

- The front door outside handle assembly (for driver side) unlocks the driver door.*

  *: except for Korea and Mexico

- The front door outside handle assembly (for front passenger side) unlocks all doors.*

  *: w/ Entry System Back Door Open Function and for Korea and Mexico

(d) The main body ECU (multiplex network body ECU) sounds the wireless door lock buzzer twice, and the main body ECU (multiplex network body ECU) flashes the hazard warning lights twice, as an answer back for entry unlock.

8. ENTRY LOCK FUNCTION

(a) The entry lock signal is transmitted to the certification ECU (smart key ECU assembly) when the user (who has the key in their possession) exits the vehicle and touches the lock senor on the door outside handle assembly or presses the lock switch on the back door opener switch assembly*.

*: w/ Entry System Back Door Open Function

(b) The certification ECU (smart key ECU assembly) transmits a request signal for the indoor electrical key oscillators (for front, center and rear floor), door electrical key oscillators (for driver side and front passenger side*) and outside electrical key oscillator (for rear side)* to form detection areas.

*: w/ Entry System Back Door Open Function

(c) The certification ECU (smart key ECU assembly) judges and certifies the ID code. It then checks the location of the key, and if all doors are closed, the ECU transmits a door lock signal to the main body ECU (multiplex network body ECU).

(d) The main body ECU (multiplex network body ECU) receives this signal and actuates the lock motors.

(e) The main body ECU (multiplex network body ECU) blinks the hazard warning lights once and the main body ECU (multiplex network body ECU) sounds the wireless door lock buzzer once as an answerback for the entry lock function.

9. ENTRY SYSTEM BACK DOOR OPEN FUNCTION*

*: w/ Entry System Back Door Open Function

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(a) The unlock signal is transmitted to the certification ECU (smart key ECU assembly) from the back door opener switch assembly.

(b) The certification ECU (smart key ECU assembly) transmits a request signal for the outside electrical key oscillator (for rear side) to form a detection area.

(c) The key receives this signal and returns the ID code to the door control receiver assembly.

(d) The certification ECU (smart key ECU assembly) judges and certifies the ID code, and check the location of the key. The ECU transmits a back door open signal to the main body ECU (multiplex network body ECU).

(e) Any ECU receives this signal and actuates the motor to open manually the back door.

10. PREVENTION OF KEY CONFINEMENT FUNCTION

(a) The key confinement prevention function prevents the key from being locked in the vehicle.

(1) When the door is locked by the lock knob in the inside door handle while the key is still in the vehicle interior, the main body ECU (multiplex network body ECU) receives this signal and transmits the door condition signal to the certification ECU (smart key ECU assembly).

(2) The certification ECU (smart key ECU assembly) transmits a request signal for the indoor electrical key oscillators (for front, center and rear floor) to form detection areas.

(3) The key receives this signal and returns the ID code to the door control receiver assembly.

(4) The certification ECU (smart key ECU assembly) judges and certifies the ID code, and check the location of the key. The ECU transmits a door unlock signal to the main body ECU (multiplex network body ECU).

(5) The main body ECU (multiplex network body ECU) receives this signal and actuates the all door lock assemblies to unlock.

(6) The certification ECU (smart key ECU assembly) sounds the wireless door lock buzzer and buzzer in the combination meter as an answer back for unlock.

11. WARNING FUNCTION

(a) Warning

(1) When any of the situations below occur, the smart key system causes the certification ECU (smart key ECU assembly) to sound a buzzer in the combination meter assembly and the wireless door lock buzzer assembly, a message to appear on the multi-information display, and the power switch illumination to operate in order to alert the driver.

Situation	Condition
A	The hybrid vehicle control system is left running and the shift lever is in R, N, D or B when the driver gets out of the vehicle.
B	The key reminder sounds.
C	The hybrid vehicle control system is left running and park (P) is selected when the driver gets out of the vehicle.

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Situation	Condition
D	A door is ajar.
E	The hybrid vehicle control system is left running when a passenger gets out of the vehicle while holding the key.
F	The key is not in the detection areas.
G	The key is left in the vehicle.
H	The key battery is weak.
I	The power management ECU is malfunctioning.
J	The hybrid vehicle control system cannot be started (driver error).
K	The hybrid vehicle control system cannot be started (system error).
L	An attempt is made to turn off the vehicle with the shift lever in a R, D or B.
M	Auto power off operation occurs.
N	Immobiliser system certification completion occurs.
O	The vehicle is driven without a key.

(2) Situation A

- There are 2 patterns for situation A.
  - Pattern 1:

    When the hybrid vehicle control system is left running and the shift lever is in R, N, D or B, the driver opens the door and attempts to get out of the vehicle.

    In this situation, the following control is performed:

<table>
<tr><td>Possible Effects without Warning</td><td colspan="3">Sudden vehicle start, vehicle theft, vehicle roll-away</td></tr>
<tr><td>Warning Active Condition</td><td colspan="3">The warning is activated when all of the following conditions are met:
○ The power switch is in a mode other than off.
○ The shift lever is in R, N, D or B.
○ The vehicle speed is less than 5 km/h (3.1 mph).
○ The driver door is opened.</td></tr>
<tr><td rowspan="3">Warning Method</td><td rowspan="2">Combination Meter Assembly</td><td>Buzzer</td><td>Sounds continuously</td></tr>
<tr><td>Multi-information Display</td><td>The following warning message is displayed:
○ Shift to P Position</td></tr>
<tr><td colspan="2">Wireless Door Lock Buzzer Assembly</td><td>-</td></tr>
<tr><td colspan="2">Power Switch Illumination</td><td>-</td></tr>
</table>

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Warning Stop Condition	The warning is stopped when one of the following conditions is met: ○ The power switch is turned off. ○ The P position switch is pushed. ○ The vehicle speed is above 5 km/h (3.1 mph). ○ The driver door is closed.

(3) Situation B

- There are two patterns for situation B.
  - Pattern 1:

    When the driver door is open, the driver turns the power switch on (ACC) and attempts to leave the vehicle.
  - Pattern 2:

    When the driver door is open, the driver turns the power switch from on (IG) to off and attempts to leave the vehicle.

    In these situations, the following control is performed:

Possible Effects without Warning	Vehicle theft		
Warning Active Condition	The warning is activated when either of the following patterns is met: ○ Pattern 1: ▪ The power switch is on (ACC). ▪ The driver door is opened. ▪ The remote air conditioning system is off. ○ Pattern 2: ▪ The power switch is off. ▪ The shift control is unlocked. ▪ The driver door is opened.		
Waning Method	Combination Meter Assembly	Buzzer	Sounds continuously at short and even intervals
		Multi-information Display	-
	Wireless Door Lock Buzzer Assembly		-
	Power Switch Illumination		-
Warning Stop Condition	The warning is stopped when one of the following conditions is met: ○ The power switch is turned on (IG). ○ The driver door is closed. ○ The power switch is turned off and the shift control is locked.		

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	○ The remote air conditioning system is turned on.

(4) Situation C

- There are 2 patterns for situation C.
  - Pattern 1:

    When the hybrid vehicle control system is left running and park (P) is selected, the driver closes the driver door and attempts to leave the vehicle while holding the key.

    In this situation, the following control is performed:

Possible Effects without Warning	Vehicle theft, hybrid vehicle control system cannot be restarted, discharged battery		
Warning Active Condition	The warning is activated when all of the following conditions are met: ○ Park (P) is selected. ○ The power switch is in a mode other than off. ○ The key is not in the vehicle. ○ The driver door is opened → closed. ○ The vehicle speed is 0 km/h (0 mph).		
Warning Method	Combination Meter Assembly	Buzzer	Sounds once
		Multi-information Display	The following warning message is displayed: ○ Key not Detected
	Wireless Door Lock Buzzer Assembly		Sounds 3 times
	Power Switch Illumination		-
Warning Stop Condition	The warning is stopped when either of the following conditions is met: ○ The power switch is turned off. ○ The key is returned to the vehicle.		

(5) Situation D

- The lock sensor on the door outside handle assembly is touched to perform entry lock with a door open.

In this situation, the following control is performed:

Possible Effects without Warning	Vehicle theft

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<table>
<tr><td>Warning Active Condition</td><td colspan="3">The warning is activated when all of the following conditions are met:

• The power switch is off.
• Any door is opened.
• The lock sensor on the door outside handle assembly is on (touched).</td></tr>
<tr><td rowspan="3">Warning Method</td><td rowspan="2">Combination Meter Assembly</td><td>Buzzer</td><td>-</td></tr>
<tr><td>Multi-information Display</td><td>-</td></tr>
<tr><td colspan="2">Wireless Door Lock Buzzer Assembly</td><td>Sounds continuously</td></tr>
<tr><td>Warning Stop Condition</td><td colspan="2">Power Switch Illumination</td><td>-</td></tr>
<tr><td></td><td colspan="3">The warning is stopped when one of the following conditions is met:

• The power switch is turned to a mode other than off.
• All doors are closed.
• An unlock operation is performed using the wireless door lock remote function.
• The touch sensor on the inner side of a door outside handle assembly is used to perform entry unlock.
• 10 seconds have elapsed after the wireless door lock buzzer assembly is activated.</td></tr>
</table>

(6) Situation E

- When the hybrid vehicle control system is left running, a passenger leaves the vehicle while holding the key.

In this situation, the following control is performed:

<table>
<tr><td>Possible Effect without Warning</td><td colspan="3">Hybrid vehicle control system cannot be restarted</td></tr>
<tr><td>Warning Active Condition</td><td colspan="3">The warning is activated when all of the following conditions are met:

• The power switch is in a mode other than off.
• A door other than the driver door is opened → closed.
• The vehicle speed is 0 mph (0 km/h).
• The key is not in the vehicle.</td></tr>
<tr><td rowspan="3">Warning Method</td><td rowspan="2">Combination Meter Assembly</td><td>Buzzer</td><td>Sounds once</td></tr>
<tr><td>Multi-information Display</td><td>The following warning message is displayed:

• Key not Detected</td></tr>
<tr><td colspan="2">Wireless Door Lock Buzzer Assembly</td><td>Sounds 3 times</td></tr>
<tr><td colspan="2">Power Switch Illumination</td><td>-</td></tr>
</table>

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Warning Stop Condition	The warning is stopped when either of the following conditions is met: • The power switch is turned off. • The key is returned to the vehicle.

(7) Situation F

• When the key is not in the vehicle or the key battery is dead, the driver attempts to start the hybrid vehicle control system or turn the power switch on (IG).

In this situation, the following control is performed:

Possible Effects without Warning	Confuses the user		
Warning Active Condition	The warning is activated when all of the following conditions are met: • The power switch is pushed. • The key is not in the vehicle. • The immobiliser system is set.		
Warning Method	Combination Meter Assembly	Buzzer	Sounds once
		Multi-information Display	The following warning message is displayed for 15 seconds (and then automatically turned off). • Key not Detected
	Wireless Door Lock Buzzer Assembly		-
	Power Switch Illumination		-
Warning Stop Condition	Check if the key is in the detection area. If the key is in the detection area, press the wireless door lock switch and confirm that the indicator comes on. If the indicator does not come on, replace the key battery with a new one.		

(8) Situation G

• There are two patterns for situation G.

  • Pattern 1:

    The lock sensor on a door outside handle assembly is touched to perform entry lock with the key left in the vehicle.

    In this situation, the following control is performed:

Possible Effect without Warning	Vehicle theft

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Warning Active Condition	The warning is activated when all of the following conditions are met: ○ The power switch is off. ○ All doors are closed. ○ The key is in the vehicle. ○ The lock sensor on the door outside handle assembly is on (touched). ○ Any door is unlocked.		
Warning Method	Combination Meter Assembly	Buzzer	-
		Multi-information Display	The following warning message is displayed for 60 seconds (and then automatically turned off). ○ Key Detected in Vehicle
	Wireless Door Lock Buzzer Assembly		Sounds continuously
	Power Switch Illumination		-
Warning Stop Condition	The warning is stopped when one of the following conditions is met:		
	Combination Meter Assembly	Multi-information Display	○ The power switch is turned to a mode other than off. ○ Lock operation is detected.
	Wireless Door Lock Buzzer Assembly		○ 10 seconds have elapsed after the wireless door lock buzzer assembly is activated. ○ Any door is opened. ○ The power switch is turned to a mode other than off. ○ Lock operation is detected.

(9) Situation H

- The vehicle is driven using a key that has a low battery.

In this situation, the following control is performed:

Possible Effect without Warning	Smart key system does not function		
Warning Active Condition	The warning is activated when both of the following conditions are met: • The power switch is turned off after being left on (IG) for more than 20 minutes. • The key battery voltage is low.		
Warning Method	Combination Meter Assembly	Buzzer	-
		Multi-information Display	The following warning message is displayed for 15 seconds (and then automatically turned off).

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			• Key Battery Low
	Wireless Door Lock Buzzer Assembly		-
	Power Switch Illumination		-
Warning Stop Condition	The key battery is replaced with a new one.		

(10) Situation I

- A malfunction of the power management control ECU is detected.

In this situation, the following control is performed:

Possible Effect without Warning	Malfunction detection		
Warning Active Condition	A malfunction of the power management ECU is detected.		
Warning Method	Combination Meter Assembly	Buzzer	-
		Multi-information Display	-
	Wireless Door Lock Buzzer Assembly		-
	Power Switch Illumination		The amber indicator blinks at 2-second intervals (goes off automatically after 15 seconds).
Warning Stop Condition	The power management control ECU returns to normal.		

(11) Situation J

- There are two patterns for situation J.
  - Pattern 1:

    A warning message appears on the multi-information display when the driver does not follow the proper procedure to start the vehicle.

    In this situation, the following control is performed:

Possible Effects without Warning	Usability function
Warning Active Condition	The warning is activated when all of the following conditions are met: ○ The power switch is turned off. ○ Driver door is closed → opened. ○ The power switch is turned from off to on (ACC) more than twice with the hybrid vehicle control system off and brake pedal not depressed.

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Warning Method	Combination Meter Assembly	Buzzer	-
		Multi-information Display	The following warning message is displayed for 10 seconds (and then automatically turned off). ○ Depress Brake Pedal and Push Power Switch to Start
	Wireless Door Lock Buzzer Assembly		-
	Power Switch Illumination		-
Warning Stop Condition	The power switch is pushed with the brake pedal depressed.		

- Pattern 2:

A message indicating how to start the hybrid vehicle control system appears on the multi-information display when the shift lever is in a position in which the hybrid vehicle control system cannot be started.

In this situation, the following control is performed:

Possible Effects without Warning	Usability function		
Warning Active Condition	The warning is activated when all of the following conditions are met: ○ The hybrid vehicle control system is stopped. ○ The vehicle speed is 0 km/h (0 mph). ○ More than 0.5 seconds have elapsed after the power switch is turned on (IG). ○ The shift lever is R, N, D or B.		
Warning Method	Combination Meter Assembly	Buzzer	-
		Multi-information Display	The following warning message is displayed: ○ Shift to P Position to Start
	Wireless Door Lock Buzzer Assembly		-
	Power Switch Illumination		-
Warning Stop Condition	The warning is stopped when one of the following conditions is met: ○ The P position switch is pushed. ○ The shift lever is moved to N. ○ The vehicle speed is above 0 km/h (0 mph). ○ The power switch is turned off or on (ACC). ○ The hybrid vehicle control system is started.		

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(12) Situation K

- There are two patterns for situation K.
  - Pattern 1:

    When the power switch is pushed, the key cannot be detected in the vehicle two times in a row.

    In this situation, the following control is performed:

Possible Effects without Warning	Usability function		
Warning Active Condition	The warning is activated when all of the following conditions are met: ○ The immobiliser system is set. ○ The key is not in the vehicle. ○ When the power switch is turned on (ACC) or on (IG) , a certification error occurs two times in a row.		
Warning Method	Combination Meter Assembly	Buzzer	Sounds once
		Multi-information Display	The following warning message is displayed for 60 seconds (and then automatically turned off). ○ Depress Brake Pedal, Touch Power Switch with Key
	Wireless Door Lock Buzzer Assembly		-
	Power Switch Illumination		-
Warning Stop Condition	The warning is stopped when either of the following conditions is met: ○ The immobiliser system certification result is OK. ○ Key certification in the vehicle has stopped either because 30 seconds have elapsed after any of the doors is opened and closed, or because the brake pedal is depressed.		

  - Pattern 2:

    The driver attempts to start the hybrid vehicle control system after performing a driver door key linked unlock operation.

    In this situation, the following control is performed:

Possible Effects without Warning	Usability function
Warning Active Condition	The warning is activated when all of the following conditions are met: ○ A driver door key linked unlock operation is performed. ○ The immobiliser system is set. ○ The power switch is pushed.

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	○ The key is not in the vehicle.		
Warning Method	Combination Meter Assembly	Buzzer	Sounds once
		Multi-information Display	The following warning message is displayed for 60 seconds (and then automatically turned off). ○ Depress Brake Pedal, Touch Power Switch with Key
	Wireless Door Lock Buzzer Assembly		-
	Power Switch Illumination		-
Warning Stop Condition	The warning is stopped when either of the following conditions is met: ○ The immobiliser system certification result is OK. ○ The Key is returned to the vehicle.		

(13) Situation L

• A warning message appears on the multi-information display when the driver attempts to turn the power switch off with the shift lever in R, N, D or B.

In this situation, the following control is performed:

Possible Effects without Warning	Usability function		
Warning Active Condition	The warning is activated when both of the following conditions are met: • The shift lever in R, N, D or B. • The power switch is turned from on (IG) to on (ACC).		
Warning Method	Combination Meter Assembly	Buzzer	-
		Multi-information Display	The following warning message is displayed: • Shift to P Position and Push Power Switch Turn Power Off
	Wireless Door Lock Buzzer Assembly		-
	Power Switch Illumination		-
Warning Stop Condition	The warning is stopped when either of the following conditions is met: • The P position switch is pushed. • The power switch is turned to a mode other than on (ACC).		

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(14) Situation M

- A warning message appears on the multi-information display when automatic power off operation occurs.

In this situation, the following control is performed:

Possible Effects without Warning	Battery Saving function		
Warning Active Condition	The warning is activated when all of the following conditions are met: • Park (P) is selected. • The power switch is on (ACC) or on (IG). • The vehicle speed is 0 km/h (0 mph). • The hybrid vehicle control system is stopped. • The power source control system is turned off by automatic power off function.		
Warning Method	Combination Meter Assembly	Buzzer	-
		Multi-information Display	The following warning message is displayed for 10 seconds (and then automatically turned off). • Auto Power Off to Conserve Battery
	Wireless Door Lock Buzzer Assembly		-
	Power Switch Illumination		-
Warning Stop Condition	The power switch is turned to a mode other than off.		

(15) Situation N

- A warning message appears on the multi-information display when a key with a depleted battery is touched to the power switch while depressing the brake.

In this situation, the following control is performed:

Possible Effects without Warning	Malfunction detection		
Warning Active Condition	Key certification result is OK.*		
Warning Method	Combination Meter Assembly	Buzzer	Sounds once
		Multi-information Display	The following warning message is displayed for 10 seconds (and then automatically turned off). • Depress Brake Pedal and Push Power Switch to Start
	Wireless Door Lock Buzzer Assembly		-

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	Power Switch Illumination	The amber indicator blinks
Warning Stop Condition	The warning is stopped when either of the following conditions is met: • The hybrid vehicle control system is started. • The key is returned to the vehicle.	

*: This situation occurs following situation M.

(16) Situation O

• A warning message appears on the multi-information display when the vehicle starts moving without the registered key in the vehicle interior.

In this situation, the following control is performed:

Possible Effects without Warning	Hybrid vehicle control system cannot be restarted		
Warning Active Condition	When vehicle speed is detected after the key is removed from the vehicle, the warning is activated (only for first time).		
Warning Method	Combination Meter Assembly	Buzzer	Sounds once
		Multi-information Display	The following warning message is displayed: • Key not Detected
	Wireless Door Lock Buzzer Assembly		-
	Power Switch Illumination		-
Warning Stop Condition	The warning is stopped when either of the following conditions is met: • The power switch is turned off. • The key is returned the vehicle.		

12. BATTERY SAVING

(a) Vehicle Battery Saving Function

In the smart key system, signals are emitted outside the vehicle at a prescribed interval (0.25 seconds) when the doors are locked. Therefore, the vehicle battery could be drained if the vehicle remains parked for a long time. For this reason, the controls listed below are affected:

Condition	Control
Both conditions below are met for 5 days: • Key is not in detection area • Touch sensor or lock switch operation is not	Signal transmission interval is extended from 0.25 to 0.75 seconds

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Condition	Control
performed	
Both conditions below are met for 14 days: • Key is not in detection area • Touch sensor or lock switch operation is not performed	The smart key system is automatically deactivates

Reinstatement Conditions

- A wireless door lock control signal (lock, unlock) is input and the ID code matches.
- A user carries the key and touches a lock sensor on a door outside handle assembly.
- The driver door is locked or unlocked by the mechanical key.

(b) Key Battery and Vehicle Battery Saving Function

In the smart key system, if the key is constantly in the exterior detection area of the doors, the system maintains periodic communication with the key. Therefore, if the vehicle remains parked in that state for a long time, the key battery and vehicle battery could be drained. For this reason, if this state continues longer than 10 minutes, the smart key system automatically becomes deactivated.

Reinstatement Conditions

- A wireless door lock control signal (lock, unlock) is input and the ID code matches.
- A user carries the key and touches a lock sensor on a door outside handle assembly.
- A door is locked or unlocked by the mechanical key.

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HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

- Use the following procedure to troubleshoot the smart key system.
- *: Use the Techstream.

1.	VEHICLE BROUGHT TO WORKSHOP

NEXT

2.	CUSTOMER PROBLEM ANALYSIS

HINT:

- In troubleshooting, confirm that the problem symptoms have been accurately identified. Preconceptions should be discarded in order to make an accurate judgment. To clearly understand what the problem symptoms are, it is extremely important to ask the customer about the problem and the conditions at the time the malfunction occurred.
- Gather as much information as possible for reference. Past problems that seem unrelated may also help in some cases.
- The following 5 items are important points in the problem analysis:

What	Vehicle model, system name
When	Date, time, occurrence frequency
Where	Road conditions
Under what conditions?	Running conditions, driving conditions, weather conditions
How did it happen?	Problem symptoms

NEXT

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 before proceeding to the next step.

NEXT

4.	INSPECT COMMUNICATION FUNCTION OF CAN COMMUNICATION SYSTEM*

(a) Use the Techstream to check if the CAN communication system is functioning normally.

Result:

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Result	Proceed to
ECU connected, communication line is normal.	A
ECU connected, communication line is malfunctioning.	B

B ▶ INFO GO TO CAN COMMUNICATION SYSTEM

A ▼

5.	INSPECT COMMUNICATION FUNCTION OF LIN COMMUNICATION SYSTEM (LIN)*

(a) Use the Techstream to check if the LIN communication system (LIN) is functioning normally INFO.

Result:

Result	Proceed to
LIN DTC is not output.	A
LIN DTC is output.	B

B ▶ INFO GO TO LIN COMMUNICATION SYSTEM

A ▼

6.	CHECK FOR DTC*

(a) Check for DTCs and note any codes that are output.

(b) Clear the DTCs.

(c) Recheck for DTCs. Based on the DTCs output, try to cause the same engine immobiliser system DTC, wireless door lock control system DTC or smart key system (for start function) DTC to be output by simulating the symptoms indicated by the DTCs.

Result:

Result	Proceed to
DTC is not output.	A
Engine immobiliser system DTC is output.	B
Wireless door lock control system DTC is output.	C
Smart key system (for start function) DTC is output.	D

B ▶ INFO GO TO ENGINE IMMOBILISER SYSTEM
C ▶ INFO GO TO WIRELESS DOOR LOCK CONTROL SYSTEM SYSTEM
D ▶ INFO GO TO SMART KEY SYSTEM (for Start Function)

A ▼

7.	PROBLEM SYMPTOMS TABLE

(a) Refer to Problem Symptoms Table INFO.

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Result:

Result	Proceed to
Fault is not listed in Problem Symptoms Table.	A
Fault is listed in Problem Symptoms Table.	B

B ▶ Go to step 9

A

▼

8.	OVERALL ANALYSIS AND TROUBLESHOOTING*

(a) Operation Check INFO

(b) Data List / Active Test INFO

(c) Terminals of ECU INFO

NEXT

▼

9.	REPAIR OR REPLACEMENT

NEXT

▼

10.	CONFIRMATION TEST

NEXT ▶ **END**

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OPERATION CHECK

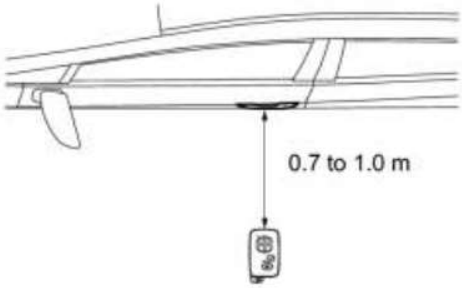
1. SMART KEY SYSTEM OPERATION INSPECTION

(a) Check the entry unlock function.

(1) Use the wireless lock operation to lock the doors. With the key outside the vehicle, touch a front door outside handle assembly (touch sensor) and check that the door unlocks.

(b) Check the entry unlock operation detection area.

(1) Step 1: Hold the key at the same height as the door outside handle assembly (approximately 0.8 m (2.62 ft.)). Make sure that the direction of the key is as shown in the illustration.



(2) Step 2: Check that when the key is brought within 0.7 to 1.0 m (2.30 to 3.28 ft.) of the vehicle, the system enters unlock standby mode.

HINT:

When the system enters unlock standby mode, the key LED illuminates.



(3) Step 3: After the system enters unlock standby mode, touch the door outside handle assembly (touch sensor) within 3 seconds. Check that the door unlocks.

NOTICE:

The key may not be able to communicate with the system within a 0.2 m (0.656 ft.) radius of each door outside handle assembly.

(4) Step 4: Repeat step 2 and 3 for the remaining front door.



(5) Step 5: Inspect the door outside handle assembly (touch sensor) response sensitivity. When the system is in unlock standby mode, check that touching the area shown in the illustration causes the door to unlock.

NOTICE:

When touching the highlighted area, touching too quickly or having extended contact may not trigger the sensor. In such a case, the door will not unlock.

(6) Step 6: Repeat step 5 for the remaining front door.

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(c) Check the entry lock function.

NOTICE:

If the key is in the cabin , but is not in a detection area (on the instrument panel, rear tray, in the glove box, or on the floor), the key confinement function may not operate. This can result in the key confinement.



(1) Step 1: Confirm that all the doors lock when a lock sensor on a front door outside handle is touched with all the doors closed and unlocked while the key is outside the vehicle.



(2) Step 2: Inspect the smart door lock detection area. Hold the key 0.1 m (0.328 ft.) below the window (about 1 m (3.28 ft.) above the ground). Move the key about 0.3 m (0.984 ft.) away from the vehicle and touch the lock sensor as shown in the illustration to check that the all doors lock.

- Due to the key being unable to communicate with the system from within 0.2 m (0.656 ft.) of the door handle, the lock sensor may not operate when the lock sensor is touched by the same hand that is holding the key.
- If the key confinement prevention function buzzer sounds, radio waves from the indoor electrical oscillator may be leaking from the vehicle.

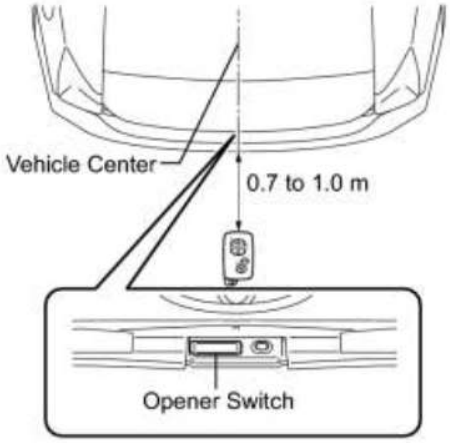
(d) Check the entry system back door open function.*

*: w/ Entry System Back Door Open Function

(1) Close the back door. With the key outside the vehicle, check that pushing the back door opener switch assembly opens the back door.

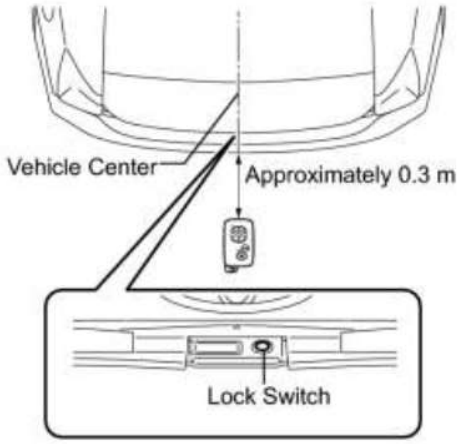
(2) Inspect the entry back door open operation detection area. Hold the key at the same height as the back door opener switch assembly (approximately 0.8 m (2.62 ft.)) aligning it with the center of the rear of the vehicle. Make sure that the direction of the key is as shown in the illustration. Check that when the key is brought within 0.7 to 1.0 m (2.30 to 3.28 ft.) of the vehicle, pushing the back door opener switch assembly (opener switch) opens the back door.

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(e) Check the entry back door lock function.*

*: w/ Entry System Back Door Open Function



(1) Close all of the vehicle doors. With the key in your possession outside the vehicle, check that pushing the back door opener switch assembly (lock switch) locks all the doors.

- When pressing the lock switch, hold the key about 1 m (3.28 ft.) above the ground and about 0.3 m (0.984 ft.) away from the vehicle as shown in the illustration.
- Due to the key being unable to communicate with the system from within 0.2 m (0.656 ft.) of the door handle, the lock sensor may not operate when the lock sensor is touched by the same hand that is holding the key.
- If the key confinement prevention function buzzer sounds, radio waves from the indoor electrical oscillator may be leaking from the vehicle.

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(f) Check the entry hybrid vehicle control system start function.

(1) While holding the key, confirm that the power switch indicator light illuminates green when the power switch is off, park (P) is selected and the brake pedal is depressed. With the power switch indicator illuminates green, confirm that the hybrid vehicle control system starts when the power switch is pressed.

(2) While holding the key, confirm that the power switch turns off → on (ACC) → on (IG) → off every time the power switch is pressed when the brake pedal is not depressed.

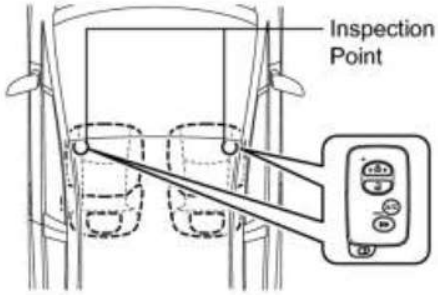
HINT:

When the power switch is pressed with the power switch on (IG) and the shift lever is in R, N, D or B, the power switch will not turn off but remain on (ACC).

(3) With the hybrid vehicle control system running, vehicle stopped and park (P) selected, confirm that pressing the power switch turns the hybrid vehicle control system off, and opening the driver door.

HINT:

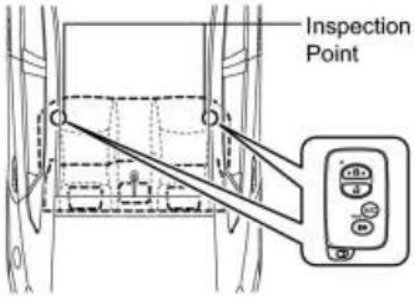
When the power switch is pressed with the power switch on (IG) and wthe shift lever is in R, N, D or B, the power switch will not turn off but remain on (ACC).



(4) Inspect the detection area for the entry hybrid vehicle control system start function (for front floor). Make sure that the direction of the key is as shown in the illustration. When the key is in either of the 2 inspection points shown in the illustration, check that the hybrid vehicle control system can start.

NOTICE:

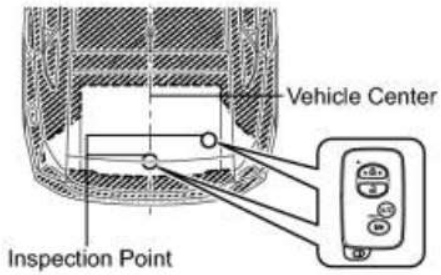
The hybrid vehicle control system may not start when the key is on the instrument panel, rear package tray or in the glove box.



(5) Inspect the detection area for the entry hybrid vehicle control system start function (for center floor). Make sure that the direction of the key is as shown in the illustration. When the key is in either of the 2 inspection points shown in the illustration, check that the hybrid vehicle control system can start.

NOTICE:

The hybrid vehicle control system may not start when the key is on the instrument panel, rear package tray or in the glove box.



(6) Inspect the detection area for the entry hybrid vehicle control system start function (for rear floor). Make sure that the direction of the key is as shown in the illustration. When the key is in either of the 2 inspection points shown in the illustration, check that the hybrid vehicle control system can start.

NOTICE:

The hybrid vehicle control system may not start when the key is on the instrument panel, rear package tray or in the glove box.

(g) Check the key confinement prevention function (in cabin)

NOTICE:

Perform this check with a window open to prevent key confinement.

(1) Turn the power switch off.

(2) Put the key on a front seat or a rear seat.

(3) Close all the doors (all doors are in unlocked state).

(4) Confirm that the door lock does not operate but the wireless door lock buzzer sounds for 10 seconds when a front door lock sensor is touched.

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(h) Check the key cancel function.

(1) While the power switch is on (IG), check that the back door opener switch assembly (opener switch) is the only switch that can be operated in the smart key system.

(2) While the key cancel function (smart key system cancel function) is on, check that all functions of the smart key system cannot be operated.

(i) Check the answer-back function (hazard warning light flashing and buzzer sounding).

Entry Operation	Hazard Warning Light	Buzzer
Entry Door Lock	Flashes once	Sounds once
Entry Door Unlock	Flashes twice	Sounds twice
Entry System Back Door Open Function	Does not flash	Does not sound

(j) Check that the key reminder warning buzzer sounds.

(1) With the key inside the vehicle, close the driver door. Then turn the power switch off or on (ACC).

(2) Open the driver door and check that the buzzer sounds intermittently.

(k) Check that the key reminder warning buzzer stops.

(1) When the buzzer is sounding, check that the buzzer stops sounding if either of the following is performed:

- Close the driver door (front door courtesy light switch is off).
- Turn the power switch on (IG).

2. KEY DIAGNOSTIC MODE

HINT:

Key diagnostic mode checks if the key within a selected oscillator detection area is operating normally. The results are output through the wireless door lock buzzer assembly.

(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 / Utility / Key Communication Check.

(e) Check the values by referring to the table below.

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

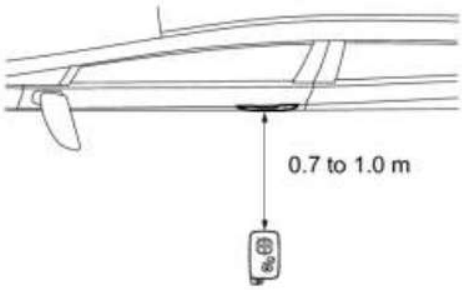
Tester Display	Inspection Range
Overhead + Driver Side*1	Door electrical key oscillator (for driver side)

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Tester Display	Inspection Range
Overhead + Passenger Side*2	Door electrical key oscillator (for front passenger side)*
Overhead + Front Room*3	Indoor electrical key oscillator (for front floor)
Overhead + Rear Room*4	Indoor electrical key oscillator (for center floor)
Overhead + Back Door (inside)*5	Indoor electrical key oscillator (for rear floor)
Overhead + Back Door*6	Outside electrical key oscillator (for rear side)*

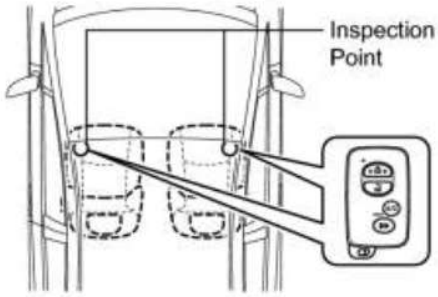
*: w/ Entry System Back Door Open Function

(f) When the key is brought near the selected oscillator, check that the wireless door lock buzzer sounds.



(1) *1: Door electrical key oscillator (for driver side)

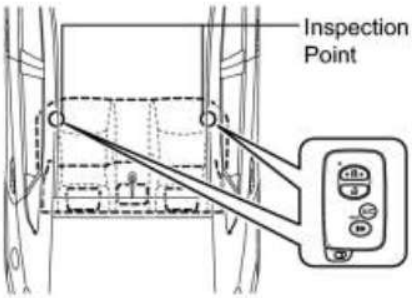
- Hold the key at the same height as the door outside handle assembly (0.7 to 1.0 m (2.30 to 3.28 ft.)). Make sure that the direction of the key is as shown in the illustration.
- *2: Perform the same inspection above for the door electrical key oscillator (for front passenger side).



(2) *3: Indoor electrical key oscillator (for front floor)

HINT:

Place the key on the driver or front passenger seat cushion.



(3) *4: Indoor electrical key oscillator (for center floor)

HINT:

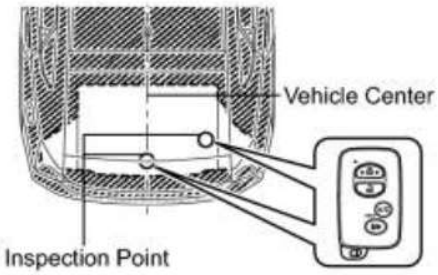
Place the key on the rear seat cushion.

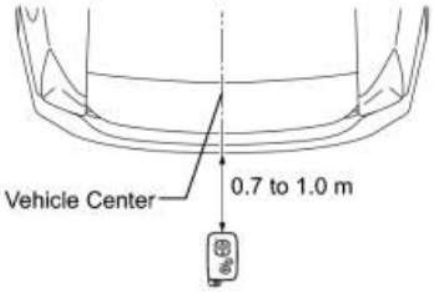
(4) *5: Indoor electrical key oscillator (for rear floor)

HINT:

Place the key on the luggage area.

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(5) *6: Outside electrical key oscillator (for rear side)

HINT:

Hold the key at the same height as the rear bumper upper surface and align with the center of the rear of the vehicle (0.7 to 1.0 m (2.30 to 3.28 ft.)). Make sure that the direction of the key is as shown in the illustration.

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CUSTOMIZE PARAMETERS

1. CUSTOMIZING FUNCTION WITH TECHSTREAM

HINT:

The items in the table below can be customized.

NOTICE:

- When the customer requests a change in a function, first make sure that the function can be customized.
- Be sure to make a note of the current setting before customizing.
- When troubleshooting a function, first make sure that the function is set to the default setting.

(a) Connect the Techstream to the DLC3.

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

(c) Turn the Techstream on.

(d) Enter the following menus: Customize Setting.

(e) Select the setting by referring to the table below.

Smart Key / Access

Tester Display	Default	Content	Setting
Park Wait Time	2.5 s	Function that sets waiting time to permit opening door after door is locked with entry lock function	0.5 s, 1.5 s, 2.5 s or 5 s
Ignition Available Area	All	Function that switches the entry hybrid vehicle control system start detection area	Front or All*1
Back Door Opening Operation*2	Long	Function that opens the back door when the driver has the key and presses back door opener switch assembly (opener switch)	Long, Twice or OFF

- *1: Weak radio waves will still be emitted from oscillators other than the front oscillator even when the "Front" customize setting is selected.
- *2: w/ Entry System Back Door Open Function

Warning

Tester Display	Default	Content	Setting
Key Low Battery Warning	ON	Function that warns driver that the key battery is weak	ON or OFF

2. ENTRY UNLOCK MODE SWITCHING*

*: except for Korea and Mexico

(a) To change the vehicle entry unlock mode, make sure that the vehicle power is off and simultaneously push and hold the lock switch and another switch on the key for 5 seconds.

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Driver door unlock default setting:

When the switches are pressed and held for 5 seconds, the entry door unlock mode changes to the mode that is not currently selected.

NOTICE:

After pressing and holding the switches for 5 seconds, wait 5 seconds before performing the same procedure again.

- Driver door unlock mode:

  When the driver door touch sensor is touched, only the driver door unlocks. When another touch sensor is touched, all doors unlock.*

  *: w/ Entry System Back Door Open Function

- All door unlock mode:

  When any touch sensor is touched, all doors unlock.

(b) The certification ECU (smart key ECU assembly) receives this signal from the door control receiver assembly and changes the smart key system to entry unlock mode.

(c) The certification ECU (smart key ECU assembly) sounds the buzzers of the wireless door lock buzzer assembly.

Mode	Wireless Door Lock Buzzer Assembly
Driver Door (Default)	Sounds 3 times
All Doors (Customized)	Sounds 2 times

HINT:

The procedure only changes entry unlock mode of the smart key system. It does not switch the unlocking of the wireless door lock control.

3. ELECTRICAL KEY CANCEL

The electrical key cancel operation disables the following functions:

- Entry Unlock/Lock
- Entry Hybrid Vehicle Control System Start
- Entry System Back Door Open Function*

  *: w/ Entry System Back Door Open Function

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- Electrical Key Lock-in Prevention
- Warning

(a) The operation procedure is as follows:

Precondition:

Power switch off, driver door closed and unlocked.

(1) Push the unlock switch of the key once.

(2) Open the driver door within 5 seconds.

(3) Push the unlock switch of the key twice within 5 seconds.

(4) Close and open the driver door twice within 30 seconds.

(Driver door: Close → Open → Close → Open)

(5) Push the unlock switch of the key twice within 5 seconds.

(6) Close and open the driver door within 30 seconds.

(Driver door: Close → Open)

(7) Close the driver door within 5 seconds.

When electrical key cancel is activated, the wireless door lock buzzer sounds twice.

To return to the original condition, perform the procedure again. When the original condition is returned, the wireless door lock buzzer sounds once.

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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.

