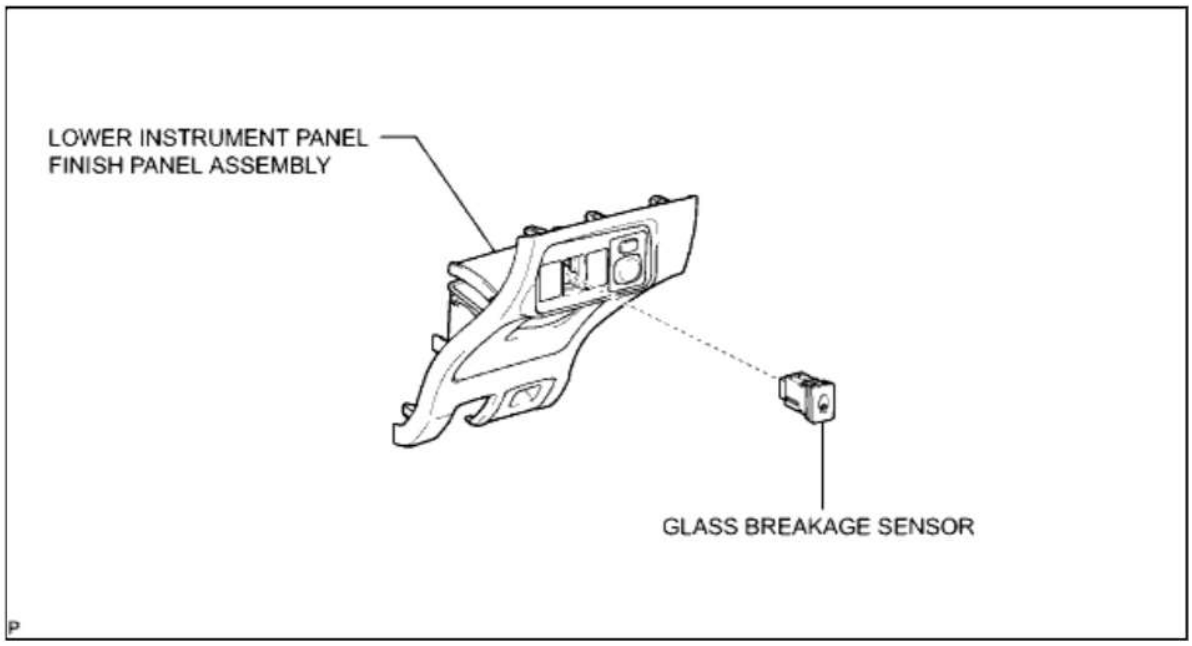
Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000003CO7002X
Title: THEFT DETERRENT / KEYLESS ENTRY: GLASS BREAKAGE SENSOR: COMPONENTS (2010 Corolla)		

COMPONENTS

ILLUSTRATION



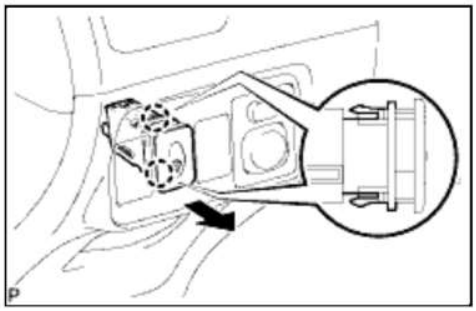
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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000003CO8002X
Title: THEFT DETERRENT / KEYLESS ENTRY: GLASS BREAKAGE SENSOR: REMOVAL (2010 Corolla)		

REMOVAL

1. REMOVE LOWER INSTRUMENT PANEL FINISH PANEL ASSEMBLY INFO

2. REMOVE GLASS BREAKAGE SENSOR



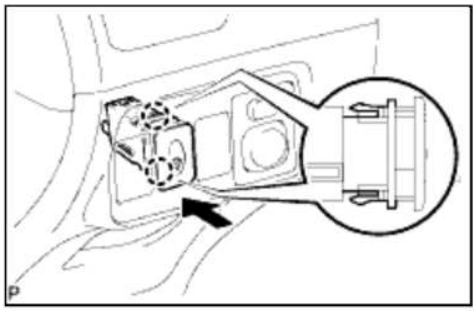
(a) Disengage the 2 claws and remove the glass breakage sensor.

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000003CO5002X
Title: THEFT DETERRENT / KEYLESS ENTRY: GLASS BREAKAGE SENSOR: INSTALLATION (2010 Corolla)		

INSTALLATION

1. INSTALL GLASS BREAKAGE SENSOR



(a) Engage the 2 claws and install the glass breakage sensor.

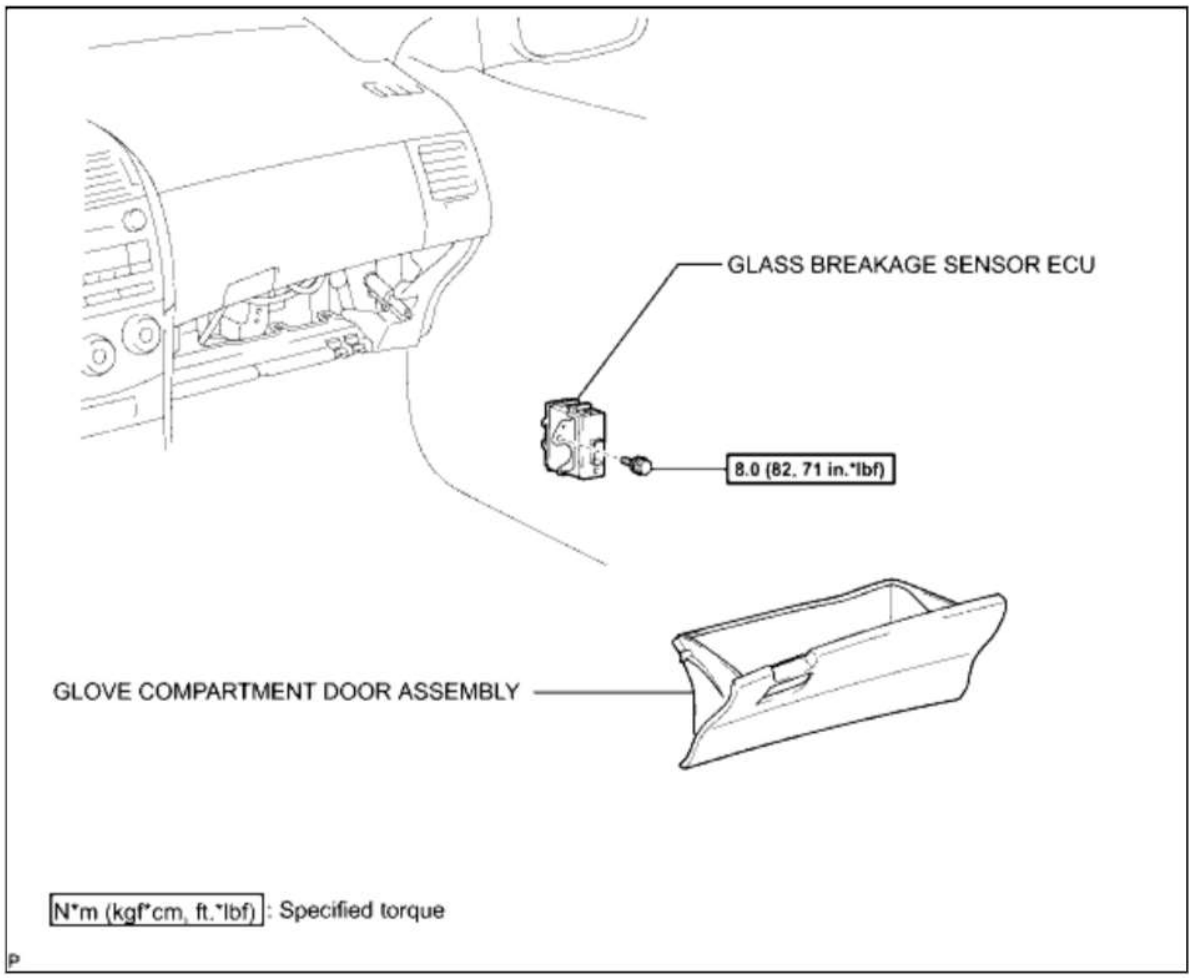
2. INSTALL LOWER INSTRUMENT PANEL FINISH PANEL ASSEMBLY INFO

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Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000003CO7003X
Title: THEFT DETERRENT / KEYLESS ENTRY: GLASS BREAKAGE SENSOR ECU: COMPONENTS (2010 Corolla)		

COMPONENTS

ILLUSTRATION



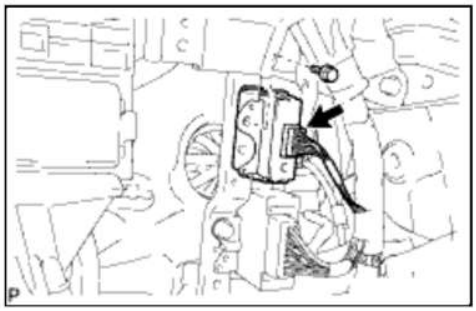
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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000003CO8003X
Title: THEFT DETERRENT / KEYLESS ENTRY: GLASS BREAKAGE SENSOR ECU: REMOVAL (2010 Corolla)		

REMOVAL

1. REMOVE GLOVE COMPARTMENT DOOR ASSEMBLY INFO

2. REMOVE GLASS BREAKAGE SENSOR ECU



(a) Disconnect the connector.

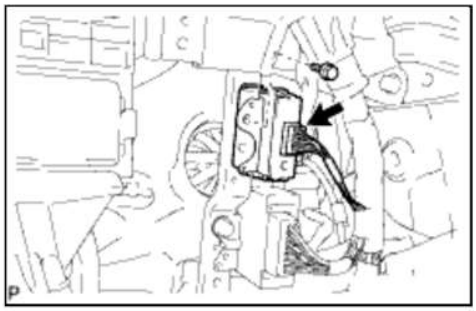
(b) Remove the bolt and glass breakage sensor ECU.

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000003CO5003X
Title: THEFT DETERRENT / KEYLESS ENTRY: GLASS BREAKAGE SENSOR ECU: INSTALLATION (2010 Corolla)		

INSTALLATION

1. INSTALL GLASS BREAKAGE SENSOR ECU



(a) Install the glass breakage sensor ECU with the bolt.

Torque: 8.0 N·m (82 kgf·cm, 71in·lbf)

(b) Connect the connector.

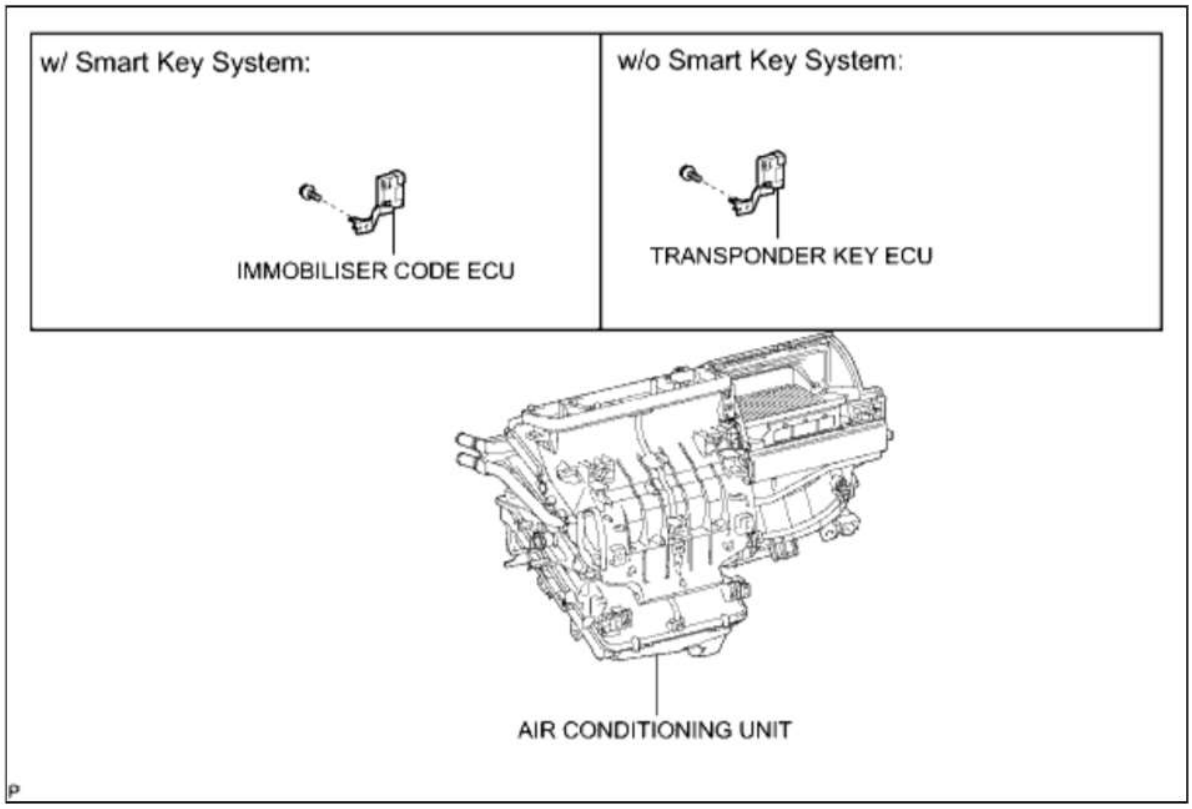
2. INSTALL GLOVE COMPARTMENT DOOR ASSEMBLY INFO