Smart Key System

Symptom	Suspected Area	See page
Entry answer-back buzzer does not sound	Wireless door lock control system	INFO
	Certification ECU (smart key ECU assembly)	-
All door entry lock/unlock functions and wireless functions do not operate	Power door lock control system	INFO
	Key (for Standard)	-
	Key battery	-
	Fuse (ECU-B, ECU-B2)	-
	Wire harness or connector	-
	Door control receiver assembly	-
	Certification ECU (Smart key ECU assembly)	-
All door entry lock/unlock functions do not operate, but wireless functions operate*1	Power door lock control system	INFO
	Key	-
	Certification ECU (Smart key ECU assembly)	-
Door entry lock/unlock functions do not operate, but wireless functions operate*2	Power door lock control system	INFO
	Key	-
	Certification ECU (Smart key ECU assembly)	-
	Front door outside handle assembly (for driver side)	INFO
	Certification ECU (Smart key ECU assembly)	-
	Wire harness or connector	-
Driver side door entry unlock function does not operate	Power door lock control system	INFO
	Front door outside handle assembly (for driver side)	-
	Certification ECU (Smart key ECU assembly)	-
	Wire harness or connector	-
Front passenger side door entry unlock function does not	Power door lock control system	INFO

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Symptom	Suspected Area	See page
operate*1	Front door outside handle assembly (for front passenger side)	-
	Certification ECU (Smart key ECU assembly)	-
	Wire harness or connector	-
Driver side door entry lock and unlock functions do not operate*1	Power door lock control system	INFO
	Front door outside handle assembly (for driver side)	-
	Certification ECU (Smart key ECU assembly)	-
	Wire harness or connector	-
Front passenger side door entry lock and unlock functions do not operate*1	Power door lock control system	INFO
	Front door outside handle assembly (for front passenger side)	-
	Certification ECU (Smart key ECU assembly)	-
	Wire harness or connector	-
Driver side door entry lock function does not operate	Power door lock control system	INFO
	Front door outside handle assembly (for driver side)	-
	Certification ECU (Smart key ECU assembly)	-
	Wire harness or connector	-
Front passenger side door entry lock function does not operate*1	Power door lock control system	INFO
	Front door outside handle assembly (for front passenger side)	-
	Certification ECU (Smart key ECU assembly)	-
	Wire harness or connector	-
Room oscillator does not recognize key	Indoor electrical key oscillator (for front floor)	INFO
	Indoor electrical key oscillator (for center floor)	-
	Indoor electrical key oscillator (for rear floor)	-
	Certification ECU (Smart key ECU assembly)	-
	Wire harness or connector	-
Entry interior alarm does not sound	Meter/gauge system	INFO
	Certification ECU (Smart key ECU	-

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Symptom	Suspected Area	See page
	assembly)	
Back door entry unlock function does not operate*1	Power door lock control system	INFO
	Back door opener switch assembly	-
	Certification ECU (Smart key ECU assembly)	-
	Wire harness or connector	-
Back door entry lock and unlock functions do not operate*1	Power door lock control system	INFO
	Outside electrical key oscillator (for rear side)	-
	Certification ECU (Smart key ECU assembly)	-
	Back door opener switch assembly	-
	Wire harness or connector	-
Back door entry lock function does not operate*1	Power door lock control system	INFO
	Back door opener switch assembly	-
	Certification ECU (Smart key ECU assembly)	-
	Wire harness or connector	-

- *1: w/ Entry System Back Door Open Function
- *2 w/o Entry System Back Door Open Function

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TERMINALS OF ECU

1. CHECK CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

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

Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
L62-1 (+B) - Body ground	B - Body ground	+B power supply	Always	11 to 14 V
L62-15 (E) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
L62-17 (CUTB) - Body ground	Y - Body ground	Dark current cut fuse pin input signal	Always	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 voltage and check for pulses according to the value(s) in the table below.

Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
L62-3 (CLG1) - L62-15 (E)	G - W-B	Door electrical key oscillator (for driver side) sensor signal	• Power switch off • All doors closed • Key not in cabin	No pulse generation
L62-3 (CLG1) - L62-15 (E)	G - W-B	Door electrical key oscillator (for driver side) sensor signal	• Power switch off • All doors closed • Key not in cabin • All doors locked by	Pulse generation

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Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
			wireless lock function	
L62-4 (CG1B) - L62-15 (E)	R - W-B	Door electrical key oscillator (for driver side) sensor signal	• Power switch off • All doors closed • Key not in cabin	No pulse generation
L62-4 (CG1B) - L62-15 (E)	R - W-B	Door electrical key oscillator (for driver side) sensor signal	• Power switch off • All doors closed • Key not in cabin • All doors locked by wireless lock function	Pulse generation
L62-5 (CLG2) - L62-15 (E)*	G - W-B	Door electrical key oscillator (for front passenger side) sensor signal	• Power switch off • All doors closed • Key not in cabin	No pulse generation
L62-5 (CLG2) - L62-15 (E)*	G - W-B	Door electrical key oscillator (for front passenger side) sensor signal	• Power switch off • All doors closed • Key not in cabin • All doors locked by wireless lock function	Pulse generation
L62-6 (CG2B) - L62-15 (E)*	R - W-B	Door electrical key oscillator (for front passenger side) sensor signal	• Power switch off • All doors closed • Key not in cabin	No pulse generation
L62-6 (CG2B) - L62-15 (E)*	R - W-B	Door electrical key oscillator (for front passenger side) sensor signal	• Power switch off • All doors closed • Key not in cabin • All doors locked by wireless lock function	Pulse generation
L62-7 (CLG5) - L62-15 (E)	G - W-B	Indoor electrical key oscillator (for front floor) sensor signal	• Power switch off • All doors closed • Key not in cabin • Door outside handle assembly (lock sensor) not touched	No pulse generation
L62-7 (CLG5) - L62-15 (E)	G - W-B	Indoor electrical key oscillator (for front floor) sensor signal	• Power switch off • All doors closed • Key not in cabin • Door outside handle assembly (lock sensor) touched	Pulse generation

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Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
L62-8 (CG5B) - L62-15 (E)	R - W-B	Indoor electrical key oscillator (for front floor) sensor signal	• Power switch off • All doors closed • Key not in cabin • Door outside handle assembly (lock sensor) not touched	No pulse generation
L62-8 (CG5B) - L62-15 (E)	R - W-B	Indoor electrical key oscillator (for front floor) sensor signal	• Power switch off • All doors closed • Key not in cabin • Door outside handle assembly (lock sensor) touched	Pulse generation
L62-16 (IG) - Body ground	BE - Body ground	IG power supply	Power switch off	Below 1 V
L62-16 (IG) - Body ground	BE - Body ground	IG power supply	Power switch on (IG)	11 to 14 V
L62-18 (TSW1) - L62-15 (E)	B - W-B	Lock sensor (for driver side) detection signal	• Power switch off • All doors closed • Lock sensor (for driver side) not touched	Pulse generation
L62-18 (TSW1) - L62-15 (E)	B - W-B	Lock sensor (for driver side) detection signal	• Power switch off • All doors closed • Lock sensor (for driver side) touched	Below 2 V
L62-19 (TSW2) - L62-15 (E)*	B - W-B	Lock sensor (for front passenger side) detection signal	• Power switch off • All doors closed • Lock sensor (for front passenger side) not touched	Pulse generation
L62-19 (TSW2) - L62-15 (E)*	B - W-B	Lock sensor (for front passenger side) detection signal	• Power switch off • All doors closed • Lock sensor (for front passenger side) touched	Below 2 V
L62-20 (SEN1) - L62-15 (E)	Y - W-B	Touch sensor (for driver side) detection signal	• Power switch off • All doors closed • Key not in detection area • Touch sensor (for driver side) not touched	Pulse generation

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Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
L62-20 (SEN1) - L62-15 (E)	Y - W-B	Touch sensor (for driver side) detection signal	• Power switch off • All doors closed • Key not in detection area • Touch sensor (for driver side) touched	Below 2 V
L62-21 (SEN2) - L62-15 (E)*	Y - W-B	Touch sensor (for front passenger side) detection signal	• Power switch off • All doors closed • Key not in detection area • Touch sensor (for front passenger side) not touched	Pulse generation
L62-21 (SEN2) - L62-15 (E)*	Y - W-B	Touch sensor (for front passenger side) detection signal	• Power switch off • All doors closed • Key not in detection area • Touch sensor (for front passenger side) touched	Below 2 V
L62-22 (TSW5) - L62-15 (E)*	GR - W-B	Back door opener switch assembly (opener switch) signal	Back door opener switch assembly (opener switch) not pushed	Pulse generation
L62-22 (TSW5) - L62-15 (E)*	GR - W-B	Back door opener switch assembly (opener switch) signal	Back door opener switch assembly (opener switch) pushed	Below 1 V
L62-23 (TSW6) - L62-15 (E)*	LG - W-B	Back door opener switch assembly (lock switch) signal	Back door opener switch assembly (lock switch) not pushed	Pulse generation
L62-23 (TSW6) - L62-15 (E)*	LG - W-B	Back door opener switch assembly (lock switch) signal	Back door opener switch assembly (lock switch) pushed	Below 1 V
L62-24 (CLG6) - L62-15 (E)	GR - W-B	Indoor electrical key oscillator (for center floor) sensor signal	• Power switch off • All doors closed • Key not in cabin • Door outside handle assembly (lock sensor) not touched	No pulse generation
L62-24 (CLG6) - L62-15 (E)	GR - W-B	Indoor electrical key oscillator (for center floor) sensor signal	• Power switch off • All doors closed • Key not in cabin • Door outside handle assembly (lock sensor)	Pulse generation

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Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
			touched	
L62-25 (CG6B) - L62-15 (E)	BR - W-B	Indoor electrical key oscillator (for center floor) sensor signal	• Power switch off • All doors closed • Key not in cabin • Door outside handle assembly (lock sensor) not touched	No pulse generation
L62-25 (CG6B) - L62-15 (E)	BR - W-B	Indoor electrical key oscillator (for center floor) sensor signal	• Power switch off • All doors closed • Key not in cabin • Door outside handle assembly (lock sensor) touched	Pulse generation
L62-26 (CLG7) - L62-15 (E)	G - W-B	Indoor electrical key oscillator (for rear floor) sensor signal	• Power switch off • All doors closed • Key not in cabin • Door outside handle assembly (lock sensor) not touched	No pulse generation
L62-26 (CLG7) - L62-15 (E)	G - W-B	Indoor electrical key oscillator (for rear floor) sensor signal	• Power switch off • All doors closed • Key not in cabin • Door outside handle assembly (lock sensor) touched	Pulse generation
L62-27 (CG7B) - L62-15 (E)	R - W-B	Indoor electrical key oscillator (for rear floor) sensor signal	• Power switch off • All doors closed • Key not in cabin • Door outside handle assembly (lock sensor) not touched	No pulse generation
L62-27 (CG7B) - L62-15 (E)	R - W-B	Indoor electrical key oscillator (for rear floor) sensor signal	• Power switch off • All doors closed • Key not in cabin • Door outside handle assembly (lock sensor) touched	Pulse generation
L62-32 (POS1) - L62-15 (E)	L - W-B	Lock or unlock sensor (for driver side) output signal	Power switch off	9 to 14 V

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Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
L62-32 (POS1) - L62-15 (E)	L - W-B	Lock or unlock sensor (for driver side) output signal	Power switch on (IG)	Below 2 V
L62-33 (POS2) - L62-15 (E)*	L - W-B	Lock or unlock sensor (for front passenger side) output signal	Power switch off	9 to 14 V
L62-33 (POS2) - L62-15 (E)*	L - W-B	Lock or unlock sensor (for front passenger side) output signal	Power switch on (IG)	Below 2 V
L63-5 (RC0) - L62-15 (E)	R - W-B	Door control receiver power source	• Power switch off • Lock or unlock switch on key not pushed	Below 1 V
L63-5 (RC0) - L62-15 (E)	R - W-B	Door control receiver power source	• Power switch off • Lock or unlock switch on key pushed	4.5 to 5.5 V
L63-15 (RDA) - L62-15 (E)	Y - W-B	Door control receiver data input signal	Power switch off	Pulse between 11 to 14 V occurs regularly
L63-16 (RSSI) - L62-15 (E)	V - W-B	Door control receiver electric wave existence signal	• Power switch off • All doors locked • Lock or unlock switch on key not pushed	11 to 14 V
L63-16 (RSSI) - L62-15 (E)	V - W-B	Door control receiver electric wave existence signal	• Power switch off • All doors locked • Lock or unlock switch on key pushed	Below 2 V
L63-19 (CLG8) - L62-15 (E)*	G - W-B	Outside electrical key oscillator (for rear side) sensor signal	• Power switch off • All doors closed • Back door opener switch assembly off	No pulse generation
L63-19 (CLG8) - L62-15 (E)*	G - W-B	Outside electrical key oscillator (for rear side) sensor signal	• Power switch off • All doors closed • Back door opener switch assembly on	Pulse generation
L63-20 (CG8B) - L62-15 (E)*	R - W-B	Outside electrical key oscillator (for rear side) sensor signal	• Power switch off • All doors closed • Back door opener switch assembly off	No pulse generation
L63-20 (CG8B) -	R - W-B	Outside electrical key	• Power switch off	Pulse generation

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Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
L62-15 (E)*		oscillator (for rear side) sensor signal	• All doors closed • Back door opener switch assembly on	

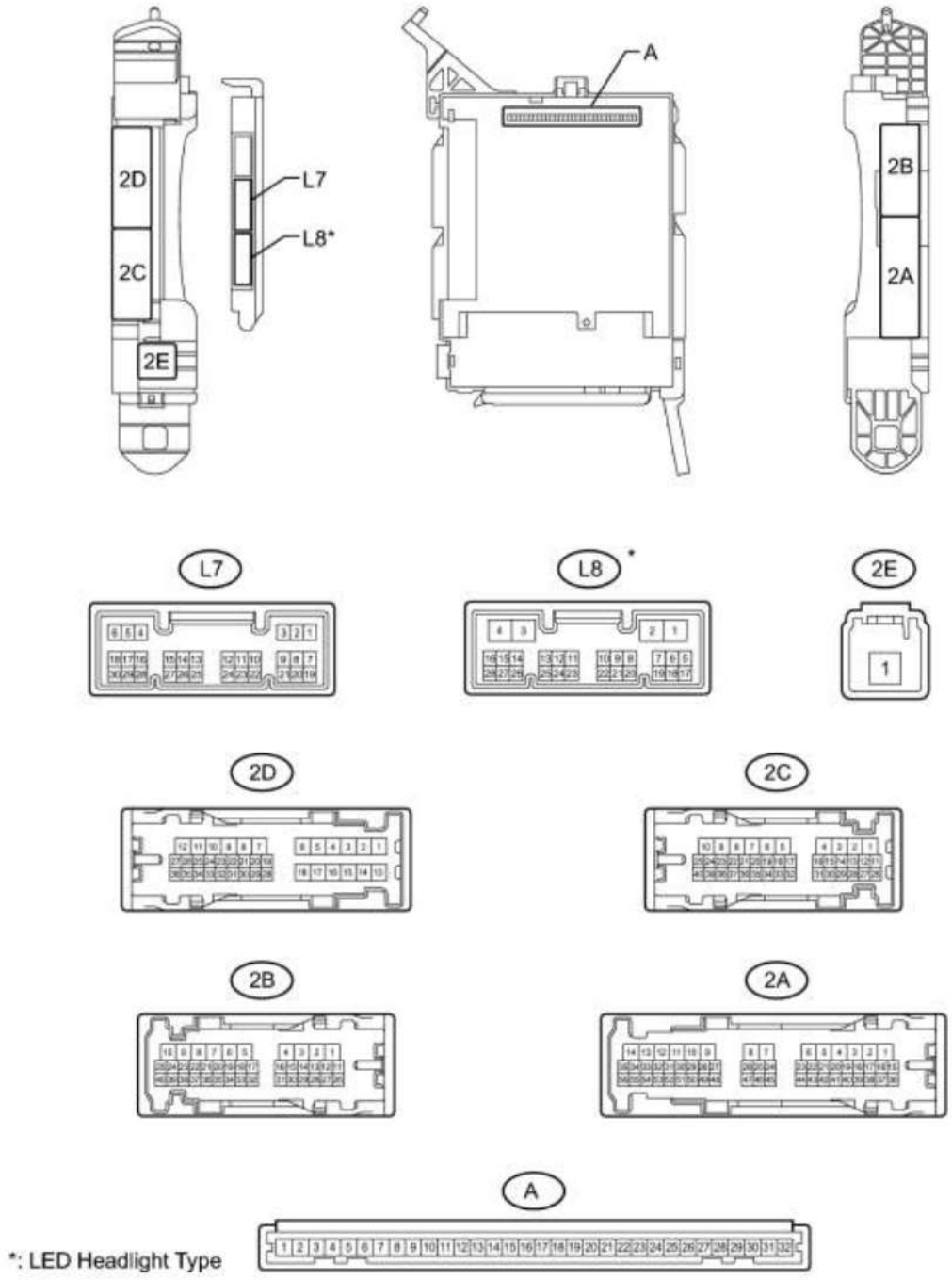
- *: w/ Entry System Back Door Open Function

If the result is not as specified, the certification ECU (smart key ECU assembly) may have a malfunction.

2. CHECK INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY AND MAIN BODY ECU (MULTIPLEX NETWORK BODY ECU)

(a) Disconnect the 2B and 2C junction block connectors.

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(b) Disconnect the A main body ECU connector.

(c) 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.

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Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
2B-6 (GND1) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
2C-18 (BECU) - Body ground	Y - Body ground	Battery power supply	Power switch off	11 to 14 V
L8-3 (GND2) - Body ground*	W-B - Body ground	Ground	Always	Below 1 Ω
A-29 (ACC) - Body ground	-	ACC power supply	Power switch on (ACC)	11 to 14 V
A-29 (ACC) - Body ground	-	ACC power supply	Power switch off	Below 1 V
A-31 (ALTB) - Body ground	-	Battery power supply	Power switch off	11 to 14 V
A-32 (IG) - Body ground	-	Power switch power supply	Power switch on (IG)	11 to 14 V
A-32 (IG) - Body ground	-	Power switch power supply	Power switch off	Below 1 V

*: LED Headlight Type

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

(d) Reconnect the 2B and 2C junction block connectors.

(e) Reconnect the A main body ECU connector.

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

Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
2B-1 (ACT-) - Body ground	B - Body ground	Door lock motor unlock drive output (except driver side)	Driver or front passenger side door control switch off	Below 1 V
2B-1 (ACT-) - Body ground	B - Body ground	Door lock motor unlock drive output (except driver side)	Driver or front passenger side door control switch unlocked	11 to 14 V
2B-8 (ACT+) - Body ground	LG - Body ground	Door lock motor lock drive output (all doors)	Driver or front passenger side door control switch off	Below 1 V
2B-8 (ACT+) - Body ground	LG - Body ground	Door lock motor lock drive output (all doors)	Driver or front passenger side door control switch locked	11 to 14 V
2B-5 (ACTD) - Body ground	B - Body ground	Driver side door lock motor unlock drive output	Driver or front passenger side door control switch off	Below 1 V
2B-5 (ACTD) - Body ground	B - Body ground	Driver side door lock motor unlock drive output	Driver or front passenger side door control switch unlocked	11 to 14 V

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Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
2D-36 (FRCY) - Body ground	BR - Body ground	Front passenger side door courtesy switch input	Front passenger side door open	Below 1 V
2D-36 (FRCY) - Body ground	BR - Body ground	Front passenger side door courtesy switch input	Front passenger side door closed	11 to 14 V
2D-35 (FLCY) - Body ground	V - Body ground	Driver side door courtesy switch input	Driver door open	Below 1 V
2D-35 (FLCY) - Body ground	V - Body ground	Driver side door courtesy switch input	Driver door closed	11 to 14 V
2D-25 (LSR) - Body ground	GR - Body ground	Rear door LH lock position switch input	Rear door LH unlocked	Below 1 V
2D-25 (LSR) - Body ground	GR - Body ground	Rear door LH lock position switch input	Power switch off, all doors closed and rear door LH locked	11 to 14 V
2B-29 (LSR) - Body ground	GR - Body ground	Rear door RH lock position switch input	Rear door RH unlocked	Below 1 V
2B-29 (LSR) - Body ground	GR - Body ground	Rear door RH lock position switch input	Power switch off, all doors closed and rear door RH locked	11 to 14 V
L7-6 (LRCY) - Body ground	G - Body ground	Rear door courtesy light switch input	Rear door open	Below 1 V
L7-6 (LRCY) - Body ground	G - Body ground	Rear door courtesy light switch input	Rear door closed	11 to 14 V
L7-7 (LSFL) - Body ground	GR - Body ground	Driver door lock position switch input	Driver door unlocked	Below 1 V
L7-7 (LSFL) - Body ground	GR - Body ground	Driver door lock position switch input	Power switch off, all doors closed and driver door locked	11 to 14 V
L7-9 (L1) - Body ground	LG - Body ground	Front passenger side door control switch input	Front passenger side door control switch locked	Below 1 V
L7-9 (L1) - Body ground	LG - Body ground	Front passenger side door control switch input	Front passenger side door control switch off	11 to 14 V
L7-10 (UL1) - Body ground	BR - Body ground	Front passenger side door control switch input	Front passenger side door control switch unlocked	Below 1 V
L7-10 (UL1) - Body ground	BR - Body ground	Front passenger side door control switch input	Front passenger side door control switch off	11 to 14 V
L7-11 (L2) - Body ground	G - Body ground	Driver door key-linked lock input	Driver door key cylinder turned to lock	Below 1 V
L7-11 (L2) - Body ground	G - Body ground	Driver door key-linked lock input	Driver door key cylinder off	11 to 14 V
L7-18 (LSFR) - Body ground	LG - Body ground	Front passenger side door lock position switch input	Front passenger side door unlocked	Below 1 V
L7-18 (LSFR) - Body ground	LG - Body ground	Front passenger side door lock position switch input	Power switch off, all doors closed and front passenger side door locked	11 to 14 V
L7-19 (BCTY) -	L - Body	Back door courtesy light	Back door open	Below 1 V

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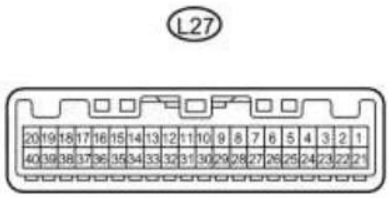
Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
Body ground	ground	switch input		
L7-19 (BCTY) - Body ground	L - Body ground	Back door courtesy light switch input	Back door closed	11 to 14 V
L7-23 (BDSU) - Body ground*1	GR - Body ground	Back door opener switch input	Back door opener switch pushed	Below 1 V
L7-23 (BDSU) - Body ground*1	GR - Body ground	Back door opener switch input	Back door opener switch not pushed	11 to 14 V
L7-24 (UL3) - Body ground	GR - Body ground	Driver door key-linked unlock input	Driver door key cylinder turned to unlock	Below 1 V
L7-24 (UL3) - Body ground	GR - Body ground	Driver door key-linked unlock input	Driver door key cylinder off	11 to 14 V

- *1: w/o Entry System Back Door Open Function

If the result is not as specified, the main body ECU (multiplex network body ECU) may have a malfunction.

3. COMBINATION METER ASSEMBLY

(a) Disconnect the L27 combination meter assembly connector.



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 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
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.

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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

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

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DIAGNOSIS SYSTEM

1. DESCRIPTION

(a) The certification ECU (smart key ECU assembly) control the vehicle smart key system functions. Smart key 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 smart key system. 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.

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DTC CHECK / CLEAR

1. CHECK 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. CLEAR 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.

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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 or Main Body / 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
D-Door Touch Sensor	Driver side door touch sensor / ON or OFF	ON: Sensor touched OFF: Sensor not touched	-
P-Door Touch Sensor*1	Front passenger side door touch sensor / ON or OFF	ON: Sensor touched OFF: Sensor not touched	-
D-Door Trigger Switch	Driver side door lock sensor / ON or OFF	ON: Sensor touched OFF: Sensor not touched	-
P-Door Trigger Switch*1	Front passenger side door lock sensor / ON or OFF	ON: Sensor touched OFF: Sensor not touched	-
Tr/B-Door Lock SW*1	Back door opener switch assembly (lock switch) / ON or OFF	ON: Back door opener switch assembly (lock switch) pushed OFF: Back door opener switch assembly (lock switch) not pushed	-
Tr/B-Door Unlock	Back door opener switch assembly	ON: Back door opener switch	-

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Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
SW*1	(opener switch) / ON or OFF	assembly (opener switch) pushed OFF: Back door opener switch assembly (opener switch) not pushed	
Ignition Switch	Power switch on (IG) / ON or OFF	ON: Power switch on (IG) or hybrid vehicle control system started OFF: Power switch off	-
Unmatched Vehicle-ID	No communication condition between vehicle and key (vehicle-ID) / Yes or No	Yes: Key ID code not matched to vehicle No: Key ID code matched to vehicle	-
No Response	No communication condition between vehicle and key (response) / Yes or No	Yes: Key ID code not matched to vehicle No: Key ID code matched to vehicle	-
Unmatch Code or Form	No communication condition between vehicle and key (response code and format) / Yes or No	Yes: Key ID code not matched to vehicle No: Key ID code matched to vehicle	-
Key Low Battery	Low key battery / Yes or No	Yes: Key battery voltage low No: Key battery voltage normal	-
Power Save Cnt 10 Min	Power save counter - 10 minutes / Min: 0; Max: 255	Within range from 0 to 255	-
Power Save Cnt 5 Day	Power save counter - 5 days / Min: 0; Max: 255	Within range from 0 to 255	-
Power Save Cnt 14 Day	Power save counter - 14 days / Min: 0; Max: 255	Within range from 0 to 255	-
ID Code Difference(Resp)	No communication condition between vehicle and key (ID code) / Yes or No	Yes: Key ID code not matched to vehicle No: Key ID code matched to vehicle	-
C Code Difference	No communication condition between vehicle and key (challenge code) / Yes or No	Yes: Key ID code not matched to vehicle No: Key ID code matched to vehicle	-

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Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Auto Entry Cancel SW	Entry function cancel / ON or OFF	Mode status displayed	-
Door Unlock Mode2*2	Door Unlock Mode / All or Driver	Mode status displayed	-
Ignition Available Area	Ignition available area / Front or All	Customization status displayed	-
Parking Wait Time	Parking wait time / 0.5s, 1.5s, 2.5s or 5s	Customization status displayed	-
B-Dr Opening Operation*1	Back door opening operation / Long, Twice or OFF	Customization status displayed	-
Key Low Battery Warning	Low key battery warning / ON or OFF	Customization status displayed	-

- *1: w/ Entry System Back Door Open Function
- *: except for Korea and Mexico

Main Body (Main Body ECU (Multiplex Network Body ECU))

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
ACC SW	Power switch on (ACC) / ON or OFF	ON: Power switch on (ACC) OFF: Power switch off	-
IG SW	Power switch on (IG) / ON or OFF	ON: Power switch on (IG) OFF: Power switch off	-
RR Door Courtesy SW	Rear door courtesy light switch signal/ON or OFF	ON: Rear door RH or LH open OFF: Rear door RH and LH closed	-
RL Door Courtesy SW	Rear door courtesy light switch signal/ON or OFF	ON: Rear door RH or LH open OFF: Rear door RH and LH closed	-
Back Door Courtesy SW	Back door courtesy switch signal/ON or OFF	ON: Back door open OFF: Back door closed	-
Back Door Open	Back door lock/Permit or Prohibit	Permit: Back door unlocked Prohibit: Back door locked	-
Door Lock SW-Lock	Front passenger side door control switch lock signal/ON or OFF	ON: Lock side of front passenger side door control switch pushed OFF: Lock side of front passenger side door control switch not pushed	-
Door Lock SW-Unlock	Front passenger side door control switch unlock signal/ON or OFF	ON: Unlock side of front passenger side door control switch pushed	-

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Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
		OFF: Unlock side of front passenger side door control switch not pushed	
Door Key SW-Lock	Driver door key-linked lock/unlock switch lock signal/ON or OFF	ON: Driver door key cylinder turned to lock position OFF: Driver door key cylinder not turned to lock position	-
D Door Key SW-UL	Driver door key-linked lock/unlock switch unlock signal/ON or OFF	ON: Driver door key cylinder turned to unlock position OFF: Driver door key cylinder not turned to unlock position	-
FR Door Lock Pos	Front passenger side door lock position switch signal/LOCK or UNLOCK	LOCK: Front passenger side door locked UNLOCK: Front passenger side door unlocked	-
FR Door Courtesy	Front passenger side door courtesy light switch signal/ON or OFF	ON: Front passenger side door open OFF: Front passenger side door closed	-
FL Door Lock Pos	Driver door lock position switch signal/LOCK or UNLOCK	LOCK: Driver door locked UNLOCK: Driver door unlocked	-
FL Door Courtesy	Driver door courtesy light switch signal/ON or OFF	ON: Driver door open OFF: Driver door closed	-
Back Door Open Handle SW	Back door opener switch signal/ON or OFF	ON: Back door opener switch pushed OFF: Back door opener switch not pushed	-
RR-Door Lock Pos SW	Rear door lock position switch signal/LOCK or UNLOCK	LOCK: Rear door RH or LH locked UNLOCK: Rear door RH and LH unlocked	-
RL-Door Lock Pos SW	Rear door lock position switch signal/LOCK or UNLOCK	LOCK: Rear door RH or LH locked UNLOCK: Rear door RH and LH unlocked	-

2. ACTIVE TEST

HINT:

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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 or Main Body / 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
Overhead Tuner Power Supply ON	Door control receiver assembly	ON/OFF	-

Main Body (Main Body ECU (Multiplex Network Body ECU))

Tester Display	Test Part	Control Range	Diagnostic Note
Trunk and Back-door Open	Back door lock motor	ON/OFF	-

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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.

Certification ECU (Smart Key ECU Assembly)

DTC Code	Detection Item	Trouble Area	See page
B27A1	Open in Driver Side Electrical Antenna Circuit	1. Front door outside handle assembly (for driver side) 2. Certification ECU (smart key ECU assembly) 3. Wire harness or connector	INFO
B27A2 *	Open in Front Passenger Side Electrical Antenna Circuit	1. Front door outside handle assembly (for front passenger side) 2. Certification ECU (smart key ECU assembly) 3. Wire harness or connector	INFO
B27A5	Open in Front Floor Electrical Key Oscillator Circuit	1. Indoor electrical key oscillator (for front floor) 2. Certification ECU (smart key ECU assembly) 3. Wire harness or connector	INFO
B27A6	Open in Rear Floor Electrical Key Oscillator Circuit	1. Indoor electrical key oscillator (for center floor) 2. Certification ECU (smart key ECU assembly) 3. Wire harness or connector	INFO
B27A7	Open in Inside Luggage Compartment Electrical Key Oscillator Circuit	1. Indoor electrical key oscillator (for rear floor) 2. Certification ECU (smart key ECU assembly) 3. Wire harness or connector	INFO
B27A8 *	Open in Outside Luggage Compartment Electrical Key Antenna Circuit	1. Outside electrical key oscillator (for rear side)	INFO

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DTC Code	Detection Item	Trouble Area	See page
		2. Certification ECU (smart key ECU assembly) 3. Wire harness or connector	

*: w/ Entry System Back Door Open Function

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DTC	B27A1	Open in Driver Side Electrical Antenna Circuit

DESCRIPTION

The certification ECU (smart key ECU assembly) generates a request signal and sends it to the electrical key oscillator built into the front door outside handle assembly (for driver side) at 0.25-second intervals. To detect a key near the driver door, the front door outside handle assembly (for driver side) creates a detection area with a radius of approximately 1.0 m (3.28 ft.) from the driver door at 0.25-second intervals.

DTC B27A1 is detected by the certification ECU (smart key ECU assembly) if an open circuit is detected between the certification ECU (smart key ECU assembly) and front door outside handle assembly (for driver side) terminals (between CLG1 and ANT1, or CG1B and ANT2).

DTC No.	DTC Detection Condition	Trouble Area
B27A1	Open circuit detected between the certification ECU (smart key ECU assembly) and front door outside handle assembly (for driver side) terminals (between CLG1 and ANT1, or CG1B and ANT2).	• Front door outside handle assembly (for driver side) • Certification ECU (smart key ECU assembly) • Wire harness or connector

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

The smart key system (for entry function) uses a LIN communication system and CAN communication system. Inspect the communication function by following How to Proceed with Troubleshooting INFO. Troubleshoot the smart key system (for entry function) after confirming that the communication system is functioning properly.

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PROCEDURE

1.	CHECK CONNECTOR (CONNECTOR CONNECTION CONDITION)

(a) Turn the power switch off.

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

OK:

Connectors are properly connected.

NG ▶ CONNECT CONNECTORS PROPERLY

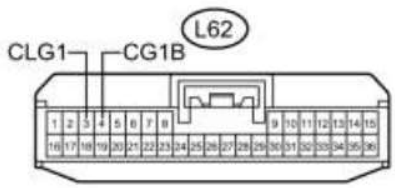
OK

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2.	CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - FRONT DOOR OUTSIDE HANDLE)

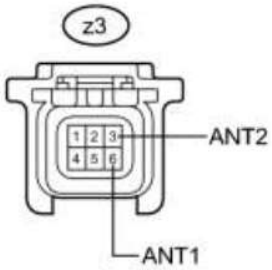
(a) Disconnect the certification ECU (smart key ECU assembly) connector.

*1



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

*2



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

Standard Resistance:

Tester Connection	Condition	Specified Condition

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Tester Connection	Condition	Specified Condition
L62-3 (CLG1) - z3-6 (ANT1)	Always	Below 1 Ω
L62-4 (CG1B) - z3-3 (ANT2)	Always	Below 1 Ω
L62-3 (CLG1) - Body ground	Always	10 kΩ or higher
L62-4 (CG1B) - Body ground	Always	10 kΩ or higher
z3-6 (ANT1) - Body ground	Always	10 kΩ or higher
z3-3 (ANT2) - 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 Front Door Outside Handle Assembly (for Driver Side))

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

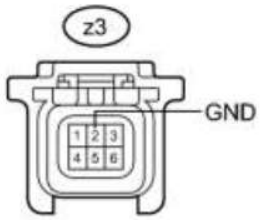
▼

3.	CHECK HARNESS AND CONNECTOR (FRONT DOOR OUTSIDE HANDLE - BODY GROUND)

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

Standard Resistance:

*1



H

Tester Connection	Condition	Specified Condition
z3-2 (GND) - Body ground	Always	Below 1 Ω

Text in Illustration

*1	Front view of wire harness connector (to Front Door Outside Handle Assembly (for Driver Side))

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

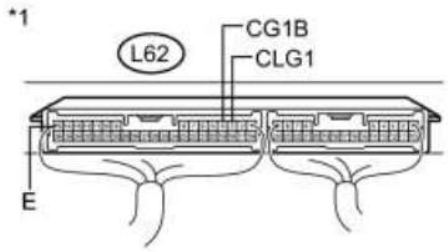
OK

▼

4.	INSPECT CERTIFICATION ECU (SMART KEY ECU ASSEMBLY) (INDOOR ELECTRICAL KEY OSCILLATOR SIGNAL OUTPUT)

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

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(b) Measure the resistance and check for pulses according to the value(s) in the table below.

Standard Resistance:

Tester Connection	Condition	Specified Condition
L62-15 (E) - Body ground	Always	Below 1 Ω

Standard:

Tester Connection	Condition	Specified Condition
L62-3 (CLG1) - L62-15 (E)	• Power switch off • All doors closed • Key not in cabin	No pulse generation
L62-3 (CLG1) - L62-15 (E)	• Power switch off • All doors closed • Key not in cabin • All doors locked by wireless lock function	Pulse generation
L62-4 (CG1B) - L62-15 (E)	• Power switch off • All doors closed • Key not in cabin	No pulse generation
L62-4 (CG1B) - L62-15 (E)	• Power switch off • All doors closed • Key not in cabin • All doors locked by wireless lock function	Pulse generation

Text in Illustration

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

NG ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

OK

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5.	REPLACE FRONT DOOR OUTSIDE HANDLE ASSEMBLY (for Driver Side)

(a) Replace the front door outside handle assembly (for driver side) INFO.

NEXT

6.	CHECK DTC OUTPUT

(a) Clear the DTCs INFO.

(b) Recheck for DTCs.

OK:

DTC B27A1 is not output.

NG ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

OK ▶ **END (FRONT DOOR OUTSIDE HANDLE ASSEMBLY WAS DEFECTIVE)**

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DTC	B27A2	Open in Front Passenger Side Electrical Antenna Circuit

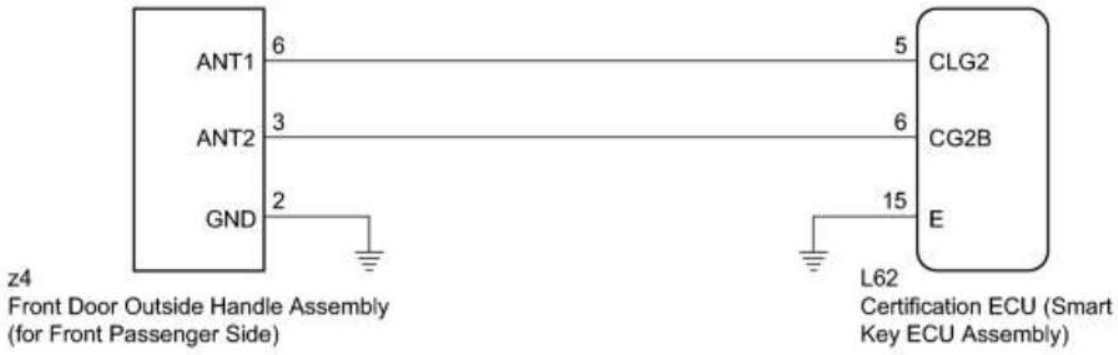
DESCRIPTION

The certification ECU (smart key ECU assembly) generates a request signal and sends it to the door electrical key oscillator built into the front door outside handle assembly (for front passenger side) at 0.25-second intervals. To detect a key near the front passenger door, the front door outside handle assembly (for front passenger side) creates a detection area with a radius of approximately 1.0 m (3.28 ft.) from the front passenger door at 0.25-second intervals.

DTC B27A2 is detected by the certification ECU (smart key ECU assembly) if an open circuit is detected between the certification ECU (smart key ECU assembly) and front door outside handle assembly (for front passenger side) terminals (between CLG2 and ANT1, or CG2B and ANT2).

DTC No.	DTC Detection Condition	Trouble Area
B27A2	Open circuit detected between the certification ECU (smart key ECU assembly) and front door outside handle assembly (for front passenger side) terminals (between CLG2 and ANT1, or CG2B and ANT2).	• Front door outside handle assembly (for front passenger side) • Certification ECU (smart key ECU assembly) • Wire harness or connector

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

The smart key system (for entry function) uses a LIN communication system and CAN communication system. Inspect the communication function by following How to Proceed with Troubleshooting INFO. Troubleshoot

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the smart key system (for entry function) after confirming that the communication system is functioning properly.

PROCEDURE

1.	CHECK CONNECTOR CONNECTION CONDITION

(a) Turn the power switch off.

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

OK:

Connectors are properly connected.

NG ▶ CONNECT CONNECTORS PROPERLY

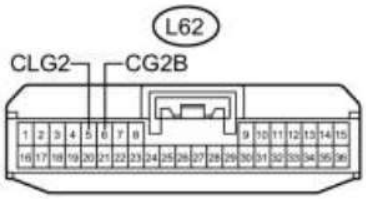
OK

▼

2.	CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - FRONT DOOR OUTSIDE HANDLE)

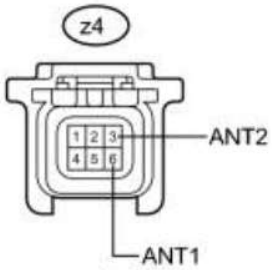
(a) Disconnect the certification ECU (smart key ECU assembly) connector.

*1



(b) Disconnect the front door outside handle assembly (for front passenger side) connector.

*2



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

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Standard Resistance:

Tester Connection	Condition	Specified Condition
L62-5 (CLG2) - z4-6 (ANT1)	Always	Below 1 Ω
L62-6 (CG2B) - z4-3 (ANT2)	Always	Below 1 Ω
L62-5 (CLG2) - Body ground	Always	10 kΩ or higher
L62-6 (CG2B) - Body ground	Always	10 kΩ or higher
z4-6 (ANT1) - Body ground	Always	10 kΩ or higher
z4-3 (ANT2) - 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 Front Door Outside Handle Assembly (for Front Passenger Side))

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

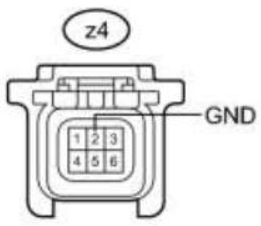
▼

3.	CHECK HARNESS AND CONNECTOR (FRONT DOOR OUTSIDE HANDLE - BODY GROUND)

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

Standard Resistance:

*1



Tester Connection	Condition	Specified Condition
z4-2 (GND) - Body ground	Always	Below 1 Ω

Text in Illustration

*1	Front view of wire harness connector (to Front Door Outside Handle Assembly (for Front Passenger Side))

H

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

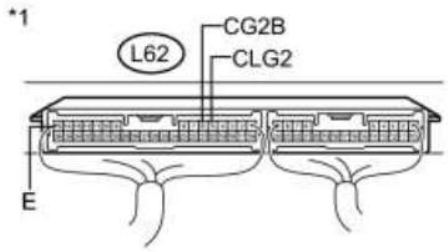
OK

▼

4.	INSPECT CERTIFICATION ECU (SMART KEY ECU ASSEMBLY) (DOOR ELECTRICAL KEY OSCILLATOR SIGNAL OUTPUT)

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

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connector.

(b) Measure the resistance and check for pulses according to the value(s) in the table below.

Standard Resistance:

Tester Connection	Condition	Specified Condition
L62-15 (E) - Body ground	Always	Below 1 Ω

Standard:

Tester Connection	Condition	Specified Condition
L62-5 (CLG2) - L62-15 (E)	• Power switch off • All doors closed • Key not in cabin	No pulse generation
L62-5 (CLG2) - L62-15 (E)	• Power switch off • All doors closed • Key not in cabin • All doors locked by wireless lock function	Pulse generation
L62-6 (CG2B) - L62-15 (E)	• Power switch off • All doors closed • Key not in cabin	No pulse generation
L62-6 (CG2B) - L62-15 (E)	• Power switch off • All doors closed • Key not in cabin • All doors locked by wireless lock function	Pulse generation

Text in Illustration

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

NG ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

OK

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5.	REPLACE FRONT DOOR OUTSIDE HANDLE ASSEMBLY (for Front Passenger Side)

(a) Replace the front door outside handle assembly (for front passenger side) INFO.

NEXT

6.	CHECK DTC OUTPUT

(a) Clear the DTCs INFO.

(b) Recheck for DTCs.

OK:

DTC B27A2 is not output.

NG ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

OK ▶ **END (FRONT DOOR OUTSIDE HANDLE ASSEMBLY WAS DEFECTIVE)**

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DTC	B27A5	Open in Front Floor Electrical Key Oscillator Circuit

DESCRIPTION

The certification ECU (smart key ECU assembly) generates a request signal and sends it to the indoor electrical key oscillator (for front floor). To detect the key inside the cabin, the indoor electrical key oscillator (for front floor) creates a detection area in the cabin.

DTC B27A5 is detected by the certification ECU (smart key ECU assembly) when an open circuit occurs between the certification ECU (smart key ECU assembly) and indoor electrical key oscillator (for front floor) terminals (between CLG5 and CLG3, or CG5B and CLGB).

DTC No.	DTC Detection Condition	Trouble Area
B27A5	Open circuit detected between the certification ECU (smart key ECU assembly) and indoor electrical key oscillator (for front floor) terminals (between CLG5 and CLG3, or CG5B and CLGB).	• Indoor electrical key oscillator (for front floor) • Certification ECU (smart key ECU assembly) • Wire harness or connector

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

The smart key system (for entry function) uses a LIN communication system and CAN communication system. Inspect the communication function by following How to Proceed with Troubleshooting INFO. Troubleshoot the smart key system (for entry function) after confirming that the communication system is functioning properly.

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PROCEDURE

1.	CHECK CONNECTOR CONNECTION CONDITION

(a) Turn the power switch off.

(b) Check that the connectors are properly connected to the certification ECU (smart key ECU assembly) and the indoor electrical key oscillator (for front floor).

OK:

Connectors are properly connected.

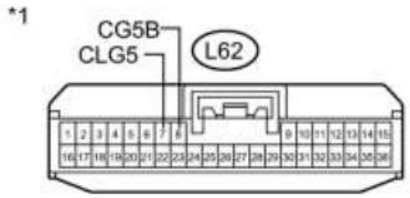
NG ▶ CONNECT CONNECTORS PROPERLY

OK

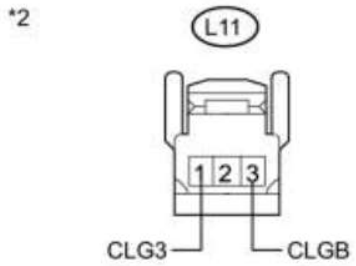
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2.	CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - INDOOR ELECTRICAL KEY OSCILLATOR)

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



(b) Disconnect the indoor electrical key oscillator (for front floor) connector.



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

Standard Resistance:

Tester Connection	Condition	Specified Condition

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Tester Connection	Condition	Specified Condition
L62-7 (CLG5) - L11-1 (CLG3)	Always	Below 1 Ω
L62-8 (CG5B) - L11-3 (CLGB)	Always	Below 1 Ω
L62-7 (CLG5) - Body ground	Always	10 kΩ or higher
L62-8 (CG5B) - Body ground	Always	10 kΩ or higher
L11-1 (CLG3) - Body ground	Always	10 kΩ or higher
L11-3 (CLGB) - Body ground	Always	10 kΩ or higher

Text in Illustration

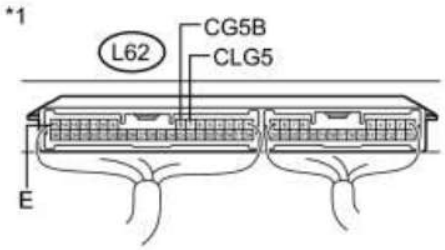
*1	Front view of wire harness connector (to Certification ECU (Smart Key ECU Assembly))
*2	Front view of wire harness connector (to Indoor Electrical Key Oscillator (for Front Floor))

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

▼

3.	INSPECT CERTIFICATION ECU (SMART KEY ECU ASSEMBLY) (INDOOR ELECTRICAL KEY OSCILLATOR SIGNAL OUTPUT)



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

(b) Measure the resistance and check for pulses according to the value(s) in the table below.

Standard Resistance:

Tester Connection	Condition	Specified Condition
L62-15 (E) - Body ground	Always	Below 1 Ω

Standard:

Tester Connection	Condition	Specified Condition
L62-7 (CLG5) - L62-15	• Power switch off	No pulse generation

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Tester Connection	Condition	Specified Condition
(E)	• All doors closed • Key not in cabin • Door outside handle assembly (lock sensor) not touched	
L62-7 (CLG5) - L62-15 (E)	• Power switch off • All doors closed • Key not in cabin • Door outside handle assembly (lock sensor) touched	Pulse generation
L62-8 (CG5B) - L62-15 (E)	• Power switch off • All doors closed • Key not in cabin • Door outside handle assembly (lock sensor) not touched	No pulse generation
L62-8 (CG5B) - L62-15 (E)	• Power switch off • All doors closed • Key not in cabin • Door outside handle assembly (lock sensor) touched	Pulse generation

Text in Illustration

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

NG ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

OK

▼

4.	REPLACE INDOOR ELECTRICAL KEY OSCILLATOR (for Front Floor)

(a) Replace the indoor electrical key oscillator (for front floor) INFO.

NEXT

▼

5.	CHECK DTC OUTPUT

(a) Clear the DTCs INFO.

(b) Recheck for DTCs.

OK:

DTC B27A5 is not output.

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NG ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

OK ▶ **END (INDOOR ELECTRICAL KEY OSCILLATOR WAS DEFECTIVE)**

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DTC	B27A6	Open in Rear Floor Electrical Key Oscillator Circuit

DESCRIPTION

The certification ECU (smart key ECU assembly) generates a request signal and sends it to the indoor electrical key oscillator (for center floor). To detect the key inside the cabin, the indoor electrical key oscillator (for center floor) creates a detection area in the cabin.

DTC B27A6 is detected by the certification ECU (smart key ECU assembly) when an open circuit occurs between the certification ECU (smart key ECU assembly) and indoor electrical key oscillator (for center floor) terminals (between CLG6 and CLG4, or CG6B and CLGB).

DTC No.	DTC Detection Condition	Trouble Area
B27A6	Open circuit detected between the certification ECU (smart key ECU assembly) and indoor electrical key oscillator (for center floor) terminals (between CLG6 and CLG4, or CG6B and CLGB).	• Indoor electrical key oscillator (for center floor) • Certification ECU (smart key ECU assembly) • Wire harness or connector

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

The smart key system (for entry function) uses a LIN communication system and CAN communication system. Inspect the communication function by following How to Proceed with Troubleshooting INFO. Troubleshoot the smart key system (for entry function) after confirming that the communication system is functioning properly.

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PROCEDURE

1.	CHECK CONNECTOR CONNECTION CONDITION

(a) Turn the power switch off.

(b) Check that the connectors are properly connected to the certification ECU (smart key ECU assembly) and the indoor electrical key oscillator (for center floor).

OK:

Connectors are properly connected.

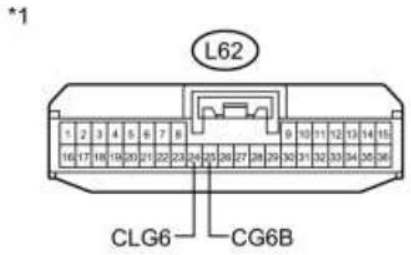
NG ▶ CONNECT CONNECTORS PROPERLY

OK

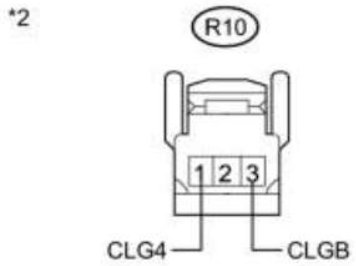
▼

2.	CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - INDOOR ELECTRICAL KEY OSCILLATOR)

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



(b) Disconnect the indoor electrical key oscillator (for center floor) connector.



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

Standard Resistance:

Tester Connection	Condition	Specified Condition

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Tester Connection	Condition	Specified Condition
L62-24 (CLG6) - R10-1 (CLG4)	Always	Below 1 Ω
L62-25 (CG6B) - R10-3 (CLGB)	Always	Below 1 Ω
L62-24 (CLG6) - Body ground	Always	10 kΩ or higher
L62-25 (CG6B) - Body ground	Always	10 kΩ or higher
R10-1 (CLG4) - Body ground	Always	10 kΩ or higher
R10-3 (CLGB) - 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 Indoor Electrical Key Oscillator (for Center Floor))

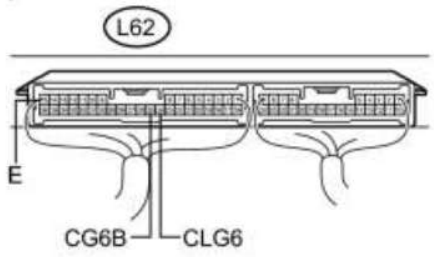
NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

▼

3.	INSPECT CERTIFICATION ECU (SMART KEY ECU ASSEMBLY) (INDOOR ELECTRICAL KEY OSCILLATOR SIGNAL OUTPUT)

*1



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

(b) Measure the resistance and check for pulses according to the value(s) in the table below.

Standard Resistance:

Tester Connection	Condition	Specified Condition
L62-15 (E) - Body ground	Always	Below 1 Ω

Standard:

Tester Connection	Condition	Specified Condition
L62-24 (CLG6) - L62-15	• Power switch off	No pulse generation

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Tester Connection	Condition	Specified Condition
(E)	• All doors closed • Key not in cabin • Door outside handle assembly (lock sensor) not touched	
L62-24 (CLG6) - L62-15 (E)	• Power switch off • All doors closed • Key not in cabin • Door outside handle assembly (lock sensor) touched	Pulse generation
L62-25 (CG6B) - L62-15 (E)	• Power switch off • All doors closed • Key not in cabin • Door outside handle assembly (lock sensor) not touched	No pulse generation
L62-25 (CG6B) - L62-15 (E)	• Power switch off • All doors closed • Key not in cabin • Door outside handle assembly (lock sensor) touched	Pulse generation

Text in Illustration

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

NG ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

OK

▼

4.	REPLACE INDOOR ELECTRICAL KEY OSCILLATOR (for Center Floor)

(a) Replace the indoor electrical key oscillator (for center floor) INFO.

NEXT

▼

5.	CHECK DTC OUTPUT

(a) Clear the DTCs INFO.

(b) Recheck for DTCs.

OK:

DTC B27A6 is not output.

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NG ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

OK ▶ **END (INDOOR ELECTRICAL KEY OSCILLATOR WAS DEFECTIVE)**

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DTC	B27A7	Open in Inside Luggage Compartment Electrical Key Oscillator Circuit

DESCRIPTION

The certification ECU (smart key ECU assembly) generates a request signal and sends it to the indoor electrical key oscillator (for rear floor). To detect the key inside the cabin, the indoor electrical key oscillator (for rear floor) creates a detection area in the cabin.

DTC B27A7 is detected by the certification ECU (smart key ECU assembly) when an open circuit occurs between the certification ECU (smart key ECU assembly) and indoor electrical key oscillator (for rear floor) terminals (between CLG7 and CLG6, or CG7B and CLGB).

DTC No.	DTC Detection Condition	Trouble Area
B27A7	Open circuit detected between the certification ECU (smart key ECU assembly) and indoor electrical key oscillator (for rear floor) terminals (between CLG7 and CLG6, or CG7B and CLGB).	• Indoor electrical key oscillator (for rear floor) • Certification ECU (smart key ECU assembly) • Wire harness or connector

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

The smart key system (for entry function) uses a LIN communication system and CAN communication system. Inspect the communication function by following How to Proceed with Troubleshooting INFO. Troubleshoot the smart key system (for entry function) after confirming that the communication system is functioning properly.

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PROCEDURE

1.	CHECK CONNECTOR CONNECTION CONDITION

(a) Turn the power switch off.

(b) Check that the connectors are properly connected to the certification ECU (smart key ECU assembly) and the indoor electrical key oscillator (for rear floor).

OK:

Connectors are properly connected.

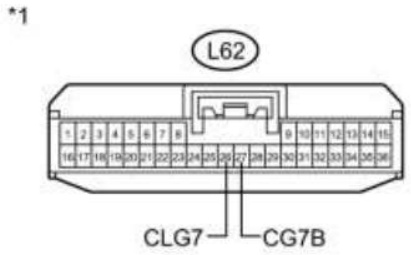
NG ▶ CONNECT CONNECTORS PROPERLY

OK

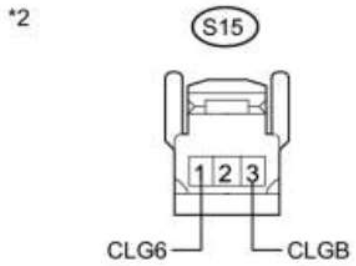
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2.	CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - INDOOR ELECTRICAL KEY OSCILLATOR)

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



(b) Disconnect the indoor electrical key oscillator (for rear floor) connector.



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

Standard Resistance:

Tester Connection	Condition	Specified Condition

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Tester Connection	Condition	Specified Condition
L62-26 (CLG7) - S15-1 (CLG6)	Always	Below 1 Ω
L62-27 (CG7B) - S15-3 (CLGB)	Always	Below 1 Ω
L62-26 (CLG7) - Body ground	Always	10 kΩ or higher
L62-27 (CG7B) - Body ground	Always	10 kΩ or higher
S15-1 (CLG6) - Body ground	Always	10 kΩ or higher
S15-3 (CLGB) - 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 Indoor Electrical Key Oscillator (for Rear Floor))

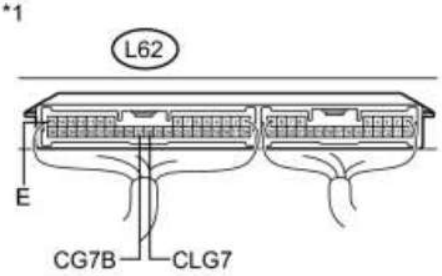
NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

▼

3.	INSPECT CERTIFICATION ECU (SMART KEY ECU ASSEMBLY) (INDOOR ELECTRICAL KEY OSCILLATOR SIGNAL OUTPUT)

*1



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

(b) Measure the resistance and check for pulses according to the value(s) in the table below.

Standard Resistance:

Tester Connection	Condition	Specified Condition
L62-15 (E) - Body ground	Always	Below 1 Ω

Standard:

Tester Connection	Condition	Specified Condition
L62-26 (CLG7) - L62-15	• Power switch off	No pulse generation

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Tester Connection	Condition	Specified Condition
(E)	• All doors closed • Key not in cabin • Door outside handle assembly (lock sensor) not touched	
L62-26 (CLG7) - L62-15 (E)	• Power switch off • All doors closed • Key not in cabin • Door outside handle assembly (lock sensor) touched	Pulse generation
L62-27 (CG7B) - L62-15 (E)	• Power switch off • All doors closed • Key not in cabin • Door outside handle assembly (lock sensor) not touched	No pulse generation
L62-27 (CG7B) - L62-15 (E)	• Power switch off • All doors closed • Key not in cabin • Door outside handle assembly (lock sensor) touched	Pulse generation

Text in Illustration

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

NG ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

OK

▼

4.	REPLACE INDOOR ELECTRICAL KEY OSCILLATOR (for Rear Floor)

(a) Replace the indoor electrical key oscillator (for rear floor) INFO.

NEXT

▼

5.	CHECK DTC OUTPUT

(a) Clear the DTCs INFO.

(b) Recheck for DTCs.

OK:

DTC B27A7 is not output.

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NG ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

OK ▶ **END (INDOOR ELECTRICAL KEY OSCILLATOR WAS DEFECTIVE)**

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DTC	B27A8	Open in Outside Luggage Compartment Electrical Key Antenna Circuit

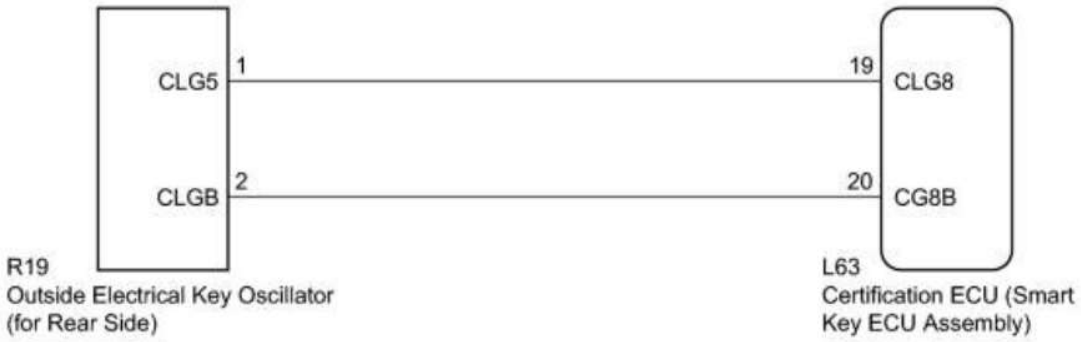
DESCRIPTION

The certification ECU (smart key ECU assembly) generates a request signal and sends it to the outside electrical key oscillator (for rear side). To detect the key near the driver door, the outside electrical key oscillator (for rear side) creates a detection area towards the area approximately 1.0 m (3.28 ft.) from the back door.

DTC B27A8 is detected by the certification ECU (smart key ECU assembly) when an open circuit occurs between the certification ECU (smart key ECU assembly) and outside electrical key oscillator (for rear side) terminals (between CLG8 and CLG5, or CG8B and CLGB).

DTC No.	DTC Detection Condition	Trouble Area
B27A8	Open circuit detected between the certification ECU (smart key ECU assembly and outside electrical key oscillator (for rear side) terminals (between CLG8 and CLG5, or CG8B and CLGB).	• Outside electrical key oscillator (for rear side) • Certification ECU (smart key ECU assembly) • Wire harness or connector

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

The smart key system (for entry function) uses a LIN communication system and CAN communication system. Inspect the communication function by following How to Proceed with Troubleshooting INFO. Troubleshoot the smart key system (for entry function) after confirming that the communication system is functioning properly.

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PROCEDURE

1.	CHECK CONNECTOR CONNECTION CONDITION

(a) Turn the power switch off.

(b) Check that the connectors are properly connected to the certification ECU (smart key ECU assembly) and the outside electrical key oscillator (for rear side).

OK:

Connectors are properly connected.

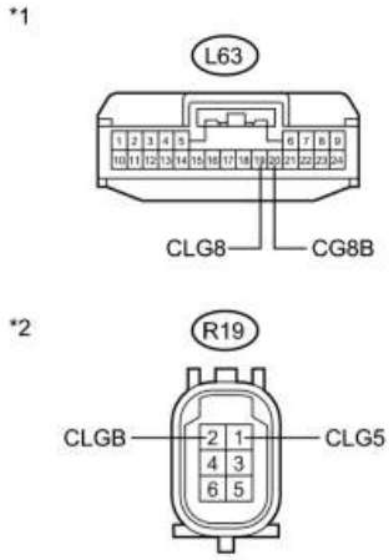
NG ▶ CONNECT CONNECTORS PROPERLY

OK

▼

2.	CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - OUTSIDE ELECTRICAL KEY OSCILLATOR)

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



(b) Disconnect the outside electrical key oscillator (for rear side) connector.

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

Standard Resistance:

Tester Connection	Condition	Specified Condition

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Tester Connection	Condition	Specified Condition
L63-19 (CLG8) - R19-1 (CLG5)	Always	Below 1 Ω
L63-20 (CG8B) - R19-2 (CLGB)	Always	Below 1 Ω
L63-19 (CLG8) - Body ground	Always	10 kΩ or higher
L63-20 (CG8B) - Body ground	Always	10 kΩ or higher
R19-1 (CLG5) - Body ground	Always	10 kΩ or higher
R19-2 (CLGB) - 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 Outside Electrical Key Oscillator (for Rear Side))

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

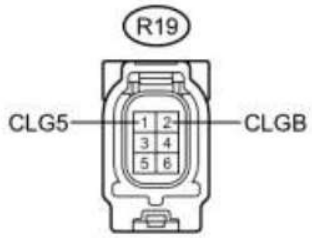
▼

3.	INSPECT OUTSIDE ELECTRICAL KEY OSCILLATOR

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

Standard Resistance:

*1



Tester Connection	Condition	Specified Condition
R19-1 (CLG5) - R19-2 (CLGB)	Always	Below 1 Ω

Text in Illustration

*1	Component without harness connected (Outside Electrical Key Oscillator (for Rear Side))

NG ▶ REPLACE OUTSIDE ELECTRICAL KEY OSCILLATOR

OK

▼

4.	REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

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

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NEXT

5.	CHECK DTC OUTPUT

(a) Clear the DTCs INFO.

(b) Recheck for DTCs.

OK:

DTC B27A8 is not output.

NG ▶ REPLACE OUTSIDE ELECTRICAL KEY OSCILLATOR

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

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Entry Answer-back Buzzer does not Sound

DESCRIPTION

The smart key system uses the wireless door lock buzzer assembly to perform various vehicle exterior warnings. When the conditions for each warning are met, the certification ECU (smart key ECU assembly) sends a buzzer request signal to the main body ECU (multiplex network body ECU) via CAN communication. The wireless door lock assembly sounds the buzzer according to the signal from the main body ECU (multiplex network body ECU).

INSPECTION PROCEDURE

NOTICE:

The smart key system (for entry function) uses a LIN communication system and CAN communication system. Inspect the communication function by following How to Proceed with Troubleshooting INFO. Troubleshoot the smart key system (for entry function) after confirming that the communication system is functioning properly.

PROCEDURE

1.	READ VALUE USING TECHSTREAM (ANSWER-BACK BUZZER FUNCTION)

(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 / Main Body / Data List.

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

Main Body (Main Body ECU (Multiplex Network Body ECU))

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Wireless Buzzer Resp	Answer-back buzzer operation / ON or OFF	Customization status displayed	-

Result:

Result	Proceed to
Customize setting is ON.	A
Customize setting is OFF.	B

B ▶ PERFORM CUSTOMIZE SETTING (Proceed to Customize Parameters)

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A

2.	PERFORM ACTIVE TEST USING TECHSTREAM

(a) Enter the following menus: Body Electrical / Main Body / Active Test.

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

Main Body (Main Body ECU (Multiplex Network Body ECU))

Tester Display	Test Part	Control Range	Diagnostic Note
Wireless Buzzer	Wireless door lock buzzer assembly	ON/OFF	-

OK:

Wireless door lock buzzer sounds.

NG GO TO WIRELESS DOOR LOCK CONTROL SYSTEM (Proceed to No Answer-Back)

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

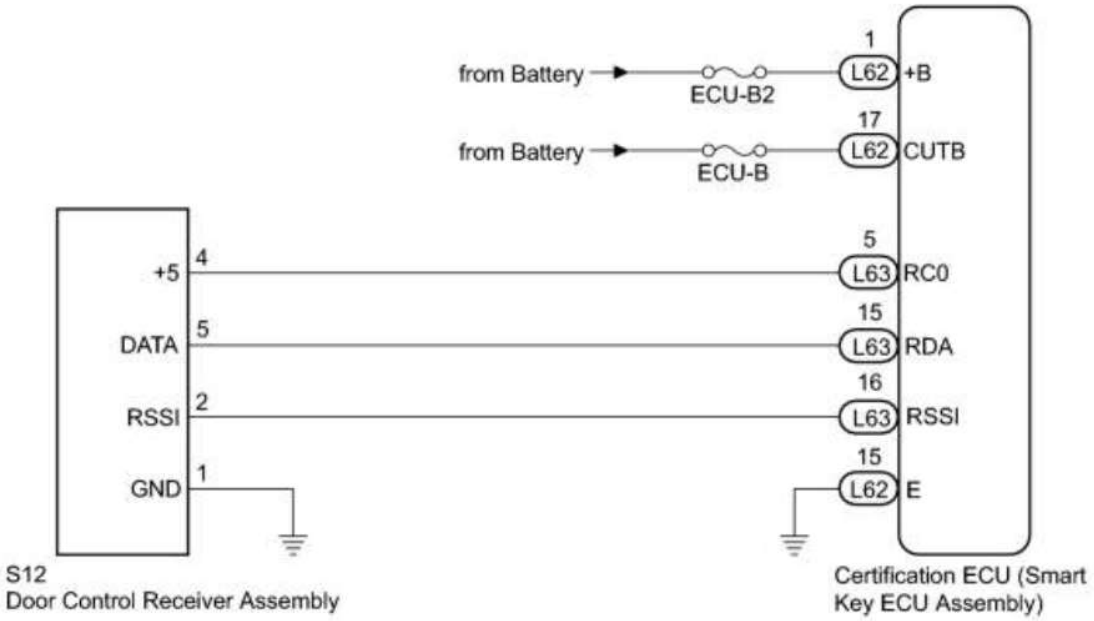
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All Door Entry Lock/Unlock Functions and Wireless Functions do not Operate

DESCRIPTION

When the entry door lock and unlock functions and wireless door lock and unlock functions do not operate, radio wave interference, or a malfunction in the key or signal circuit between the door control receiver assembly and certification ECU (smart key ECU assembly) is suspected. The signal circuit is shared by the entry function and wireless door lock function.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- The smart key system (for entry function) uses a LIN communication system and CAN communication system. Inspect the communication function by following How to Proceed with Troubleshooting INFO. Troubleshoot the smart key system (for entry function) after confirming that the communication system is functioning properly.
- Before performing the inspection, check that DTC B1242 (wireless door lock control) is not output INFO.
- Confirm that another key is not in the cabin.

PROCEDURE

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1.	CHECK POWER DOOR LOCK OPERATION

(a) When the door control switch on the master switch assembly is operated, check that the doors unlock and lock according to switch operation INFO.

OK:

Door locks operate normally.

NG ▶ GO TO POWER DOOR LOCK CONTROL SYSTEM (Proceed to Problem Symptoms Table)

OK

▼

2.	CHECK ELECTRICAL KEY TRANSMITTER

(a) Check if another registered key is available.

Result:

Result	Proceed to
Another registered key is not available.	A
Another registered key is available.	B

B ▶ CHECK ELECTRICAL KEY TRANSMITTER (OPERATION)

A

▼

3.	REGISTER ELECTRICAL KEY TRANSMITTER

(a) Register a new key INFO.

NEXT

▼

4.	CHECK ELECTRICAL KEY TRANSMITTER (OPERATION)

(a) Using the key registered in the previous step or another registered key, check that the entry function operates normally INFO.

OK:

Entry function operates normally.

NG ▶ CHECK WAVE ENVIRONMENT

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OK

5.	CHECK ELECTRICAL KEY TRANSMITTER (LED)

(a) Check that the transmitter LED illuminates each time when the switch is pushed 3 times.

Result:

Result	Proceed to
Transmitter LED does not illuminate at all when switch is pushed 3 times.	A
Transmitter LED illuminates each time when switch is pushed 3 times.	B
Transmitter LED does not illuminate the second or third time.	C

HINT:

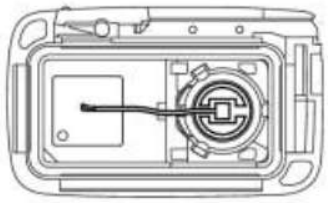
If the transmitter LED does not illuminate the second or third time, replace the transmitter battery as it is depleted.

C REPLACE TRANSMITTER BATTERY

B REPLACE ELECTRICAL KEY TRANSMITTER

A

6.	INSPECT TRANSMITTER BATTERY (VOLTAGE)



(a) Remove the battery from the key that does not operate. Attach a lead wire (0.6 mm (0.0236 in.) or less in diameter including wire sheath) with tape or equivalent to the negative (-) terminal INFO.

NOTICE:

Do not wrap the wire around the terminal, wedge it between the terminals, or solder it. A terminal may be deformed or damaged, and the battery will not be able to be installed correctly.

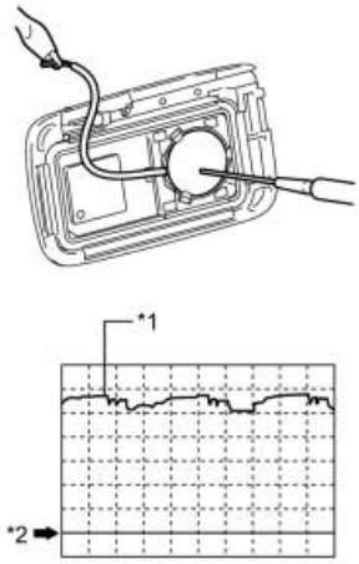
(b) Carefully pull the lead wire out from the position shown in the illustration and install the previously removed transmitter battery.

(c) Using an oscilloscope, check the transmitter battery voltage waveform.

HINT:

When measuring the battery voltage, while operating the lock switch of a

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door outside handle assembly, bring the key within the entry operating range to perform the measurement. For the entry operating range, refer to System Description INFO.

Standard Voltage:

Item	Content
Tester Connection	Battery positive (+) - Battery negative (-)
Tool Setting	0.5 V/DIV., 100 ms/DIV.
Condition	Power switch off, all doors closed and lock switch pushed
Specified Condition	2.2 to 3.2 V (Refer to the waveform)

Text in Illustration

*1	Measurement Position
*2	GND

NG ▶ REPLACE TRANSMITTER BATTERY

OK ▶ **REPLACE ELECTRICAL KEY TRANSMITTER**

7.	CHECK WAVE ENVIRONMENT

(a) Bring the key near the door control receiver, and check the wireless function.

HINT:

- When the key is brought near the door control receiver, the possibility of wave interference decreases, and it can be determined if wave interference is causing the problem symptom.
- If the inspection result indicates that the problem only occurs in certain locations or times of day, the possibility of wave interference is high. Also, added vehicle components may cause wave interference. If installed, remove them and perform the operation check.

OK:

Wireless function operates normally.

NG ▶ CHECK POWER SOURCE

OK ▶ **AFFECTED BY WAVE INTERFERENCE**

8.	CHECK POWER SOURCE

(a) Check if functions other than the entry function operate when the power switch is off.

Result:

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Result	Proceed to
Other functions do not operate.	A
Other functions operate.	B

HINT:

Perform this check using functions that do not require the power switch to be on (ACC or IG) in order to operate.

B ▶ GO TO SMART KEY SYSTEM (for Start Function) (Proceed to How to Proceed with Troubleshooting)

A

▼

9.	INSPECT FUSES (ECU-B2, ECU-B)

(a) Remove the ECU-B2 and ECU-B fuses from the engine room relay block and junction block.

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
ECU-B2 fuse	Always	Below 1 Ω
ECU-B fuse	Always	Below 1 Ω

NG ▶ REPLACE FUSE (ECU-B2, ECU-B)

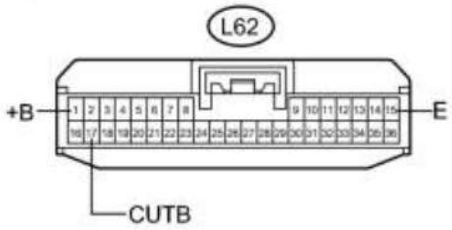
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10.	CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - BATTERY AND BODY GROUND)

(a) Install the ECU-B2 and ECU-B fuses to the engine room relay block and junction block.

*1



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

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

Standard Voltage:

Tester Connection	Condition	Specified Condition
L62-1 (+B) - Body ground	Except power switch on (READY)	11 to 14 V
L62-1 (+B) - Body ground	Power switch on (READY)	11 to 15.5 V
L62-17 (CUTB) - Body ground	Except power switch on (READY)	11 to 14 V
L62-17 (CUTB) - Body ground	Power switch on (READY)	11 to 15.5 V

Standard Resistance:

Tester Connection	Condition	Specified Condition
L62-15 (E) - Body ground	Always	Below 1 Ω

Text in Illustration

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

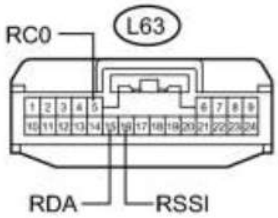
NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

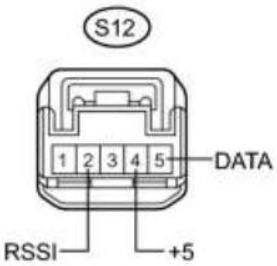
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11.	CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - DOOR CONTROL RECEIVER)

*1



*2



(a) Disconnect the door control receiver assembly connector.

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

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Standard Resistance:

Tester Connection	Condition	Specified Condition
L63-5 (RC0) - S12-4 (+5)	Always	Below 1 Ω
L63-15 (RDA) - S12-5 (DATA)	Always	Below 1 Ω
L63-16 (RSSI) - S12-2 (RSSI)	Always	Below 1 Ω
L63-5 (RC0) - Body ground	Always	10 kΩ or higher
L63-15 (RDA) - Body ground	Always	10 kΩ or higher
L63-16 (RSSI) - Body ground	Always	10 kΩ or higher
S12-4 (+5) - Body ground	Always	10 kΩ or higher
S12-5 (DATA) - Body ground	Always	10 kΩ or higher
S12-2 (RSSI) - 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 Door Control Receiver Assembly)

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

▼

12.	CHECK HARNESS AND CONNECTOR (DOOR CONTROL RECEIVER - BODY GROUND)

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

Standard Resistance:

*1



Tester Connection	Condition	Specified Condition
S12-1 (GND) - Body ground	Always	Below 1 Ω

Text in Illustration

*1	Front view of wire harness connector (to Door Control Receiver Assembly)

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

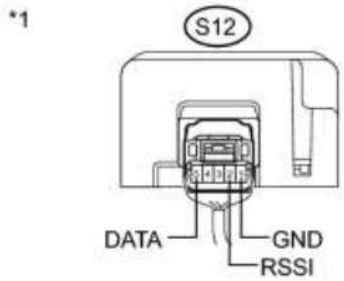
OK

▼

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13.	INSPECT DOOR CONTROL RECEIVER ASSEMBLY (POWER SOURCE)

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



(b) Reconnect the door control receiver assembly connector.

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

Standard Voltage:

Tester Connection	Condition	Specified Condition
S12-2 (RSSI) - S12-1 (GND)	• Power switch off • All doors locked • Lock or unlock switch on key not pushed	11 to 14 V
S12-2 (RSSI) - S12-1 (GND)	• Power switch off • All doors locked • Lock or unlock switch on key pushed	Below 2 V
S12-5 (DATA) - S12-1 (GND)	Power switch off	Pulse between 11 to 14 V occurs regularly

Text in Illustration

*1	Component with harness connected (Door Control Receiver Assembly)

NG ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

OK

▼

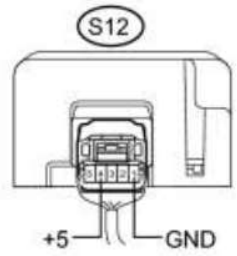
14.	INSPECT DOOR CONTROL RECEIVER ASSEMBLY (DOOR CONTROL RECEIVER SIGNAL OUTPUT)

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

Standard Voltage:

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*1



Tester Connection	Condition	Specified Condition
S12-4 (+5) - S12-1 (GND)	• Power switch off • Lock or unlock switch on key not pushed	Below 1 V
S12-4 (+5) - S12-1 (GND)	• Power switch off • Lock or unlock switch on key pushed	4.5 to 5.5 V

Text in Illustration

*1	Component with harness connected (Door Control Receiver Assembly)

NG ▶ REPLACE DOOR CONTROL RECEIVER ASSEMBLY

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

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All Door Entry Lock/Unlock Functions do not Operate, but Wireless Functions Operate

DESCRIPTION

When the wireless door lock and unlock functions operate, the communication circuit between the door lock receiver assembly and certification ECU (smart key ECU assembly) is normal. When the entry lock and unlock functions do not operate, radio wave interference, a customized entry cancel function, or a communication error between the key and vehicle in the smart communication circuit, is suspected.

INSPECTION PROCEDURE

NOTICE:

- The smart key system (for entry function) uses a LIN communication system and CAN communication system. Inspect the communication function by following How to Proceed with Troubleshooting INFO. Troubleshoot the smart key system (for entry function) after confirming that the communication system is functioning properly.
- Confirm that another key is not in the cabin.

PROCEDURE

1.	CHECK POWER DOOR LOCK OPERATION

(a) When the door control switch on the master switch assembly is operated, check that the doors unlock and lock according to switch operation INFO.

OK:

Door locks operate normally.

NG ▶ GO TO POWER DOOR LOCK CONTROL SYSTEM (Proceed to Problem Symptoms Table)

OK

▼

2.	READ VALUE USING TECHSTREAM (ENTRY CANCEL FUNCTION)

(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.

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

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Auto Entry Cancel SW	Entry function cancel / ON or OFF	Mode status displayed	-

Result:

Result	Proceed to
Entry function cancel is OFF.	A
Entry function cancel is ON.	B

B ▶ PERFORM CANCELLATION OF ENTRY KEY CANCEL FUNCTION (Proceed to Customize Parameters)

A

▼

3.	CHECK WAVE ENVIRONMENT

(a) Move the key as described below and perform the operation inspection.

HINT:

- When the key is brought near the door outside handle assembly or outside electrical key oscillator, the possibility of wave interference decreases, and it can be determined if wave interference is causing the problem symptom.
- The transmitting waves of the wireless functions and entry functions are the same, but the wave logic is different. Therefore, it is possible that only the wireless functions or only the entry functions are affected by wave interference.



(b) Bring the key near the driver door outside handle assembly, and perform a front driver door entry lock and unlock operation check.

HINT:

When pressing the lock switch, hold the electrical key transmitter about 1 m (3.28 ft.) above the ground and about 0.3 m (0.984 ft.) away from the vehicle as shown in the illustration.

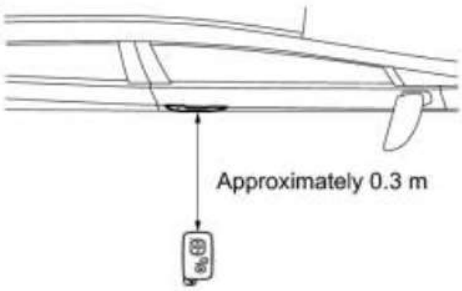
NOTICE:

If the key is brought within 0.2 m (0.656 ft.) of the door outside handle assembly, communication is not possible.

(c) Bring the key near the front passenger door outside handle assembly, and perform a front passenger door entry lock and unlock operation check.*

*: w/ Entry System Back Door Open Function

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HINT:

When pressing the lock switch, hold the electrical key transmitter about 1 m (3.28 ft.) above the ground and about 0.3 m (0.984 ft.) away from the vehicle as shown in the illustration.

NOTICE:

If the key is brought within 0.2 m (0.656 ft.) of the door outside handle assembly, communication is not possible.

(d) Bring the key near the outside electrical key oscillator (for rear side), and perform an entry back door open function check.*

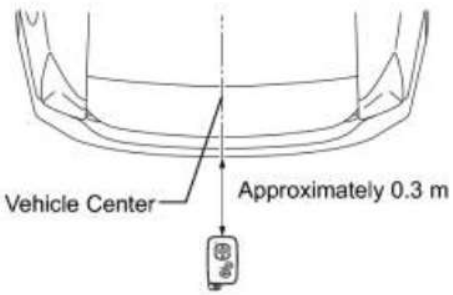
*: w/ Entry System Back Door Open Function

HINT:

When pressing the lock switch, hold the electrical key transmitter about 1 m (3.28 ft.) above the ground and about 0.3 m (0.984 ft.) away from the vehicle as shown in the illustration.

NOTICE:

If the key is brought within 0.2 m (0.656 ft.) of the rear bumper, communication is not possible.



HINT:

If the inspection result indicates that the problem only occurs in certain locations or times of day, the possibility of wave interference is high. Also, added vehicle components may cause wave interference. If installed, remove them and perform the operation check.

Result:

w/ Entry System Back Door Open Function

Result	Proceed to
Entry function does not operate for all doors.	A
Entry function operates for all doors.	B
Entry function operates for an individual door.	C

w/o Entry System Back Door Open Function

Result	Proceed to
Entry function does not operate for driver door.	A
Entry function operates for driver door.	B

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C GO TO OTHER PROBLEM (Proceed to Problem Symptoms Table)

B AFFECTED BY WAVE INTERFERENCE

A

4.	SYSTEM CHECK

(a) Check the vehicle specification.

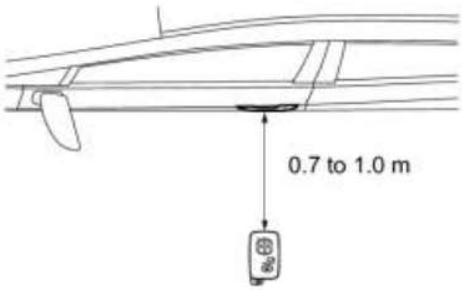
Result:

Result	Proceed to
w/ Entry System Back Door Open Function	A
w/o Entry System Back Door Open Function	B

B PERFORM KEY DIAGNOSTIC MODE INSPECTION

A

5.	PERFORM KEY DIAGNOSTIC MODE INSPECTION



(a) Diagnostic mode inspection (door electrical key oscillator (for driver side))

(1) Connect the Techstream to the DLC3.

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

(3) Turn the Techstream on.

(4) Enter the following menus: Body Electrical / Smart Key / Utility / Key Communication Check / Overhead + Driver Side.

(5) When the key is in the position shown in the illustration, check that the wireless door lock buzzer sounds.

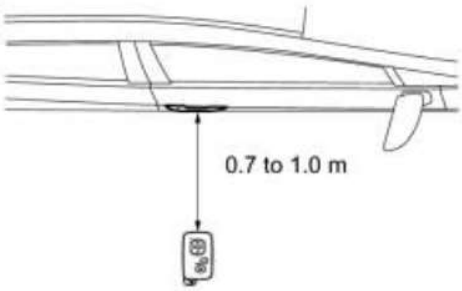
HINT:

Hold the electrical key transmitter at the same height as the door outside handle (0.7 to 1.0 m (2.30 to 3.28 ft.)). Make sure that the direction of the key is as shown in the illustration.

(b) Diagnostic mode inspection (door electrical key oscillator (for front passenger side))

(1) Connect the Techstream to the DLC3.

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

(3) Turn the Techstream on.