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Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000003G04001X
Title: THEFT DETERRENT / KEYLESS ENTRY: ID CODE BOX: COMPONENTS (2010 Corolla)		

COMPONENTS

ILLUSTRATION



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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000003G05001X
Title: THEFT DETERRENT / KEYLESS ENTRY: ID CODE BOX: REMOVAL (2010 Corolla)		

REMOVAL

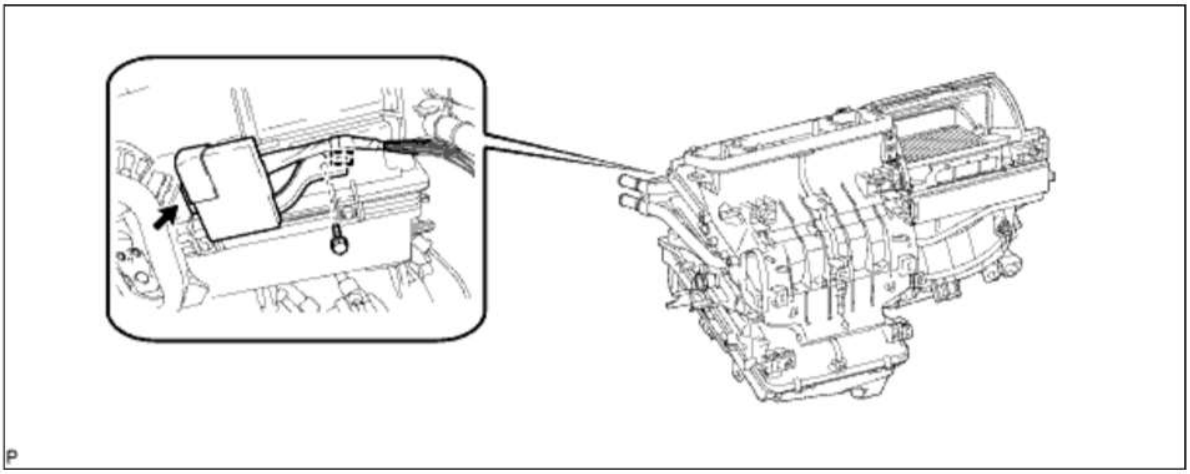
1. REMOVE AIR CONDITIONING UNIT

HINT:

Refer to the removal procedure for the air conditioning unit INFO .

2. REMOVE IMMOBILISER CODE ECU (w/ Smart Key System)

(a) Disconnect the connector.

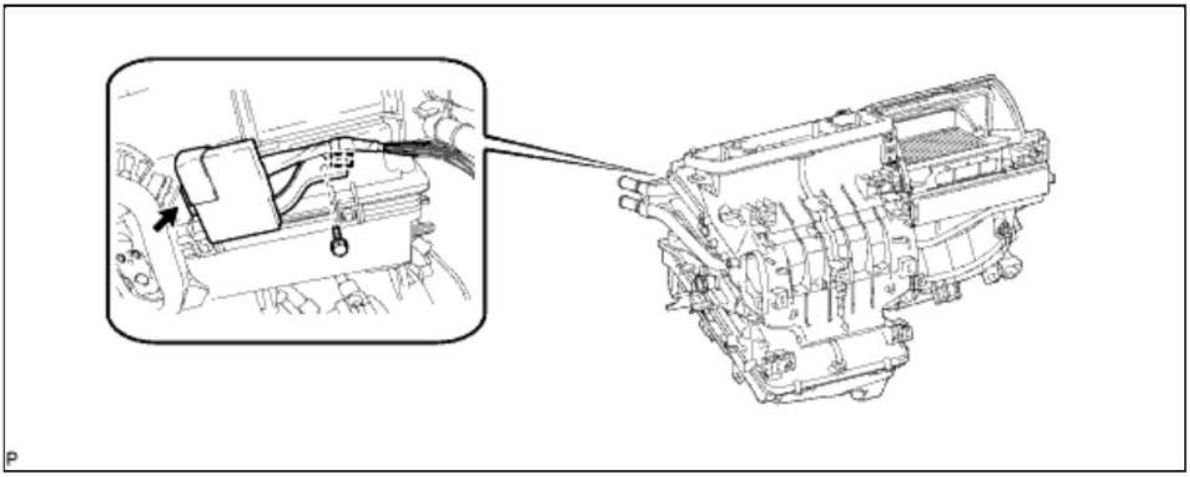


(b) Disengage the clamp.

(c) Remove the bolt and the immobiliser code ECU.

3. REMOVE TRANSPONDER KEY ECU (w/o Smart Key System)

(a) Disconnect the connector.



(b) Disengage the clamp.

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(c) Remove the bolt and the transponder key ECU.



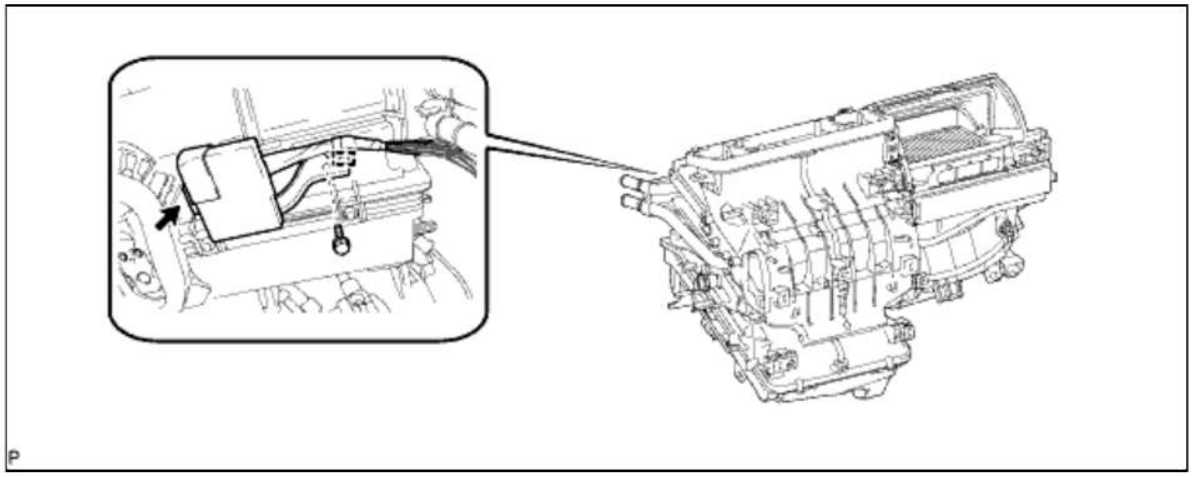
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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000003G03001X
Title: THEFT DETERRENT / KEYLESS ENTRY: ID CODE BOX: INSTALLATION (2010 Corolla)		

INSTALLATION

1. INSTALL IMMOBILISER CODE ECU (w/ Smart Key System)

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

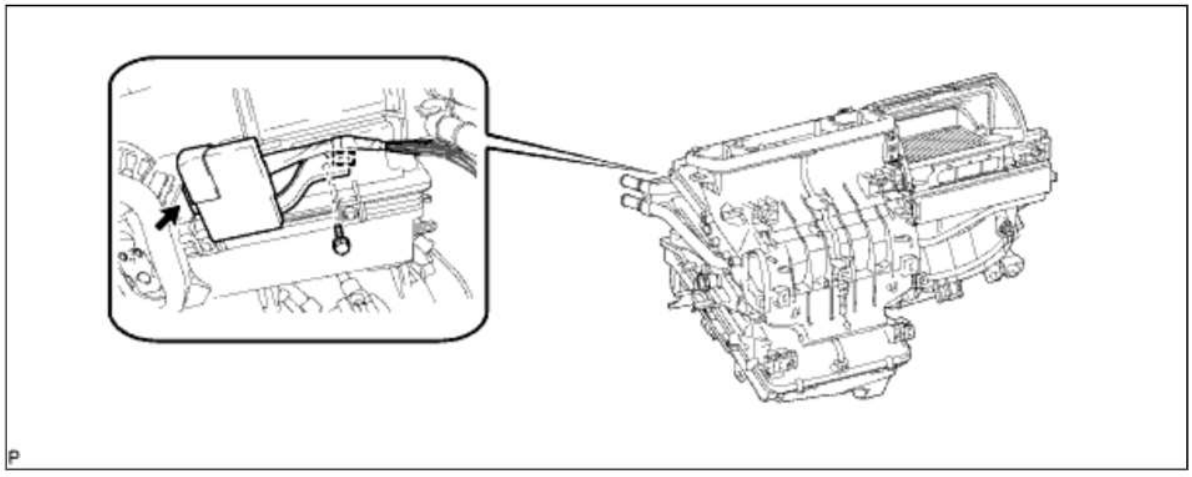


(b) Engage the clamp.

(c) Connect the connector.

2. INSTALL TRANSPONDER KEY ECU (w/o Smart Key System)

(a) Install the transponder key ECU with the bolt.



(b) Engage the clamp.

(c) Connect the connector.

3. INSTALL AIR CONDITIONING UNIT

HINT:

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Refer to the installation procedure for the air conditioning unit INFO .



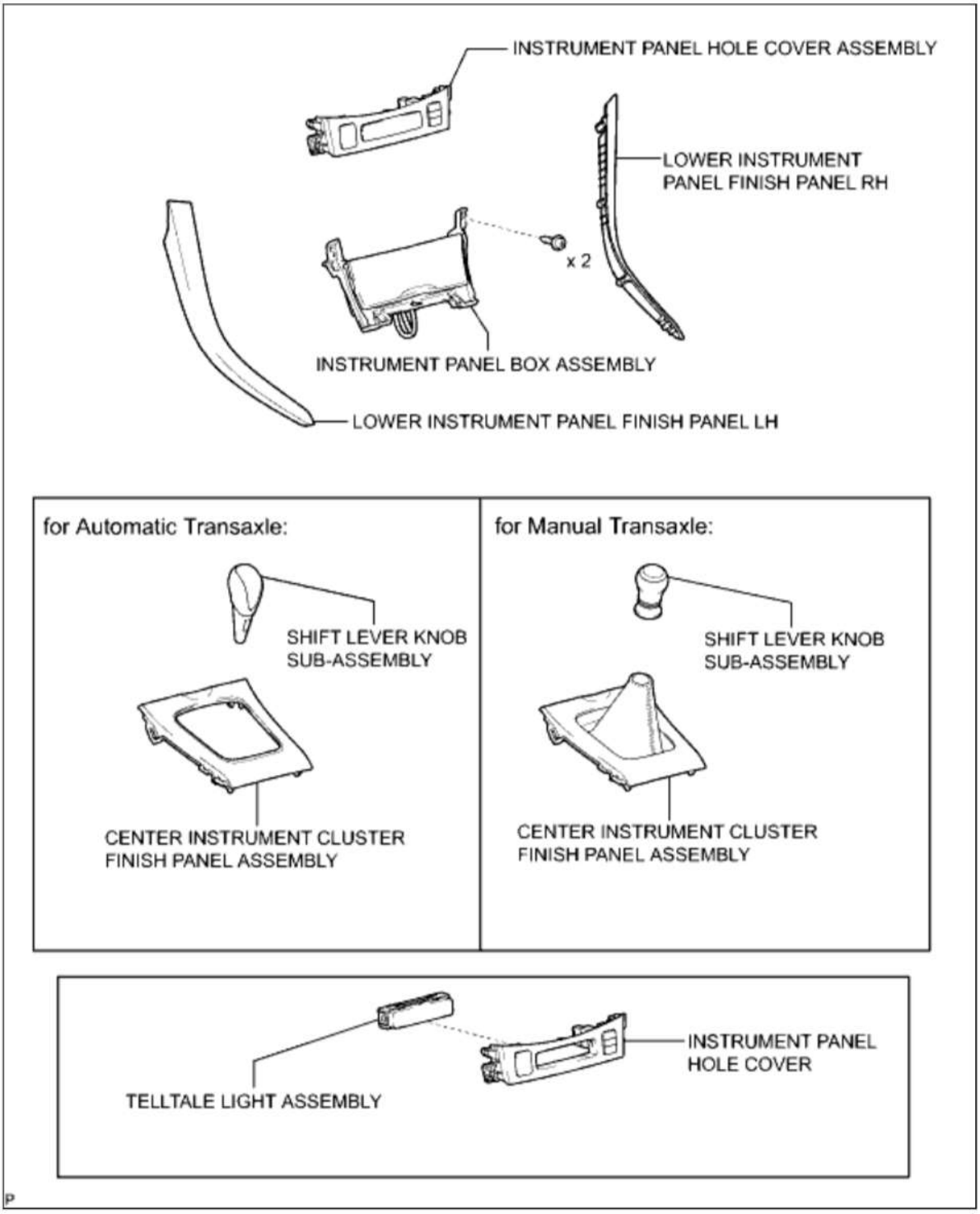
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Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000003FX6001X
Title: THEFT DETERRENT / KEYLESS ENTRY: SECURITY INDICATOR LIGHT ASSEMBLY: COMPONENTS (2010 Corolla)		