(4) Enter the following menus: Body Electrical / Smart Key / Utility / Key Communication Check / Overhead + Passenger Side.

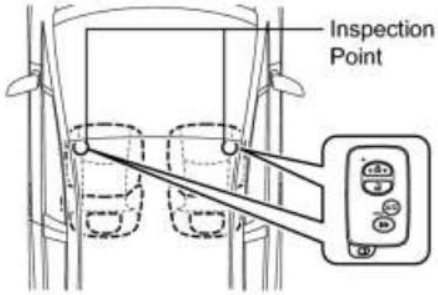
(5) When the key is in the position shown in the illustration, check that the wireless door lock buzzer sounds.

HINT:

Hold the electrical key transmitter at the same height as the door outside handle (0.7 to 1.0 m (2.30 to 3.28 ft.)). Make sure that the direction of the key is as shown in the illustration.

(c) Diagnostic mode inspection (indoor electrical key oscillator (for front floor))

(1) Connect the Techstream to the DLC3.



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

(3) Turn the Techstream on.

(4) Enter the following menus: Body Electrical / Smart Key / Utility / Key Communication Check / Overhead + Front Room.

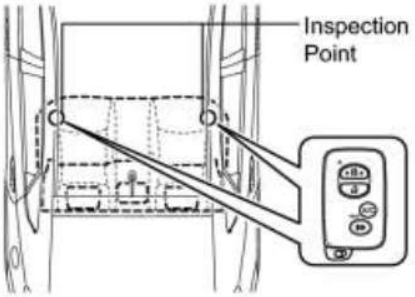
(5) When the key is in the position shown in the illustration, check that the wireless door lock buzzer sounds.

HINT:

Place the key on the driver or front passenger seat cushion.

(d) Diagnostic mode inspection (indoor electrical key oscillator (for center floor))

(1) Connect the Techstream to the DLC3.



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

(3) Turn the Techstream on.

(4) Enter the following menus: Body Electrical / Smart Key / Utility / Key Communication Check / Overhead + Rear Room.

(5) When the key is in the position shown in the illustration, check that the wireless door lock buzzer sounds.

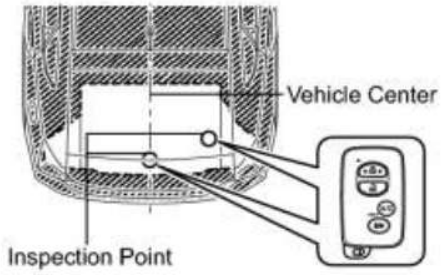
HINT:

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Place the key on the rear seat cushion.

(e) Diagnostic mode inspection (indoor electrical key oscillator (for rear floor))

(1) Connect the Techstream to the DLC3.



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

(3) Turn the Techstream on.

(4) Enter the following menus: Body Electrical / Smart Key / Utility / Key Communication Check / Overhead + Back Door (inside).

(5) When the key is in the position shown in the illustration, check that the wireless door lock buzzer sounds.

HINT:

Place the key on the luggage area.

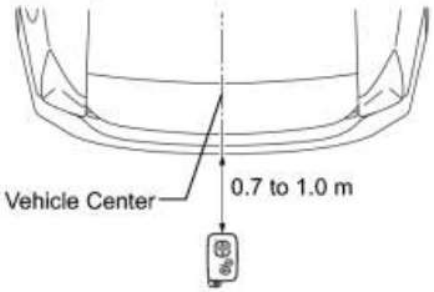
(f) Diagnostic mode inspection (outside electrical key oscillator (for rear side))

(1) Connect the Techstream to the DLC3.

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

(3) Turn the Techstream on.

(4) Enter the following menus: Body Electrical / Smart Key / Utility / Key Communication Check / Overhead + Back Door (outside).



(5) When the key is in the position shown in the illustration, check that the wireless door lock buzzer sounds.

HINT:

Hold the electrical key transmitter at the same height as the rear bumper upper surface and align with the center of the rear of the vehicle (0.7 to 1.0 m (2.30 to 3.28 ft.)). Make sure that the direction of the key is as shown in the illustration.

Result:

Result	Proceed to
Wireless door lock buzzer does not sound for all electrical key oscillators.	A
Wireless door lock buzzer does not sound only for either door electrical key oscillator.	B

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Wireless door lock buzzer does not sound only for one indoor electrical key oscillator.	C
Wireless door lock buzzer does not sound only for outside electrical key oscillator (for rear side).	D
Wireless door lock buzzer sounds for all electrical key oscillators.	E

E REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

D GO TO OTHER PROBLEM (Proceed to Back Door Entry Lock and Unlock Functions do not Operate)

C GO TO OTHER PROBLEM (Proceed to Room Oscillator does not Recognize Key)

B GO TO OTHER PROBLEM (Proceed to Problem Symptoms Table for Each Door)

A

6.	CHECK ELECTRICAL KEY TRANSMITTER

(a) Check if another registered key is available.

Result:

Result	Proceed to
Another registered key is not available.	A
Another registered key is available.	B

B CHECK ELECTRICAL KEY TRANSMITTER (OPERATION)

A

7.	REGISTER ELECTRICAL KEY TRANSMITTER

(a) Register a new key INFO.

NEXT

8.	CHECK ELECTRICAL KEY TRANSMITTER (OPERATION)

(a) Using the key registered in the previous step or another registered key, check that the entry function operates normally INFO.

OK:

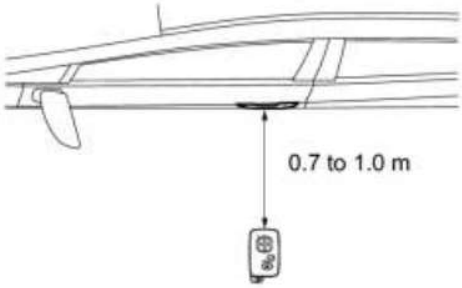
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Entry function operates normally.

NG ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

OK ▶ **REPLACE ELECTRICAL KEY TRANSMITTER (REPLACE MALFUNCTIONING KEY)**

9.	PERFORM KEY DIAGNOSTIC MODE INSPECTION



(a) Diagnostic mode inspection (door electrical key oscillator (for driver side))

(1) Connect the Techstream to the DLC3.

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

(3) Turn the Techstream on.

(4) Enter the following menus: Body Electrical / Smart Key / Utility / Key Communication Check / Overhead + Driver Side.

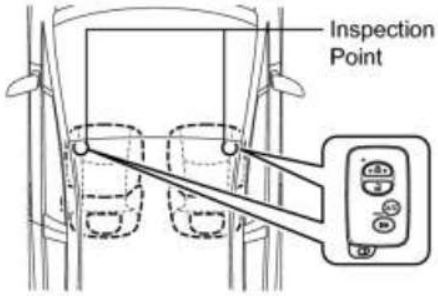
(5) When the key is in the position shown in the illustration, check that the wireless door lock buzzer sounds.

HINT:

Hold the electrical key transmitter at the same height as the door outside handle (0.7 to 1.0 m (2.30 to 3.28 ft.)). Make sure that the direction of the key is as shown in the illustration.

(b) Diagnostic mode inspection (indoor electrical key oscillator (for front floor))

(1) Connect the Techstream to the DLC3.



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

(3) Turn the Techstream on.

(4) Enter the following menus: Body Electrical / Smart Key / Utility / Key Communication Check / Overhead + Front Room.

(5) When the key is in the position shown in the illustration, check that the wireless door lock buzzer sounds.

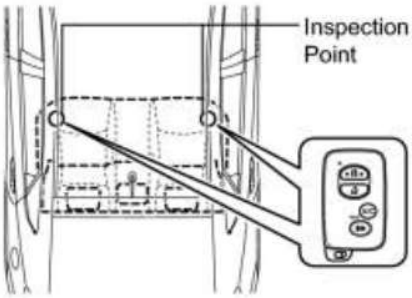
HINT:

Place the key on the driver or front passenger seat cushion.

(c) Diagnostic mode inspection (indoor electrical key oscillator (for center floor))

(1) Connect the Techstream to the DLC3.

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

(3) Turn the Techstream on.

(4) Enter the following menus: Body Electrical / Smart Key / Utility / Key Communication Check / Overhead + Rear Room.

(5) When the key is in the position shown in the illustration, check that the wireless door lock buzzer sounds.

HINT:

Place the key on the rear seat cushion.

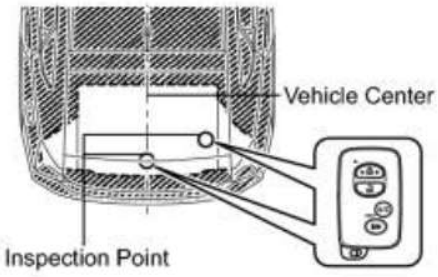
(d) Diagnostic mode inspection (indoor electrical key oscillator (for rear floor))

(1) Connect the Techstream to the DLC3.

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

(3) Turn the Techstream on.

(4) Enter the following menus: Body Electrical / Smart Key / Utility / Key Communication Check / Overhead + Back Door (inside).



(5) When the key is in the position shown in the illustration, check that the wireless door lock buzzer sounds.

HINT:

Place the key on the luggage area.

Result:

Result	Proceed to
Wireless door lock buzzer does not sound for all electrical key oscillators.	A
Wireless door lock buzzer does not sound only for driver door electrical key oscillator.	B
Wireless door lock buzzer does not sound only for one indoor electrical key oscillator.	C
Wireless door lock buzzer sounds for all electrical key oscillators.	D

D ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

C ▶ GO TO OTHER PROBLEM (Proceed to Room Oscillator does not Recognize Key)

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B GO TO OTHER PROBLEM (Proceed to Driver Side Door Entry Lock and Unlock Functions do not Operate)

A

10.	CHECK ELECTRICAL KEY TRANSMITTER

(a) Check if another registered key is available.

Result:

Result	Proceed to
Another registered key is not available.	A
Another registered key is available.	B

B CHECK ELECTRICAL KEY TRANSMITTER (OPERATION)

A

11.	REGISTER ELECTRICAL KEY TRANSMITTER

(a) Register a new key INFO.

NEXT

12.	CHECK ELECTRICAL KEY TRANSMITTER (OPERATION)

(a) Using the key registered in the previous step or another registered key, check that the entry function operates normally INFO.

OK:

Entry function operates normally.

NG REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

OK **REPLACE ELECTRICAL KEY TRANSMITTER (REPLACE MALFUNCTIONING KEY)**

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Driver Side Door Entry Unlock Function does not Operate

DESCRIPTION

If the driver door entry lock function operates normally, but its entry unlock function does not, this means that the request code from the driver door is being output normally. In this case, a malfunction in the touch sensor circuit (from the certification ECU (smart key ECU assembly) to the front door outside handle assembly (touch sensor)) is suspected.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- The smart key system (for entry function) uses a LIN communication system and CAN communication system. Inspect the communication function by following How to Proceed with Troubleshooting INFO. Troubleshoot the smart key system (for entry function) after confirming that the communication system is functioning properly.
- Confirm that another key is not in the cabin.

PROCEDURE

1.	CHECK POWER DOOR LOCK OPERATION

(a) When the door control switch on the master switch assembly is operated, check that the doors unlock and lock according to switch operation INFO.

OK:

Door locks operate normally.

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NG ▶ GO TO POWER DOOR LOCK CONTROL SYSTEM (Proceed to Problem Symptoms Table)

OK

▼

2.	READ VALUE USING TECHSTREAM (DOOR OUTSIDE HANDLE)

(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
D-Door Touch Sensor	Status of touch sensor (for driver side) / ON or OFF	ON: Touch sensor touched OFF: Touch sensor not touched	-

OK:

On the Techstream screen, the display changes between ON and OFF as shown in the chart above.

NG ▶ CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - FRONT DOOR OUTSIDE HANDLE)

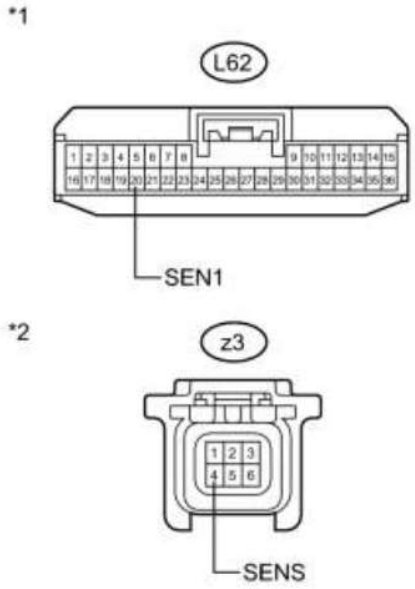
OK ▶ **REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)**

3.	CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - FRONT DOOR OUTSIDE HANDLE)

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

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

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
L62-20 (SEN1) - z3-4 (SENS)	Always	Below 1 Ω
L62-20 (SEN1) - Body ground	Always	10 kΩ or higher
z3-4 (SENS) - 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 Front Door Outside Handle Assembly (for Driver Side))

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

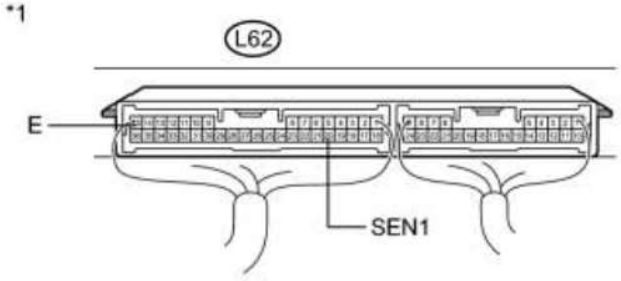
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4.	INSPECT CERTIFICATION ECU (SMART KEY ECU ASSEMBLY) (TOUCH SENSOR SIGNAL INPUT)

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

(b) Reconnect the front door outside handle assembly (for driver side) connector.

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(c) Measure the voltage and check for pulses according to the value(s) in the table below.

Standard:

Tester Connection	Condition	Specified Condition
L62-20 (SEN1) - L62-15 (E)	• Power switch off • All doors closed • Key not in detection area • Touch sensor (for driver side) not touched	Pulse generation
L62-20 (SEN1) - L62-15 (E)	• Power switch off • All doors closed • Key not in detection area • Touch sensor (for driver side) touched	Below 2 V

Text in Illustration

*1	Component with harness connected (Certification ECU (Smart Key ECU Assembly))	-	-

NG ▶ REPLACE FRONT DOOR OUTSIDE HANDLE ASSEMBLY (for Driver Side)

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

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Front Passenger Side Door Entry Unlock Function does not Operate

DESCRIPTION

If the front passenger door entry lock function operates normally, but its entry unlock function does not, this means that the request code from the front passenger door is being output normally. In this case, a malfunction in the touch sensor circuit (from the certification ECU (smart key ECU assembly) to the front door outside handle assembly (touch sensor)) is suspected.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- The smart key system (for entry function) uses a LIN communication system and CAN communication system. Inspect the communication function by following How to Proceed with Troubleshooting INFO. Troubleshoot the smart key system (for entry function) after confirming that the communication system is functioning properly.
- Confirm that another key is not in the cabin.

PROCEDURE

1.	CHECK POWER DOOR LOCK OPERATION

(a) When the door control switch on the master switch assembly is operated, check that the doors unlock and lock according to switch operation INFO.

OK:

Door locks operate normally.

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NG ▶ GO TO POWER DOOR LOCK CONTROL SYSTEM (Proceed to Problem Symptoms Table)

OK

▼

2.	READ VALUE USING TECHSTREAM (DOOR OUTSIDE HANDLE)

(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
P-Door Touch Sensor	Status of touch sensor (for front passenger side) / ON or OFF	ON: Touch sensor touched OFF: Touch sensor not touched	-

OK:

On the Techstream screen, the display changes between ON and OFF as shown in the chart above.

NG ▶ CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - FRONT DOOR OUTSIDE HANDLE)

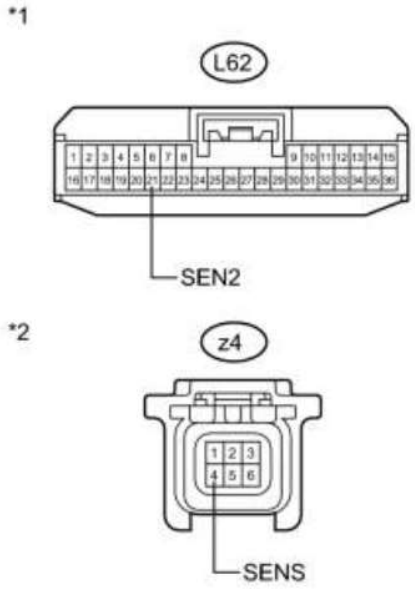
OK ▶ **REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)**

3.	CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - FRONT DOOR OUTSIDE HANDLE)

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

(b) Disconnect the front door outside handle assembly (for front passenger side) connector.

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
L62-21 (SEN2) - z4-4 (SENS)	Always	Below 1 Ω
L62-21 (SEN2) - Body ground	Always	10 kΩ or higher
z4-4 (SENS) - 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 Front Door Outside Handle Assembly (for Front Passenger Side))

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

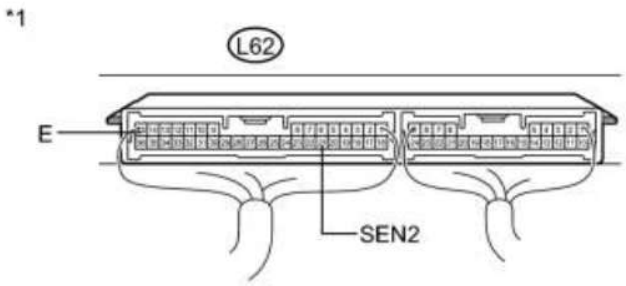
▼

4.	INSPECT CERTIFICATION ECU (SMART KEY ECU ASSEMBLY) (TOUCH SENSOR SIGNAL INPUT)

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

(b) Reconnect the front door outside handle assembly (for front passenger side) connector.

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(c) Measure the voltage and check for pulses according to the value(s) in the table below.

Standard:

Tester Connection	Condition	Specified Condition
L62-21 (SEN2) - L62-15 (E)	• Power switch off • All doors closed • Key not in detection area • Touch sensor (for front passenger side) not touched	Pulse generation
L62-21 (SEN2) - L62-15 (E)	• Power switch off • All doors closed • Key not in detection area • Touch sensor (for front passenger side) touched	Below 2 V

Text in Illustration

*1	Component with harness connected (Certification ECU (Smart Key ECU Assembly))	-	-

NG ▶ REPLACE FRONT DOOR OUTSIDE HANDLE ASSEMBLY (for Front Passenger Side)

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

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Driver Side Door Entry Lock and Unlock Functions do not Operate

DESCRIPTION

When the entry lock and unlock functions do not operate only for the driver door, an error in output request codes from the driver door or malfunction in the front door outside handle assembly is suspected. If the entry functions for the other doors operate normally, then the communication circuit between the key and door control receiver assembly is functioning normally. In this case, radio wave interference or a malfunction in the request code sending circuit (from the certification ECU (smart key ECU assembly) to the front door outside handle assembly (for driver side)) is suspected.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- The smart key system (for entry function) uses a LIN communication system and CAN communication system. Inspect the communication function by following How to Proceed with Troubleshooting INFO. Troubleshoot the smart key system (for entry function) after confirming that the communication system is functioning properly.
- Confirm that another key is not in the cabin.

PROCEDURE

1.	CHECK POWER DOOR LOCK OPERATION

(a) When the door control switch on the master switch assembly is operated, check that the doors unlock and lock according to switch operation INFO.

OK:

Door locks operate normally.

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NG ▶ GO TO POWER DOOR LOCK CONTROL SYSTEM (Proceed to Problem Symptoms Table)

OK

▼

2.	CHECK WAVE ENVIRONMENT

(a) Bring the key near the front door outside handle assembly (for driver side), and perform a driver door entry lock and unlock operation check.

NOTICE:

If the key is brought within 0.2 m (0.656 ft.) of the door outside handle assembly, communication is not possible.



- When pressing the lock switch and touching the touch sensor, hold the electrical key transmitter about 1 m (3.28 ft.) above the ground and about 0.3 m (0.984 ft.) away from the vehicle as shown in the illustration.
- When the key is brought near the front door outside handle assembly (for driver side), the possibility of wave interference decreases, and it can be determined if wave interference is causing the problem symptom.
- If the operation is normal, the possibility of wave interference is high. Also, added vehicle components may cause wave interference. If installed, remove them and perform the operation check.

OK:

Entry functions operate normally.

NG ▶ CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - FRONT DOOR OUTSIDE HANDLE)

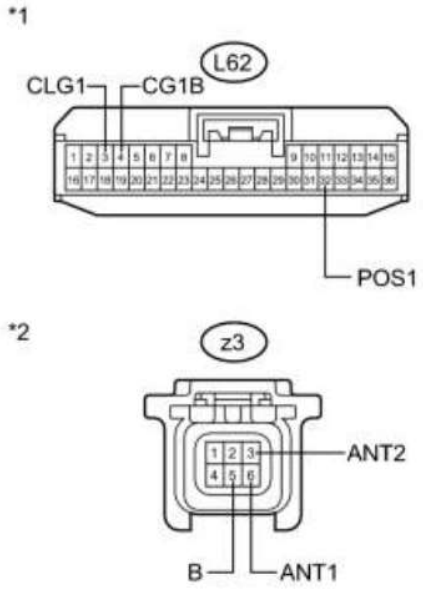
OK ▶ **AFFECTED BY WAVE INTERFERENCE**

3.	CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - FRONT DOOR OUTSIDE HANDLE)

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

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

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
L62-3 (CLG1) - z3-6 (ANT1)	Always	Below 1 Ω
L62-4 (CG1B) - z3-3 (ANT2)	Always	Below 1 Ω
L62-32 (POS1) - z3-5 (B)	Always	Below 1 Ω
L62-3 (CLG1) - Body ground	Always	10 kΩ or higher
L62-4 (CG1B) - Body ground	Always	10 kΩ or higher
L62-32 (POS1) - Body ground	Always	10 kΩ or higher
z3-6 (ANT1) - Body ground	Always	10 kΩ or higher
z3-3 (ANT2) - Body ground	Always	10 kΩ or higher
z3-5 (B) - 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 Front Door Outside Handle Assembly (for Driver Side))

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

▼

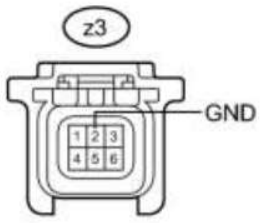
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4.	CHECK HARNESS AND CONNECTOR (FRONT DOOR OUTSIDE HANDLE - BODY GROUND)

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

Standard Resistance:

*1



Tester Connection	Condition	Specified Condition
z3-2 (GND) - Body ground	Always	Below 1 Ω

H

Text in Illustration

*1	Front view of wire harness connector (to Front Door Outside Handle Assembly (for Driver Side))

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

▼

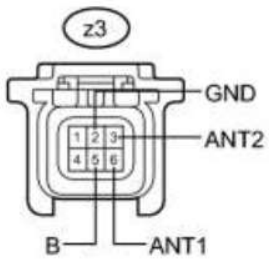
5.	INSPECT FRONT DOOR OUTSIDE HANDLE ASSEMBLY (DOOR OSCILLATOR, LOCK/UNLOCK SENSOR SIGNAL INPUT)

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

(b) Measure the voltage and check for pulses according to the value(s) in the table below.

Standard:

*1



Tester Connection	Condition	Specified Condition
z3-6 (ANT1) - z3-3 (ANT2)	• Power switch off • All doors closed • Key not in cabin	No pulse generation
z3-6 (ANT1) - z3-3 (ANT2)	• Power switch off • All doors closed • Key not in cabin • All doors locked by wireless lock function	Pulse generation
z3-5 (B) - z3-2 (GND)	Power switch off	9 to 14 V
z3-5 (B) - z3-2 (GND)	Power switch on (IG)	Below 2 V

H

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Text in Illustration

*1	Front view of wire harness connector (to Front Door Outside Handle Assembly (for Driver Side))

NG ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

OK

▼

6.	REPLACE FRONT DOOR OUTSIDE HANDLE ASSEMBLY (for Driver Side)

(a) Replace the front door outside handle assembly (for driver side) INFO.

NEXT

▼

7.	CHECK FRONT DOOR OUTSIDE HANDLE ASSEMBLY (for Driver Side)

(a) Check that the entry functions operate normally INFO.

OK:

Entry functions operate normally.

NG ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

OK ▶ **END (FRONT DOOR OUTSIDE HANDLE ASSEMBLY WAS DEFECTIVE)**

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Front Passenger Side Door Entry Lock and Unlock Functions do not Operate

DESCRIPTION

When the entry lock and unlock functions do not operate only for the front passenger door, an error in output request codes from the front passenger door or malfunction in the front door outside handle assembly is suspected. If the entry functions for the other doors operate normally, then the communication circuit between the key and door control receiver assembly is functioning normally. In this case, radio wave interference or a malfunction in the request code sending circuit (from the certification ECU (smart key ECU assembly) to the front door outside handle assembly (for driver side)) is suspected.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- The smart key system (for entry function) uses a LIN communication system and CAN communication system. Inspect the communication function by following How to Proceed with Troubleshooting INFO. Troubleshoot the smart key system (for entry function) after confirming that the communication system is functioning properly.
- Confirm that another key is not in the cabin.

PROCEDURE

1.	CHECK POWER DOOR LOCK OPERATION

(a) When the door control switch on the master switch assembly is operated, check that the doors unlock and lock according to switch operation INFO.

OK:

Door locks operate normally.

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NG ▶ GO TO POWER DOOR LOCK CONTROL SYSTEM (Proceed to Problem Symptoms Table)

OK

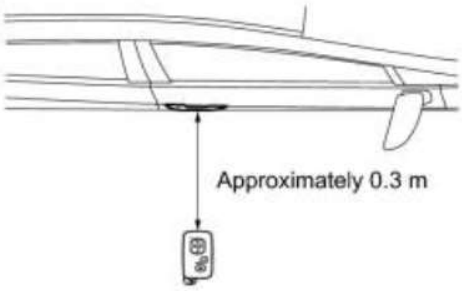
▼

2.	CHECK WAVE ENVIRONMENT

(a) Bring the key near the front door outside handle assembly (for front passenger side), and perform a front passenger door entry lock and unlock operation check.

NOTICE:

If the key is brought within 0.2 m (0.656 ft.) of the door outside handle assembly, communication is not possible.



- When pressing the lock switch and touching the touch sensor, hold the electrical key transmitter about 1 m (3.28 ft.) above the ground and about 0.3 m (0.984 ft.) away from the vehicle as shown in the illustration.
- When the key is brought near the front door outside handle assembly (for front passenger side), the possibility of wave interference decreases, and it can be determined if wave interference is causing the problem symptom.
- If the operation is normal, the possibility of wave interference is high. Also, added vehicle components may cause wave interference. If installed, remove them and perform the operation check.

OK:

Entry functions operate normally.

NG ▶ CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - FRONT DOOR OUTSIDE HANDLE)

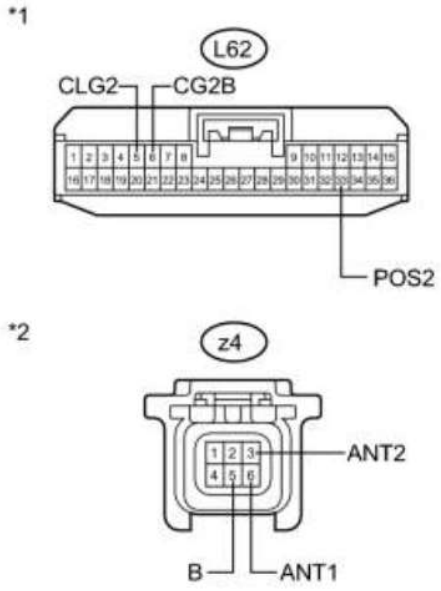
OK ▶ **AFFECTED BY WAVE INTERFERENCE**

3.	CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - FRONT DOOR OUTSIDE HANDLE)

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

(b) Disconnect the front door outside handle assembly (for front passenger side) connector.

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
L62-5 (CLG2) - z4-6 (ANT1)	Always	Below 1 Ω
L62-6 (CG2B) - z4-3 (ANT2)	Always	Below 1 Ω
L62-33 (POS2) - z4-5 (B)	Always	Below 1 Ω
L62-5 (CLG2) - Body ground	Always	10 kΩ or higher
L62-6 (CG2B) - Body ground	Always	10 kΩ or higher
L62-33 (POS2) - Body ground	Always	10 kΩ or higher
z4-6 (ANT1) - Body ground	Always	10 kΩ or higher
z4-3 (ANT2) - Body ground	Always	10 kΩ or higher
z4-5 (B) - 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 Front Door Outside Handle Assembly (for Front Passenger Side))

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

▼

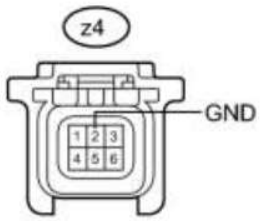
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4.	CHECK HARNESS AND CONNECTOR (FRONT DOOR OUTSIDE HANDLE - BODY GROUND)

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

Standard Resistance:

*1



Tester Connection	Condition	Specified Condition
z4-2 (GND) - Body ground	Always	Below 1 Ω

H

Text in Illustration

*1	Front view of wire harness connector (to Front Door Outside Handle Assembly (for Front Passenger Side))

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

▼

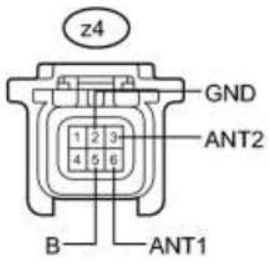
5.	INSPECT FRONT DOOR OUTSIDE HANDLE ASSEMBLY (DOOR OSCILLATOR, LOCK/UNLOCK SENSOR SIGNAL INPUT)

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

(b) Measure the voltage and check for pulses according to the value(s) in the table below.

Standard:

*1



H

Tester Connection	Condition	Specified Condition
z4-6 (ANT1) - z4-3 (ANT2)	• Power switch off • All doors closed • Key not in cabin	No pulse generation
z4-6 (ANT1) - z4-3 (ANT2)	• Power switch off • All doors closed • Key not in cabin • All doors locked by wireless lock function	Pulse generation
z4-5 (B) - z4-2 (GND)	Power switch off	9 to 14 V
z4-5 (B) - z4-2 (GND)	Power switch on (IG)	Below 2 V

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Text in Illustration

*1	Front view of wire harness connector (to Front Door Outside Handle Assembly (for Front Passenger Side))

NG ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

OK

▼

6.	REPLACE FRONT DOOR OUTSIDE HANDLE ASSEMBLY (for Front Passenger Side)

(a) Replace the front door outside handle assembly (for front passenger side) INFO.

NEXT

▼

7.	CHECK FRONT DOOR OUTSIDE HANDLE ASSEMBLY (for Front Passenger Side)

(a) Check that the entry functions operate normally INFO.

OK:

Entry functions operate normally.

NG ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

OK ▶ **END (FRONT DOOR OUTSIDE HANDLE ASSEMBLY WAS DEFECTIVE)**

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Driver Side Door Entry Lock Function does not Operate

DESCRIPTION

If the driver door entry unlock function operates normally, but its entry lock function does not, this means that the request code from the driver door is being output normally. In this case, a malfunction in the lock sensor circuit (from the certification ECU (smart key ECU assembly) to the front door outside handle assembly (lock sensor)) is suspected.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- The smart key system (for entry function) uses a LIN communication system and CAN communication system. Inspect the communication function by following How to Proceed with Troubleshooting INFO. Troubleshoot the smart key system (for entry function) after confirming that the communication system is functioning properly.
- Confirm that another key is not in the cabin.

PROCEDURE

1.	CHECK POWER DOOR LOCK OPERATION

(a) When the door control switch on the master switch assembly is operated, check that the doors unlock and lock according to switch operation INFO.

OK:

Door locks operate normally.

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NG ▶ GO TO POWER DOOR LOCK CONTROL SYSTEM (Proceed to Problem Symptoms Table)

OK

▼

2.	READ VALUE USING TECHSTREAM (DOOR OUTSIDE HANDLE)

(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
D-Door Trigger SW	Driver side door lock switch / ON or OFF	ON: Entry lock switch pressed OFF: Entry lock switch not pressed	-

OK:

On the Techstream screen, the display changes between ON and OFF as shown in the chart above.

NG ▶ CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - FRONT DOOR OUTSIDE HANDLE)

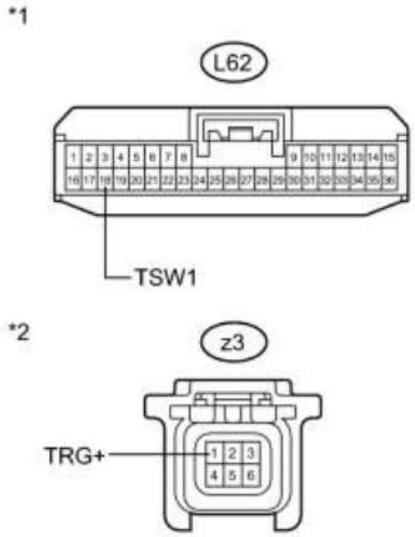
OK ▶ **REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)**

3.	CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - FRONT DOOR OUTSIDE HANDLE)

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

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

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
L62-18 (TSW1) - z3-1 (TRG+)	Always	Below 1 Ω
L62-18 (TSW1) - Body ground	Always	10 kΩ or higher
z3-1 (TRG+) - 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 Front Door Outside Handle Assembly (for Driver Side))

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

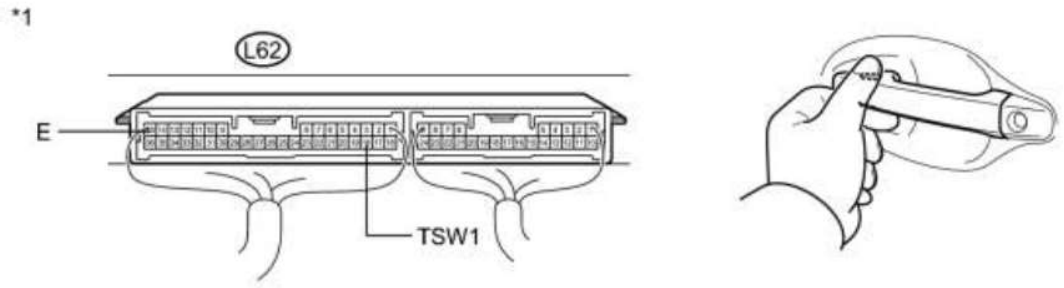
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4.	INSPECT CERTIFICATION ECU (SMART KEY ECU ASSEMBLY) (LOCK SENSOR SIGNAL INPUT)

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

(b) Reconnect the front door outside handle assembly (for driver side) connector.

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(c) Measure the voltage and check for pulses according to the value(s) in the table below.

Standard:

Tester Connection	Condition	Specified Condition
L62-18 (TSW1) - L62-15 (E)	• Power switch off • All doors closed • Lock sensor (for driver side) not touched	Pulse generation
L62-18 (TSW1) - L62-15 (E)	• Power switch off • All doors closed • Lock sensor (for driver side) touched	Below 2 V

Text in Illustration

*1	Component with harness connected (Certification ECU (Smart Key ECU Assembly))	-	-

NG ▶ REPLACE FRONT DOOR OUTSIDE HANDLE ASSEMBLY (for Driver Side)

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

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Front Passenger Side Door Entry Lock Function does not Operate

DESCRIPTION

If the front passenger door entry unlock function operates normally, but its entry lock function does not, this means that the request code from the front passenger door is being output normally. In this case, a malfunction in the lock sensor circuit (from the certification ECU (smart key ECU assembly) to the front door outside handle assembly (lock sensor)) is suspected.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- The smart key system (for entry function) uses a LIN communication system and CAN communication system. Inspect the communication function by following How to Proceed with Troubleshooting INFO. Troubleshoot the smart key system (for entry function) after confirming that the communication system is functioning properly.
- Confirm that another key is not in the cabin.

PROCEDURE

1.	CHECK POWER DOOR LOCK OPERATION

(a) When the door control switch on the master switch assembly is operated, check that the doors unlock and lock according to switch operation INFO.

OK:

Door locks operate normally.

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NG ▶ GO TO POWER DOOR LOCK CONTROL SYSTEM (Proceed to Problem Symptoms Table)

OK

▼

2.	READ VALUE USING TECHSTREAM (DOOR OUTSIDE HANDLE)

(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
P-Door Trigger SW	Front passenger side door lock switch / ON or OFF	ON: Entry lock switch pressed OFF: Entry lock switch not pressed	-

OK:

On the Techstream screen, the display changes between ON and OFF as shown in the chart above.

NG ▶ CHECK HARNESS AND CONNECTOR (FRONT DOOR OUTSIDE HANDLE - CERTIFICATION ECU)

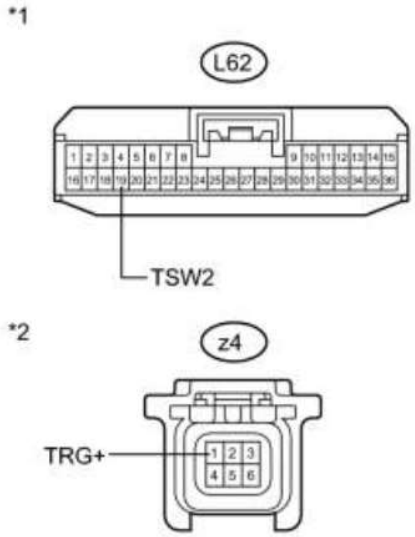
OK ▶ **REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)**

3.	CHECK HARNESS AND CONNECTOR (FRONT DOOR OUTSIDE HANDLE - CERTIFICATION ECU)

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

(b) Disconnect the front door outside handle assembly (for front passenger side) connector.

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
L62-19 (TSW2) - z4-1 (TRG+)	Always	Below 1 Ω
L62-19 (TSW2) - Body ground	Always	10 kΩ or higher
z4-1 (TRG+) - 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 Front Door Outside Handle Assembly (for Front Passenger Side))

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

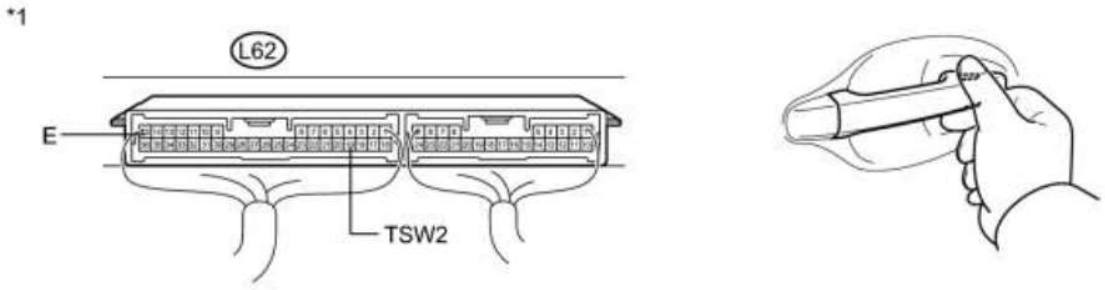
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4.	INSPECT CERTIFICATION ECU (SMART KEY ECU ASSEMBLY) (LOCK SENSOR SIGNAL INPUT)

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

(b) Reconnect the front door outside handle assembly (for front passenger side) connector.

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(c) Measure the voltage and check for pulses according to the value(s) in the table below.

Standard:

Tester Connection	Condition	Specified Condition
L62-19 (TSW2) - L62-15 (E)	• Power switch off • All doors closed • Lock sensor (for front passenger side) not touched	Pulse generation
L62-19 (TSW2) - L62-15 (E)	• Power switch off • All doors closed • Lock sensor (for front passenger side) touched	Below 2 V

Text in Illustration

*1	Component with harness connected (Certification ECU (Smart Key ECU Assembly))	-	-

NG ▶ REPLACE FRONT DOOR OUTSIDE HANDLE ASSEMBLY (for Front Passenger Side)

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

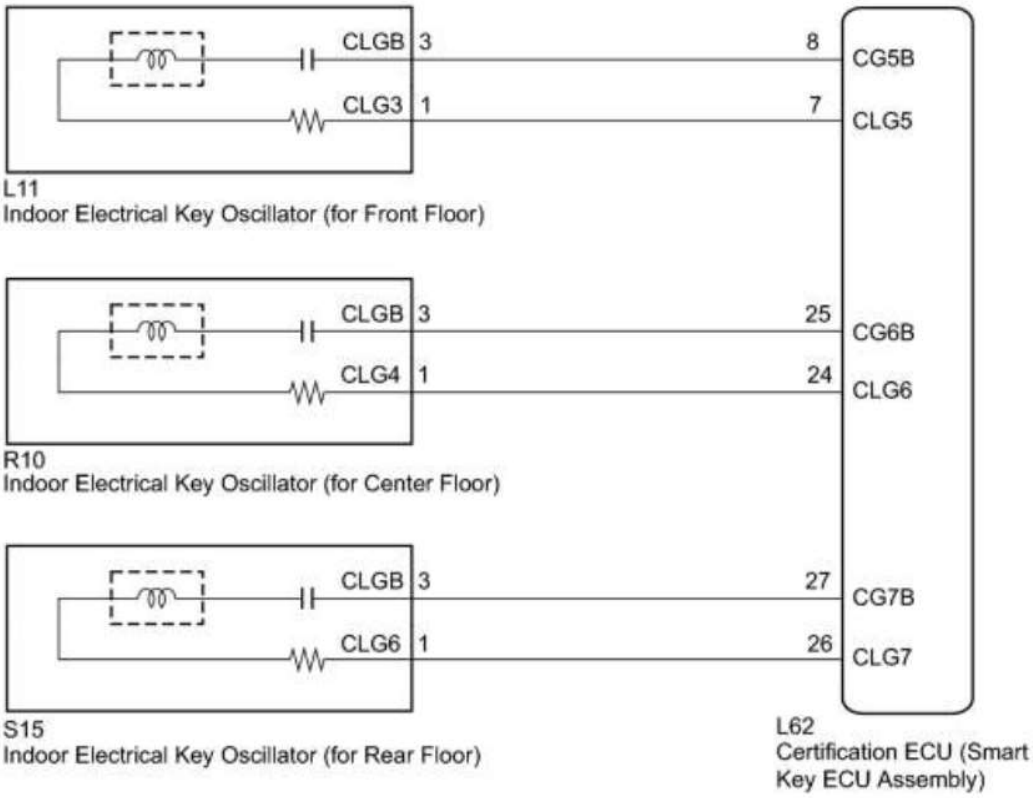
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Room Oscillator does not Recognize Key

DESCRIPTION

If the room oscillator does not recognize a key, one of the following may be the cause: 1) communication between the indoor electrical key oscillator (for front floor) and key cannot be performed; 2) communication between the indoor electrical key oscillator (for center floor) and key cannot be performed; or 3) communication between the indoor electrical key oscillator (for rear floor) and key cannot be performed.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- The smart key system (for entry function) uses a LIN communication system and CAN communication system. Inspect the communication function by following How to Proceed with Troubleshooting INFO. Troubleshoot the smart key system (for entry function) after confirming that the communication system is functioning properly.
- When using the Techstream with the power switch off to troubleshoot:

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Connect the Techstream to the DLC3, and turn a courtesy light switch on and off at 1.5-second intervals until communication between the Techstream and vehicle begins.

PROCEDURE

1.	CHECK SMART KEY SYSTEM (for Entry Function)

(a) Check that entry lock and unlock functions can be operated at each door INFO.

OK:

Entry lock and unlock functions operate normally.

NG ▶ GO TO OTHER PROBLEM (Proceed to Problem Symptoms Table)

OK

▼

2.	CHECK SMART KEY SYSTEM (for Start Function)

(a) Remove the battery of the key INFO.



(b) With the brake pedal depressed, touch the power switch while facing the logo side of the key to the power switch.

(c) When operating the power switch, check whether the power source mode changes.

OK:

Power source mode changes.

HINT:

- When the key cannot be verified even though it is within the specified range, the hybrid vehicle control system start check can be performed by removing the transmitter battery from the key and holding the transmitter close to the power switch.
- When performing the check, if the power source mode changes, there is a problem with key certification inside the cabin.

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NG ▶ GO TO SMART KEY SYSTEM (for Start Function) (Proceed to Power Source Mode does not Change to ON)

OK

▼

3.	CHECK WAVE ENVIRONMENT

(a) Install the battery to the key INFO.

(b) Bring the key near the indoor electrical key oscillator (for front floor), and check that the hybrid vehicle control system can be started.

NOTICE:

If the key is brought within 0.2 m (0.656 ft.) of the indoor electrical key oscillator (for front floor), communication is not possible.

(c) Bring the key near the indoor electrical key oscillator (for center floor), and check that the hybrid vehicle control system can be started.

NOTICE:

If the key is brought within 0.2 m (0.656 ft.) of the indoor electrical key oscillator (for center floor), communication is not possible.

(d) Bring the key near the indoor electrical key oscillator (for rear floor), and check that the hybrid vehicle control system can be started*.

*: If the customize setting for Ignition Available Area is not set All, the hybrid vehicle control system will not start. Before performing this inspection, check that All has been selected INFO.

NOTICE:

If the key is brought within 0.2 m (0.656 ft.) of the indoor electrical key oscillator (for rear floor), communication is not possible.

HINT:

- When the key is brought near the indoor electrical key oscillator, the possibility of wave interference decreases, and it can be determined if wave interference is causing the problem symptom.
- If the operation is normal, the possibility of wave interference is high. Also, added vehicle components may cause wave interference. If installed, remove them and perform the operation check.

OK:

The hybrid vehicle control system starts.

NG ▶ PERFORM KEY DIAGNOSTIC MODE INSPECTION

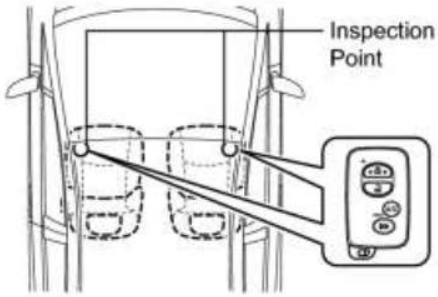
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OK ▶ **AFFECTED BY WAVE INTERFERENCE**

4.	PERFORM KEY DIAGNOSTIC MODE INSPECTION

(a) Diagnostic mode inspection (indoor electrical key oscillator (for front floor))

(1) Connect the Techstream to the DLC3.



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

(3) Turn the Techstream on.

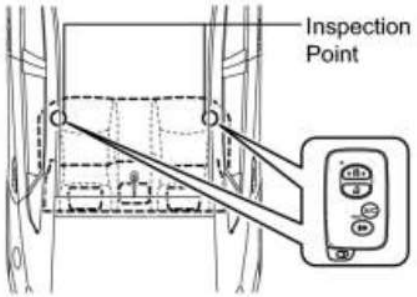
(4) Enter the following menus: Body Electrical / Smart Key / Utility / Key Communication Check / Overhead + Front Room.

(5) When the electrical key transmitter is in the position shown in the illustration, check that the wireless door lock buzzer sounds.

- Place the key on the driver or front passenger seat cushion.
- If the buzzer sounds, it can be determined that the indoor electrical key oscillators are operating normally.

(b) Diagnostic mode inspection (indoor electrical key oscillator (for center floor))

(1) Connect the Techstream to the DLC3.



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

(3) Turn the Techstream on.

(4) Enter the following menus: Body Electrical / Smart Key / Utility / Key Communication Check / Overhead + Rear Room.

(5) When the electrical key transmitter is in the position shown in the illustration, check that the wireless door lock buzzer sounds.

- Place the key on the rear seat cushion.
- If the buzzer sounds, it can be determined that the indoor electrical key oscillators are operating normally.

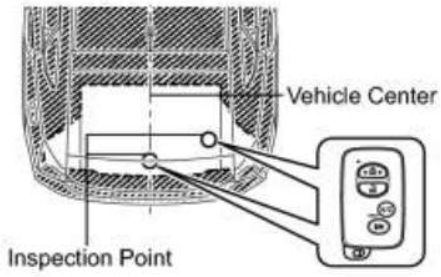
(c) Diagnostic mode inspection (indoor electrical key oscillator (for rear floor))

(1) Connect the Techstream to the DLC3.

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

(3) Turn the Techstream on.

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(4) Enter the following menus: Body Electrical / Smart Key / Utility / Key Communication Check / Overhead + Back Door (inside).

(5) When the electrical key transmitter is in the position shown in the illustration, check that the wireless door lock buzzer sounds.

- Place the key on the luggage area.
- If the buzzer sounds, it can be determined that the indoor electrical key oscillators are operating normally.

Result:

Result	Proceed to
Wireless door lock buzzer does not sound only for indoor electrical key oscillator (for front floor).	A
Wireless door lock buzzer does not sound only for indoor electrical key oscillator (for center floor).	B
Wireless door lock buzzer does not sound only for indoor electrical key oscillator (for rear floor).	C
Wireless door lock buzzer sounds for all indoor electrical key oscillators.	D

D ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

C ▶ CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - INDOOR ELECTRICAL KEY OSCILLATOR)

B ▶ CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - INDOOR ELECTRICAL KEY OSCILLATOR)

A

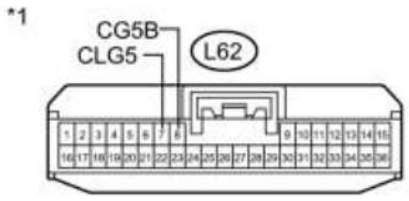
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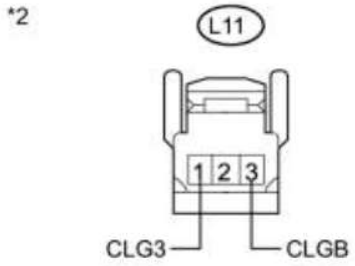
5.	CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - INDOOR ELECTRICAL KEY OSCILLATOR)

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

(b) Disconnect the indoor electrical key oscillator (for front floor) connector.

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
L62-7 (CLG5) - L11-1 (CLG3)	Always	Below 1 Ω
L62-8 (CG5B) - L11-3 (CLGB)	Always	Below 1 Ω
L62-7 (CLG5) - Body ground	Always	10 kΩ or higher
L62-8 (CG5B) - Body ground	Always	10 kΩ or higher
L11-1 (CLG3) - Body ground	Always	10 kΩ or higher
L11-3 (CLGB) - 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 Indoor Electrical Key Oscillator (for Front Floor))

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

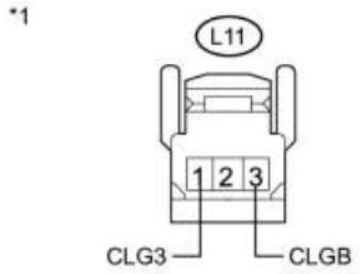
OK

▼

6.	INSPECT INDOOR ELECTRICAL KEY OSCILLATOR (for Front Floor (INPUT))

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

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(b) Check for pulses according to the value(s) in the table below.

Standard:

Tester Connection	Condition	Specified Condition
L11-1 (CLG3) - L11-3 (CLGB)	• Power switch off • All doors closed • Key not in cabin • Door outside handle assembly (lock sensor) not touched	No pulse generation
L11-1 (CLG3) - L11-3 (CLGB)	• Power switch off • All doors closed • Key not in cabin • Door outside handle assembly (lock sensor) touched	Pulse generation

Text in Illustration

*1	Front view of wire harness connector (to Indoor Electrical Key Oscillator (for Front Floor))

NG ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

OK

▼

7.	REPLACE INDOOR ELECTRICAL KEY OSCILLATOR (for Front Floor)

(a) Replace the indoor electrical key oscillator (for front floor INFO.

NEXT

▼

8.	PERFORM KEY DIAGNOSTIC MODE INSPECTION (for Front Floor)

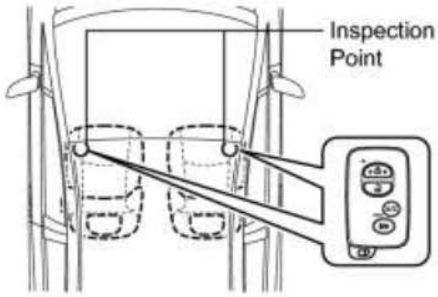
(a) Connect the Techstream to the DLC3.

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

(c) Turn the Techstream on.

(d) Enter the following menus: Body Electrical / Smart Key / Utility / Key Communication Check / Overhead + Front Room.



(e) When the electrical key transmitter is in the position shown in the illustration, check that the wireless door lock buzzer sounds.

OK:

Wireless door lock buzzer sounds.

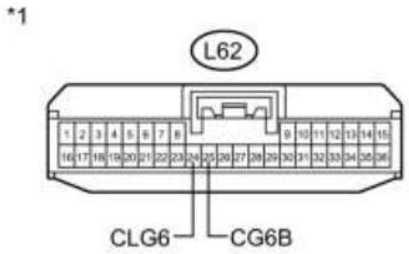
- Place the key on the driver or front passenger seat cushion.
- If the buzzer sounds, it can be determined that the indoor electrical key oscillators are operating normally.

NG ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

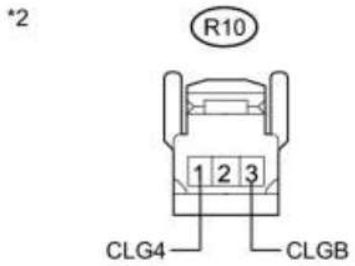
OK ▶ **END (INDOOR ELECTRICAL KEY OSCILLATOR WAS DEFECTIVE)**

9.	CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - INDOOR ELECTRICAL KEY OSCILLATOR)

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



(b) Disconnect the indoor electrical key oscillator (for center floor) connector.



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

Standard Resistance:

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Tester Connection	Condition	Specified Condition
L62-24 (CLG6) - R10-1 (CLG4)	Always	Below 1 Ω
L62-25 (CG6B) - R10-3 (CLGB)	Always	Below 1 Ω
L62-24 (CLG6) - Body ground	Always	10 kΩ or higher
L62-25 (CG6B) - Body ground	Always	10 kΩ or higher
R10-1 (CLG4) - Body ground	Always	10 kΩ or higher
R10-3 (CLGB) - 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 Indoor Electrical Key Oscillator (for Center Floor))

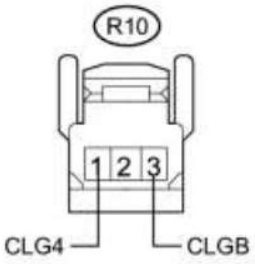
NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

▼

10.	INSPECT INDOOR ELECTRICAL KEY OSCILLATOR (for Center Floor (INPUT))

*1



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

(b) Check for pulses according to the value(s) in the table below.

Standard:

Tester Connection	Condition	Specified Condition
R10-1 (CLG4) - R10-3 (CLGB)	• Power switch off • All doors closed • Key not in cabin • Door outside handle assembly (lock sensor) not touched	No pulse generation
R10-1 (CLG4) - R10-3 (CLGB)	• Power switch off • All doors closed	Pulse generation

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Tester Connection	Condition	Specified Condition
	• Key not in cabin • Door outside handle assembly (lock sensor) touched	

Text in Illustration

*1	Front view of wire harness connector (to Indoor Electrical Key Oscillator (for Center Floor))

NG ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

OK

▼

11.	REPLACE INDOOR ELECTRICAL KEY OSCILLATOR (for Center Floor)

(a) Replace the indoor electrical key oscillator (for center floor) INFO.

NEXT

▼

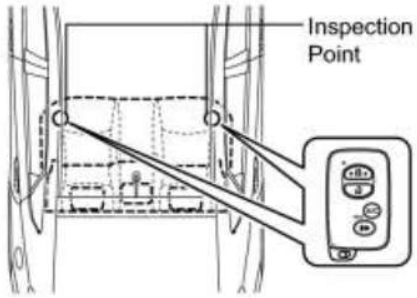
12.	PERFORM KEY DIAGNOSTIC MODE INSPECTION (for Center Floor)

(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 / Utility / Key Communication Check / Overhead + Rear Room.



(e) When the electrical key transmitter is in the position shown in the illustration, check that the wireless door lock buzzer sounds.

OK:

Wireless door lock buzzer sounds.

- Place the key on the driver or front passenger seat cushion.
- If the buzzer sounds, it can be determined that the indoor electrical key oscillators are operating normally.

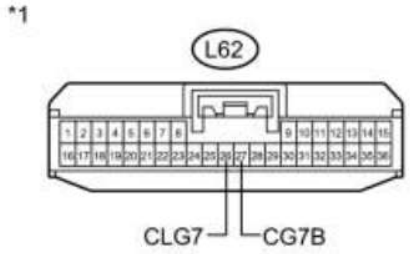
NG ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

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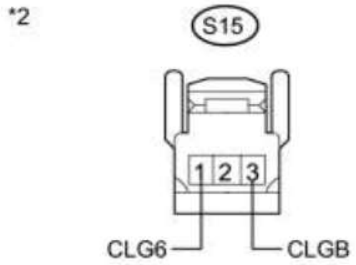
OK ▶ **END (INDOOR ELECTRICAL KEY OSCILLATOR WAS DEFECTIVE)**

13.	CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - INDOOR ELECTRICAL KEY OSCILLATOR)

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



(b) Disconnect the indoor electrical key oscillator (for rear floor) connector.



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

Standard Resistance:

Tester Connection	Condition	Specified Condition
L62-26 (CLG7) - S15-1 (CLG6)	Always	Below 1 Ω
L62-27 (CG7B) - S15-3 (CLGB)	Always	Below 1 Ω
L62-26 (CLG7) - Body ground	Always	10 kΩ or higher
L62-27 (CG7B) - Body ground	Always	10 kΩ or higher
S15-1 (CLG6) - Body ground	Always	10 kΩ or higher
S15-3 (CLGB) - 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 Indoor Electrical Key Oscillator (for Rear Floor))

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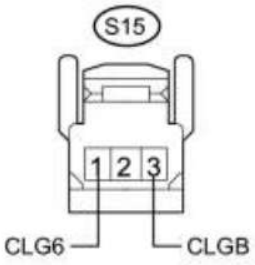
NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

▼

14.	INSPECT INDOOR ELECTRICAL KEY OSCILLATOR (for Rear Floor (INPUT))

*1



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

(b) Check for pulses according to the value(s) in the table below.

Standard:

Tester Connection	Condition	Specified Condition
S15-1 (CLG6) - S15-3 (CLGB)	• Power switch off • All doors closed • Key not in cabin • Door outside handle assembly (lock sensor) not touched	No pulse generation
S15-1 (CLG6) - S15-3 (CLGB)	• Power switch off • All doors closed • Key not in cabin • Door outside handle assembly (lock sensor) touched	Pulse generation

Text in Illustration

*1	Front view of wire harness connector (to Indoor Electrical Key Oscillator (for Rear Floor))

NG ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

OK

▼

15.	REPLACE INDOOR ELECTRICAL KEY OSCILLATOR (for Rear Floor)

(a) Replace the indoor electrical key oscillator (for rear floor) INFO.

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NEXT

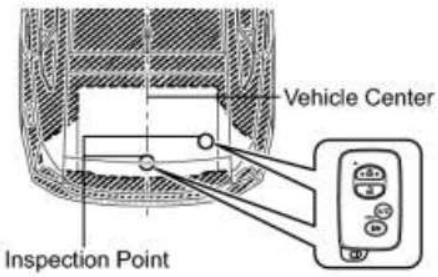
16.	PERFORM KEY DIAGNOSTIC MODE INSPECTION (for Rear Floor)

(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 / Utility / Key Communication Check / Overhead + Back Door (inside).



(e) When the electrical key transmitter is in the position shown in the illustration, check that the wireless door lock buzzer sounds.

OK:

Wireless door lock buzzer sounds.

- Place the key on the driver or front passenger seat cushion.
- If the buzzer sounds, it can be determined that the indoor electrical key oscillators are operating normally.

NG ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

OK ▶ **END (INDOOR ELECTRICAL KEY OSCILLATOR WAS DEFECTIVE)**

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Entry Interior Alarm does not Sound

DESCRIPTION

The smart key system uses the combination meter buzzer to perform various vehicle interior warnings. When the conditions for each warning are met, the certification ECU (smart key ECU assembly) sends a buzzer signal to the combination meter assembly, and the combination meter buzzer sounds.

INSPECTION PROCEDURE

NOTICE:

The smart key system (for entry function) uses a LIN communication system and CAN communication system. Inspect the communication function by following How to Proceed with Troubleshooting INFO. Troubleshoot the smart key system (for entry function) after confirming that the communication system is functioning properly.

PROCEDURE

1.	CHECK COMBINATION METER ASSEMBLY (OPERATION)

(a) When the power switch is on (IG) and the shift lever is in R, check that the combination meter buzzer sounds.

OK:

Combination meter buzzer sounds.

NG ▶ GO TO METER / GAUGE SYSTEM (Proceed to Problem Symptoms Table)

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

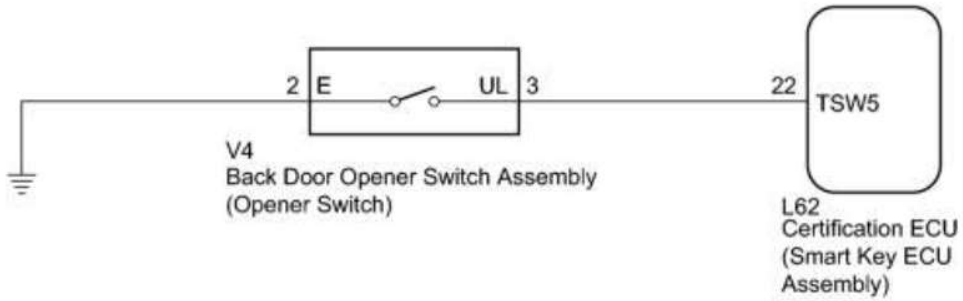
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Back Door Entry Unlock Function does not Operate

DESCRIPTION

If the entry back door open function does not operate but the back door entry lock function operates, the communication between the vehicle and key is normal. As a faulty part, the back door open switch circuit (from the back door opener switch assembly (opener switch) to the certification ECU (smart key ECU assembly)) is suspected.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- The smart key system (for entry function) uses a LIN communication system and CAN communication system. Inspect the communication function by following How to Proceed with Troubleshooting INFO. Troubleshoot the smart key system (for entry function) after confirming that the communication system is functioning properly.
- Confirm that another key is not in the cabin.

PROCEDURE

1.	READ VALUE USING TECHSTREAM (ENTRY BACK DOOR OPEN FUNCTION)

(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.

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(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
B-Dr Opening Operation	Back door opening Operation / Long, Twice, OFF	Customization status displayed	-

Result:

Result	Proceed to
Customize setting is Long or Twice.	A
Customize setting is OFF.	B

B ▶ PERFORM CUSTOMIZE SETTING (Proceed to Customize Parameters)

A

▼

2.	CHECK POWER DOOR LOCK OPERATION

(a) When the door control switch on the master switch assembly is operated, check that the doors unlock and lock according to switch operation INFO.

OK:

Door locks operate normally.

NG ▶ GO TO POWER DOOR LOCK CONTROL SYSTEM (Proceed to Problem Symptoms Table)

OK

▼

3.	PERFORM ACTIVE TEST USING TECHSTREAM

(a) Enter the following menus: Body Electrical / Main Body / Active Test.

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

Main Body (Main Body ECU (Multiplex Network Body ECU))

Tester Display	Test Part	Control Range	Diagnostic Note
Trunk and Back-Door Open	Operate back door lock motor	ON or OFF	-

OK:

The back door lock assembly unlatches when ON is selected.

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NG ▶ GO TO POWER DOOR LOCK CONTROL SYSTEM (Proceed to Problem Symptoms Table)

OK

▼

4.	READ VALUE USING TECHSTREAM (BACK DOOR OPENER SWITCH)

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

(b) 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
Tr/B-Door Unlock SW	Back door opener switch assembly (opener switch) / ON or OFF	ON: Back door opener switch assembly (opener switch) pushed OFF: Back door opener switch assembly (opener switch) not pushed	-

OK:

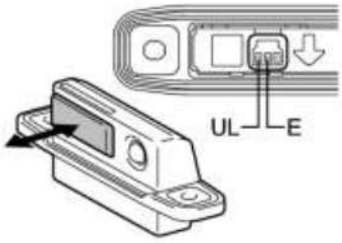
On the Techstream screen, the display changes between ON and OFF as shown in the chart above.

NG ▶ INSPECT BACK DOOR OPENER SWITCH ASSEMBLY

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

5.	INSPECT BACK DOOR OPENER SWITCH ASSEMBLY

*1



(a) Remove the back door opener switch assembly INFO.

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

Standard Resistance:

Tester Connection	Switch Position	Specified Condition
2 (E) - 3 (UL)	Back door opener switch assembly (opener switch) not pushed (OFF)	10 kΩ or higher
2 (E) - 3 (UL)	Back door opener switch assembly (opener switch) pushed (ON)	Below 1 Ω

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Text in Illustration

*1	Component without harness connected (Back Door Opener Switch Assembly)

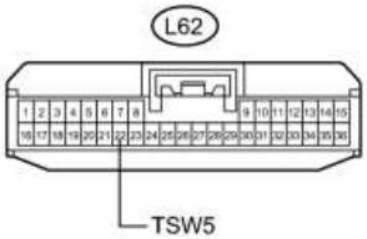
NG ▶ REPLACE BACK DOOR OPENER SWITCH ASSEMBLY

OK

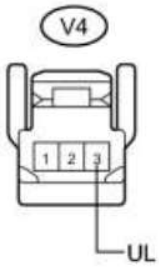
▼

6.	CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - BACK DOOR OPENER SWITCH)

*1



*2



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

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
L62-22 (TSW5) - V4-3 (UL)	Always	Below 1 Ω
L62-22 (TSW5) - Body ground	Always	10 kΩ or higher
V4-3 (UL) - 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

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	(to Back Door Opener Switch Assembly)

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

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

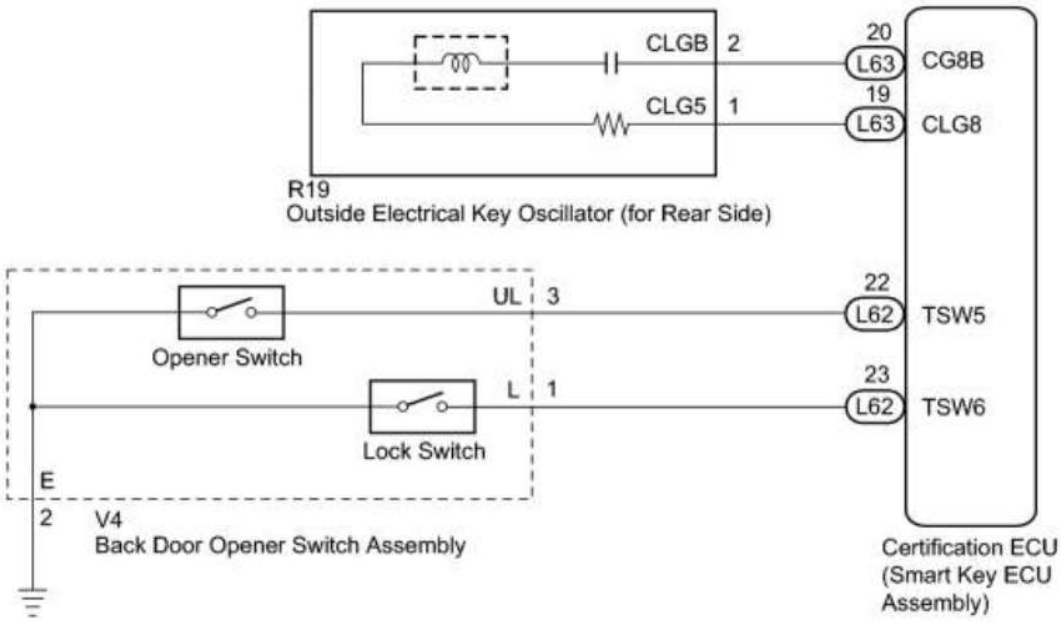
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Back Door Entry Lock and Unlock Functions do not Operate

DESCRIPTION

When the back door entry lock and unlock functions do not operate, one of the following may be malfunctioning: 1) power door lock control system; 2) outside electrical key oscillator (for rear side); 3) certification ECU (smart key ECU assembly), or 4) back door opener switch assembly.

WIRING DIAGRAM



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INSPECTION PROCEDURE

NOTICE:

- The smart key system (for entry function) uses a LIN communication system and CAN communication system. Inspect the communication function by following How to Proceed with Troubleshooting INFO. Troubleshoot the smart key system (for entry function) after confirming that the communication system is functioning properly.
- Confirm that another key is not in the cabin.

PROCEDURE

1.	CHECK POWER DOOR LOCK OPERATION

(a) When the door control switch o[INFO]master switch assembly is operated, check that the doors unlock and lock according to switch operation .

OK:

Door locks operate normally.

NG ▶ GO TO POWER DOOR LOCK CONTROL SYSTEM (Proceed to Problem Symptoms Table)

OK

▼

2.	READ VALUE USING TECHSTREAM (BACK DOOR OPENER SWITCH)

(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/Display	Normal Condition	Diagnostic Note
Tr/B-Door Lock SW	Back door opener switch assembly (lock switch) / ON or OFF	ON: Back door opener switch assembly (lock switch) pushed OFF: Back door opener switch assembly (lock switch) not pushed	-
Tr/B-Door Unlock SW	Back door opener switch assembly (opener switch) / ON or OFF	ON: Back door opener switch assembly (opener switch) pushed OFF: Back door opener switch assembly (opener switch) not pushed	-

OK:

On the Techstream screen, the display changes between ON and OFF as shown in the chart above.

NG ▶ CHECK HARNESS AND CONNECTOR (BACK DOOR OPENER SWITCH - BODY GROUND)

OK

▼

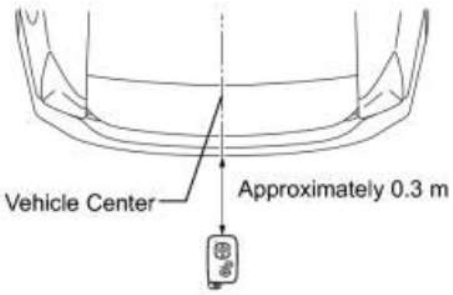
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3.	CHECK WAVE ENVIRONMENT

(a) Bring the key near the outside electrical key oscillator (for rear side), and perform an entry back door open and entry lock functions check.

NOTICE:

If the key is brought within 0.2 m (0.656 ft.) of the rear bumper, communication is not possible.



- When pressing the lock switch and pressing the opener switch, hold the electrical key transmitter about 1 m (3.28 ft.) above the ground and about 0.3 m (0.984 ft.) away from the vehicle as shown in the illustration.
- When the key is brought near the outside electrical key oscillator (for rear side), the possibility of wave interference decreases, and it can be determined if wave interference is causing the problem symptom.
- If the operation is normal, the possibility of wave interference is high. Also, added vehicle components may cause wave interference. If installed, remove them and perform the operation.

OK:

Entry functions operate normally.

NG ▶ PERFORM KEY DIAGNOSTIC MODE INSPECTION

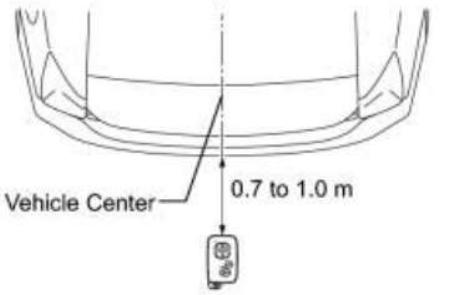
OK ▶ **AFFECTED BY WAVE INTERFERENCE**

4.	PERFORM KEY DIAGNOSTIC MODE INSPECTION

(a) Diagnostic mode inspection (outside electrical key oscillator (for rear side))

(1) Connect the Techstream to the DLC3.

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



(3) Turn the Techstream on.

(4) Enter the following menus: Body Electrical / Smart Key / Utility / Key Communication Check / Overhead + Back Door.

(5) When the electrical key transmitter is in the position shown in the illustration, check that the wireless door lock buzzer sounds.

- Hold the electrical key transmitter at the same height as the rear bumper upper surface and align with the center of the rear of the vehicle (0.7 to 1.0 m (2.30 to 3.28 ft.)). Make sure that the direction of the key is as shown in the illustration.
- If the buzzer sounds, it can be determined that the outside electrical key oscillator (for rear side) is operating normally.

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OK:

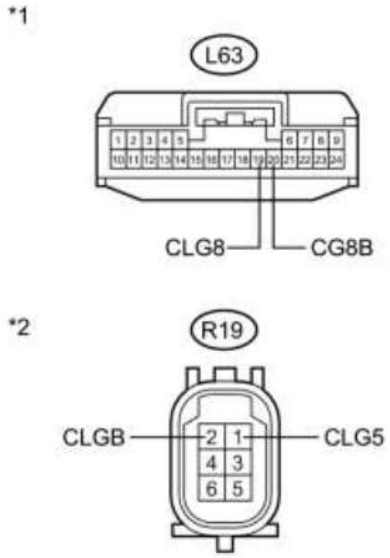
Wireless door lock buzzer sounds.

NG ▶ CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - OUTSIDE ELECTRICAL KEY OSCILLATOR)

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

5.	CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - OUTSIDE ELECTRICAL KEY OSCILLATOR)

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



(b) Disconnect the outside electrical key oscillator (for rear side) connector.

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
L63-19 (CLG8) - R19-1 (CLG5)	Always	Below 1 Ω
L63-20 (CG8B) - R19-2 (CLGB)	Always	Below 1 Ω
L63-19 (CLG8) - Body ground	Always	10 kΩ or higher
L63-20 (CG8B) - Body ground	Always	10 kΩ or higher
R19-1 (CLG5) - Body ground	Always	10 kΩ or higher
R19-2 (CLGB) - Body ground	Always	10 kΩ or higher

Text in Illustration

*1	Front view of wire harness connector

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	(to Certification ECU (Smart Key ECU Assembly))
*2	Front view of wire harness connector (to Outside Electrical Key Oscillator (for Rear Side))

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

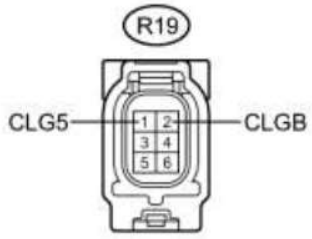
▼

6.	INSPECT OUTSIDE ELECTRICAL KEY OSCILLATOR (for Rear Side)

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

Standard Resistance:

*1



Tester Connection	Condition	Specified Condition
R19-1 (CLG5) - R19-2 (CLGB)	Always	Below 1 Ω

Text in Illustration

*1	Component without harness connected (Outside Electrical Key Oscillator (for Rear Side))

NG ▶ REPLACE OUTSIDE ELECTRICAL KEY OSCILLATOR (for Rear Side)

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

7.	CHECK HARNESS AND CONNECTOR (BACK DOOR OPENER SWITCH - BODY GROUND)

*1



(a) Disconnect the back door opener switch assembly connector.

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
V4-2 (E) - Body ground	Always	Below 1 Ω

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Text in Illustration

*1	Front view of wire harness connector (to Back Door Opener Switch Assembly))

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK ▶ **REPLACE BACK DOOR OPENER SWITCH ASSEMBLY**

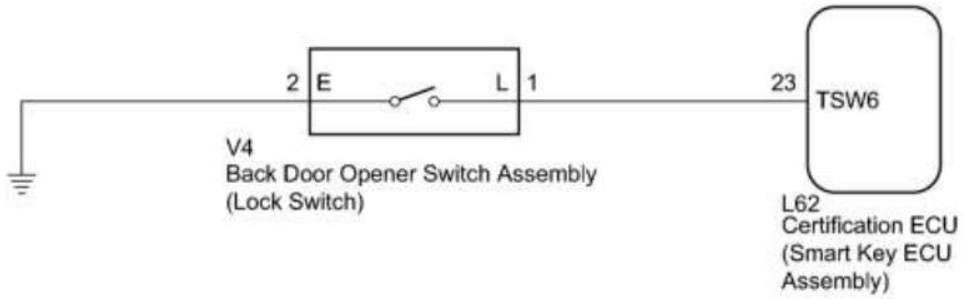
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Back Door Entry Lock Function does not Operate

DESCRIPTION

If the back door entry lock function does not operate but the back door open function operates, the communication between the vehicle and key is normal. As a faulty part, the entry lock switch circuit (from the back door opener switch assembly (lock switch) to the certification ECU (smart key ECU assembly)) is suspected.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- The smart key system (for entry function) uses a LIN communication system and CAN communication system. Inspect the communication function by following How to Proceed with Troubleshooting INFO. Troubleshoot the smart key system (for entry function) after confirming that the communication system is functioning properly.
- Confirm that another key is not in the cabin.

PROCEDURE

1.	CHECK POWER DOOR LOCK OPERATION

(a) When the door control switch on the master switch assembly is operated, check that the doors unlock and lock according to switch operation INFO.

OK:

Door locks operate normally.

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NG ▶ GO TO POWER DOOR LOCK CONTROL SYSTEM (Proceed to Problem Symptoms Table)

OK

▼

2.	READ VALUE USING TECHSTREAM (BACK DOOR OPENER SWITCH)

(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/Display	Normal Condition	Diagnostic Note
Tr/B-Door Lock SW	Back door opener switch assembly (lock switch) / ON or OFF	ON: Back door opener switch assembly (lock switch) pushed OFF: Back door opener switch assembly (lock switch) not pushed	-

OK:

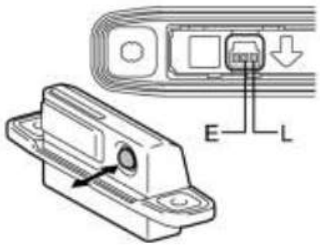
On the Techstream screen, the display changes between ON and OFF as shown in the chart above.

NG ▶ INSPECT BACK DOOR OPENER SWITCH ASSEMBLY

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

3.	INSPECT BACK DOOR OPENER SWITCH ASSEMBLY

*1



(a) Remove the back door opener switch assembly INFO.

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

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Standard Resistance:

Tester Connection	Switch Position	Specified Condition
1 (L) - 2 (E)	Back door opener switch assembly (lock switch) not pushed (OFF)	10 kΩ or higher
1 (L) - 2 (E)	Back door opener switch assembly (lock switch) pushed (ON)	Below 1 Ω

Text in Illustration

*1	Component without harness connected (Back Door Opener Switch Assembly)

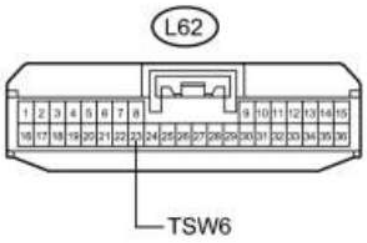
NG ▶ REPLACE BACK DOOR OPENER SWITCH ASSEMBLY

OK

▼

4.	CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - BACK DOOR OPENER SWITCH)

*1



*2



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

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
L62-23 (TSW6) - V4-1 (L)	Always	Below 1 Ω
L62-23 (TSW6) - Body ground	Always	10 kΩ or higher
V4-1 (L) - Body ground	Always	10 kΩ or higher

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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 Back Door Opener Switch Assembly)

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

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

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PRECAUTION

1. WHEN DISCONNECTING CABLE FROM NEGATIVE AUXILIARY BATTERY TERMINAL

NOTICE:

When disconnecting the cable from the negative (-) auxiliary battery terminal, initialize the following system after the cable is reconnected.

System Name	See Procedure
Advanced Parking Guide System	INFO

(a) The power source mode (off, on (ACC), on (IG)) is always retained in memory by the vehicle. If the auxiliary battery is disconnected, the power source mode that was present before disconnection will be restored after the auxiliary battery is reconnected. Be sure to turn the power switch off (change the power source mode to off) before disconnecting the cable from the negative (-) auxiliary battery terminal. Be careful if the power source mode of a vehicle with a discharged auxiliary battery is not known.

(b) After the cable is reconnected to the negative (-) auxiliary battery terminal, the hybrid control system may not start on the first attempt. This is not a malfunction. The hybrid control system will start normally for subsequent attempts.

HINT:

In this chapter, the expression "power source" has been used in some locations to allow precise explanations. The power source mode is also expressed using conventional expressions such as "power switch off", "power switch on (ACC)" and "power switch on (IG)".

2. PRECAUTIONS FOR PUSH-BUTTON START FUNCTION

(a) Before starting hybrid control system, firmly depress the brake pedal until the indicator in the power switch turns green.

(b) The smart key system, wireless door lock control system and engine immobiliser system may not operate normally, or the size of the operation area may decrease in the following situations:

(1) When the smart key battery is depleted.

(2) When any facility that generates strong radio waves or electrical noise such as a TV tower, power plant, gas station, broadcast station, large video-billboard or airport are located near the inspection site.

(3) When the key is located near a wireless device such as a radio, cellular phone or cordless telephone.

(4) When the smart key is in contact with or covered with a metal object similar to the following:

- Metal or aluminum plated card
- Aluminum film from a cigarette box
- Metallic wallet or bag
- Coins
- Heating pad

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- Media such as CDs or DVDs

(5) When a wireless remote is operated near the vehicle.

(6) When the key is carried with following items:

- Electronic key or wireless remote from another vehicle
- PC or similar handheld device
- Digital audio player
- Portable game device

(7) When a metallic film is applied to the rear glass.

3. WHEN KEY BATTERY IS LOW

(a) When the key battery is depleted, the hybrid control system cannot be started using the smart function. For how to start the hybrid control system when the key battery is depleted, see Description INFO.

(b) If the electrical key is held near the power switch to start the hybrid control system when the electrical key battery is depleted, the following warnings will sound:

(1) Driver door open → closed

- An exit warning will sound if R, N, D or B is selected and the power source (power switch) is in a mode other than off.

- An exit warning will sound if park (P) is selected and the power source is in a mode other than off.

(2) Doors other than the driver door open → closed

- A warning will sound to indicate that the electrical key has been taken out of the vehicle.

These warnings will sound because it is not possible for the vehicle to determine if the key is present in the vehicle (due to the depleted key battery). These warnings do not indicate system malfunctions.

4. EMERGENCY HYBRID CONTROL SYSTEM STOP CONTROL

(a) If it is necessary to stop the hybrid control system in an emergency while driving the vehicle, push and hold the power switch for more than 3 seconds.

While driving, the power switch should only be operated in the event of on emergency.

NOTICE:

If the hybrid control system stops while the vehicle is being driven, this could lead to an accident.

5. EMERGENCY HYBRID CONTROL SYSTEM START CONTROL

(a) If there is a malfunction in the stop light switch or STOP fuse, their signals may not be correctly transmitted to the power management control ECU. This may result in the hybrid control system not starting even if the power switch is pressed while the brake pedal is depressed and park (P) is selected.

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To activate the hybrid control system:

(1) Push the P position switch.

(2) Parking brake pedal is depressed.

(3) Turn the power switch from off to on (ACC).