COMPONENTS

ILLUSTRATION

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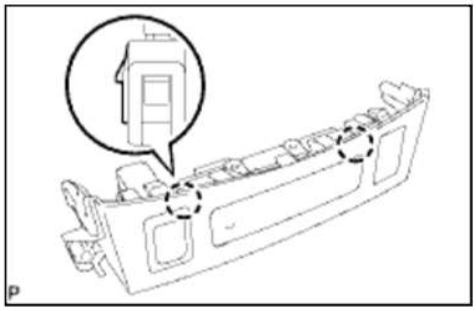


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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000003FX7001X
Title: THEFT DETERRENT / KEYLESS ENTRY: SECURITY INDICATOR LIGHT ASSEMBLY: REMOVAL (2010 Corolla)		

REMOVAL

1. **REMOVE LOWER INSTRUMENT PANEL FINISH PANEL LH** INFO
2. **REMOVE LOWER INSTRUMENT PANEL FINISH PANEL RH** INFO
3. **REMOVE SHIFT LEVER KNOB SUB-ASSEMBLY (for Manual Transaxle)** INFO
4. **REMOVE SHIFT LEVER KNOB SUB-ASSEMBLY (for Automatic Transaxle)** INFO
5. **REMOVE CENTER INSTRUMENT CLUSTER FINISH PANEL ASSEMBLY (for Manual Transaxle)** INFO
6. **REMOVE CENTER INSTRUMENT CLUSTER FINISH PANEL ASSEMBLY (for Automatic Transaxle)** INFO
7. **REMOVE INSTRUMENT PANEL BOX ASSEMBLY** INFO
8. **REMOVE INSTRUMENT PANEL HOLE COVER ASSEMBLY** INFO
9. **REMOVE TELLTALE LIGHT ASSEMBLY**



(a) Disengage the 2 claws and remove the telltale light assembly.

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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000XUC03BX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Entry Function): SYSTEM DESCRIPTION (2010 Corolla)		

SYSTEM DESCRIPTION

CAUTION:

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

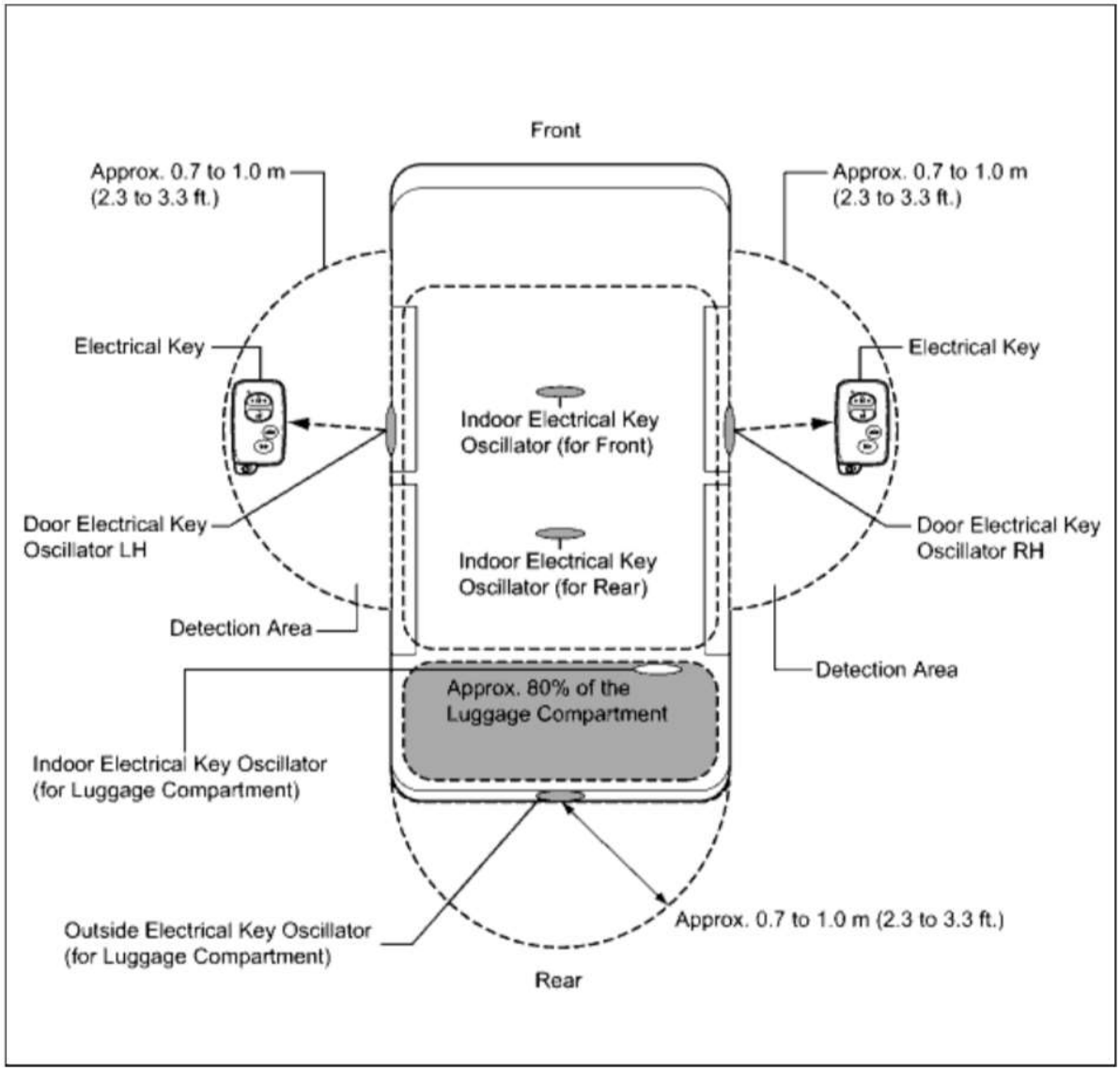
1. SMART KEY SYSTEM DESCRIPTION

(a) In addition to conventional mechanical key and wireless door lock control functions, the smart key system enables door locking/unlocking, steering lock releasing, engine starting, and luggage compartment door opening 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 a key 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 electrical key oscillators (2 door electrical key oscillators, 3 indoor electrical key oscillators, and 1 outside electrical key oscillator).

2. DETECTION AREA

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(a) Precautions for the entire system:

- Be sure to carry the key during inspection of the smart key system.
- As weak radio waves are used to detect the key, the key detection area may decrease, or the key may not be detected correctly in the following situations:
    a. The key battery is depleted.
    b. Any facilities that generate strong radio waves, such as a TV tower, power plant, broadcast station, or gas station, are located near the inspection site.
    c. A wireless device, such as a cellular phone, is carried with the key.
    d. The key is in contact with or covered with metal.
    e. Another wireless door lock control function is operated near the vehicle.
    f. The key is located near a device that generates high voltage or noise.
- The key may be difficult to operate for a reason relating to the vehicle body shape.
- The key may not be detected correctly if it is around the vehicle's windows, the door handle, or the center of the bumper even when it is in the detection area outside the vehicle.
- The key may not be detected correctly if it is on the instrument panel, rear package tray, floor, or in the glove box even when it is in the detection area inside the vehicle.
- The engine cannot be started even when the key is in the detection area inside the

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luggage compartment.

- The key may not operate if the key is not held properly.
- The smart key system does not operate in the following conditions:

  a. The smart key system is canceled.
  b. The key battery is completely depleted (the indicator does not blink when pushing any of the buttons on the key).

3. FUNCTION OF MAIN COMPONENTS

COMPONENT	FUNCTION
Key	Consists of mechanical key, transmitter for wireless door lock control, and transceiver for smart key system
Certification ECU (smart key ECU assembly)	Controls smart key system in accordance with signals from each electrical key oscillator, various switches, ECUs, and key • Judges and certifies ID code from door control receiver • Transmits engine immobiliser unset signal to ID code box (immobiliser code ECU) • Transmits steering unlock signals to steering lock ECU
Main Body ECU (instrument panel junction block)	Controls push button start function in accordance with signals from various switches, ECUs, and combination meter • Transmits key verification request signal to certification ECU (smart key ECU assembly) in accordance with engine switch signal, and turns relays ON and OFF • Receives request signal from certification ECU (smart key ECU assembly) and actuates door lock motor to unlock or lock door • Transmits each door condition signal to certification ECU (smart key ECU assembly)
ID Code Box (immobiliser code ECU)	Receives steering unlock or engine immobiliser unset signals from certification ECU (smart key ECU assembly), certifies them, and transmits unset signals to steering lock ECU or ECM
Outside Door Handle (driver door and passenger door) (antenna)	Transmits request signals
Outside Door Handle (driver door and passenger door) (touch sensor)	Detects that person touches inside of outside handle
Outside Door Handle (driver door and passenger door) (lock switch)	Transmits door lock request signals to certification ECU (smart key ECU assembly)
Door Electrical Key Oscillator (driver door and passenger door)	Receives request signal from certification ECU (smart key ECU assembly), and forms detection area around front door

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COMPONENT	FUNCTION
Indoor Electrical Key Oscillator (front and rear)	Receives request signal from certification ECU (smart key ECU assembly), and forms detection area in vehicle interior
Indoor Electrical Key Oscillator (luggage compartment)	Receives request signal from certification ECU (smart key ECU assembly), and forms detection area in luggage compartment
Outside Electrical Key Oscillator (luggage compartment)	Receives request signal from certification ECU (smart key ECU assembly), and forms detection area around luggage compartment door
Door Control Receiver	• Receives ID code from key in detection area and transmits it to certification ECU (smart key ECU assembly) • Receives ID code from key in luggage compartment and transmits it to certification ECU (smart key ECU assembly)
Electrical Key Antenna	Receives ID code from key and transmits it to door control receiver
Luggage Compartment Door Opener Outer Switch	Transmits luggage compartment door open request signal to certification ECU (smart key ECU assembly)
Stop Light Switch	Outputs state of brake pedal to main body ECU (instrument panel junction block)
• Wireless Door Lock Buzzer • Combination Meter ○ Multi-information Display ○ Buzzer	When certification ECU (smart key ECU assembly) detects human errors such as those below, it warns driver by sounding wireless door lock buzzer, displaying information and sounding a buzzer in combination meter in accordance with request signal from ECU Example: • Key is taken out of vehicle • Driver leaves vehicle while engine is still running

4. CONSTRUCTION AND OPERATION

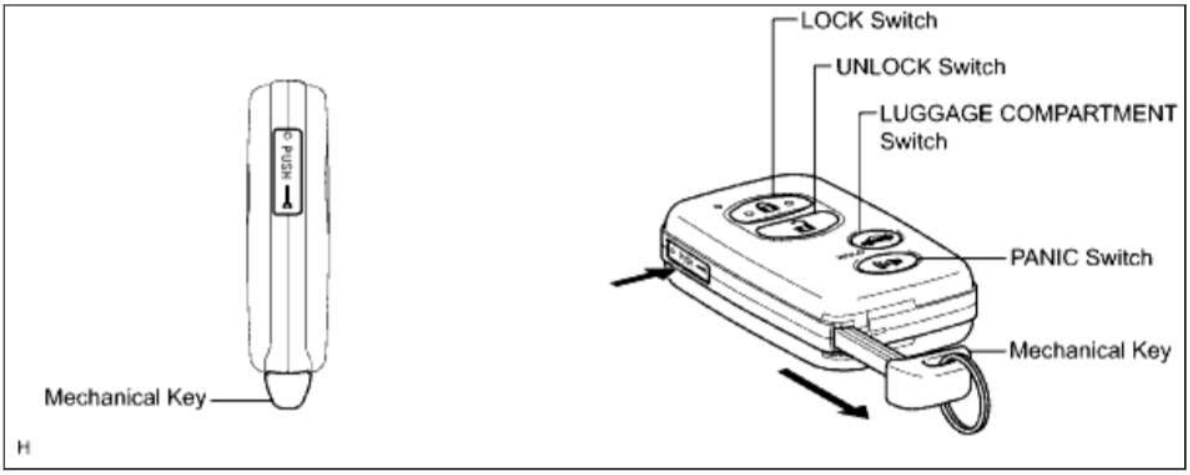
(a) Key

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

- The transceiver for the smart key system receives signals from the oscillators and sends the ID code to the tuner.
- The transmitter for the wireless door lock control has a LOCK switch, UNLOCK switch, LUGGAGE COMPARTMENT switch.
- This mechanical key works for the driver door, luggage compartment door, and glove box, but cannot start the engine.