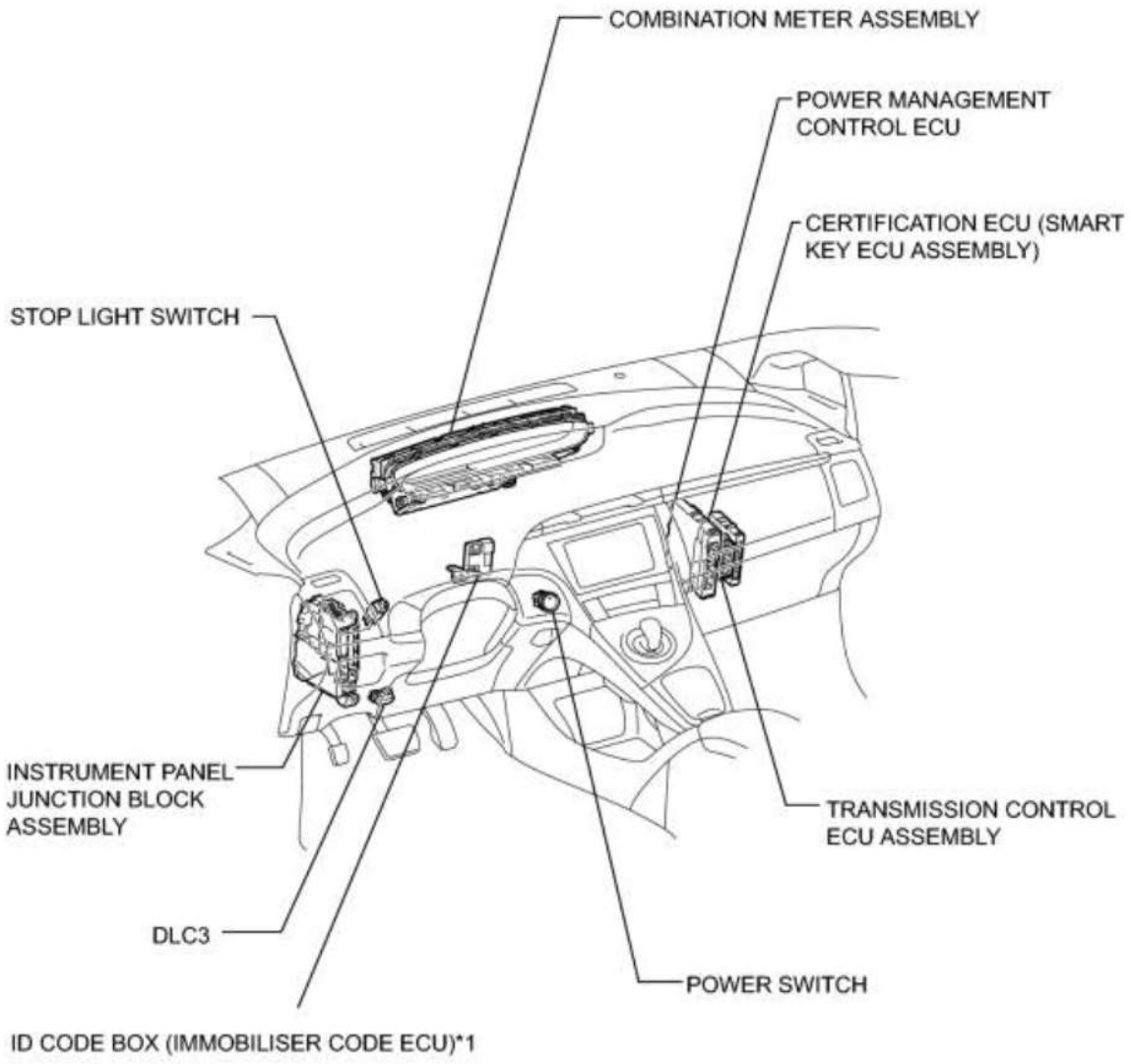
(4) Brake pedal is depressed.

(5) Press and hold the power switch for 15 seconds or more.

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PARTS LOCATION

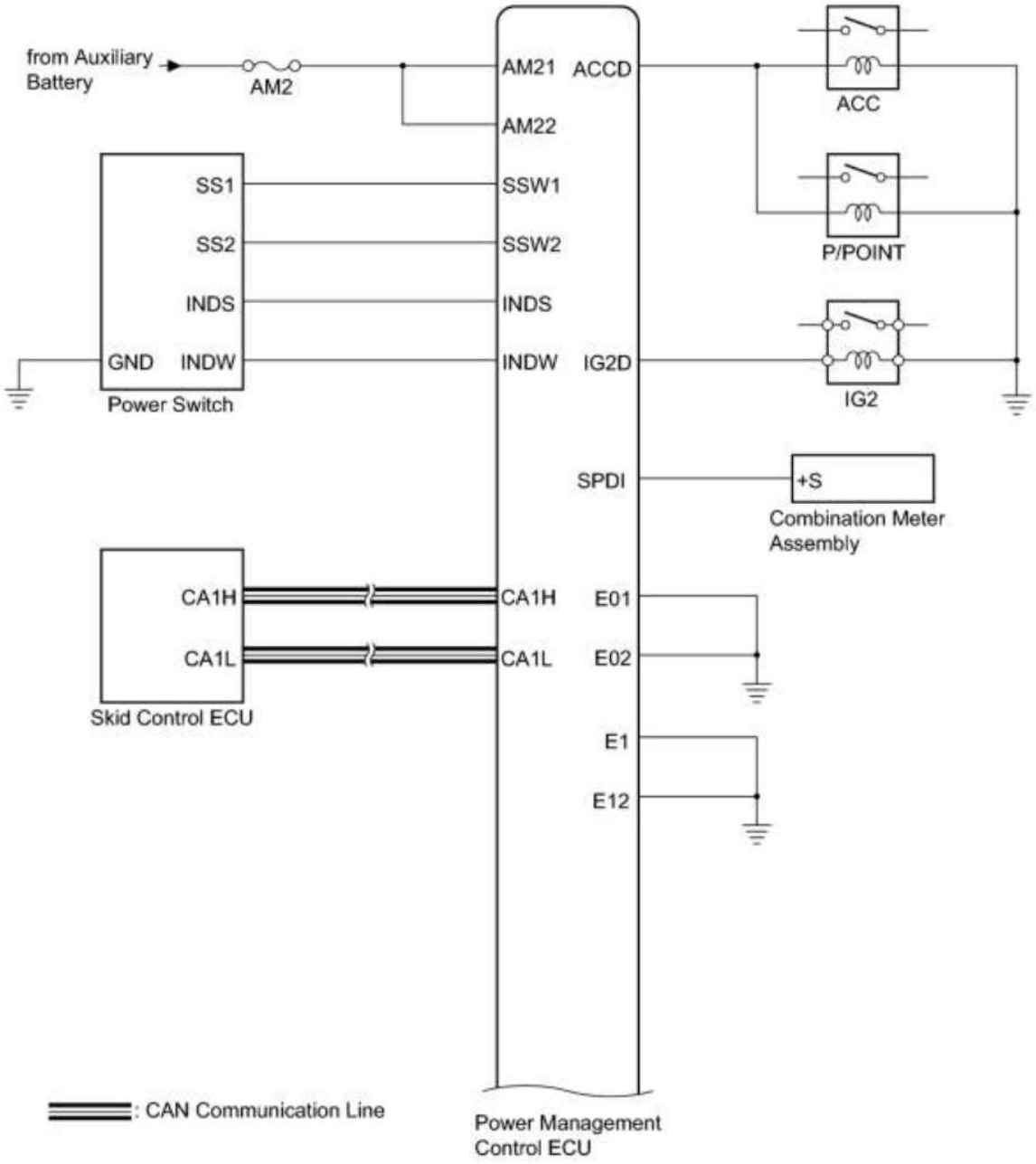
ILLUSTRATION



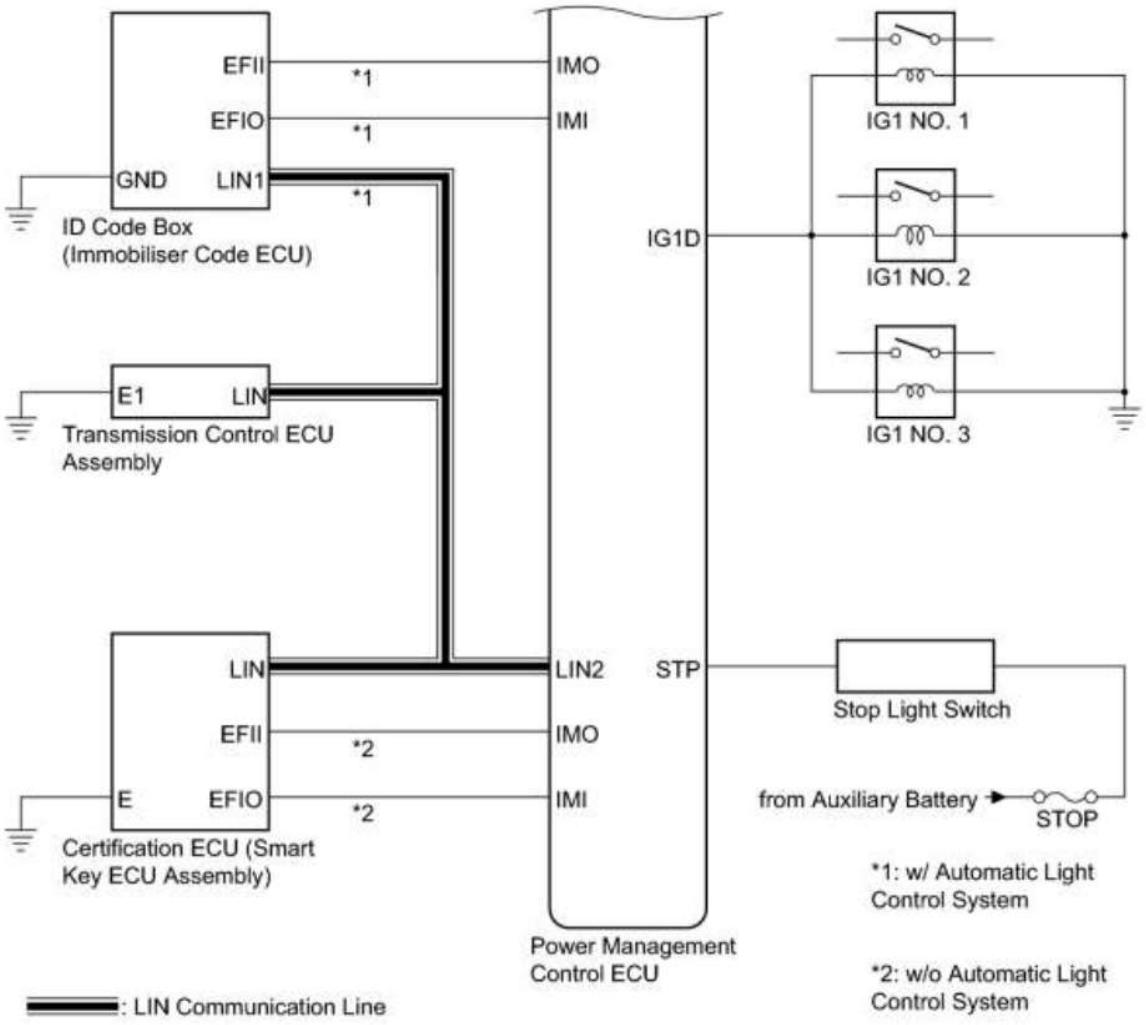
*1: w/ Automatic Light Control System

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SYSTEM DIAGRAM

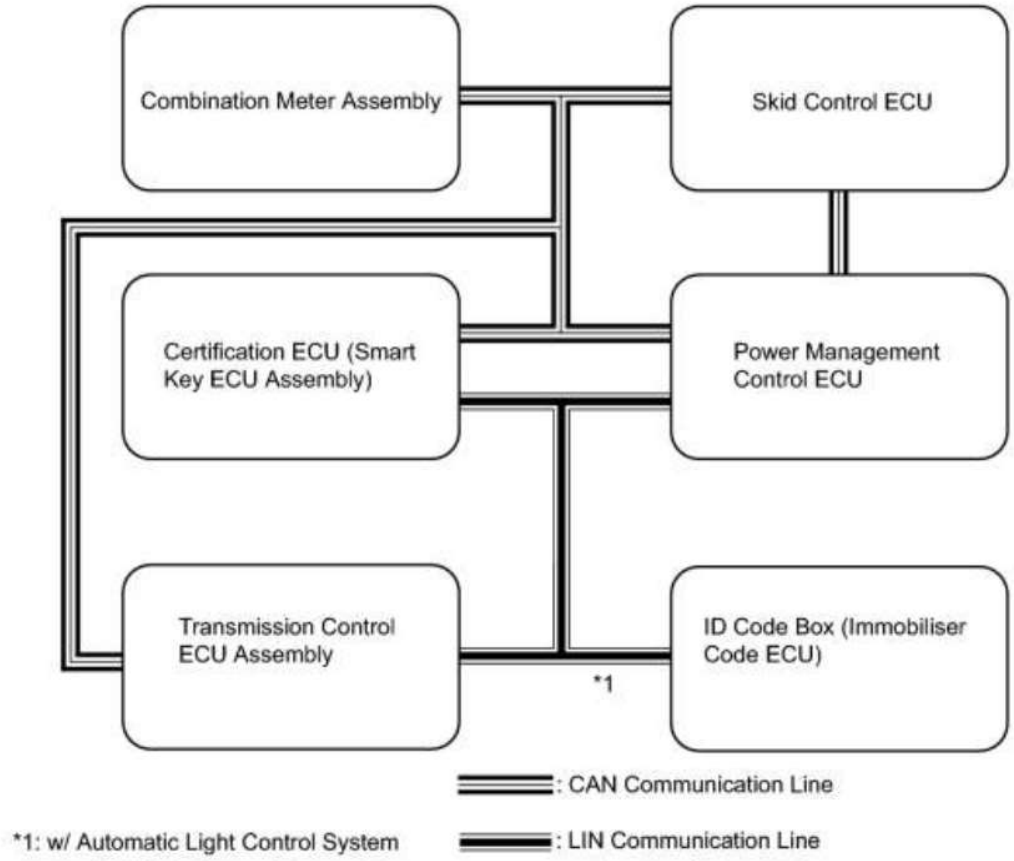


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Communication Table

Transmitting ECU (Transmitter)	Receiving ECU (Receiver)	Signal	Communication Method
Combination meter assembly	Power management control ECU	Vehicle speed signal	Local communication
Skid control ECU	Power management control ECU	Stop light switch signal	CAN/Local communication
Main body ECU	Power management control ECU	Driver seat courtesy switch signal	CAN
Main body ECU	Power management control ECU	Parking brake switch signal	CAN
Skid control ECU	Power management control ECU	Vehicle speed signal	CAN
Transmission control ECU	Power management control ECU	Transmission control ECU trouble condition signal	CAN/Local communication
Transmission control ECU	Power management control ECU	P position state signal	CAN/Local communication
Power management control	Combination meter	Message request signal for push	CAN

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Transmitting ECU (Transmitter)	Receiving ECU (Receiver)	Signal	Communication Method
ECU	assembly	start	
Power management control ECU	Certification ECU (smart key ECU assembly)	P position state signal	LIN
Power management control ECU	Certification ECU (smart key ECU assembly)	Shift position P signal	LIN
Power management control ECU	Certification ECU (smart key ECU assembly)	ID code certification result request signal	LIN
Power management control ECU	Certification ECU (smart key ECU assembly)	Power supply ON operation condition signal	LIN
Power management control ECU	Certification ECU (smart key ECU assembly)	Hybrid control system start operation condition signal*2	LIN
Power management control ECU	Certification ECU (smart key ECU assembly)	ACC relay drive condition signal	LIN
Power management control ECU	Certification ECU (smart key ECU assembly)	IG relay drive condition signal	LIN
Transmission control ECU	Certification ECU (smart key ECU assembly)	Lock determination signal	LIN
Transmission control ECU	Certification ECU (smart key ECU assembly)	Unlock determination signal	LIN
Transmission control ECU	Certification ECU (smart key ECU assembly)	L code certification condition signal	LIN
Certification ECU (smart key ECU assembly)	ID code box (immobiliser code ECU)	Hybrid control system start operation condition signal*1	LIN
Certification ECU (smart key ECU assembly)	ID code box (immobiliser code ECU)	3-bit code transmission request signal*1	LIN
Certification ECU (smart key ECU assembly)	ID code box (immobiliser code ECU)	S code certification condition signal*1	LIN
Certification ECU (smart key ECU assembly)	Power management control ECU	Smart key system effective state signal	LIN
Certification ECU (smart key ECU assembly)	Power management control ECU	Key certification effective state signal	LIN
Certification ECU (smart key ECU assembly)	Power management control ECU	Engine immobiliser unset signal	LIN
ID code Box (immobiliser code ECU)	Certification ECU (smart key ECU assembly)	3-bit code transmission request reception condition signal	LIN
ID code Box (immobiliser code ECU)	Certification ECU (smart key ECU assembly)	S code certification result signal	LIN
ID code Box (immobiliser code ECU)	Certification ECU (smart key ECU assembly)	L code certification result signal	LIN
ID code Box (immobiliser code ECU)	Certification ECU (smart key ECU assembly)	S code registration condition signal	LIN

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Transmitting ECU (Transmitter)	Receiving ECU (Receiver)	Signal	Communication Method
ID code Box (immobiliser code ECU)	Certification ECU (smart key ECU assembly)	L code registration condition signal	LIN

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

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SYSTEM DESCRIPTION

1. PUSH-BUTTON START DESCRIPTION

(a) The push-button start uses a push-type power switch, which the driver can operate by merely carrying the electrical key. This system consists primarily of the power management control ECU, power switch, transmission control ECU assembly, electrical key, ACC relay, P/POINT relay, IG1 NO. 1 relay, IG1 NO. 2 relay, IG1 NO. 3 relay, IG2 relay, ID code box (immobiliser code ECU) and certification ECU (smart key ECU assembly). The power management control ECU controls the system. This function operates in cooperation with the smart key system.

HINT:

In this chapter, the expression "power source" has been used in some locations to allow precise explanations. The power source mode is also expressed using conventional expressions such as "power switch off", "power switch on (ACC)" and "power switch on (IG)".

2. FUNCTION OF MAIN COMPONENTS

Component	Function
Power Switch • Transponder Key Amplifier	• Transmits power switch signal to power management control ECU. • Informs driver of power source mode or system abnormality with illumination stage of indicator light. • Receives ID code and transmits it to certification ECU (smart key ECU assembly) when key battery is low.
Electrical Key	Receives signals from oscillators and returns ID code to entry door control receiver.
Electrical Key Oscillator • Console and Rear Seat	Receives request signals from certification ECU (smart key ECU assembly) and forms detection area in vehicle.
Power Management Control ECU	• Changes power source mode in 4 stages (off, on (ACC), on (IG), on (READY) in accordance with shift position and state of stop light switch. • Controls push-button start function in accordance with signals received from switches and each ECU. • Power management control ECU and certification ECU (smart key ECU assembly) permit starting of hybrid control system after receiving unlock signal from transmission control ECU.
Certification ECU (Smart Key ECU Assembly)	Certifies ID code received from entry door control receiver and transmits the certification results to the ID code box (immobiliser code ECU) and transmission control ECU assembly.
Stop Light Switch	Outputs state of brake pedal to power management control ECU.
ID Code Box (Immobiliser Code ECU)	Receives gearshift control unlock or engine immobiliser unset signals from the certification ECU (smart key ECU assembly), certifies them, and transmits each unset signal to transmission control ECU assembly or power management

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Component	Function
	control ECU.
Transmission Control ECU Assembly	• Transmission control ECU locks/unlocks gearshift control based on lock/unlock request signals from certification ECU (smart key ECU assembly). • Detects gearshift control lock/unlock status and transmits to other ECUs. • Transmission control ECU activates the shift control actuator based on signals from the power management control ECU when gearshift control is unlocked. • Transmission control ECU controls the application timing of current to the parking lock motor based on signals from the rotation angle sensor.

3. SYSTEM FUNCTION

The electric controls of the push-button start function are described below:

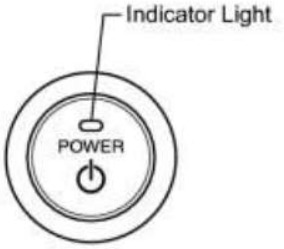
Control	Outline
Power switch control	When the person carrying the key enters the vehicle and the brake pedal is depressed, the power management control ECU sends the key certification request signal to the certification ECU (smart key ECU assembly). On receiving the key certification request signal, the certification ECU (smart key ECU assembly) generates a request signal and sends it to the indoor electrical key oscillator. The indoor electrical key oscillator transmits the request signal in order to detect that the key is in the cabin. When the key receives the request signal, it sends back the response code and ID code. When the door control receiver assembly receives the signal from the key, it sends the ID code to the certification ECU (smart key ECU assembly). The ID code box verifies check results received from the certification ECU via LIN and sends them to the power management control ECU. Based on these results, the power management control ECU authorizes the operation of the power switch. If the ID codes match, the certification ECU (smart key ECU assembly) sends the certification OK signal to the power management control ECU. Upon receiving the certification OK signal, the power management control ECU illuminates the power switch indicator light, changes the power source mode and starts the hybrid control system depending on how the power switch is operated.
Diagnosis	When the power management control ECU detects a malfunction, the power management control ECU diagnoses and memorizes information related to the fault.

4. CONSTRUCTION AND OPERATION

(a) Power Switch

The power switch consists of a momentary type switch, 3 color (amber,

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green, greenish white) LEDs, and a transponder key amplifier.

- The greenish white LED is for illumination.
- The amber and green LEDs are for the indicator lights. The driver can check the present power source mode and whether the hybrid control system can start in accordance with the illumination state of the indicator light.
- When the power management control ECU detects an abnormality in the push-button start system, it makes the amber indicator light flash. If the hybrid control system stopped in this state, it may not be possible to restart it.

(b) Indicator Light Condition

Power Switch Indicator Light Condition

Power Source Mode/Condition	Indicator Light Condition	
	Brake Pedal Released	Brake Pedal Depressed, Park (P) selected
off	off	Turns on (Green)
on (ACC, IG)	Turns on (Amber)	Turns on (Green)
on (READY)	off	off
System malfunction	Flashes (Amber) for 15 sec.	Flashes (Amber) for 15 sec.

(c) Power Management Control ECU

The power management control ECU consists of the IG1 NO. 1, IG1 NO. 2, IG1 NO. 3, IG2, ACC, P/POINT relay actuation circuits and CPU.

HINT:

Before removing the auxiliary battery, make sure to turn the power switch off. The power management control ECU constantly stores the present power source mode in its memory. Therefore, if the power supply for the power management control ECU is interrupted by disconnecting the auxiliary battery, the power management control ECU restores the power source mode after the auxiliary battery is reconnected. For this reason, if the auxiliary battery is disconnected when the power switch is other than off, the power source mode will be restored to the vehicle at the same time the power source mode is restored to the power management control ECU (by reconnecting the auxiliary battery).

5. PUSH-BUTTON START FUNCTION OPERATION

(a) This system has different power source mode patterns depending on the brake pedal condition and shift lever position.

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Brake Pedal	Shift Lever	Power Source Mode Pattern
Depressed	P	When the power switch is pushed once. • off → on (READY)
Not depressed	P	Each time the power switch is pushed. • off → on (ACC) → on (IG) → off
	Except P	Each time the power switch is pushed. • on (ACC) → on (IG) → off
-	P	When the power switch is pushed in the on (READY) condition. • on (READY) → off
-	Except P	When the power switch is pushed in the on (READY) condition. • on (READY) → off

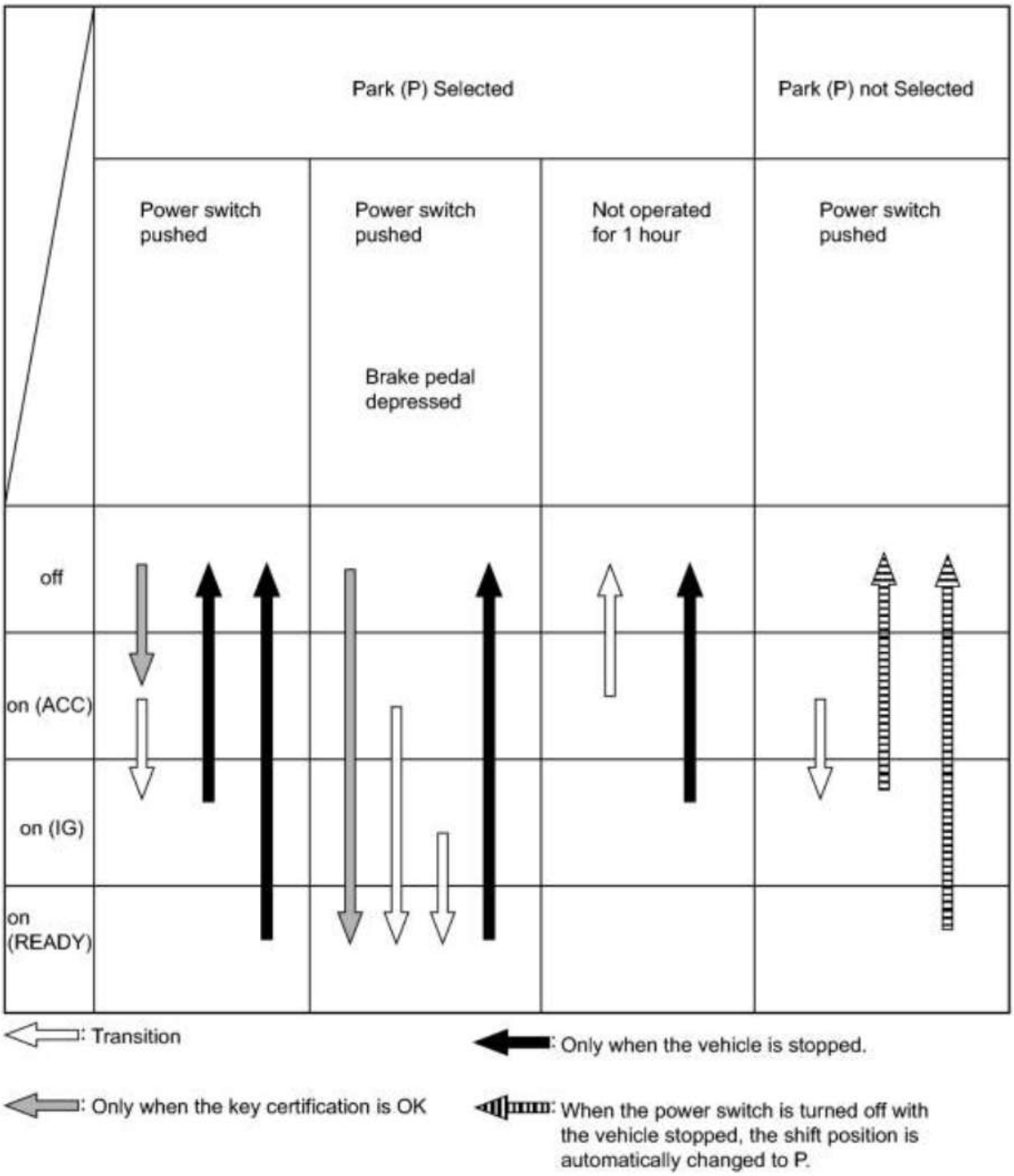
When the key battery is low, the push-button start function can be operated by holding the key against the power switch.

- After approximately 1 hour has elapsed with the power switch on (ACC) or on (IG) and park (P) selected, the power management control ECU will automatically cut the power supply (the power source mode will change to off).
- The illustration below shows the transition of power source modes.

  Transition of power source modes:

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Transition of Power Source Modes:



HINT:

While the vehicle is being driven normally, operation of the power switch is disabled. However, if the hybrid control system must be stopped in an emergency while the vehicle is being driven, pressing the power switch for 3 seconds or more stops the hybrid control system. The power source mode will change from on (READY) to on (ACC).

6. WHEN KEY BATTERY IS LOW

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(a) To operate the push-button start function when the key battery is low, hold the key close to the power switch with the brake pedal depressed.

(b) The power management control ECU transmits a key verification request signal to the certification ECU (smart key ECU assembly) when it receives the stop light switch signal.

(c) The certification ECU (smart key ECU assembly) does not receive an ID code response from the entry door control receiver, so it actuates the transponder key amplifier built into the power switch.

(d) The transponder key amplifier outputs an engine immobiliser radio wave to the key.

(e) The key receives the radio wave, and returns a radio wave response to the transponder key amplifier.

(f) The transponder key amplifier combines the key ID codes with the radio wave response, and transmits it to the certification ECU (smart key ECU assembly).

(g) The certification ECU (smart key ECU assembly) judges and verifies the ID code, and transmits a key verification OK signal to the power management control ECU. The buzzer in the combination meter sounds at the same time.

(h) After the buzzer sounds, if the power switch is pressed within 10 seconds with the brake pedal not depressed, the power source mode changes to on (ACC) or on (IG), the same as in the normal condition.

HINT:

The key (for card type) operation inspection can performed using the same procedure as for the key (for standard type).

7. DIAGNOSIS

The power management control ECU can detect malfunctions in the push-button start function when the power source mode is on (IG).

When the ECU detects a malfunction, the amber indicator light of the power switch flashes to warn the driver. At the same time, the ECU stores a 5-digit Diagnostic Trouble Code (DTC) in its memory.

- The indicator light warning continues for 15 seconds even after the power source mode is changed to off.
- The DTC can be read by connecting the Techstream to the DLC3.
- The push-button start function cannot be operated if a malfunction occurs.

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HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

- Use the following procedure to troubleshoot the start function.
- *: Use the Techstream.

1.	VEHICLE BROUGHT TO WORKSHOP

NEXT

2.	CUSTOMER PROBLEM ANALYSIS CHECK

HINT:

- In troubleshooting, confirm that the problem symptoms have been accurately identified. Preconceptions should be discarded in order to make an accurate judgment. To clearly understand what the problem symptoms are, it is extremely important to ask the customer about the problem and the conditions at the time the malfunction occurred.
- Gather as much information as possible for reference. Past problems that seem unrelated may also help in some cases.

- The following 5 items are important points in problem analysis:

What	Vehicle model, system name
When	Date, time, occurrence frequency
Where	Road conditions
Under what conditions?	Running conditions, driving conditions, weather conditions
How did it happen?	Problem symptoms

NEXT

3.	INSPECT AUXILIARY BATTERY VOLTAGE

Standard Voltage:

11 to 14 V

If the voltage is below 11 V, recharge or replace the auxiliary battery before proceeding to the next step.

NEXT

4.	CHECK CAN COMMUNICATION SYSTEM*

(a) Use the Techstream to check if the CAN communication system is functioning normally INFO.

Result:

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Result	Proceed to
CAN communication DTC is not output	A
CAN communication DTC is output	B

B ▶ INFO GO TO CAN COMMUNICATION SYSTEM

A ▼

5.	CHECK LIN COMMUNICATION SYSTEM*

(a) Use the Techstream to check if the LIN communication system (LIN) is functioning normally INFO.

Result:

Result	Proceed to
LIN communication DTC is not output	A
LIN communication DTC is output	B

B ▶ INFO GO TO LIN COMMUNICATION SYSTEM

A ▼

6.	CHECK FOR DTC (for Entry Function)*

(a) Check for DTC and note any codes that are output INFO.

(b) Clear the DTC.

(c) Recheck for DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC is output	B

B ▶ INFO GO TO DIAGNOSTIC TROUBLE CODE CHART

A ▼

7.	CHECK FOR DTC (for Start Function)*

(a) Check for DTC and note any codes that are output INFO.

(b) Clear the DTC.

(c) Recheck for DTCs.

Result:

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Result	Proceed to
DTC is not output	A
DTC is output	B

B ▶ INFO GO TO DIAGNOSTIC TROUBLE CODE CHART

A ▼

8.	INSPECT BASIC OPERATION

(a) Check that the hybrid control system starts normally when the power switch is pushed while the brake pedal is depressed and park (P) is selected.

(b) Check that the power source mode can be changed by pushing the power switch.

HINT:

Without depressing the brake pedal, push the power switch repeatedly. The power source mode should change from off to on (ACC), to on (IG) and back to off.

With the brake pedal depressed, push the power switch. The hybrid control system should start regardless of the original power source mode.

OK:

Hybrid control system can start normally.

NEXT ▼

9.	PROBLEM SYMPTOMS TABLE

Result:

Result	Proceed to
Fault is not listed in Problem Symptoms Table	A
Fault is listed in Problem Symptoms Table	B

B ▶ Go to step 11

A ▼

10.	OVERALL ANALYSIS AND TROUBLESHOOTING*

(a) Terminals of ECU INFO

(b) Data List / Active Test INFO

NEXT ▼

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11.	REPAIR OR REPLACE

NEXT

12.	CONFIRMATION TEST

NEXT **END**

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CUSTOMIZE PARAMETERS

1. CUSTOMIZING FUNCTION WITH TECHSTREAM

HINT:

The items in the table below can be customized.

NOTICE:

- When the customer requests a change in a function, first make sure that the function can be customized.
- Be sure to make a note of the current setting before customizing.
- When troubleshooting a function, first make sure that the function is set to the default setting.

(a) Connect the Techstream to the DLC3.

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

(c) Turn the Techstream on.

(d) Enter the following menus: Utility / Customize Setting.

(e) Select the setting by referring to the table below.

Smart Key / Access

Tester Display	Default	Content	Setting
Ignition Available Area (Entry ignition available area)	All	Function to choose the available area for electrical key to start the hybrid control system.	Front or All*

- *: Weak radio waves will still be emitted from oscillators other than the front oscillator even when the "Front" customize setting is selected.

2. CUSTOMIZING FUNCTION WITHOUT TECHSTREAM

Performing the following procedure disables the smart key system.

HINT:

To start the hybrid control system while the smart key system is disabled, follow the procedure for when the key battery is low INFO.

(a) The procedure to disable the smart key system is as follows:

HINT:

Repeating the following steps switches the smart key system status between activated and disabled.

Preconditions:

Power switch off, driver door closed and unlocked.

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(1) Press the unlock switch of the key once.

(2) Open the driver door within 5 seconds after pressing the unlock switch of the key in the previous step.

(3) Repeat closing and opening of the driver door twice within 30 seconds after opening the driver door in the previous step.

(4) Press the unlock switch of the key twice within 30 seconds after the last closing of the driver door in the previous step.

(5) Close and then open the driver door within 30 seconds after pressing the unlock switch of the key twice in the previous step.

(6) Close the driver door within 5 seconds after opening the driver door in the previous step.

(7) Check that the wireless buzzer sounds once*1 or twice*2.

- *1: When the smart key system status is changed from activated to disabled.
- *2: When the smart key system status is changed from disabled to activated.

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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.

Smart Key System

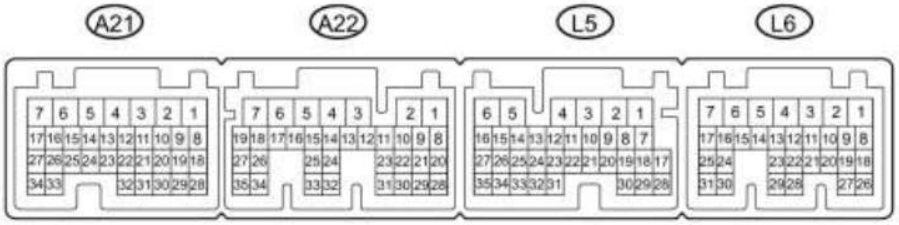
Symptom	Suspected Area	See page
Power Source Mode does not Change to ON (IG and ACC)	Indoor electrical key oscillator*1	INFO
	Smart key system (for Entry function)	INFO
	AM2 fuse	-
	Power management control ECU	-
	Power switch	-
	Wire harness or connector	-
Power Source Mode does not Change to ON (IG)	Indoor electrical key oscillator*1	INFO
	AM2 fuse	INFO
	IG1 relay	-
	IG2 relay	-
	Instrument panel junction block assembly	-
	Engine room relay block	-
	Power management control ECU	-
	Wire harness or connector	-
Power Source Mode does not Change to ON (ACC)	Indoor electrical key oscillator*1	INFO
	AM2 fuse	INFO
	ACC relay	-
	Instrument panel junction block assembly	-
	Power management control ECU	-
	Wire harness or connector	-
Power Source Mode does not Change to ON (Ready)	Indoor electrical key oscillator*1	INFO
	Smart key system (for Entry function)	INFO
	Stop light switch	-
	Engine room relay block	-
	Engine immobiliser system	-
	Hybrid control system	-
	Transmission control ECU assembly	-
	Power management control ECU	-
	Wire harness or connector	-

- *1: w/o Entry Function

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TERMINALS OF ECU

1. CHECK POWER MANAGEMENT CONTROL ECU



Y

(a) Disconnect the A22, L5 and L6 connectors.

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

Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
A22-2 (IG2D) - Body ground	V - Body ground	IG2 relay operation signal	Always	131 to 230 Ω
A22-23 (STP) - Body ground	L - Body ground	Stop light switch signal	Brake pedal depressed	11 to 14 V
A22-23 (STP) - Body ground	L - Body ground	Stop light switch signal	Brake pedal released	Below 1 V
L5-1 (AM22) - Body ground	W - Body ground	+B power supply	Always	9.5 to 16 V
L6-7 (AM21) - Body ground	W - Body ground	+B power supply	Always	9.5 to 16 V
L5-6 (E1) - Body ground	BR - Body ground	Ground	Always	Below 1 Ω
L6-4 (E12) - Body ground	BR - Body ground	Ground	Always	Below 1 Ω
L6-24 (CA1L) - Body ground	W - Body ground	CAN communication line	Always	10 kΩ or higher
L6-25 (CA1H) - Body ground	B - Body ground	CAN communication line	Always	10 kΩ or higher
L6-17 (SSW2) - Body ground	Y - Body ground	Power switch signal	Power switch pushed	Below 1 Ω
L6-17 (SSW2) - Body ground	Y - Body ground	Power switch signal	Power switch not pushed	10 kΩ or higher
L5-7 (SSW1) - Body ground	B - Body ground	Power switch signal	Power switch pushed	Below 1 Ω

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Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
L5-7 (SSW1) - Body ground	B - Body ground	Power switch signal	Power switch not pushed	10 kΩ or higher
L6-1 (ACCD) - Body ground	G - Body ground	ACC relay operation signal	Always	50.625 to 61.875 Ω
L6-2 (IG1D) - Body ground	B - Body ground	IG1 relay operation signal	Always	50.625 to 61.875 Ω
L6-11 (LIN2) - Body ground	L - Body ground	LIN communication line	Always	10 kΩ or higher

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

(c) Reconnect the A22, L5 and L6 connectors.

(d) Measure the voltage and check for pulses according to the value(s) in the table below.

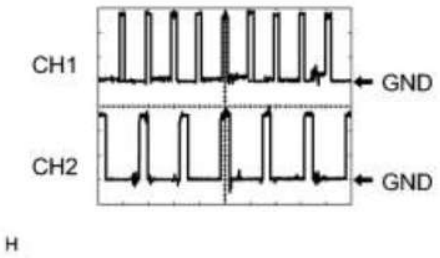
Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
A22-2 (IG2D) - L5-6 (E1)	V - BR	IG2 signal	Power switch on (IG)	Output voltage at terminal AM21 or AM22 is -2 V or more
A22-2 (IG2D) - L5-6 (E1)	V - BR	IG2 signal	Power switch on (ACC)	Below 1 V
L5-9 (INDW) - L5-6 (E1)	G - BR	Warning signal	Brake pedal depressed, park (P) selected, power switch on (ACC, IG)	8 to 14 V
A22-22 (PCON) - L5-6 (E1)	LG - BR	P position signal	Park (P) selected	Pulse generation (See waveform 1)
A22-28 (PPOS) - L5-6 (E1)	W - BR	P position signal	Park (P) selected	Pulse generation (See waveform 1)
L6-17 (SSW2) - L5-6 (E1)	Y - BR	Power switch signal	Power switch not pushed	Output voltage at terminal AM21 or AM22 is -2 V or more
L6-17 (SSW2) - L5-6 (E1)	Y - BR	Power switch signal	Power switch pushed	Below 1 V
L5-7 (SSW1) - L5-6 (E1)	B - BR	Power switch signal	Power switch not pushed	Output voltage at terminal AM21 or AM22 is -2 V or more
L5-7 (SSW1) - L5-6 (E1)	B - BR	Power switch signal	Power switch pushed	Below 1 V
L6-1 (ACCD) - L5-6 (E1)	G - BR	ACC signal	Power switch on (ACC)	Output voltage at terminal AM21 or AM22 is -2 V or more

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Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
L6-1 (ACCD) - L5-6 (E1)	G - BR	ACC signal	Power switch off	Below 1 V
L6-2 (IG1D) - L5-6 (E1)	B - BR	IG1 signal	Power switch on (IG)	Output voltage at terminal AM21 or AM22 is -2 V or more
L6-2 (IG1D) - L5-6 (E1)	B - BR	IG1 signal	Power switch on (ACC)	Below 1 V
L5-8 (INDS) - L5-6 (E1)	R - BR	Vehicle condition signal	Brake pedal depressed, park (P) selected	8 to 14 V
L5-14 (SPDI) - L5-6 (E1)	V - BR	Vehicle speed signal	Power switch on (IG), wheel rotated slowly	Pulse generation (See waveform 2)
L6-20 (IMO) - L5-6 (E1)	L - BR	Immobiliser communication status	Immobiliser communicating	Pulse generation (See waveform 3)
L6-21 (IMI) - L5-6 (E1)	R - BR	Immobiliser communication status	Immobiliser communicating	Pulse generation (See waveform 4)

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

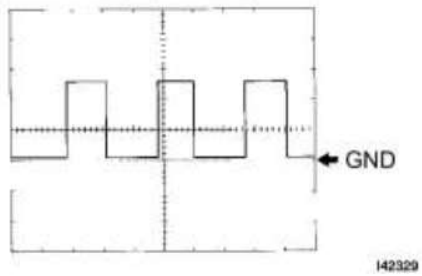
(e) Using an oscilloscope, check the signal waveform of the ECU.



(1) Waveform 1

Tester Connection	CH1: A22-22 (PCON) - L5-6 (E1) CH2: A22-28 (PPOS) - L5-6 (E1)
Tool Setting	5 V/DIV., 20 ms./DIV.
Vehicle Condition	Power switch on (IG)

(2) Waveform 2



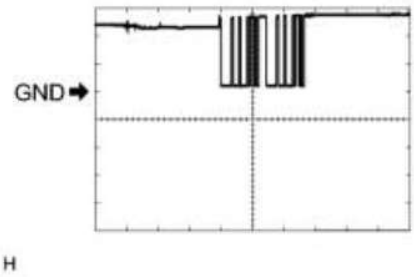
Tester Connection	L5-14 (SPDI) - L5-6 (E1)
Tool Setting	5 V/DIV., 10 ms./DIV.
Vehicle Condition	Driving at approx. 20 km/h (12 mph)

HINT:

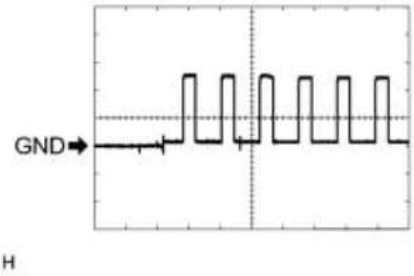
The wavelength becomes shorter as the vehicle speed increases.