A total of 4 keys can be registered.

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(b) Electrical key oscillator (door electrical key oscillators, indoor electrical key oscillators (front, rear and luggage compartment) and outside electrical key oscillator (luggage compartment))

Each electrical key 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 the door electrical key oscillator and outside electrical key oscillator (luggage compartment) is approximately 0.7 to 1.0 m (2.3 to 3.3 ft.) from the outside handle of the door or the center of the rear bumper.

- The detection area of the door electrical key oscillator is formed by transmitting a request signal every 0.25 seconds while the engine switch is off and each door is locked. In this way, the oscillator detects the proximity of a key. During entry lock, the detection area is formed with the lock switch on.
- The detection area of the outside electrical key oscillator (luggage compartment) is formed when the power luggage door open switch is on.
- The detection area of the indoor electrical key oscillator (front and rear) is formed when the driver door is opened or closed, during start ignition, when a warning is activated, or the lock switch is on.
- The detection area of the indoor electrical key oscillator (luggage compartment) is formed when the luggage compartment door is closed, or the luggage compartment opener outer switch is pressed.

5. ENTRY FUNCTION OPERATION

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

FUNCTION	OUTLINE
Mechanical Key	Operation is same as conventional mechanical key.
Wireless Door Lock Control	This function remotely locks and unlocks all doors or luggage compartment. Operation is same as wireless door lock control system. However, receiver in certification ECU (smart key ECU assembly) uses entry door control receiver to control locking and unlocking.
Entry Illumination	When person carrying key enters detection area, door will enter unlock standby mode and front map light will illuminate.
Entry Unlock	When key is located in detection area of door electrical key oscillator, door will unlock by touching inside of outside door handle.

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FUNCTION	OUTLINE
Entry Unlock Mode Switching INFO	Changes doors that can be unlocked with entry unlock function between 2 modes. • Driver door mode • All door mode
Entry Lock	When key is located in detection area of door electrical key oscillator and engine switch is off, door can be locked by pressing lock switch on outside door handle.
Entry Luggage Compartment Open	When key is in detection area of outside electrical key oscillator (luggage compartment), luggage compartment door opens by pressing luggage compartment opener outer switch.
Key Lock-in Prevention	• Prevents confinement of key if door is locked using outside door handle while key is still inside vehicle. • If all doors are locked and luggage compartment door is closed while key is still in luggage compartment, warning buzzer sounds. If luggage compartment open switch is operated, luggage compartment door can be opened.
Warning	When any of situations below occur, smart key system causes certification ECU (smart key ECU assembly) to sound buzzer in combination meter and wireless door lock buzzer in order to alert driver. • Occupant leaves with key. • Engine switch is operated while key is outside actuation area. • Entry lock is operated while key is inside vehicle. • Key battery is weak. • The key is left in the vehicle. • A door is ajar. • The key is left in the luggage compartment. • Steering lock does not release. • The steering lock mechanism is malfunctioning. • The main body ECU (instrument panel junction block) is malfunctioning.
Battery Saving	If key is constantly located within actuation area of door electrical key oscillator, system maintains periodic communication with key. Therefore, if vehicle remains parked in that state for a long time, key battery and vehicle battery could be drained.
Key Cancel INFO	Following key functions can be cancelled by performing certain operations: • Entry Unlock/Lock • Entry Luggage Compartment Open • Key Lock-in Prevention • Warning
Key Code Registration	The total number of keys that can be registered is four. Enables the registration (writing and storing) of transmitter recognition codes in the EEPROM that is contained in the certification ECU (smart key ECU assembly).

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6. WIRELESS DOOR LOCK AND UNLOCK AND LUGGAGE COMPARTMENT OPEN FUNCTION

Push the LOCK/UNLOCK/LUGGAGE COMPARTMENT switch on the key to operate each function. For details, 

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7. ENTRY UNLOCK FUNCTION

(a) The detection area is formed by communication between a door electrical key oscillator and door control receiver when the door is locked in order to detect access of the person carrying the key.

(b) When the person carrying the key enters the detection area around the vehicle, the matching of the ID codes for a door electrical key oscillator and key will automatically be performed. After the matching is completed, the door will enter unlock standby mode.

(c) In unlock standby mode, the antenna built into the outside handle starts sensing. If the outside handle is held (the back side of the handle is touched), the door unlock operation will be performed. At this time, the hazard warning light blinks twice and the wireless door lock buzzer sounds twice.

(d) If any of the doors are not opened after a door unlock operation, all doors will automatically lock after 60 seconds.

8. ENTRY LOCK FUNCTION

(a) After leaving the vehicle carrying the key, push the lock switch on the outside handle when all the doors are closed.

(b) The certification ECU (smart key ECU assembly) determines whether the key is located inside or outside the cabin based on the information from a door electrical key oscillator and indoor electrical key oscillator. Then matching of the ID codes is performed.

(c) When the matching result shows that the ID codes of the key and indoor antenna do not match and the ID codes of the key and door electrical key oscillator match, the door lock function will operate. At this time, the hazard warning lights blink once and the wireless door lock buzzer sounds once.

(d) If the key is located inside the cabin, the door lock function will not operate and the alarm buzzer (beep sound) will sound for 2 seconds.

9. ENTRY LUGGAGE COMPARTMENT OPEN FUNCTION

Stand in front of the luggage compartment with the key and push the power luggage compartment opener switch to start the matching of the ID codes for the outside electrical key oscillator (luggage compartment). If the ID codes match, luggage compartment door open operation will be performed.

10. KEY LOCK-IN PREVENTION FUNCTION

(a) If you attempt to lock the door through keyless operation (move the lock knob to the lock position and then close the door) with the key in the cabin, the system determines that the key is located in the cabin and unlocks the door.

(b) If the luggage compartment is closed with the key in it, the alarm will sound and the luggage compartment can be opened only when all the doors are locked in order to prevent key confinement in the vehicle.

11. WARNING FUNCTION

(a) General

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 and the wireless door

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lock buzzer in order to alert the driver.

WARNING FUNCTION OPERATION CONDITION	SITUATION
Exit warning if shift lever position is not P and power source mode is not off.	A
Exit warning if shift lever position is P and power source mode is not off.	B
An occupant leaves with the key.	C
The engine switch is operated while the key is outside the detection area.	D
Entry lock is operated while the key is inside the cabin or luggage compartment.	E
The key battery is weak.	F
The key reminder warning sounds.	G
A door is ajar.	H
The key is left in the luggage compartment.	I
Steering lock does not release.	J
The steering lock mechanism is malfunctioning.	K
The main body ECU (instrument panel junction block) is malfunctioning.	L

(b) Situation A

There are 2 patterns for situation A.

Pattern 1: In situation A, the door is opened and the user tries to leave the vehicle.

Pattern 2: Then the user holds the key and tries to move away from the vehicle.

In these situations, the following control is performed:

- Pattern 1

Possible Effects without Warning	Sudden vehicle start, vehicle theft, vehicle roll-away
Warning Condition	The certification ECU (smart key ECU assembly) gives warning when all following conditions are satisfied: ○ The shift lever position is not P. ○ The engine switch is not off. ○ The driver side door is opened. ○ Vehicle speed is less than 5 km/h (3.1 mph).
Combination Meter ○ Buzzer	Warning: Continuous sound
Combination Meter ○ Smart Key Indicator Light	-

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Wireless Door Lock Buzzer	-
Warning Stop Condition	The warning is stopped when one of the following conditions is met: o The engine switch is off. o The shift lever position is P. o The driver side door is closed. o Vehicle speed is above 5 km/h (3.1 mph).

- Pattern 2

Possible Effects without Warning	Sudden vehicle start, vehicle theft, vehicle roll-away
Warning Condition	The certification ECU (smart key ECU assembly) gives warning when all following conditions are satisfied: o The shift lever position is not P. o The engine switch is not off. o The driver side door is opened and closed. o Vehicle speed is 0 km/h (0 mph). o The key is not in the cabin or luggage compartment.
Combination Meter o Buzzer	Warning: Continuous sound The warning is stopped when one of the following conditions is met: o The engine switch is off. o The shift lever position is P. o The key is in the cabin or luggage compartment. o Vehicle speed is above 0 km/h (0 mph).
Combination Meter o Smart Key Indicator Light	Flashes
Wireless Door Lock Buzzer	Warning: Continuous sound The warning is stopped when one of the following conditions is met: o The engine switch is off. o The shift lever position is P. o The key is in the cabin or luggage compartment. o Vehicle speed is above 0 km/h (0 mph).

(c) Situation B

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There are 2 patterns for situation B.

Pattern 1: In situation B, the door is opened and the user tries to leave the vehicle.

Then the user holds the key and tries to move away from the vehicle.

Pattern 2: Then the user tries to use the entry lock and presses the lock switch.

In these situations, the following control is performed:

- Pattern 1

Possible Effects without Warning	Vehicle theft, engine cannot be restarted
Warning Condition	The certification ECU (smart key ECU assembly) gives warning when all following conditions are satisfied: ○ The shift lever position is P. ○ The engine switch is not off. ○ The driver side door is opened and closed. ○ The key is not in the cabin or luggage compartment.
Combination Meter ○ Buzzer	Warning: Sounds once
Combination Meter ○ Smart Key Indicator Light	Flashes
Wireless Door Lock Buzzer	Warning: Sounds 3 times The warning is stopped when either of the following conditions is met: ○ The engine switch is off. ○ The key is in the cabin or luggage compartment.

- Pattern 2

Possible Effects without Warning	Vehicle theft
Warning Condition	The certification ECU (smart key ECU assembly) gives warning when all following conditions are satisfied: ○ The shift lever position is P. ○ The engine switch is not off. ○ All doors are closed. ○ The lock switch is "ON". ○ The key is not in the cabin or luggage compartment. ○ The key is outside vehicle (within one of the

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	actuation areas).
Combination Meter ○ Buzzer	-
Combination Meter ○ Smart Key Indicator Light	-
Wireless Door Lock Buzzer	Warning: Sounds for 2 seconds

(d) Situation C

In this situation, the following control is performed:

Possible Effects without Warning	Engine cannot be restarted
Warning Condition	The certification ECU (smart key ECU assembly) gives warning when all following conditions are satisfied: • The engine switch is not off. • Any door other than driver side door is opened and closed. • The key is not in the cabin or luggage compartment.
Combination Meter • Buzzer	Warning: Sounds once
Combination Meter • Smart Key Indicator Light	Flashes
Wireless Door Lock Buzzer	Warning: Sounds 3 times The warning is stopped when one of the following conditions is met: • The engine switch is off. • Vehicle speed is above 0 km/h (0 mph). • The key is in the cabin or luggage compartment.

(e) Situation D

In this situation, the following control is performed:

Possible Effects without Warning	Confuses the user

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Warning Condition	The certification ECU (smart key ECU assembly) gives warning when both of the following conditions are satisfied: • The engine switch is off → on (IG). • The key is not in the cabin.
Combination Meter • Buzzer	Warning: Sounds once
Combination Meter • Smart Key Indicator Light	Flashes Information is displayed on the combination meter for 8seconds (disappears after 8 seconds).
Wireless Door Lock Buzzer	-

(f) Situation E

In this situation, the following control is performed:

Possible Effects without Warning	Vehicle theft
Warning Condition	The certification ECU (smart key ECU assembly) gives warning when all following conditions are satisfied: • The engine switch is off. • All doors are closed. • The lock switch is "ON". • The key is in the cabin or luggage compartment.
Combination Meter • Buzzer	-
Combination Meter • Smart Key Indicator Light	-
Wireless Door Lock Buzzer	Warning: Sounds for 2 seconds

(g) Situation F

In this situation, the following control is performed:

Possible Effects without Warning	Smart key system does not function
Warning Condition	The certification ECU (smart key ECU assembly) gives warning when all following conditions are satisfied:

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	• The engine switch is turned off after being left on (IG) for over 20 minutes. • The key battery voltage is low. • The key is in the cabin.
Combination Meter • Buzzer	Warning: Sounds once
Combination Meter • Smart Key Indicator Light	-
Wireless Door Lock Buzzer	-

(h) Situation G

There are 2 patterns for situation G.

- Pattern 1: When the driver's door is open, the driver turns the engine switch on (ACC) and attempts to leave the vehicle.
- Pattern 2: When the driver's door is open, the driver turns the engine switch from on (IG) to off and attempts to leave the vehicle.

In these situations, the following control is performed:

Pattern 1 and Pattern 2

Possible Effects without Warning	Vehicle theft
Warning Condition	The warning is activated when either of the following conditions is met: • The engine switch is on (ACC) and the driver door is opened. • The engine switch is off, the steering is unlocked, and the driver door is opened.
Combination Meter • Buzzer	Continues to sound at short and even intervals
Combination Meter • Smart Key Indicator Light	-
Wireless Door Lock Buzzer	-
Engine Switch Indicator Light	-

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Warning Stop Condition	The warning is stopped when one of the following conditions is met: • The engine switch is on (IG). • The driver side door is closed. • The engine switch is off and the steering is locked.

(i) Situation H

The lock switch on the door outside handle is pressed to perform entry lock with a door open. In this situation, the following control is performed:

Possible Effects without Warning	Vehicle theft
Warning Condition	The warning is activated when all of the following conditions are met: • The engine switch is off. • Any doors are opened. • The entry lock button on the outer door handle is operated.
Combination Meter • Buzzer	-
Combination Meter • Smart Key Indicator Light	-
Wireless Door Lock Buzzer	Warning: Continuous sound
Engine Switch Indicator Light	-
Warning Stop Condition	The warning is stopped when one of the following conditions is met: • The engine switch is off. • All doors are closed. • Wireless door lock remote function is unlocked. • Entry unlock is operated. • 10 seconds have elapsed since the wireless door lock buzzer was activated.

(j) Situation I

The luggage compartment door is closed with the key left in the luggage compartment. In this situation, the following control is performed:

Possible Effects without Warning	Vehicle theft

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Warning Condition	The warning is activated when all of the following conditions are met: • Vehicle speed is 0 km/h (0 mph). • All doors are closed and all doors are locked or the state where the door after unlock operation is waiting to open. • Entry luggage compartment open function is available.
Combination Meter • Buzzer	-
Combination Meter • Smart Key Indicator Light	-
Wireless Door Lock Buzzer	Sounds for 2 seconds
Warning Stop Condition	-

(k) Situation J

The steering lock cannot be released. In this situation, the following control is performed:

Possible Effects without Warning	Vehicle theft
Warning Condition	The steering lock cannot be released, thus the engine is prevented from starting.
Combination Meter • Buzzer	-
Combination Meter • Smart Key Indicator Light	Flashes
Wireless Door Lock Buzzer	-
Engine Switch Indicator Light	The green indicator blinks at 1-second intervals (goes off automatically in 30 seconds).
Warning Stop Condition	The engine switch is pressed while the steering wheel is turned left and right, and the steering lock is successfully released.

(l) Situation K

A malfunction of the steering lock ECU is detected. In this situation, the following control is performed:

Possible Effects without Warning	Vehicle theft

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Warning Condition	A malfunction of the steering lock ECU is detected.
Combination Meter • Buzzer	-
Combination Meter • Smart Key Indicator Light	Flashes
Wireless Door Lock Buzzer	-
Engine Switch Indicator Light	The amber indicator blinks at 2-second intervals (goes off automatically in 15 seconds).
Warning Stop Condition	The steering lock ECU returns to normal.

(m) Situation L

A malfunction of the main body ECU (instrument panel junction block) is detected. In this situation, the following control is performed:

Possible Effects without Warning	Vehicle theft
Warning Condition	A malfunction in the main body ECU (instrument panel junction block) is detected.
Combination Meter • Buzzer	-
Combination Meter • Smart Key Indicator Light	-
Wireless Door Lock Buzzer	-
Engine Switch Indicator Light	The amber indicator blinks at 2-second intervals (goes off automatically in 15 seconds).
Warning Stop Condition	The main body ECU (instrument panel junction block) returns to normal.

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 carried out:

CONDITION	CONTROL

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

Reinstatement Conditions

- A wireless door lock control signal (lock, unlock) is input and the ID code matches.
- A user carries the key and pushes a lock switch on an outside door handle.
- A 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 located within the vehicle 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 the 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

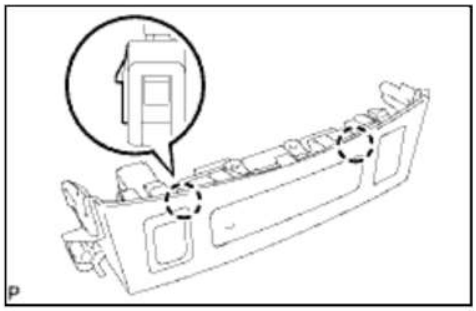
- A wireless door lock control signal (lock, unlock) is input and the ID code matches.
- A user carries the key and pushes a lock switch on an outside door handle.
- A door is locked or unlocked by the mechanical key.

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000003FX5001X
Title: THEFT DETERRENT / KEYLESS ENTRY: SECURITY INDICATOR LIGHT ASSEMBLY: INSTALLATION (2010 Corolla)		

INSTALLATION

1. INSTALL TELLTALE LIGHT ASSEMBLY



(a) Engage the 2 claws and install the telltale light assembly.

2. INSTALL INSTRUMENT PANEL HOLE COVER ASSEMBLY INFO

3. INSTALL INSTRUMENT PANEL BOX ASSEMBLY INFO

4. INSTALL CENTER INSTRUMENT CLUSTER FINISH PANEL ASSEMBLY (for Manual Transaxle) INFO

5. INSTALL CENTER INSTRUMENT CLUSTER FINISH PANEL ASSEMBLY (for Automatic Transaxle) INFO

6. INSTALL SHIFT LEVER KNOB SUB-ASSEMBLY (for Manual Transaxle) INFO

7. INSTALL SHIFT LEVER KNOB SUB-ASSEMBLY (for Automatic Transaxle) INFO

8. INSTALL LOWER INSTRUMENT PANEL FINISH PANEL LH INFO

9. INSTALL LOWER INSTRUMENT PANEL FINISH PANEL RH INFO

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Last Modified: 3-10-2010	6.4 L	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000XU6036X
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Entry Function): PRECAUTION (2010 Corolla)		

PRECAUTION

1. PRECAUTIONS WHEN USING TECHSTREAM

(a) When troubleshooting the smart key system using the Techstream with the engine switch off, connect the Techstream to the vehicle and repeat turning any of the courtesy light switches on and off until communication between the Techstream and the vehicle begins (the interval between ON and OFF should be less than 1.5 seconds).

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

2. 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 or strike the key.

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

(3) Do not use an ultrasonic washing machine to clean the key.

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

(5) Do not attach any stickers to the key.

(6) If a key is lost, delete all registered key ID codes and then reregister the remaining keys.

(b) Precautions for the entry unlock function:

(1) As the sensor is built into the backside of the outside door handle, the user must touch the backside of the handle when performing the unlock function.

(2) If the backside of the handle is touched with gloved hands, the response of the door may be delayed.

(3) During the entry unlock operation, if the door handle is pulled before the door unlocks, the unlock function cannot be completed. Confirm that the door has been unlocked before pulling the door handle to open the door.

(4) Make sure that the doors are unlocked when touching the touch sensor on the outside door handle while the key is being carried.

If the doors cannot be unlocked, the certification ECU (smart key ECU assembly) orders the main body ECU (instrument panel junction block) to perform the door unlock operation 4 times at intervals of 0.75 seconds.

At this time, the door may not be unlocked because the handle is being pulled due to some mechanical reasons.

Be sure to return the door handle to its original position.

If the door cannot be opened by pulling the handle, perform the entry unlock operation again.

(5) If the key is too close to the electrical key oscillator on the outside of the vehicle, the door may not be unlocked because the key cannot react to the strong wave output from the transmitter.

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(6) If the key is within the vehicle exterior detection area, the door can be unlocked even when a person other than the person carrying the key holds the door handle.

However, the doors other than the door that the codes match will not be unlocked.

(If the key is within the driver side door's detection area outside the vehicle, the doors will be unlocked when the person carrying the key holds the driver side door handle. However, if any door handle other than that of the driver side door is held, the doors will not be unlocked).

(7) If a door is not opened after the door unlock operation, the doors automatically lock after approximately 60 seconds.

(8) If a large amount of water is applied to the door handle due to a car wash or heavy rain, the key being within the vehicle exterior detection area may cause the doors to be unlocked.

However, the doors will be locked again after approximately 60 seconds if a door is not opened.

(9) If the key of the smart key system is used while it is being carried with the key of another smart key system, the time before the entry unlock operation will become longer than usual. This is not a malfunction.

(c) Precautions for the entry lock function:

(1) When performing the entry lock operation, firmly press the lock switch on the outside door handle.

If the lock switch is pressed too quickly or lightly, the entry lock may not operate.

(2) Signals output from the indoor electrical key antenna may leak through the window. Also, if the key is too close to a door electrical key oscillator, the electrical key oscillator output signals are too strong and the key cannot respond. As a result, when the key is near the vehicle (window, door handle), the entry lock function may not operate. Also, the key reminder warning buzzer may sound and the entry unlock operation may stop functioning. In this situation, move the key away from the vehicle (window, door handle), perform the entry lock operation and perform the entry unlock operation.

(3) Do not touch the lock switch while opening or closing a door.

If the lock switch is pressed when opening or closing a door while the key is being carried, the door ajar warning buzzer sounds (beeps outside the vehicle for 10 seconds).

(4) If the key is on the instrument panel, rear package tray, floor, or in the glove box, the key reminder function may not operate and the key may be locked in the vehicle. Always carry the key.

(5) If the key is outside the vehicle but is very close to a window or door handle (the ECU determines that the key is inside the vehicle) and the transmitter or mechanical key is used to lock the doors (entry lock is not used), entry unlock will not operate. To unlock the doors, perform a wireless door unlock operation. The entry lock function operates in this way to prevent the user from unintentionally unlocking the doors from outside the vehicle. For example, when a user operates the wireless door lock operation from inside the vehicle, radio waves from a door electrical key oscillator may leak into the vehicle interior and the doors may unlock.

(6) To allow the user enough time to check if the doors are locked after performing a door lock operation (entry lock function or wireless door lock operation), the entry unlock function will not be permitted for 3 seconds after the door lock operation.

(d) Precautions for luggage compartment door entry function:

Even if the key is within the outside electrical key oscillator (luggage compartment) detection area, the luggage compartment door cannot be opened if the key is in the following areas:

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- Near the center of the bumper
- Too close to the ground or in a high place

(e) Precautions for the function to prevent key confinement in the luggage compartment:

(1) Do not place the key in the luggage compartment.

If the luggage compartment door is closed with the key in it when all the doors are locked, the alarm to indicate key confinement will operate (beeping sound for 2 seconds outside of the vehicle). However, the alarm may not operate for some reason relating to the key location (near the spare tire or the side of the luggage compartment), the key condition (covered with metal or near metal), or ambient radio waves.