(3) Waveform 3

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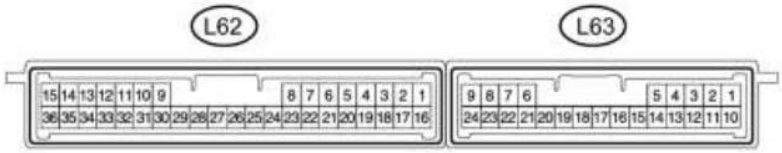
Tester Connection	L6-20 (IMO) - L5-6 (E1)
Tool Setting	5 V/DIV., 500 ms./DIV.
Vehicle Condition	Within 3 seconds after power switch on (READY), or within 3 seconds after power switch first turned on (IG) after battery disconnected and connected



(4) Waveform 4

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

2. CHECK CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)



(a) Disconnect the L62 connector.

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

Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
L62-1 (+B) - Body ground	B - Body ground	+B power supply	Always	11 to 14 V
L62-9 (CANH) - Body ground	BE - Body ground	CAN communication line	Always	10 kΩ or higher
L62-10 (CANL) - Body ground	P - Body ground	CAN communication line	Always	10 kΩ or higher
L62-15 (E) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
L62-16 (IG) - Body ground	BE - Body ground	IG power supply	Power switch on (IG)	11 to 14 V

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Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
L62-29 (LIN) - Body ground	L - Body ground	LIN communication line	Always	10 kΩ or higher

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

(c) Reconnect the L62 connector.

(d) Check for pulses according to the value(s) in the table below.

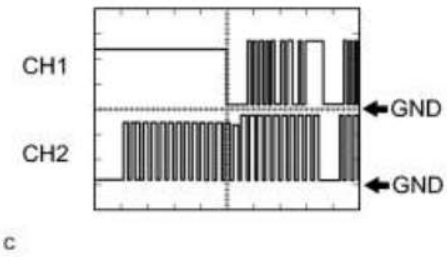
Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
L62-34 (EFII) - L62-15 (E)*1	L - W-B	Immobiliser communication status	Immobiliser communicating	Pulse generation (See waveform 1)
L62-35 (EFIO) - L62-15 (E)*1	R - W-B	Immobiliser communication status	Immobiliser communicating	Pulse generation (See waveform 1)

- *1: w/ Automatic Light Control System

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

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

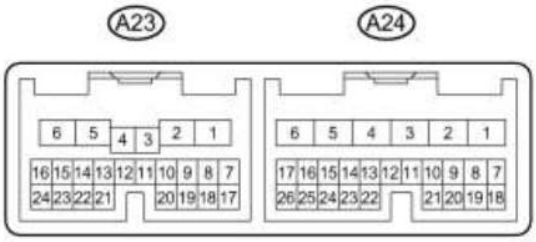
(1) Waveform 1



Tester Connection	CH1: L62-34 (EFII) - L62-15 (E) CH2: L62-35 (EFIO) - L62-15 (E)
Tool Setting	5 V/DIV., 200 ms./DIV.
Vehicle Condition	Power switch off → Power switch on (IG) → Power switch on (READY)

3. CHECK TRANSMISSION CONTROL ECU ASSEMBLY

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(a) Disconnect the A23 and A24 connectors.

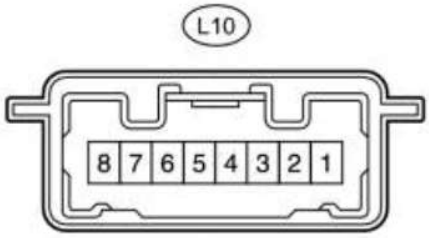
(b) Measure the voltage and resistance according to the value(s) in the table below.

Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
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
A23-16 (+B) - Body ground	L - Body ground	Ignition power supply	Power switch on (IG)	11 to 14 V
A23-16 (+B) - Body ground	L - Body ground	Ignition power supply	Power switch off	Below 1 V
A23-15 (BATT) - Body ground	SB - Body ground	+B power supply	Except power switch on (READY)	11 to 14 V
A23-15 (BATT) - Body ground	SB - Body ground	+B power supply	Power switch on (READY)	11 to 15.5 V
A24-15 (CA1L) - Body ground	BR - Body ground	CAN communication line	Always	10 kΩ or higher
A24-16 (CA1H) - Body ground	Y - Body ground	CAN communication line	Always	10 kΩ or higher
A24-24 (LIN) - Body ground	L - Body ground	LIN communication line	Always	10 kΩ or higher

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

4. CHECK ID CODE BOX (IMMOBILISER CODE ECU)

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P

(a) Disconnect the L10 connector.

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

Tester Connection	Wiring Color	Terminal Description	Condition	Specified Condition
L10-1 (+B) - L10-8 (GND)	B - W-B	+B power supply	Always	11 to 14 V
L10-8 (GND) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
L10-3 (LIN1) - Body ground	L - Body ground	LIN communication line	Always	10 kΩ or higher

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

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DIAGNOSIS SYSTEM

1. DESCRIPTION

(a) Push-button start function data and the Diagnostic Trouble Codes (DTCs) can be read through the Data Link Connector 3 (DLC3) of the vehicle. When the function seems to be malfunctioning, use the Techstream to check for malfunctions and perform repairs.

2. CHECK DLC3

(a) Check the DLC3 INFO.

3. INSPECT AUXILIARY BATTERY VOLTAGE

(a) Measure the auxiliary battery voltage.

Standard Voltage:

11 to 14 V

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

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DTC CHECK / CLEAR

1. CHECK 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 / Power Source Control / Trouble Codes.

(e) Read the DTC by following the prompts on the Techstream screen.

HINT:

Refer to the Techstream operator's manual for further details.

2. CLEAR 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 / Power Source Control / Trouble Codes.

(e) Clear the DTC by following the directions on the Techstream screen.

HINT:

Refer to the Techstream operator's manual for further details.

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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 / Power Source Control / Data List.

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

Power Source Control

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Stop Light Switch1	Stop light switch 1/ON or OFF	ON: Brake pedal depressed OFF: Brake pedal released	-
Start Switch1	Start switch 1/ON or OFF	ON: Power switch pushed OFF: Power switch not pushed	-
Start Switch2	Start switch 2/ON or OFF	ON: Power switch pushed OFF: Power switch not pushed	-
Latch Circuit	Latch circuit/ON or OFF	ON: Power switch on (IG) or on (READY) OFF: Power switch off or on (ACC)	-
IG1 Relay Monitor (Outside)	IG1 outer relay monitor/ON or OFF	ON: Power switch on (IG) OFF: Power switch off	-

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Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
IG1 Relay Monitor (Inside)	IG1 inner relay monitor/ON or OFF	ON: Power switch on (IG) OFF: Power switch off	-
IG2 Relay Monitor (Outside)	IG2 outer relay monitor/ON or OFF	ON: Power switch on (IG) OFF: Power switch off	-
IG2 Relay Monitor (Inside)	IG2 inner relay monitor/ON or OFF	ON: Power switch on (IG) OFF: Power switch off	-
Starter Request Signal	Starter request signal monitor/ON or OFF	ON: ST relay on OFF: ST relay off	-
ACC Relay Monitor	ACC relay monitor/ON or OFF	ON: Power switch on (ACC) OFF: Power switch off	-
Ready Signal	Status of the ready signal/ON or OFF	ON: Hybrid control system on (on (READY)) OFF: Hybrid control system off	-
Vehicle Speed Signal	Vehicle speed signal/Stop or Run	Stop: Vehicle stopped Run: Vehicle running	-
Shift P Signal Pulse	Status of the shift P signal pulse/Unknown, Error2, Normal2, Error1, Normal3, Error3 or Normal1	Unknown: Other Error2: Signal abnormal and park (P) selected Normal2: Signal normal and park (P) selected Error1: Signal abnormal and park (P) state cannot be determined Normal3: Signal normal and R, N, D or B selected Error3: Signal abnormal and R, N, D or B selected Normal1: Signal normal and park (P) state cannot be determined	-
Power Supply Condition	Power supply condition/All OFF, ACC ON, IG1 ON, IG2 ON, ST ON	All OFF: All relays off	-

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Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
		ACC ON: ACC relay on IG1 ON: IG1 relay on IG2 ON: IG2 relay on ST ON: ST request signal on	
Powertrain Type	Status of the powertrain type/HV-AT, Conventional-AT, Conventional-MT, Conventional-MMT	HV-AT	-
IG1 Circuit	Status of the IG1 relay activation circuit/OK or NG	OK: IG1 relay activation circuit normal NG: IG1 relay activation circuit abnormal	-
IG2 Circuit	Status of the IG2 relay activation circuit/OK or NG	OK: IG2 relay activation circuit normal NG: IG2 relay activation circuit abnormal	-
Starter Switch Signal Mismatch	Power switch error detection/No or Yes	No: Power switch error not detected Yes: Power switch error detected	-
Park Signal Mismatch	Status of the park signal mismatch/No or Yes	No: Park signal mismatch no detected Yes: Park signal mismatch detected	-
Key Certification Waiting Timed Out	Key certification error detection/No or Yes	No: Key certification error not detected Yes: Key certification error detected	-
Number of Diagnosis Code	Number of diagnosis code/Min.: 0, MAX.: 255	Number of DTCs will be displayed	-

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

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

Smart Key

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note

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Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Ignition Switch	Power switch/ON or OFF	ON: Power switch on (IG) OFF: Power switch off	-
Key Low Battery	Low key battery/Yes or No	Yes: Key battery voltage low No: Key battery voltage normal	-
# Code	Number of DTC recorded/Min.: 0, Max.: 225	Number of DTCs displayed	-
Steering Lock Sleep Cond	Transmission control ECU sleep condition/Yes or No	Yes: Transmission control ECU sleep mode can be entered No: Transmission control ECU sleep mode cannot be entered	-
Steering Lock Start Cond	Transmission control ECU start signal/Yes or No	Yes: Transmission control ECU sent a start signal No: Transmission control ECU did not send a start signal	-
Engine Start Condition	Hybrid control system start condition/OK or NG	OK: Hybrid control system allowed to start NG: Hybrid control system not allowed to start	-
Engine Start Request	Start request condition signal/OK or NG	OK: Start request condition signal received NG: Start request condition signal not received	-
3bit Code Request	Status of the 3-bit code request/OK or NG	OK: 3-bit code request signal received NG: 3-bit code request signal not received	-
S Code Check	S code certification result/OK or NG	OK: Certification confirmed NG: Certification not confirmed	-
L Code Check	L code certification result/OK or NG	OK: Certification confirmed NG: Certification not confirmed	-
Unlock Request Receive	Status of the gearshift control unlock request receive/OK or NG	OK: Gearshift control unlock request signal received NG: Gearshift control unlock request signal not received	-
Lock Request	Status of the gearshift control lock	OK: Gearshift control lock request	-

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Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Receive	request receive/OK or NG	signal received NG: Gearshift control lock request signal not received	
S Code Check (Past)	S code certification result (Past)/OK or NG	OK: Certification confirmed (past) NG: Certification not confirmed (past)	-
L Code Check (Past)	L code verification result (Past)/OK or NG	OK: Certification confirmed (past) NG: Certification not confirmed (past)	-
EFI Code Receive	SFI communication (when DTC stored)/OK or NG	OK: SFI code received NG: SFI code not received	-
EFI Communication	SFI communication /OK or NG	OK: SFI communication normal NG: SFI communication abnormal	-
Ignition Available Area	Ignition available area/Front or All	Customization status displayed	-

2. ACTIVE TEST

HINT:

Using the Techstream to perform Active Tests allows relay, 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 / Power Source Control / Active Test.

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

Power Source Control

Tester Display	Test Part	Control Range	Diagnostic Note
Indicator Condition	Power switch indicator	Green/Red/No Sig	Power switch on (READY)

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

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

Smart Key

Tester Display	Test Part	Control Range	Diagnostic Note
Power / Engine SW Light	Power switch illumination	ON/OFF	Operate with power switch on (IG) and the vehicle stopped.

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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.

Power Management Control ECU

DTC Code	Detection Item	Trouble Area	See page
B2271	Ignition Hold Monitor Malfunction	1. AM2 fuse 2. IG1 relays 3. IG2 relay 4. Power management control ECU 5. Instrument panel junction block assembly 6. Wire harness or connector	INFO
B2274	ACC Monitor Malfunction	1. AM2 fuse 2. ACC relay 3. Power management control ECU 4. Instrument panel junction block assembly 5. Wire harness or connector	INFO
B2275	STSW Monitor Malfunction	1. AM2 fuse 2. Power management Control ECU 3. Wire harness or connector	INFO
B2277	Detecting Vehicle Submersion	Power management control ECU	INFO
B2282	Vehicle Speed Signal Malfunction	1. CAN communication system 2. Combination meter system 3. Power management control ECU 4. Wire harness or connector	INFO
B2284	Brake Signal Malfunction	1. STOP fuse 2. Stop light switch assembly 3. CAN communication system	INFO

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DTC Code	Detection Item	Trouble Area	See page
		4. Skid control ECU assembly 5. Power management control ECU 6. Wire harness or connector	
B2286	Runnable Signal Malfunction	1. AM2 fuse 2. Power management control ECU 3. Wire harness or connector	INFO
U0293	Lost Communication with HV ECU	Power management control ECU	INFO

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ON-VEHICLE INSPECTION

1. CHECK POWER SOURCE MODE CHANGE FUNCTION

(a) Check the function of the power switch.

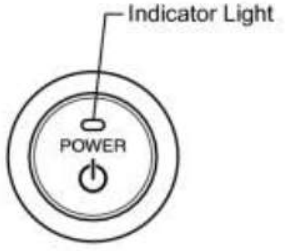
(1) Check that power source mode changes in accordance with the conditions of the shift position and brake pedal.

Brake Pedal	Shift Lever	Power Source Mode Pattern
Depressed	P	When the power switch is pushed once. • off → on (READY)
Not depressed	P	Each time the power switch is pushed. • off → on (ACC) → on (IG) → off
	Except P	Each time the power switch is pushed. • on (ACC) → on (IG) → off
-	P	When the power switch is pushed in the on (READY) condition. • on (READY) → off
-	Except P	When the power switch is pushed in the on (READY) condition. • on (READY) → off

(b) Check that the power source mode changes without pressing the power switch.

(1) With power source mode on (ACC) or on (IG) and with park (P) selected, wait for at least 1 hour. Check that the power source mode changes from on (ACC) or on (IG) to off automatically.

2. CHECK INDICATOR CONDITION



N

(a) Check the indicator light on the power switch.

(1) Check that the power switch indicator turns on and changes color according to the table below.

Power Source Mode/Condition	Indicator Light Condition	
	Brake Pedal Released	Brake Pedal Depressed, Park (P) selected
off	off	Turns on (Green)

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on (ACC, IG)	Turns on (Amber)	Turns on (Green)
on (READY)	off	off
System malfunction	Flashes (Amber) for 15 sec.	Flashes (Amber) for 15 sec.

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DTC	B2271	Ignition Hold Monitor Malfunction

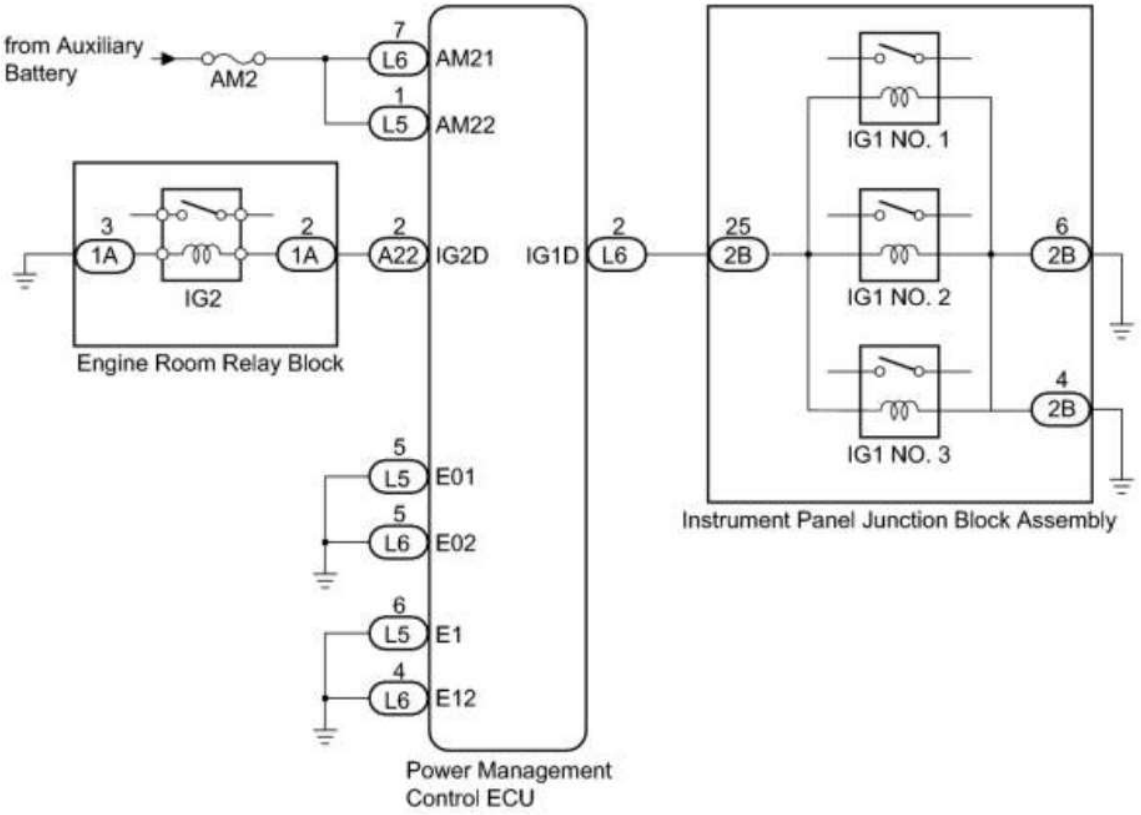
DESCRIPTION

This DTC is stored when a problem such as an open in the AM2 fuse, an open or short in the wire harness between the fuse and power management control ECU, a short in the IG output circuit inside the power management control ECU, a short between the power management control ECU and relay, or a short in the relay is detected.

DTC No.	DTC Detection Condition	Trouble Area
B2271	The hold circuit, IG1 relay actuation circuit or IG2 relay actuation circuit inside the power management control ECU is open or shorted.	• AM2 fuse • IG1 relays • IG2 relay • Power management control ECU • Instrument panel junction block assembly • Wire harness or connector

WIRING DIAGRAM

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INSPECTION PROCEDURE

NOTICE:

- When the power management control ECU is replaced with a new one and the cable from the negative (-) auxiliary battery terminal is connected, the power source mode becomes on (IG) mode. When the auxiliary battery is removed and reinstalled, the power source mode that was selected when the auxiliary battery was removed is restored.
- Inspect the fuses for circuits related to this system before performing the following inspection procedure.

PROCEDURE

1.	CHECK HARNESS AND CONNECTOR (AUXILIARY BATTERY - POWER MANAGEMENT CONTROL ECU)

(a) Disconnect the L5 and L6 connectors from the power management control ECU.

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

Standard Voltage:

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Tester Connection	Condition	Specified Condition
L5-1 (AM22) - Body ground	Always	9.5 to 16 V
L6-7 (AM21) - Body ground	Always	9.5 to 16 V

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (AUXILIARY BATTERY - POWER MANAGEMENT CONTROL ECU)

OK

▼

2.	CHECK HARNESS AND CONNECTOR (POWER MANAGEMENT CONTROL ECU - BODY GROUND)

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
L5-5 (E01) - Body ground	Always	Below 1 Ω
L5-6 (E1) - Body ground	Always	Below 1 Ω
L6-4 (E12) - Body ground	Always	Below 1 Ω
L6-5 (E02) - Body ground	Always	Below 1 Ω

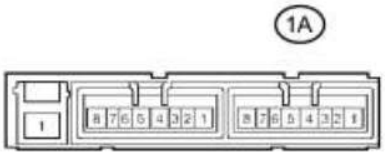
NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER MANAGEMENT CONTROL ECU - BODY GROUND)

OK

▼

3.	INSPECT IG2 RELAY

*1



(a) Remove the engine room relay block assembly.

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

Standard Resistance:

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Tester Connection	Condition	Specified Condition
1A-2 - 1A-3	20°C (68°F)	130 to 230 Ω

Text in Illustration

*1	Component without harness connected (Engine Room Relay Block)

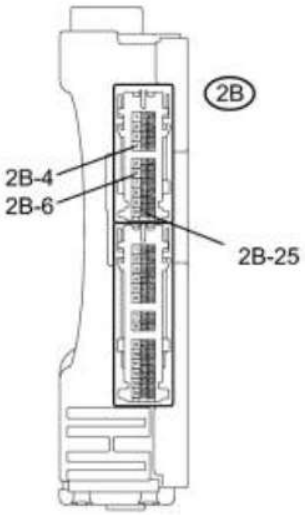
NG ▶ REPLACE IG2 RELAY

OK

▼

4.	INSPECT INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY (IG1 NO. 1, IG1 NO. 2 AND IG1 NO. 3 RELAYS)

*1



(a) Remove the instrument panel junction block assembly.

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
2B-25 - 2B-4	20°C (68°F)	101.25 to 123.75 Ω
2B-25 - 2B-6	20°C (68°F)	101.25 to 123.75 Ω
2B-4 - 2B-6	Always	Below 1 Ω

Text in Illustration

*1	Component without harness connected

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	(Instrument Panel Junction Block Assembly)

NG ▶ REPLACE INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY

OK

▼

5.	CHECK HARNESS AND CONNECTOR (POWER MANAGEMENT CONTROL ECU - INSTRUMENT PANEL J/B)

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
L6-2 (IG1D) - 2B-25	Always	Below 1 Ω
L6-2 (IG1D) - Body ground	Always	10 kΩ or higher

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

▼

6.	CHECK HARNESS AND CONNECTOR (INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY - BODY GROUND)

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
2B-4 - Body ground	Always	Below 1 Ω
2B-6 - Body ground	Always	Below 1 Ω

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY - BODY GROUND)

OK

▼

7.	CHECK HARNESS AND CONNECTOR (POWER MANAGEMENT CONTROL ECU - IG2 RELAY)

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

Standard Resistance:

Tester Connection	Condition	Specified Condition

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Tester Connection	Condition	Specified Condition
A22-2 (IG2D) - 1A-2	Always	Below 1 Ω
A22-2 (IG2D) - Body ground	Always	10 kΩ or higher

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER MANAGEMENT CONTROL ECU - IG2 RELAY)

OK

▼

8.	CHECK HARNESS AND CONNECTOR (ENGINE ROOM RELAY BLOCK ASSEMBLY - BODY GROUND)

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
1A-3 - Body ground	Always	Below 1 Ω

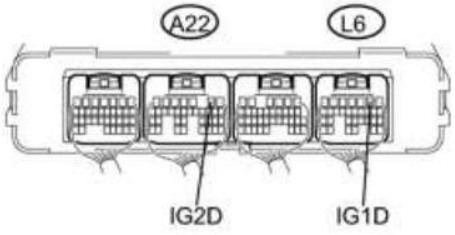
NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (ENGINE ROOM RELAY BLOCK ASSEMBLY - BODY GROUND)

OK

▼

9.	CHECK POWER MANAGEMENT CONTROL ECU

*1



(a) Install the instrument panel junction block assembly.

(b) Install the engine room relay block.

(c) Reconnect the A22 and L6 connectors.

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

Standard Voltage:

Tester Connection	Condition	Specified Condition
A22-2 (IG2D) - Body ground	Power switch on (IG)	Output voltage at terminal AM21 or AM22 is -2.5 V or more

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Tester Connection	Condition	Specified Condition
L6-2 (IG1D) - Body ground	Power switch on (IG)	Output voltage at terminal AM21 or AM22 is -2.5 V or more

Text in Illustration

*1	Component with harness connected (Power Management Control ECU)

NG ▶ REPLACE POWER MANAGEMENT CONTROL ECU

OK ▶ **USE SIMULATION METHOD TO CHECK**

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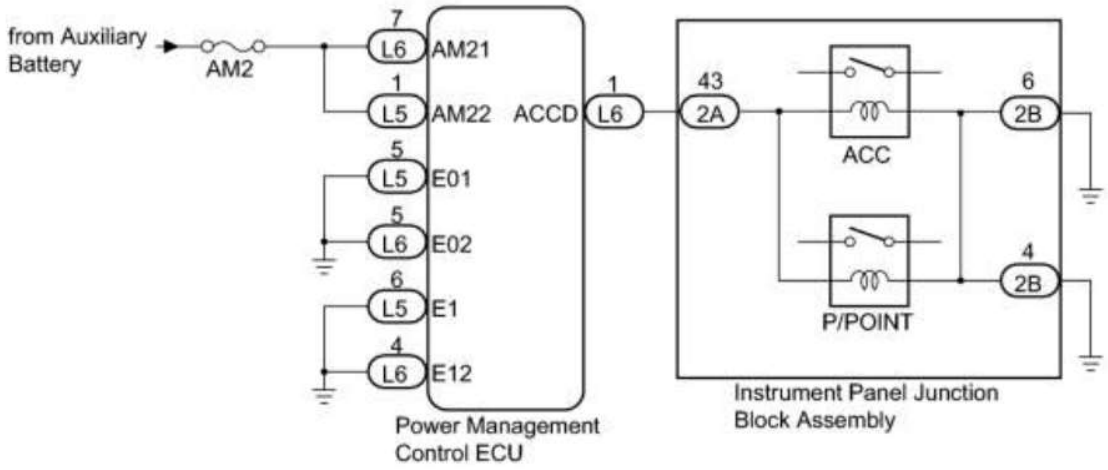
DTC	B2274	ACC Monitor Malfunction

DESCRIPTION

This DTC is stored when there is a problem in the ACC output circuit. The ACC circuit is the circuit that goes from inside the power management control ECU to the ACC relay.

DTC No.	DTC Detection Condition	Trouble Area
B2274	The ACC relay actuation circuit inside the power management control ECU or other related circuit is malfunctioning.	• AM2 fuse • ACC relay • Power management control ECU • Instrument panel junction block assembly • Wire harness or connector

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- When the power management control ECU is replaced with a new one and the cable from the negative (-) auxiliary battery terminal is connected, the power source mode becomes on (IG) mode. When the auxiliary battery is removed and reinstalled, the power source mode that was selected when the auxiliary battery was removed is restored.

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- Inspect the fuses for circuits related to this system before performing the following inspection procedure.

PROCEDURE

1.	CHECK HARNESS AND CONNECTOR (AUXILIARY BATTERY - POWER MANAGEMENT CONTROL ECU) INFO

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (AUXILIARY BATTERY - POWER MANAGEMENT CONTROL ECU)

OK

▼

2.	CHECK HARNESS AND CONNECTOR (POWER MANAGEMENT CONTROL ECU - BODY GROUND) INFO

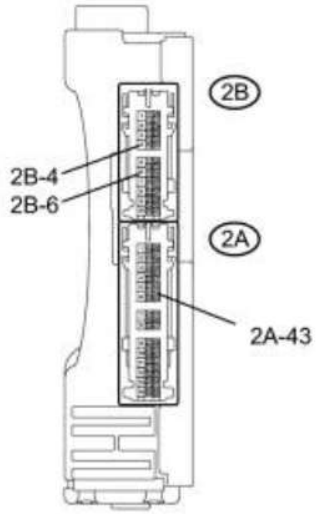
NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER MANAGEMENT CONTROL ECU - BODY GROUND)

OK

▼

3.	INSPECT INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY

*1



(a) Remove the instrument panel junction block assembly.

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
2A-43 - 2B-4	20°C (68°F)	101.25 to 123.75 Ω

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Tester Connection	Condition	Specified Condition
2A-43 - 2B-6	20°C (68°F)	101.25 to 123.75 Ω
2B-4 - 2B-6	Always	Below 1 Ω

Text in Illustration

*1	Component without harness connected (Instrument Panel Junction Block Assembly)

NG ▶ REPLACE INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY

OK

▼

4.	CHECK HARNESS AND CONNECTOR (POWER MANAGEMENT CONTROL ECU - INSTRUMENT PANEL J/B)

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
L6-1 (ACCD) - 2A-43	Always	Below 1 Ω
L6-1 (ACCD) - Body ground	Always	10 kΩ or higher

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

▼

5.	CHECK HARNESS AND CONNECTOR (INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY - BODY GROUND)

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
2B-4 - Body ground	Always	Below 1 Ω
2B-6 - Body ground	Always	Below 1 Ω

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY - BODY GROUND)

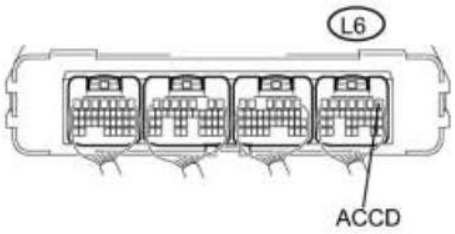
OK

▼

6.	INSPECT POWER MANAGEMENT CONTROL ECU

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*1



(a) Reinstall the instrument panel junction block assembly.

(b) Reconnect the L5 and L6 connectors.

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

Standard Voltage:

Tester Connection	Condition	Specified Condition
L6-1 (ACCD) - Body ground	Power switch on (ACC)	Output voltage at terminal AM21 or AM22 is -2.5 V or more

Text in Illustration

*1	Component with harness connected (Power Management Control ECU)

NG ▶ REPLACE POWER MANAGEMENT CONTROL ECU

OK ▶ **USE SIMULATION METHOD TO CHECK**

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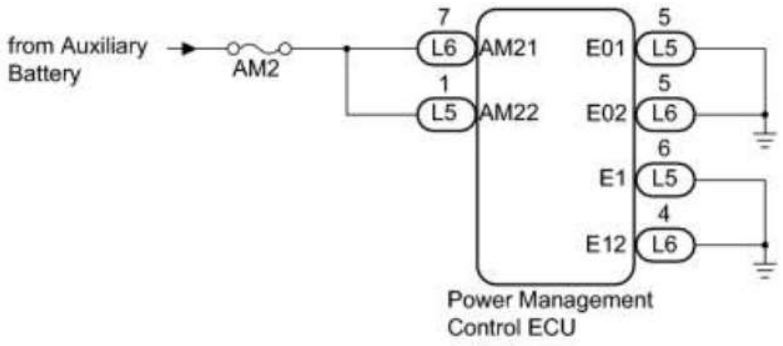
DTC	B2275	STSW Monitor Malfunction

DESCRIPTION

This DTC is stored when a malfunction is detected in the starter circuit inside the power management control ECU.

DTC No.	DTC Detection Condition	Trouble Area
B2275	Power management control ECU internal HV activation request output circuit malfunction or external circuit malfunction.	• AM2 fuse • Power management control ECU • Wire harness or connector

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- When the power management control ECU is replaced with a new one and the cable from the negative (-) auxiliary battery terminal is connected, the power source mode becomes the on (IG) mode. When the auxiliary battery is removed and reinstalled, the power source mode that was selected when the auxiliary battery was removed is restored.
- Inspect the fuses for circuits related to this system before performing the following inspection procedure.

PROCEDURE

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1.	CHECK HARNESS AND CONNECTOR (AUXILIARY BATTERY - POWER MANAGEMENT CONTROL ECU) INFO

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (AUXILIARY BATTERY - POWER MANAGEMENT CONTROL ECU)

OK ▼

2.	CHECK HARNESS AND CONNECTOR (POWER MANAGEMENT CONTROL ECU - BODY GROUND) INFO

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER MANAGEMENT CONTROL ECU - BODY GROUND)

OK ▼

3.	CHECK FOR DTC

(a) Clear the DTC INFO.

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

(c) After 25 seconds have elapsed, check if the DTC has been set again.

OK:

DTC B2275 is not output.

NG ▶ USE SIMULATION METHOD TO CHECK
OK ▶ **REPLACE POWER MANAGEMENT CONTROL ECU**

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DTC	B2277	Detecting Vehicle Submersion

DESCRIPTION

This DTC is stored when the submersion circuit monitor inside the power management control ECU detects a large amount of water.

DTC No.	DTC Detection Condition	Trouble Area
B2277	The submersion circuit monitor inside the power management control ECU detects a large amount of water.	Power management control ECU

INSPECTION PROCEDURE

NOTICE:

- When the power management control ECU is replaced with a new one and the cable from the negative (-) auxiliary battery terminal is connected, the power source mode becomes on (IG) mode. When the auxiliary battery is removed and reinstalled, the power source mode that was selected when the auxiliary battery was removed is restored.

PROCEDURE

1.	CHECK FOR DTC

(a) Clear the DTC INFO.

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

(c) After 330 seconds have elapsed, check if the DTC has been set again.

OK:

DTC B2277 is not output

HINT:

If there are any signs that water was present, before replacing the power management control ECU, take measures to prevent any further water entry.

NG ▶ REPLACE POWER MANAGEMENT CONTROL ECU
OK ▶ **USE SIMULATION METHOD TO CHECK**

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DTC	B2282	Vehicle Speed Signal Malfunction

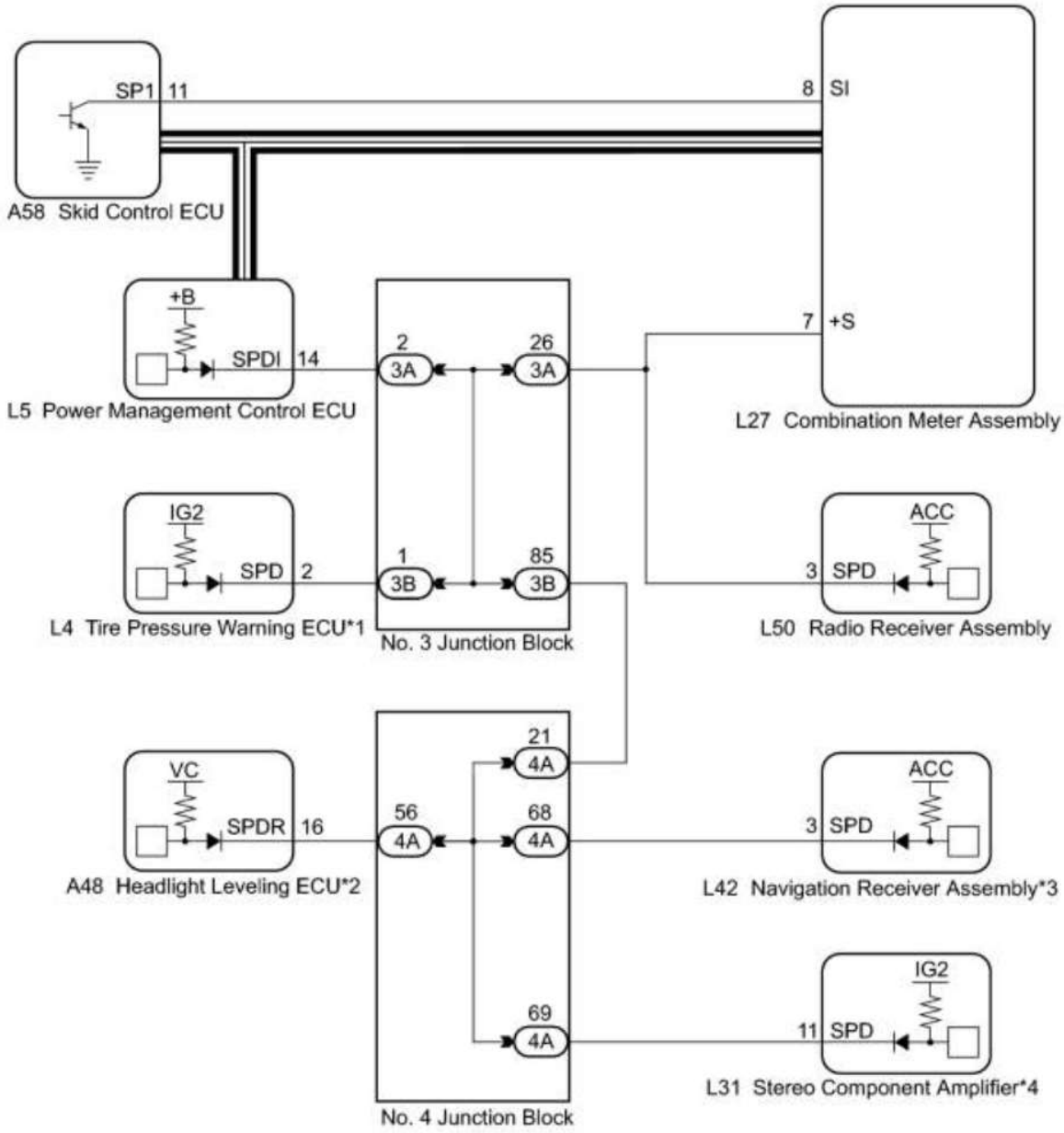
DESCRIPTION

The power management control ECU receives vehicle speed information using 2 methods. It receives a speed signal from the meter ECU via a direct line, and a from the skid control ECU via CAN. If the information sent using these 2 methods is inconsistent, this DTC will be stored.

DTC No.	DTC Detection Condition	Trouble Area
B2282	Speed information received by the power management control ECU via direct line and via CAN is inconsistent.	• CAN communication system • Combination meter assembly • Power management control ECU • No.3 junction block • Wire harness or connector

WIRING DIAGRAM

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*1: w/ Tire Pressure Warning System *2: w/ Automatic Type Headlight Beam Level Control

*3: w/ Navigation System *4: for Separate Type Amplifier System

HINT:

- A voltage of 12 V or 5 V is output from each ECU and then input to the combination meter. The signal is changed to a pulse signal at the transistor in the combination meter. Each ECU controls the respective system based on the pulse signal.
- If a short occurs in an ECU, all systems in the diagram above will not operate normally.

INSPECTION PROCEDURE

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NOTICE:

- When the power management control ECU is replaced with a new one and the cable from the negative (-) auxiliary battery terminal is connected, the power source mode becomes on (IG) mode. When the auxiliary battery is removed and reinstalled, the power source mode that was selected when the auxiliary battery was removed is restored.
- Inspect the fuses for circuits related to this system before performing the following inspection procedure.

PROCEDURE

1.	CHECK CAN COMMUNICATION SYSTEM

(a) Check if CAN communication DTCs are output.

HINT:

If any DTCs for CAN communication system malfunction are output, inspect those DTCs first.

OK:

CAN communication DTC is not output.

NG ▶ GO TO CAN COMMUNICATION SYSTEM (DIAGNOSTIC TROUBLE CODE CHART)

OK

▼

2.	CHECK SPEEDOMETER OPERATION

(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 / Combination Meter / Data List.

(e) Check the Data List for proper functioning of the vehicle speed signal.

Combination Meter

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Vehicle Speed Meter	Vehicle speed/Min.: 0, Max.: 255	Almost same as actual speed (When driving)	-

OK:

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Vehicle speed displayed on the Techstream is almost the same as the actual vehicle speed measured using a speedometer tester (calibrated chassis dynamometer).

NG ▶ GO TO METER / GAUGE SYSTEM (Speedometer Malfunction)

OK

▼

3.	READ VALUE USING TECHSTREAM

(a) Enter the following menus: Body Electrical / Power Source Control / Data List.

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

Power Source Control

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Vehicle speed signal	Vehicle speed signal/Stop or Run	Stop: Vehicle stopped Run: Vehicle running	-

OK:

Stop (vehicle is stopped) and Run (vehicle is running) appear on the screen.

NG ▶ CHECK HARNESS AND CONNECTOR (AUXILIARY BATTERY - POWER MANAGEMENT CONTROL ECU)

OK ▶ **REPLACE POWER MANAGEMENT CONTROL ECU**

4.	CHECK HARNESS AND CONNECTOR (AUXILIARY BATTERY - POWER MANAGEMENT CONTROL ECU) INFO

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (AUXILIARY BATTERY - POWER MANAGEMENT CONTROL ECU)

OK

▼

5.	CHECK HARNESS AND CONNECTOR (POWER MANAGEMENT CONTROL ECU - BODY GROUND) INFO

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER MANAGEMENT CONTROL ECU - BODY GROUND)

OK

▼

6.	CHECK HARNESS AND CONNECTOR (COMBINATION METER ASSEMBLY - POWER MANAGEMENT CONTROL ECU)

(a) Disconnect the L27 connector from the combination meter assembly.

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
L5-14 (SPDI) - L27-7 (+S)	Always	Below 1 Ω
L5-14 (SPDI) - Body ground	Always	10 kΩ or higher

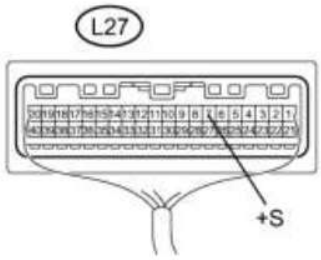
NG ▶ CHECK HARNESS AND CONNECTOR (COMBINATION METER ASSEMBLY - NO. 3 JUNCTION BLOCK)

OK

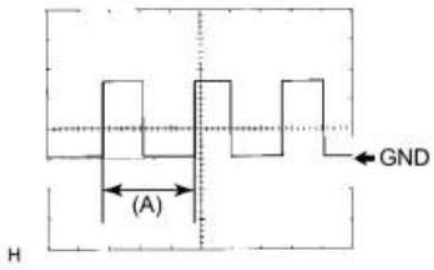
▼

7.	INSPECT COMBINATION METER ASSEMBLY

*1



(a) Remove the combination meter INFO.



(b) Reconnect the L27 connector to the combination meter assembly.

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

(d) Connect an oscilloscope to terminal L27-7 (+S) and body ground.

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

(f) Turn the wheel slowly.

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(g) Check the signal waveform according to the condition(s) in the table below.

Item	Condition
Tool setting	5 V/DIV., 20 ms./DIV.
Vehicle condition	Driving at approx. 20 km/h (12 mph)

OK:

The waveform is displayed as shown in the illustration.

Text in Illustration

*1	Component with harness connected (Combination Meter Assembly)

HINT:

When the system is functioning normally, one wheel revolution generates 4 pulses. As the vehicle speed increases, the width indicated by (A) in the illustration narrows.

NG ▶ GO TO METER / GAUGE SYSTEM (Speed Signal Circuit)

OK ▶ **REPLACE POWER MANAGEMENT CONTROL ECU**

8.	CHECK HARNESS AND CONNECTOR (COMBINATION METER ASSEMBLY - NO. 3 JUNCTION BLOCK)

(a) Disconnect the 3A connector.