(2) If the luggage compartment door is closed with the key in it when any of the doors is unlocked or open, the key confinement prevention function will not operate. In this case, use the luggage compartment opener in the cabin to open the luggage compartment door and take out the key.

(3) The alarm may erroneously operate in the following conditions. If you can confirm that you are carrying the key or that the key is in the cabin, there is no problem. The entry luggage compartment open function may not operate if the alarm erroneously operates. In this case, use the luggage compartment opener in the cabin or perform a wireless operation to open the luggage compartment door.

- The key is brought into the cabin after the luggage compartment door is opened, and then the luggage compartment door is closed.

- The luggage compartment door is closed by the person who is carrying the key.

(4) If the alarm operates when the luggage compartment door is closed with all the doors locked, the key is in the cabin or luggage compartment. Check the cabin and luggage compartment to find the key.

(5) If the luggage compartment door is closed with the key in it when all the doors are locked, the alarm will sound and the luggage compartment door can be opened. This may increase the risk of the vehicle being stolen.

(6) Do not open or close the luggage compartment door after all the doors are locked if you want to keep the spare keys in the cabin. As a result, the alarm may sound and the luggage compartment door can be opened. This may increase the risk of the vehicle being stolen.

(f) Precautions for the battery built into the key and the vehicle battery:

(1) The key is constantly checking for signals from the vehicle, which requires power from the key's built-in battery. The life of the battery is approximately 1 to 2 years depending on the usage conditions. Be sure to replace the battery when its power is low. When replacing the battery, do not touch the inner circuit board or other inner parts.

(2) The key is constantly checking for signals from the vehicle using battery power to determine whether the key is being used or not. Even if the user is carrying 2 keys and only 1 key is used, both keys will consume battery power.

(3) The key receives radio waves at approximately 314 MHz. If the key continuously receives strong, identical frequency waves, the key's battery may be drained. Store the key at least 1 m (3.3 ft.) away from TVs, personal computers, or other electrical products.

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

(5) When a door is being locked with the key in the detection area of a door electrical key oscillator, the battery is used for regular communication between the key and vehicle. If the

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vehicle is not used, keep the key away from the vehicle (more than 2 m (6.6 ft.)).

(6) After disconnecting and reconnecting the battery cable, the entry unlock function may not operate. If this occurs, perform a wireless door unlock and lock operation.

(g) Precautions for the entry unlock mode switching function:

(1) Use the entry unlock mode switching function within a 1 m (3.3 ft.) area around the vehicle.

(2) The entry unlock mode switching function cannot be used within 5 seconds of the previous mode change. Wait 5 seconds or more before performing a mode change.



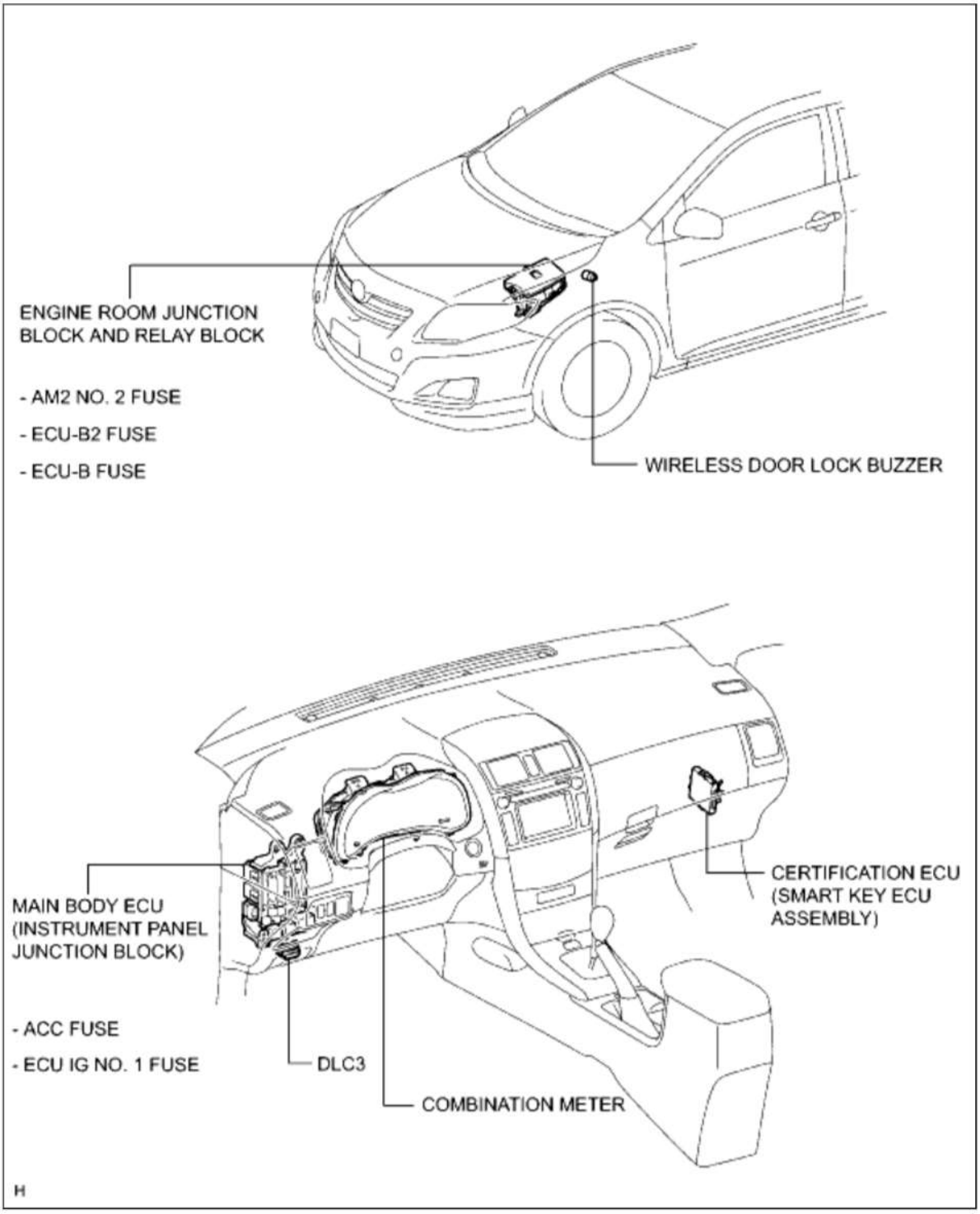
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Last Modified: 3-10-2010	6.4 R	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000XU902QX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Entry Function): PARTS LOCATION (2010 Corolla)		

PARTS LOCATION

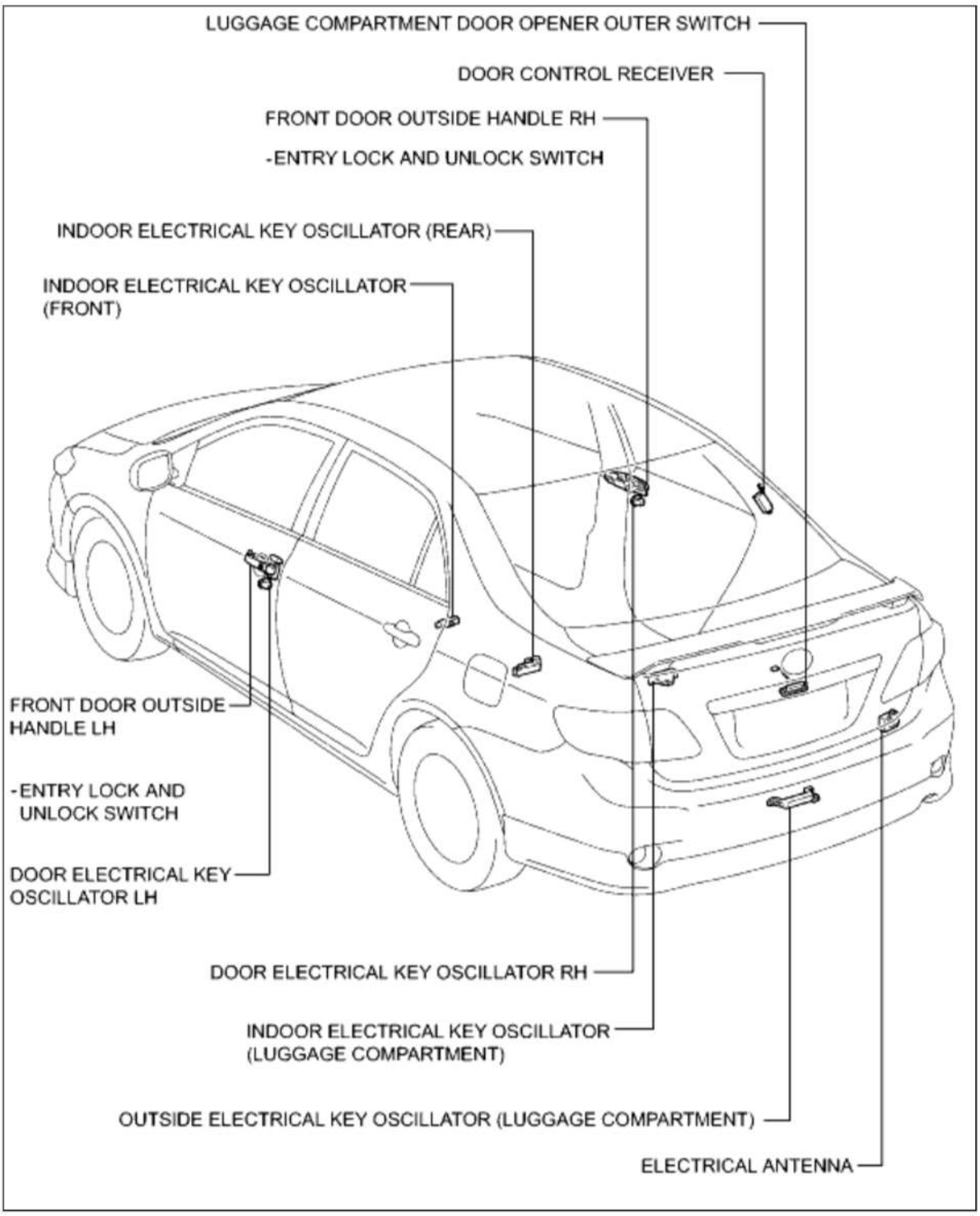
ILLUSTRATION

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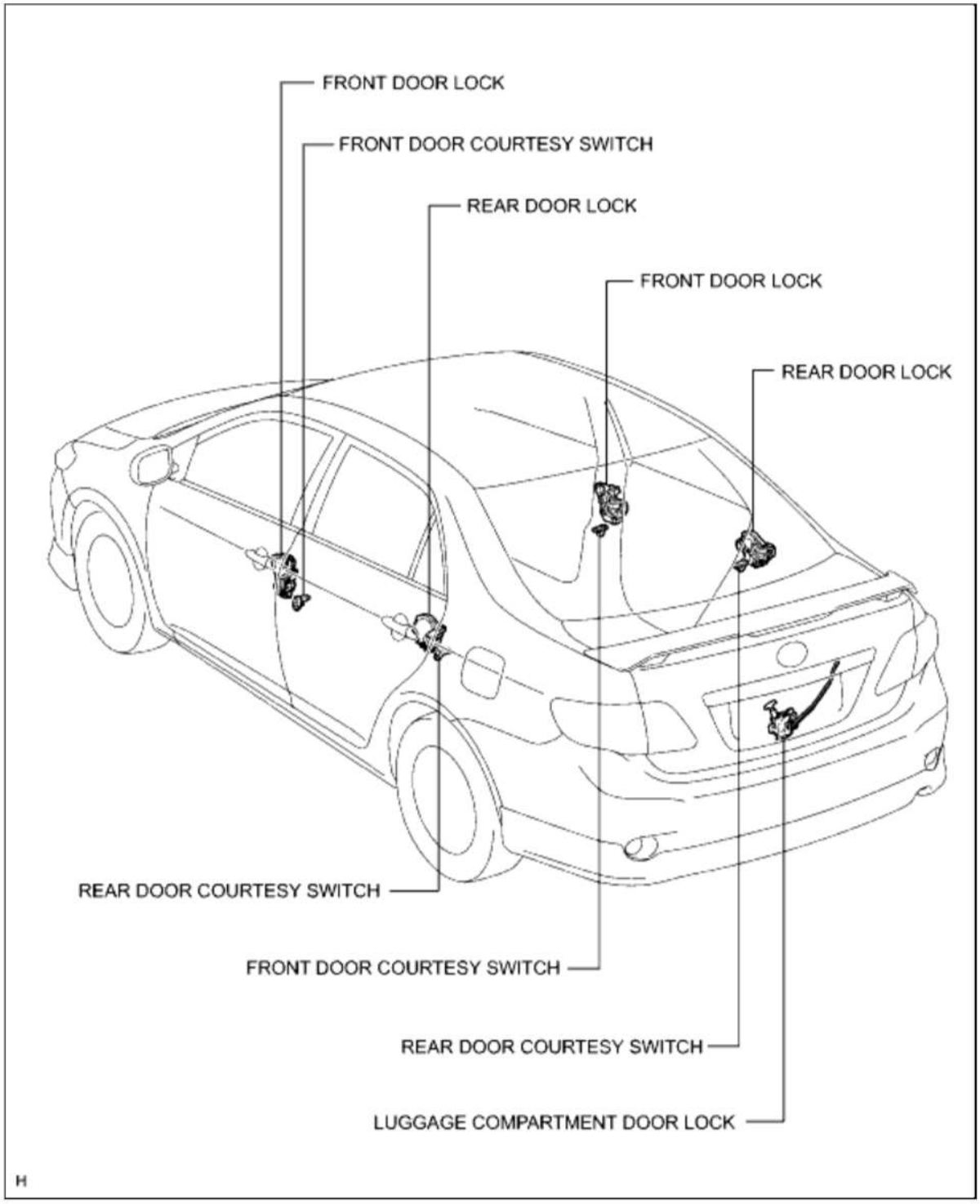
ILLUSTRATION

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ILLUSTRATION

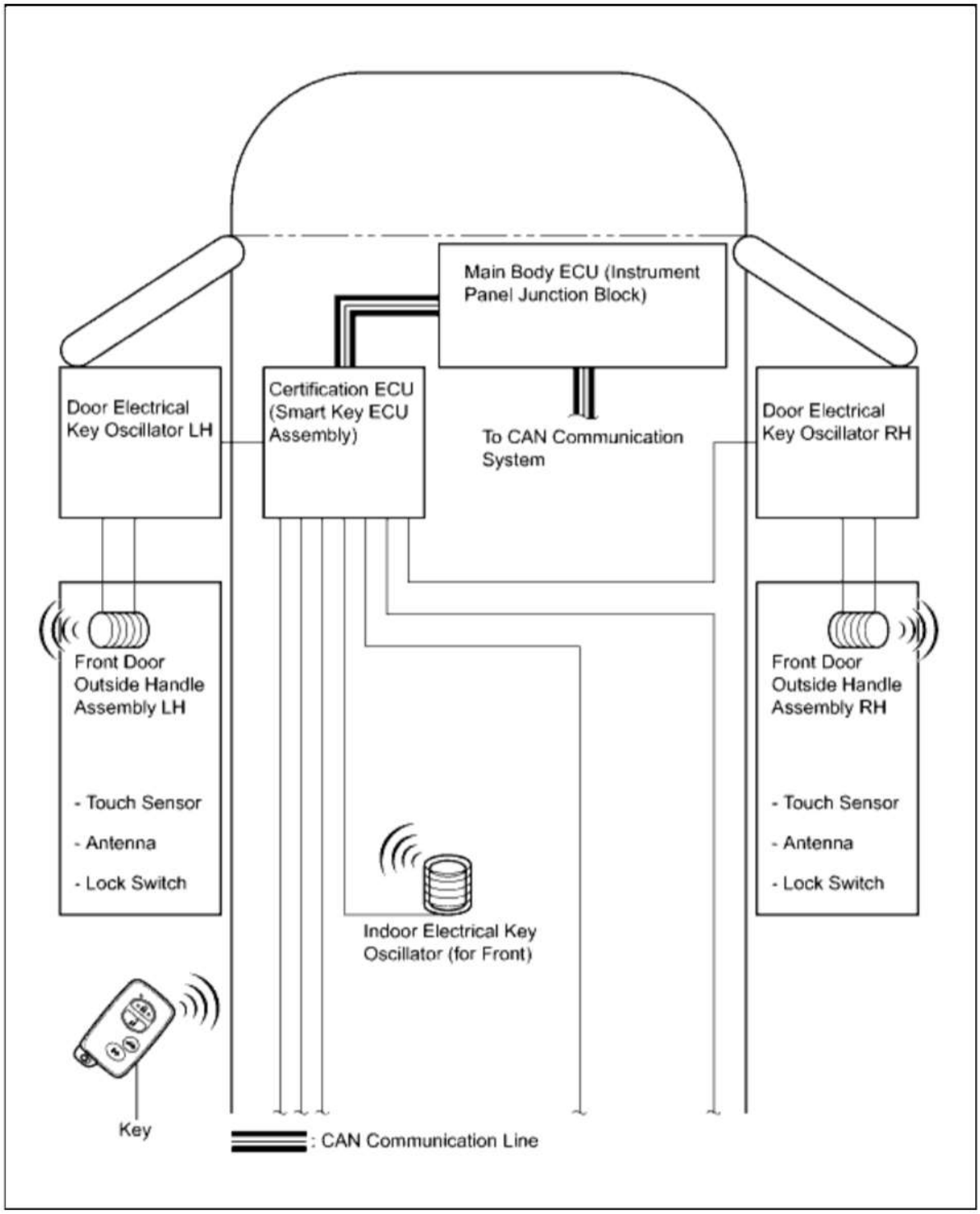
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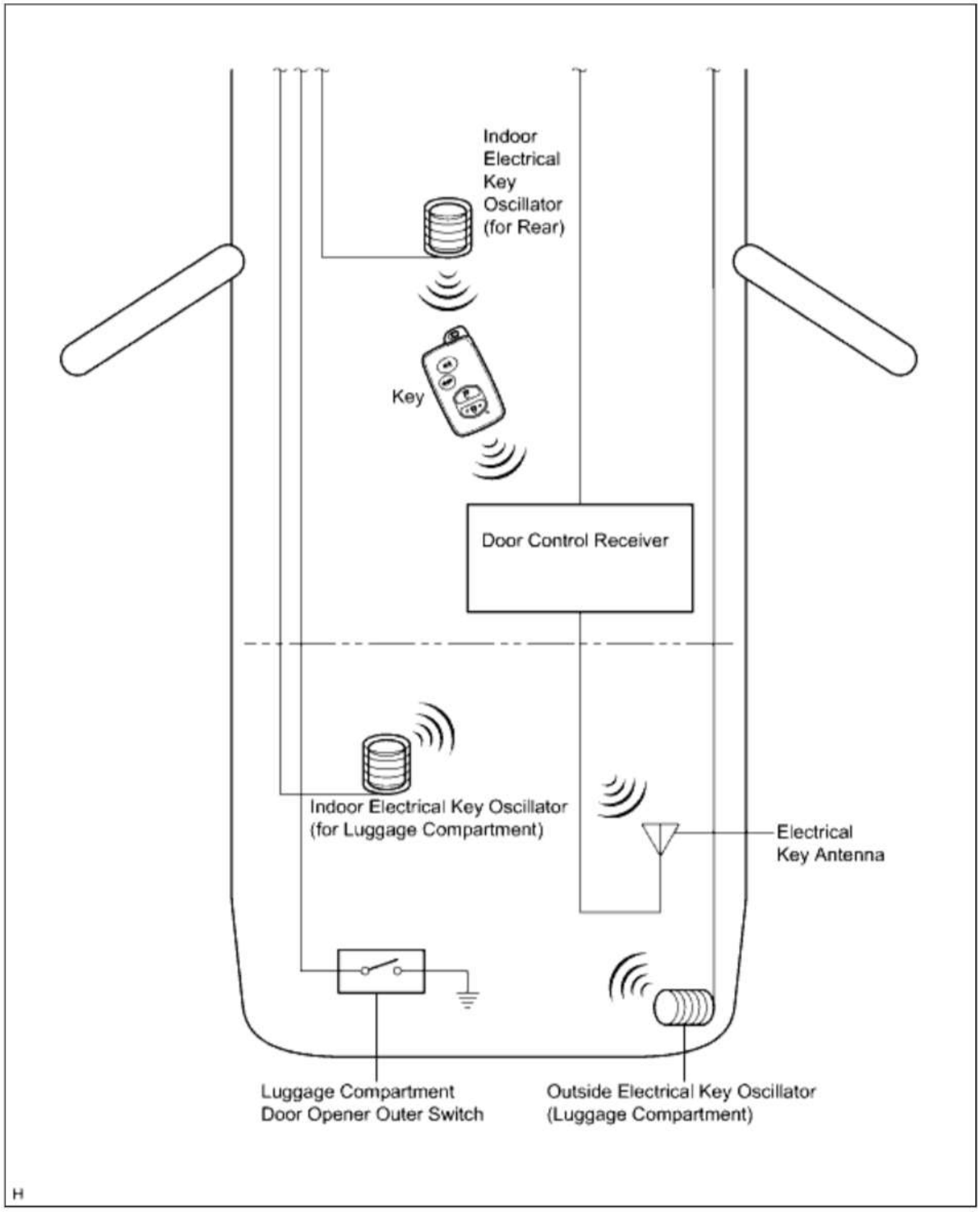
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Last Modified: 3-10-2010	6.4 U	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000XUE02YX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Entry Function): SYSTEM DIAGRAM (2010 Corolla)		

SYSTEM DIAGRAM



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TRANSMITTING ECU (TRANSMITTER)	RECEIVING ECU	SIGNAL	COMMUNICATION METHOD
Main body ECU (Instrument panel junction block)	Certification ECU (smart key ECU assembly)	Door lock output signal	CAN
		Luggage compartment door output request signal	

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TRANSMITTING ECU (TRANSMITTER)	RECEIVING ECU	SIGNAL	COMMUNICATION METHOD
		Wireless door lock buzzer request signal	
		Door lock position switch signal	
		Driver door key operated switch signal	
		Luggage compartment door key operated switch signal	
Certification ECU (smart key ECU assembly)	Main body ECU (Instrument panel junction block)	Illumination light request signal	CAN
		Light answer back signal	
		Door lock/unlock request signal	
Certification ECU (smart key ECU assembly)	Combination meter	Meter buzzer single-tone request signal	CAN
		Meter buzzer intermittence request signal	
		Meter buzzer continuation request signal	
Combination meter	• Certification ECU (smart key ECU assembly) • Main body ECU (Instrument panel junction block)	Vehicle speed signal	CAN

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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000XU703QX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Entry Function): HOW TO PROCEED WITH TROUBLESHOOTING (2010 Corolla)		

HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

- Use the following procedures to troubleshoot the smart key system.
- *: Use the Techstream.
- When troubleshooting the smart key system using the Techstream with the engine switch off, connect the Techstream to the vehicle and repeat turning any of the courtesy light switches on and off until communication between the Techstream and the vehicle begins (the interval between ON and OFF should be less than 1.5 seconds).

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 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

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NEXT

3.	**INSPECT BATTERY VOLTAGE**

(a) Measure the battery voltage.

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 (CAN)***

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

Result:

RESULT	PROCEED TO
CAN DTC is output.	A
CAN DTC is not output.	B

A **INFO** **Go to DIAGNOSTIC TROUBLE CODE CHART**

B

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

(a) Use the Techstream to check if the Multiplex Communication System (MPX) is functioning normally.

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Result:

RESULT	PROCEED TO
LIN DTC is output.	A
LIN DTC is not output.	B

A ▶ INFO **Go to DIAGNOSTIC TROUBLE CODE CHART**

B
▼

6.	**CHECK DTC OUTPUT***

(a) Check for DTCs. Based on the DTCs output, try to cause the same steering lock system DTC, 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
Steering lock system 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
DTC is not output.	E

A ▶ INFO **Go to DIAGNOSTIC TROUBLE CODE CHART**

B ▶ INFO **Go to DIAGNOSTIC TROUBLE CODE CHART**

C ▶ INFO **Go to DIAGNOSTIC TROUBLE CODE CHART**

D ▶ INFO **Go to DIAGNOSTIC TROUBLE CODE CHART**

E

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7.	PROBLEM SYMPTOMS TABLE

(a) Refer to Problem Symptoms Table INFO .