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
L27-7 (+S) - 3A-26	Always	Below 1 Ω
L27-7 (+S) - Body ground	Always	10 kΩ or higher

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (COMBINATION METER - NO. 3 JUNCTION BLOCK)

OK

▼

9.	CHECK HARNESS AND CONNECTOR (POWER MANAGEMENT CONTROL ECU - JUNCTION BLOCK)

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

Standard Resistance:

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Tester Connection	Condition	Specified Condition
L5-14 (SPDI) - 3A-2	Always	Below 1 Ω
L5-14 (SPDI) - Body ground	Always	10 kΩ or higher

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER MANAGEMENT CONTROL ECU - NO. 3 JUNCTION BLOCK)

OK ▶ **REPLACE NO. 3 JUNCTION BLOCK**

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DTC	B2284	Brake Signal Malfunction

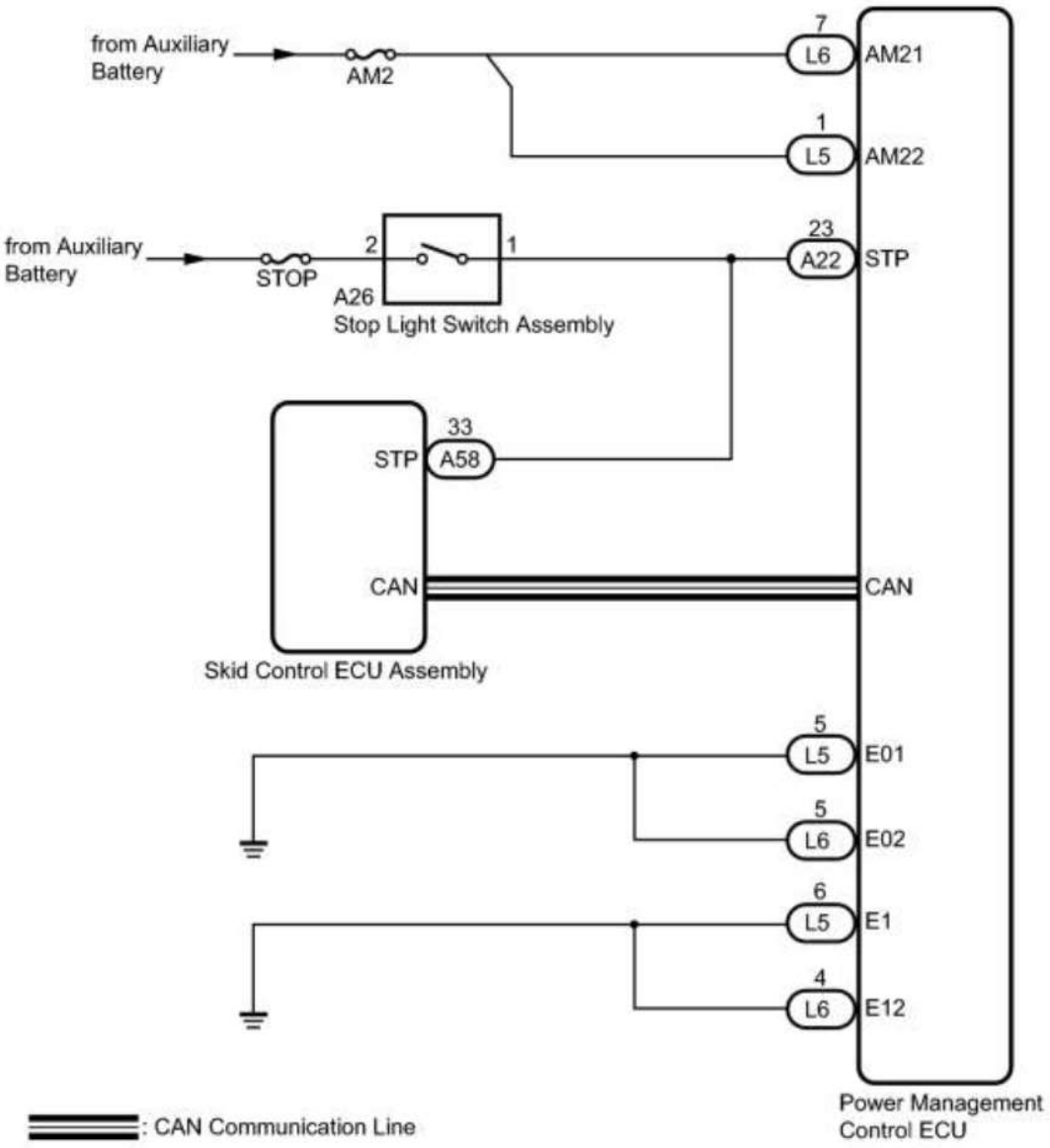
DESCRIPTION

The power management control ECU receives brake signal information from 2 sources. It receives a signal from the stop light switch assembly via a direct line, and a signal from the skid control ECU assembly via CAN. If the information from these 2 sources is inconsistent, this DTC will be stored.

DTC No.	DTC Detection Condition	Trouble Area
B2284	Stop light switch assembly operation information received by the power management control ECU from the stop light switch assembly via a direct line and stop light switch assembly information from the skid control ECU assembly via CAN are inconsistent.	• STOP fuse • Stop light switch assembly • CAN communication system • Skid control ECU assembly • Power management control ECU • Wire harness or connector

WIRING DIAGRAM

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INSPECTION PROCEDURE

NOTICE:

- When the power management control ECU is replaced with a new one and the cable from the negative (-) auxiliary battery terminal is connected, the power source mode becomes on (IG) mode. When the auxiliary battery is removed and reinstalled, the power source mode that was selected when the auxiliary battery was removed is restored.
- Inspect the fuse for circuits related to this system before performing the following inspection procedure.

HINT:

Check the connector connection to the terminal to make sure that there is no abnormality such as a loose connection, deformation, etc.

PROCEDURE

1.	CHECK HARNESS AND CONNECTOR (AUXILIARY BATTERY - POWER MANAGEMENT CONTROL ECU) INFO

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (AUXILIARY BATTERY - POWER MANAGEMENT CONTROL ECU)

OK

▼

2.	CHECK HARNESS AND CONNECTOR (POWER MANAGEMENT CONTROL ECU - BODY GROUND) INFO

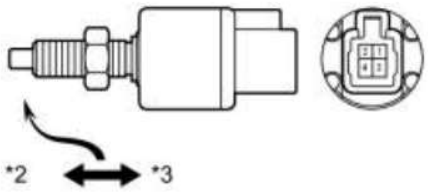
NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER MANAGEMENT CONTROL ECU - BODY GROUND)

OK

▼

3.	INSPECT STOP LIGHT SWITCH ASSEMBLY

*1



(a) Remove the stop light switch assembly INFO.

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
1 - 2	Pushed	10 kΩ or higher
3 - 4	Pushed	Below 1 Ω
1 - 2	Not pushed	Below 1 Ω
3 - 4	Not pushed	10 kΩ or higher

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Text in Illustration

*1	Component without harness connected (Stop Light Switch Assembly)
*2	Free
*3	Pushed in

NG ▶ REPLACE STOP LIGHT SWITCH ASSEMBLY

OK

▼

4.	CHECK HARNESS AND CONNECTOR (STOP LIGHT SWITCH ASSEMBLY - POWER MANAGEMENT CONTROL ECU)

(a) Disconnect the A22 connector from the power management control ECU.

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
A22-23 (STP) - A26-1	Always	Below 1 Ω
A22-23 (STP) - Body ground	Always	10 kΩ or higher

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (STOP LIGHT SWITCH ASSEMBLY - POWER MANAGEMENT CONTROL ECU)

OK

▼

5.	READ VALUE USING TECHSTREAM (STOP LIGHT SWITCH ASSEMBLY)

(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 / Power Source Control / Data List.

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

Power Source Control

Tester Display	Measurement Item/Range	Normal Condition	Specified Condition
Stop Light Switch1	Stop light switch1/ON or OFF	ON: Brake pedal depressed OFF: Brake pedal released	-

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OK:

ON (brake pedal is depressed) and OFF (brake pedal is released) appear on the screen.

NG ▶ REPLACE POWER MANAGEMENT CONTROL ECU

OK ▶ **GO TO ELECTRONICALLY CONTROLLED BRAKE SYSTEM (DTC C1249/49)**

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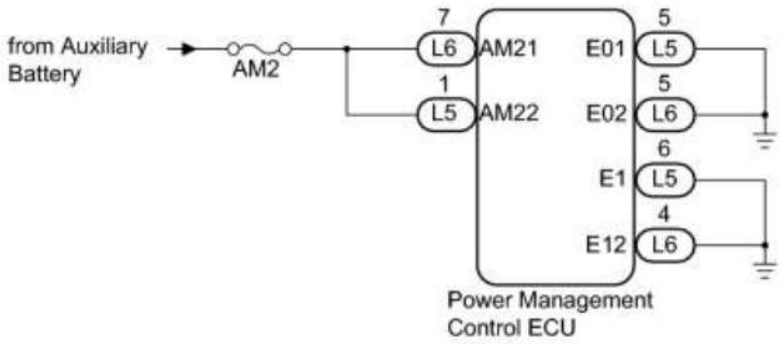
DTC	B2286	Runnable Signal Malfunction

DESCRIPTION

This DTC is stored when a malfunction is detected in the READY signal circuit inside the power management control ECU.

DTC No.	DTC Detection Condition	Trouble Area
B2286	READY signal error inside the power management control ECU.	• AM2 fuse • Power management control ECU • Wire harness or connector

WIRING DIAGRAM



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INSPECTION PROCEDURE

NOTICE:

- When the power management control ECU is replaced with a new one and the cable from the negative (-) auxiliary battery terminal is connected, the power source mode becomes on (IG) mode. When the auxiliary battery is removed and reinstalled, the power source mode that was selected when the auxiliary battery was removed is restored.
- Inspect the fuses for circuits related to this system before performing the following inspection procedure.

HINT:

Check the connector connection to the terminal to make sure that there is no abnormality such as a loose connection, deformation, etc.

PROCEDURE

1.	CHECK HARNESS AND CONNECTOR (AUXILIARY BATTERY - POWER MANAGEMENT CONTROL ECU) INFO

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (AUXILIARY BATTERY - POWER MANAGEMENT CONTROL ECU)

OK ▼

2.	CHECK HARNESS AND CONNECTOR (POWER MANAGEMENT CONTROL ECU - BODY GROUND) INFO

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER MANAGEMENT CONTROL ECU - BODY GROUND)

OK ▼

3.	CHECK FOR DTC

(a) Clear the DTC INFO.

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

(c) After 25 seconds have elapsed, check if the DTC has been set again.

OK:

DTC B2286 is not output

NG ▶ REPLACE POWER MANAGEMENT CONTROL ECU

OK ▶ **USE SIMULATION METHOD TO CHECK**

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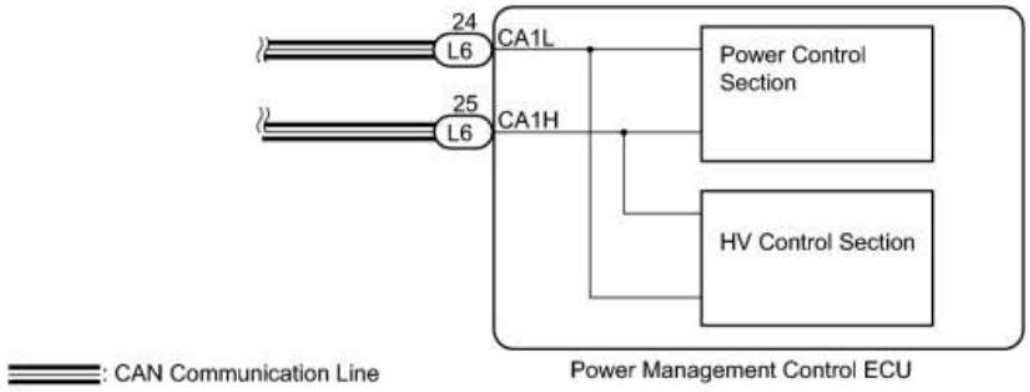
DTC	U0293	Lost Communication with HV ECU

DESCRIPTION

This DTC is stored when the power management control ECU detects a CAN communication error inside the power management control ECU (power control section - HV control section).

DTC No.	DTC Detection Condition	Trouble Area
U0293	CAN communication signal error inside the power management control ECU (power control section - HV control section).	• Power management control ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

When the power management control ECU is replaced with a new one and the cable from the negative (-) auxiliary battery terminal is connected, the power source mode becomes on (IG) mode. When the auxiliary battery is removed and reinstalled, the power source mode that was selected when the auxiliary battery was removed is reinstalled.

PROCEDURE

1.	CHECK HARNESS AND CONNECTOR (AUXILIARY BATTERY - POWER MANAGEMENT CONTROL ECU) INFO

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (AUXILIARY BATTERY - POWER MANAGEMENT CONTROL ECU)

OK

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2.	CHECK HARNESS AND CONNECTOR (POWER MANAGEMENT CONTROL ECU - BODY GROUND) INFO

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER MANAGEMENT CONTROL ECU - BODY GROUND)

OK

3.	CHECK FOR DTC

(a) Clear the DTC INFO.

(b) Check for DTC again.

OK:

DTC U0293 is not output

NG ▶ REPLACE POWER MANAGEMENT CONTROL ECU

OK ▶ **USE SIMULATION METHOD TO CHECK**

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Power Source Mode does not Change to ON (IG and ACC)

DESCRIPTION

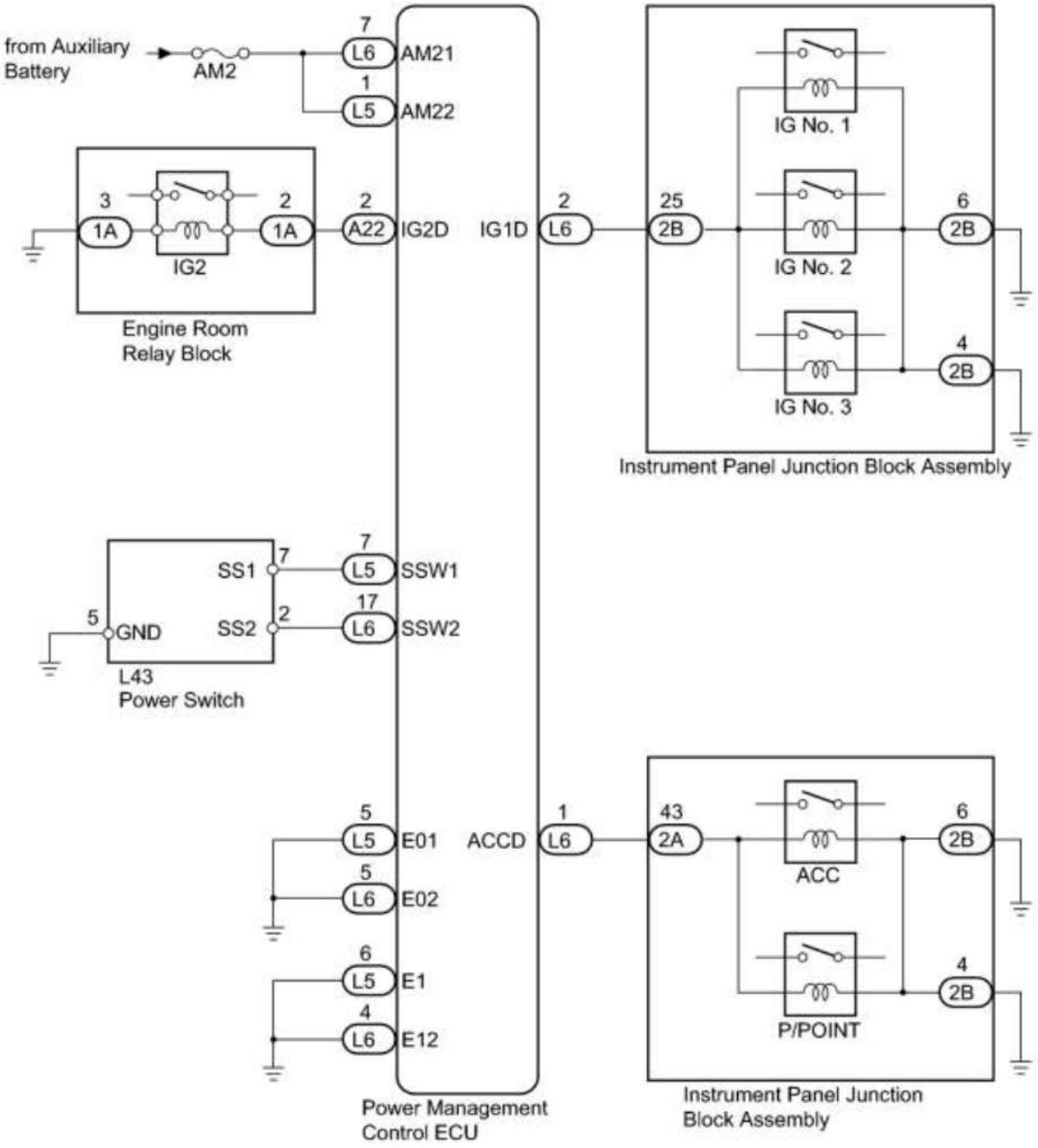
When the power switch is pushed with the electrical key in the cabin, the power management control ECU receives signals to change the power source mode.

HINT:

To allow use of the Techstream to inspect the push-button start function when the power source mode is off, repeat opening and closing any of the doors. Opening and closing a door establishes communication between the Techstream and the power management control ECU. (Opening and closing a door can also be simulated by operating a door courtesy light switch.)

WIRING DIAGRAM

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INSPECTION PROCEDURE

PROCEDURE

1.	CHECK HARNESS AND CONNECTOR (AUXILIARY BATTERY - POWER MANAGEMENT CONTROL ECU) INFO

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NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (AUXILIARY BATTERY - POWER MANAGEMENT CONTROL ECU)

OK

▼

2.	CHECK HARNESS AND CONNECTOR (POWER MANAGEMENT CONTROL ECU - BODY GROUND) INFO

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER MANAGEMENT CONTROL ECU - BODY GROUND)

OK

▼

3.	READ VALUE USING TECHSTREAM

(a) Reconnect the L5 and L6 connectors to the power management control ECU.

(b) Turn the power switch off.

(c) Connect the Techstream to the DLC3.

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

(e) Turn the Techstream on.

(f) Enter the following menus: Body Electrical / Power Source Control / Data List.

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

Power Source Control

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Key Certification Waiting Timed Out	Key certification error detection/ No or Yes	No: Key certification error not detected Yes: Key certification error detected	-

OK:

When more than 1 second elapses after the power switch is turned from off to on (IG), No is displayed in the Data List.

NG ▶ CHECK FOR DTC

OK

▼

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4.	READ VALUE USING TECHSTREAM

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

Power Source Control

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Start Switch1	Start switch 1/ON or OFF	ON: Power switch pushed OFF: Power switch not pushed	-
Start Switch2	Start switch 2/ON or OFF	ON: Power switch pushed OFF: Power switch not pushed	-

OK:

ON (power switch is pushed) and OFF (power switch is not pushed) appear on the screen.

NG ▶ CHECK POWER SWITCH

OK

▼

5.	CHECK POWER MANAGEMENT CONTROL ECU

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

Power Source Control

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Power Supply Condition	Power supply condition/All OFF, ACC ON, IG1 ON, IG2 ON, ST ON	ALL OFF: All relays off ACC ON: ACC relay on IG1 ON: IG1 relay on IG2 ON: IG2 relay on ST ON: ST request signal on	-

(b) Measure the voltage while checking the Data List on the Techstream.

Standard Voltage:

Tester Connection	Condition	Specified Condition

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Tester Connection	Condition	Specified Condition
L6-2 (IG1D) - Body ground	Power switch off	Below 1 V
L6-2 (IG1D) - Body ground	Power switch on (ACC)	Below 1 V
L6-2 (IG1D) - Body ground	Power switch on (IG)	Output voltage at terminal AM21 or AM22 is -2.5 V or more
A22-2 (IG2D) - Body ground	Power switch off	Below 1 V
A22-2 (IG2D) - Body ground	Power switch on (ACC)	Below 1 V
A22-2 (IG2D) - Body ground	Power switch on (IG)	Output voltage at terminal AM21 or AM22 is -2.5 V or more
L6-1 (ACCD) - Body ground	Power switch off	Below 1 V
L6-1 (ACCD) - Body ground	Power switch on (IG)	Output voltage at terminal AM21 or AM22 is -2.5 V or more
L6-1 (ACCD) - Body ground	Power switch on (ACC)	Output voltage at terminal AM21 or AM22 is -2.5 V or more

NG ▶ REPLACE POWER MANAGEMENT CONTROL ECU

OK

▼

6.	CONFIRMATION TEST

(a) Check that the power source mode becomes on (ACC) and on (IG) when the power switch is operated.

OK:

Power source mode becomes on (ACC) and on (IG) when the power switch is operated.

NG ▶ CHECK RELAY CONTACT SIDE CIRCUIT

OK ▶ **USE SIMULATION METHOD TO CHECK**

7.	CHECK POWER SWITCH

(a) Remove the power switch INFO.

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*1



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

Standard Resistance:

Tester Connection	Condition	Specified Condition
L43-7 (SS1) - L43-5 (GND)	Pushed	Below 1 Ω
L43-7 (SS1) - L43-5 (GND)	Not pushed	10 kΩ or higher
L43-2 (SS2) - L43-5 (GND)	Pushed	Below 1 Ω
L43-2 (SS2) - L43-5 (GND)	Not pushed	10 kΩ or higher

Text in Illustration

*1	Component without harness connected (Power Switch)

NG ▶ REPLACE POWER SWITCH

OK

▼

8.	CHECK HARNESS AND CONNECTOR (POWER SWITCH - POWER MANAGEMENT CONTROL ECU AND BODY GROUND)

(a) Disconnect the L5 and L6 connectors from the power management control ECU.

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
L6-17 (SSW2) - L43-2 (SS2)	Always	Below 1 Ω
L5-7 (SSW1) - L43-7 (SS1)	Always	Below 1 Ω

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Tester Connection	Condition	Specified Condition
L6-17 (SSW2) - Body ground	Always	10 kΩ or higher
L5-7 (SSW1) - Body ground	Always	10 kΩ or higher

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER SWITCH - POWER MANAGEMENT CONTROL ECU OR BODY GROUND)

OK ▶ **REPLACE POWER MANAGEMENT CONTROL ECU**

9.	CHECK FOR DTC

(a) Enter the following menus: Body Electrical / Power Source Control and Smart Key / DTC.

(b) Check for DTCs.

Result:

Result	Proceed to
The following DTCs are not output: • B2785 • B2287 • B2784	A
DTC B2785 is not output but DTC B2287 is output.	B
DTCs other than B2287 are output.	C

B ▶ GO TO OTHER FLOW CHART (DTC B2287)

A ▶ GO TO OTHER FLOW CHART (Room Oscillator does not Recognize Key)

C ▶ **GO TO DIAGNOSTIC TROUBLE CODE CHART**

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Power Source Mode does not Change to ON (IG)

DESCRIPTION

When the power switch is pushed with the electrical key in the cabin, the power management control ECU receives signals to change the power source mode.

HINT:

To allow use of the Techstream to inspect the push-button start function when the power source mode is off, repeat opening and closing any of the doors. Opening and closing a door establishes communication between the Techstream and power management control ECU. (Opening and closing a door can also be simulated by operating a door courtesy light switch.)

WIRING DIAGRAM

Refer to DTC B2271 INFO.

INSPECTION PROCEDURE

PROCEDURE

1.	CHECK HARNESS AND CONNECTOR (AUXILIARY BATTERY - POWER MANAGEMENT CONTROL ECU) INFO

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (AUXILIARY BATTERY - POWER MANAGEMENT CONTROL ECU)

OK

▼

2.	CHECK HARNESS AND CONNECTOR (POWER MANAGEMENT CONTROL ECU - BODY GROUND) INFO

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER MANAGEMENT CONTROL ECU - BODY GROUND)

OK

▼

3.	INSPECT IG2 RELAY INFO

NG ▶ REPLACE IG2 RELAY

OK

▼

4.	INSPECT INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY (IG1 NO. 1, IG1 NO. 2 AND IG1 NO. 3 RELAY) INFO

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NG ▶ REPLACE INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY

OK

▼

5.	CHECK HARNESS AND CONNECTOR (POWER MANAGEMENT CONTROL ECU - INSTRUMENT PANEL J/B) INFO

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

▼

6.	CHECK HARNESS AND CONNECTOR (INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY - BODY GROUND) INFO

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY - BODY GROUND)

OK

▼

7.	CHECK HARNESS AND CONNECTOR (POWER MANAGEMENT CONTROL ECU - IG2 RELAY) INFO

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER MANAGEMENT CONTROL ECU - IG2 RELAY)

OK

▼

8.	CHECK HARNESS AND CONNECTOR (ENGINE ROOM RELAY BLOCK ASSEMBLY - BODY GROUND) INFO

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (ENGINE ROOM RELAY BLOCK ASSEMBLY - BODY GROUND)

OK

▼

9.	CHECK POWER MANAGEMENT CONTROL ECU INFO

NG ▶ REPLACE POWER MANAGEMENT CONTROL ECU

OK ▶ **USE SIMULATION METHOD TO CHECK**

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Power Source Mode does not Change to ON (ACC)

DESCRIPTION

When the power switch is pushed with the electrical key in the cabin, the power management control ECU receives signals to change the power source mode.

HINT:

To allow use of the Techstream to inspect the push-button start function when the power source mode is off, repeat opening and closing any of the doors. Opening and closing a door establishes communication between the Techstream and power management control ECU. (Opening and closing a door can also be simulated by operating a door courtesy light switch.)

WIRING DIAGRAM

Refer to DTC B2274 INFO.

INSPECTION PROCEDURE

PROCEDURE

1.	CHECK HARNESS OR CONNECTOR (AUXILIARY BATTERY - POWER MANAGEMENT CONTROL ECU) INFO

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (AUXILIARY BATTERY - POWER MANAGEMENT CONTROL ECU)

OK

▼

2.	CHECK HARNESS OR CONNECTOR (POWER MANAGEMENT CONTROL ECU - BODY GROUND) INFO

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER MANAGEMENT CONTROL ECU - BODY GROUND)

OK

▼

3.	INSPECT INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY INFO

NG ▶ REPLACE INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY

OK

▼

4.	CHECK HARNESS AND CONNECTOR (POWER MANAGEMENT CONTROL ECU - INSTRUMENT PANEL J/B) INFO

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NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

▼

5.	CHECK HARNESS AND CONNECTOR (INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY - BODY GROUND) INFO

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY - BODY GROUND)

OK

▼

6.	INSPECT POWER MANAGEMENT CONTROL ECU INFO

NG ▶ REPLACE POWER MANAGEMENT CONTROL ECU

OK ▶ **USE SIMULATION METHOD TO CHECK**

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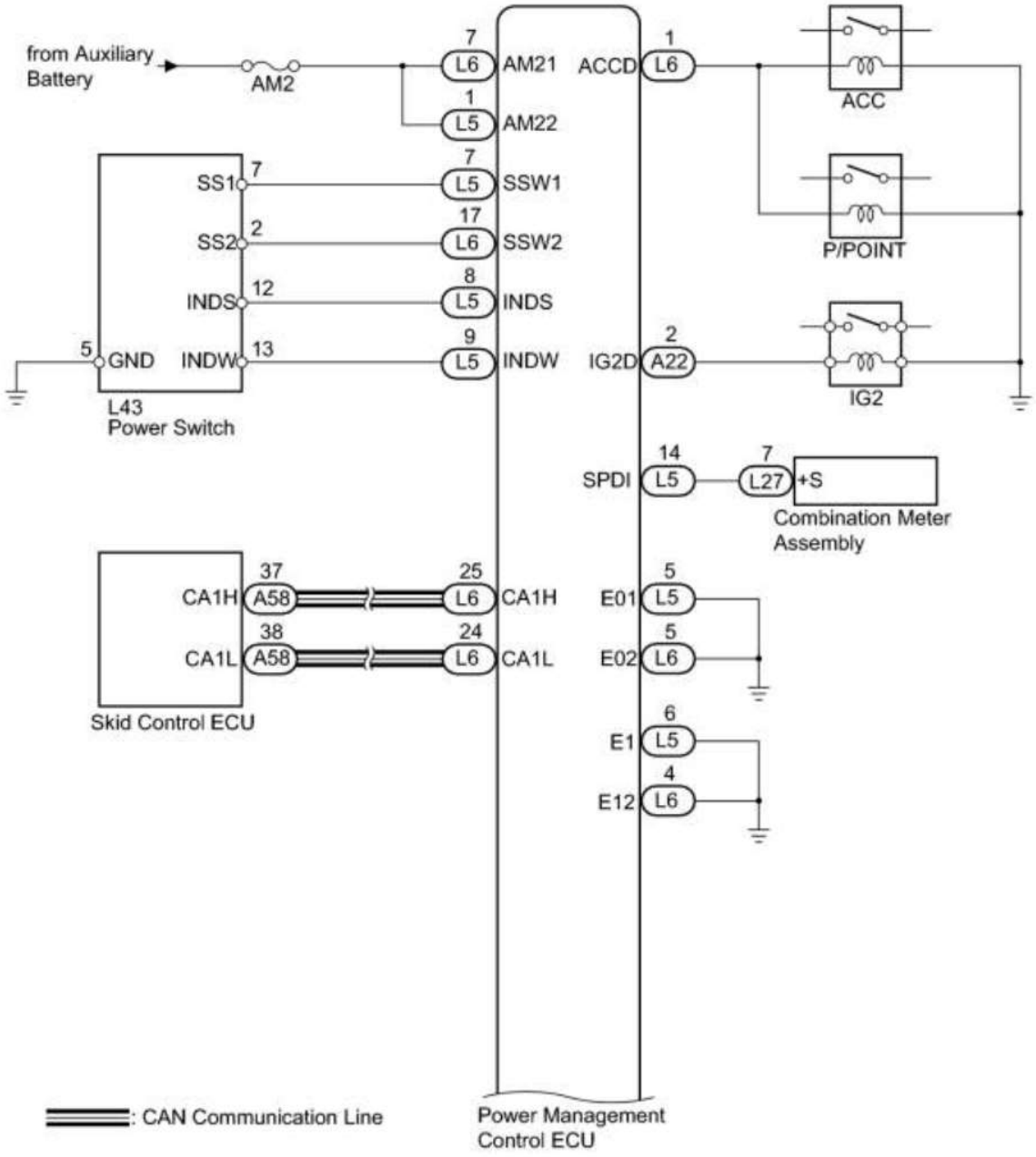
Power Source Mode does not Change to ON (READY)

DESCRIPTION

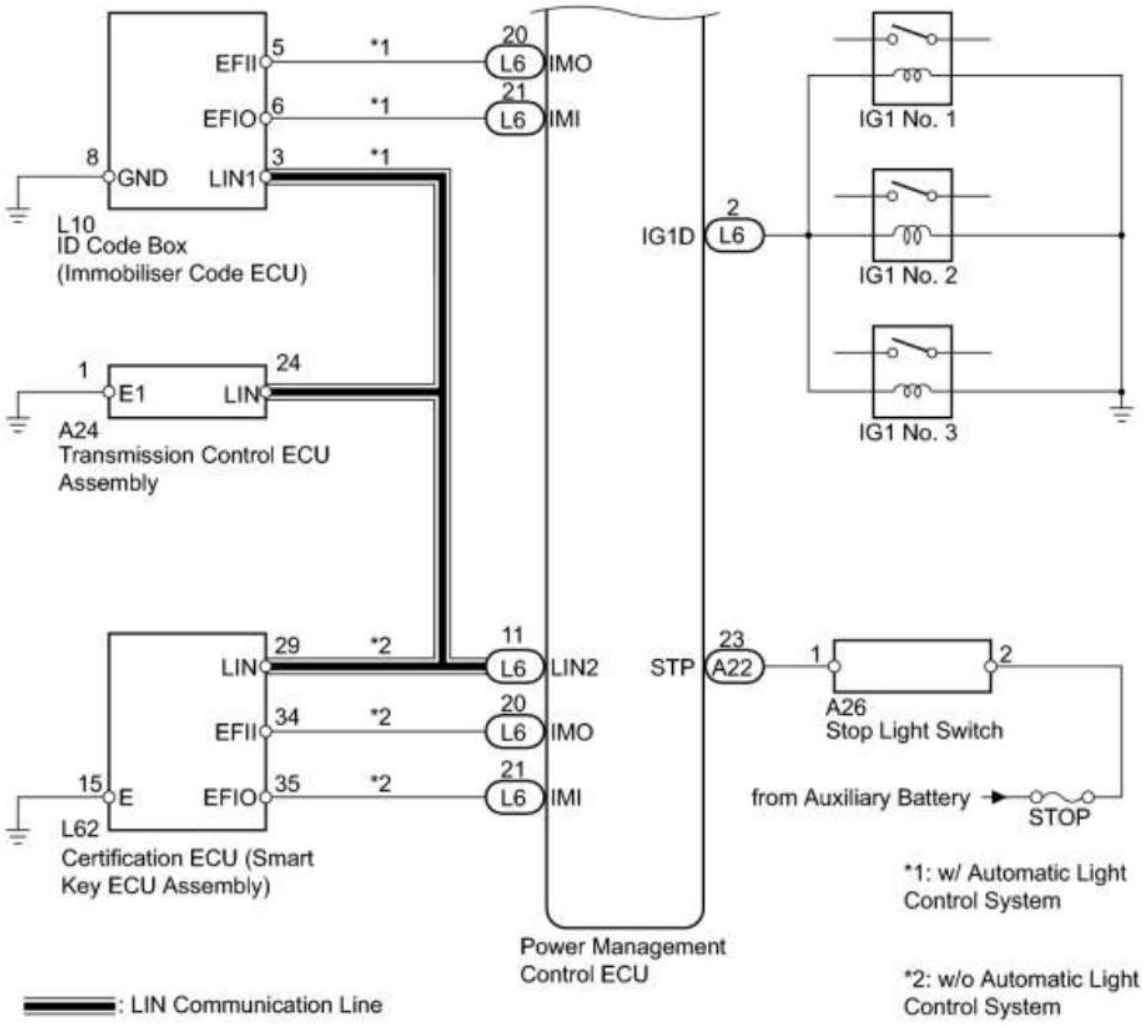
When the electronic key is in the cabin and the power switch is pressed, the power management control ECU receives a signal and changes the power source mode. In addition, when the power switch is pressed with park (P) selected and the brake pedal depressed, the hybrid system turns on (READY).

WIRING DIAGRAM

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INSPECTION PROCEDURE

NOTICE:

- When the power management control ECU is replaced with a new one and the cable from the negative (-) auxiliary battery terminal is connected, the power source mode becomes on (IG) mode. When the auxiliary battery is removed and reinstalled, power source mode that was selected when the auxiliary battery was removed is restored.
- Inspect the fuses for circuits related to this system before performing the following inspection procedure.

PROCEDURE

1.	CHECK HYBRID SYSTEM READY ON

(a) Place the electrical key on the driver seat.

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(b) Depress the brake pedal.

(c) Check that the power switch indicator light is green. Then press the power switch to check if the hybrid system turns on (READY).

OK:

Power source mode becomes on (READY).

NG ▶ CHECK FOR DTC

OK ▶ **END (HYBRID SYSTEM PERMISSION CONDITIONS WERE NOT SATISFIED)**

2.	CHECK FOR DTC

(a) Turn the power switch off.

(b) Connect the Techstream to the DLC3.

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

(d) Turn the Techstream on.

(e) Enter the following menus: Powertrain / Hybrid Control / DTC.

(f) Check for DTCs.

OK:

DTC is not output.

NG ▶ GO TO HYBRID CONTROL SYSTEM (DIAGNOSTIC TROUBLE CODE CHART)

OK

▼

3.	CHECK FOR DTC

(a) Enter the following menus: Body Electrical / Power Source Control / Data List.

(b) Check for DTCs.

OK:

DTC is not output.

NG ▶ GO TO DIAGNOSTIC TROUBLE CODE CHART

OK

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4.	CHECK POWER SOURCE CONDITION

(a) Check the power source mode change.

(1) When the key is inside the vehicle and the park (P) is selected, check that pressing the power switch causes the power source mode to change.

Result:

Result	Proceed to
off → on (ACC) → on (IG) → off	A
Power source mode does not change to on (IG and ACC)	B
Power source mode does not change to on (IG)	C
Power source mode does not change to on (ACC)	D

D GO TO OTHER FLOW CHART (Power Source Mode does not Change to ON (ACC))

C GO TO OTHER FLOW CHART (Power Source Mode does not Change to ON (IG))

B GO TO OTHER FLOW CHART (Power Source Mode does not Change to ON (IG and ACC))

A

5.	READ VALUE USING TECHSTREAM (STOP LIGHT SWITCH ASSEMBLY)

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

Power Source Control

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Stop Light Switch1	Stop light switch 1/ON or OFF	ON: Brake pedal depressed OFF: Brake pedal released	-

OK:

ON (brake pedal is depressed) and OFF (brake pedal is released) appear on the screen.

NG INSPECT STOP LIGHT SWITCH ASSEMBLY

OK

6.	READ VALUE USING TECHSTREAM (L CODE)

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

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

Smart Key

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
L Code Check	L code certification result/OK or NG	OK: L code certification result normal NG: L code certification result abnormal	-

OK:

OK appears on the screen.

NG ▶ REPLACE TRANSMISSION CONTROL ECU ASSEMBLY

OK

▼

7.	READ VALUE USING TECHSTREAM (ENGINE START REQUEST)

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

Smart Key

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Engine Start Request	Start request signal response/OK or NG	OK: Start request condition signal received NG: Start request condition signal not received	-

OK:

OK appears on the screen.

Result:

Result	Proceed to
OK (w/ Automatic Light Control System)	A
OK (w/o Automatic Light Control System)	B
NG	B

B ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

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A

▼

8.	READ VALUE USING TECHSTREAM (S CODE)

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

Smart Key

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
S Code Check	S code certification result/OK or NG	OK: S code certification result normal NG: S code certification result abnormal	-

OK:

OK appears on the screen.

NG ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

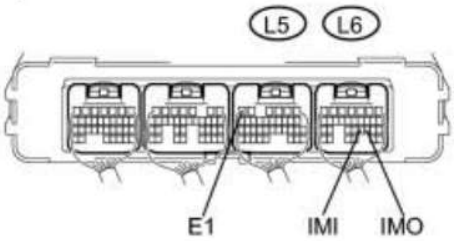
OK

▼

9.	CHECK ID CODE BOX (IMMOBILISER CODE ECU)

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

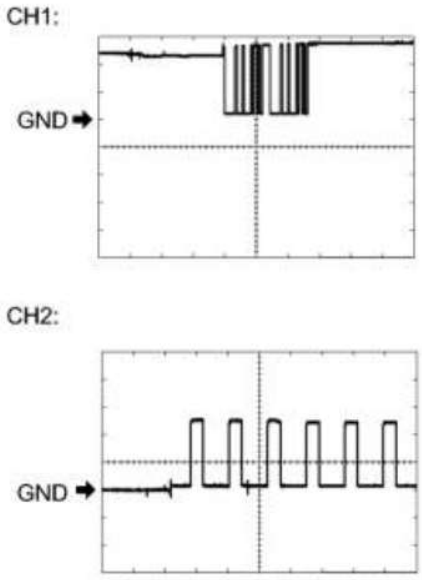
*1



(1) Waveform 1

Tester Connection	L6-20 (IMO) - L5-6 (E1)
Tool Setting	5 V/DIV., 500 ms/DIV
Vehicle 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

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(2) Waveform 2

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

OK:

The waveform is displayed as shown in illustration.

Text in Illustration

*1	Component with harness connected (Power Management Control ECU)

NG ▶ REPLACE ID CODE BOX (IMMOBILISER CODE ECU)

OK

▼

10.	READ VALUE USING TECHSTREAM

(a) Enter the following menus: Body Electrical / Power Source Control / Data List.

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

Power Source Control

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note

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Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Starter Request Signal	Hybrid control system start request signal / ON or OFF	ON: STSW signal is on OFF: STSW signal is off	-

OK:

Data List display changes when the power switch is operated.

NG ▶ REPLACE POWER MANAGEMENT CONTROL ECU

OK ▶ **GO TO HYBRID CONTROL SYSTEM**

11.	INSPECT STOP LIGHT SWITCH ASSEMBLY INFO

NG ▶ REPLACE STOP LIGHT SWITCH ASSEMBLY

OK

▼

12.	CHECK HARNESS AND CONNECTOR (POWER MANAGEMENT CONTROL ECU - STOP LIGHT SWITCH ASSEMBLY)

(a) Disconnect the A22 connector from the power management control ECU.

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
A22-23 (STP) - A26-1	Always	Below 1 Ω
A22-23 (STP)- Body ground	Always	10 kΩ or higher

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER MANAGEMENT CONTROL ECU - STOP LIGHT SWITCH ASSEMBLY)

OK ▶ **REPLACE POWER MANAGEMENT CONTROL ECU**

13.	REPLACE TRANSMISSION CONTROL ECU ASSEMBLY

(a) Replace transmission control ECU assembly INFO.

NEXT

▼

14.	CHECK HYBRID SYSTEM READY ON

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(a) Place the electrical key on the driver seat.

(b) Depress the brake pedal.

(c) Check that the power switch indicator light is green. Then press the power switch to check if the hybrid system turns on (READY).

OK:

Power source mode becomes on (READY).

Result:

Result	Proceed to
OK	A
NG (w/ Automatic Light Control System)	B
NG (w/o Automatic Light Control System)	C

C ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

B ▶ REPLACE ID CODE BOX (IMMOBILISER CODE ECU)

A ▶ **END (TRANSMISSION CONTROL ECU WAS DEFECTIVE)**

15.	REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

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

NEXT

▼

16.	CHECK HYBRID SYSTEM READY ON

(a) Place the electrical key on the driver seat.

(b) Depress the brake pedal.

(c) Check that the power switch indicator light is green. Then press the power switch to check if the hybrid system turns on (READY).

OK:

Power source mode becomes on (READY).

NG ▶ REPLACE ID CODE BOX (IMMOBILISER CODE ECU)

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

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