Result:

RESULT	PROCEED TO
Fault is listed in problem symptoms table.	A
Fault is not listed in problem symptoms table.	B

A ▶ **Go to step 9**

B

8.	OVERALL ANALYSIS AND TROUBLESHOOTING*

(a) Operation Check INFO

(b) Data List / Active Teat INFO

(c) Terminals of ECU INFO

NEXT

9.	REPAIR OR REPLACE

NEXT

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10.	CONFIRMATION TEST

NEXT END

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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000002U9W00XX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Entry Function): OPERATION CHECK (2010 Corolla)		

OPERATION CHECK

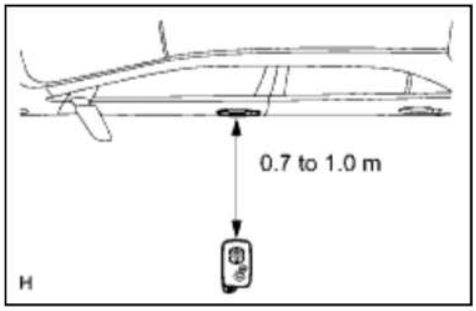
1. SMART KEY SYSTEM OPERATION INSPECTION

(a) Check the entry unlock function.

(1) Use the wireless lock operation to lock the doors. With the key in your possession, touch a door's outside handle (touch sensor) and check that the door unlocks.

(b) Check the entry unlock operation's detection area.

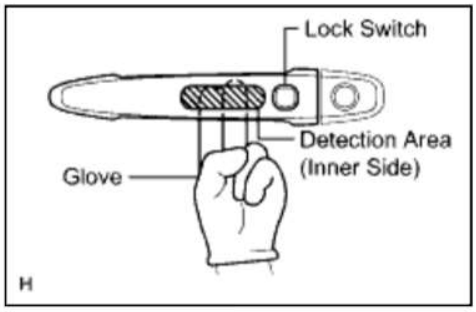
(1) Step 1: Hold the key at the same height as the door's outside handle (approximately 0.8 m (2.62 ft.)). Pay attention to the direction of the key shown in the illustration.



(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:

Unlock standby mode is signified by the key's red LED illuminating.



(3) Step 3: After the system enters unlock standby mode, touch the outside handle's 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 outside handle.

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

(5) Step 5: Inspect the door electrical key oscillator's response sensitivity. Wear protective gloves, set the system to unlock standby mode, and check that touching the inner side of the outside handle (the highlighted area in the illustration) with your finger causes the door to unlock.

NOTICE:

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

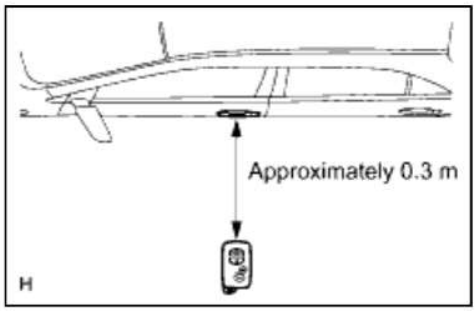
(6) Step 6: Repeat step 5 for the remaining doors.

(c) Check the entry lock function.

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(1) Step 1: Close all of the vehicle's doors. With the key in your possession outside of the vehicle, check that pressing the lock switch locks the doors.

HINT:



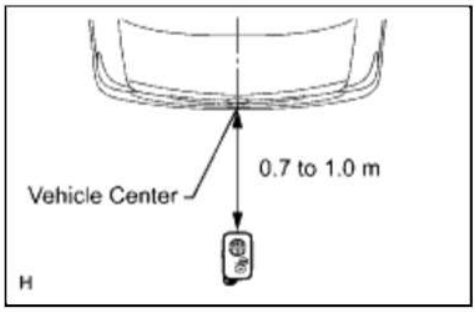
- When pressing the lock switch, hold the electrical key transmitter about 1 m (3.28 ft.) above the ground and about 0.3 m (0.984 ft.) away from the vehicle as shown in the illustration.
- Due to the key being unable to communicate with the system within a 0.2 m (0.656 ft.) distance from the outside handle, do not press the lock switch with the same hand that is holding the key. The doors may not lock.
- If the key lock-in prevention function buzzer sounds*, radio waves from the indoor electrical key oscillator may be leaking from the vehicle. Perform this same check for the front passenger side and rear doors.

*: Except Europe and China

(2) Step 2: Repeat step 1 for the remaining doors.

(d) Check the entry luggage compartment door open function.

(1) Close the luggage compartment door. With the key in your possession, check that pressing the luggage door opener switch opens the luggage compartment door.



(2) Inspect the entry luggage compartment door open operation's detection area. Hold the key at the same height as the luggage door opener switch (approximately 0.8 m (2.62 ft.)) aligning it with the center of the rear of the vehicle. Pay attention to the direction of the key 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, pressing the luggage door opener switch opens the luggage compartment door.

(e) Check the entry ignition function.

(1) When the engine is stopped:

With the key in your possession and the brake pedal depressed, check that pressing the engine switch releases the steering wheel lock and starts the engine.

HINT:

The engine can be started only when the engine switch indicator illuminates in green.

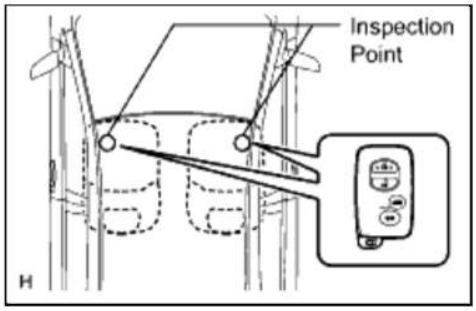
(2) When the engine is running:

With the key in your possession, check that pressing the engine switch stops the engine and activates the steering wheel lock.

HINT:

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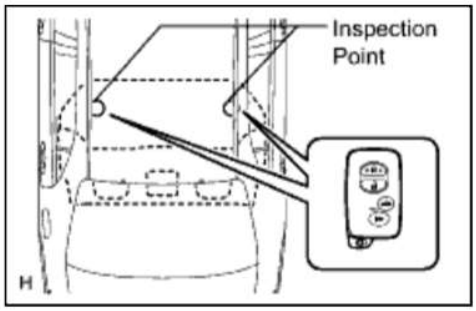
The shift position must be P to stop the engine.



(3) Inspect the entry ignition operation's detection area (front seat). Pay attention to the direction of the key in the illustration. When the key is in either of the 2 locations in the illustration, check that the engine can start.

NOTICE:

The engine cannot be started when the key is on the instrument panel or rear package tray, or in the glove box.



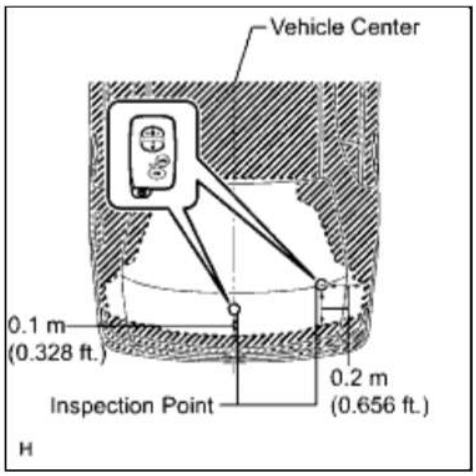
(4) Inspect the entry ignition operation's detection area (rear seat). Pay attention to the direction of the key shown in the illustration. When the key is in either of the 2 locations in the illustration, check that the engine can start.

NOTICE:

The engine cannot be started when the key is on the instrument panel or rear package tray, or in the glove box.

(f) Check the key lock-in prevention function (for luggage compartment).

(1) Place the key in the luggage compartment with all doors locked. Check that: 1) closing the luggage compartment door triggers the key's wireless buzzer (which lasts approximately 2 seconds), and 2) pressing the luggage door opener switch opens the luggage compartment door.



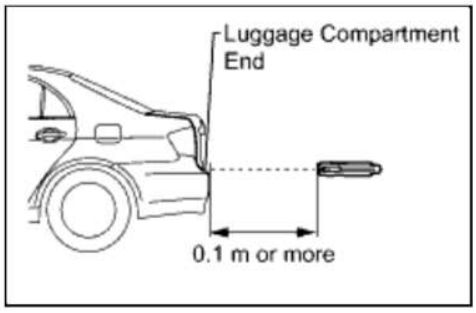
(2) Inspect the key lock-in prevention's detection area. Pay attention to the direction of the key shown in the illustration. When the key is in either of the 2 locations in the illustration, check that: 1) closing the luggage compartment door sounds the wireless buzzer, and 2) pressing the luggage door opener switch opens the luggage compartment door.

NOTICE:

If the key is inside a metal storage item, such as a metal briefcase or metal box, the key will not be able to be detected by the system.

(3) Inspect the key lock-in prevention's detection area and the entry door control receiver for wave leaks. Hold the key at the same height as the lower edge of the luggage compartment door aligning it with the center of the rear of the vehicle. Pay attention to the direction

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and position of the key shown in the illustration. Check that when the key is more than 0.1 m (0.328 ft.) away from the vehicle's rear bumper, the wireless buzzer does not sound. If the warning buzzer sounds, the entry door control receiver may have a wave leak.

(g) Check the key cancel function.

(1) While the engine switch is on (IG), check that the luggage door 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.

(h) 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 Luggage Compartment Door Open	Flashes once	Sounds once

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

(1) Carry the key in the vehicle and close the driver side door. Then turn the engine switch off or on (ACC).

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

(j) 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 side door (front door courtesy light switch is off).
- Turn the engine switch on (IG).

2. KEY DIAGNOSTIC MODE

HINT:

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

(a) Connect the Techstream to the DLC3.

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

(c) Turn the Techstream on.

(d) Enter the following menus: Body Electrical / Smart Key / Utility / Communication Check (Key Diag Mode).

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

Smart Key

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TESTER DISPLAY	INSPECTION RANGE
Overhead + Driver Side	Door electrical key oscillator (driver side)
Overhead + Passenger Side	Door electrical key oscillator (front passenger side)
Overhead + Front Room	Indoor electrical key oscillator (front floor)
Overhead + Rear Room	Indoor electrical key oscillator (rear floor)
Overhead + Luggage (outside)	Outside electrical key oscillator (luggage compartment)
Overhead + Luggage (inside)	Indoor electrical key oscillator (luggage compartment)
Immobiliser Amp	Amplifier (engine switch)

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



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Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000XUG035X
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Entry Function): CUSTOMIZE PARAMETERS (2010 Corolla)		

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.

HINT:

The following functions' default settings are ON. Part of these functions can be customized.

(a) Connect the Techstream to the DLC3.

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

(c) Turn the Techstream on.

(d) Enter the following menu: Customize Setting / Smart Key/Access.

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

Smart Key/Access (Certification ECU (Smart Key ECU assembly))

DISPLAY (ITEM)	DEFAULT	CONTENT	SETTING
Park Wait Time	2.5s	Function to set waiting time to permit opening door after door is locked with entry lock function.	0.5s / 1.5s / 2.5s / 5.0s
Ignition Available Area	ALL	Function to choose the available area for key to start the engine and cancel the steering lock.	FRONT / ALL
Trunk Open Mode	ON	Function to open the luggage compartment door when the driver has the key and presses the luggage open button.	ON / OFF
Key Low Battery Warning	ON	Function to set a warning function for a low battery.	ON / OFF

2. ENTRY UNLOCK MODE SWITCHING FUNCTION

(a) To change the vehicle to entry unlock mode switching function, make sure that the engine switch is off and simultaneously press and hold the electrical key's LOCK switch and another electrical key switch for 5 seconds.

- Driver door unlock default setting:

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When the switches are pressed and held for 5 seconds, the entry door unlock mode changes in the following order: driver door mode, all door mode.

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's touch sensor is touched, only the driver door unlocks. When another touch sensor is touched, all doors unlock.
- All door unlock mode:

  When the touch sensor is touched, all doors unlock.

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

(c) The certification ECU (smart key ECU assembly) sounds the wireless door lock buzzer and combination meter buzzer to inform the user that the mode has been switched.

MODE	WIRELESS DOOR LOCK BUZZER	COMBINATION METER BUZZER
Driver Door (Default)	Sounds 3 times	Sounds once
All Doors (Customized)	Sounds 2 times	Sounds once

HINT:

The function only changes the 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 Luggage Compartment Open
- Key Lock-in Prevention
- Warning

(a) The operation procedures are as follows:

Precondition:

Engine switch off, driver side door closed and unlocked.

(1) Unlock the driver side door once with the UNLOCK switch of the key.

(2) Open the driver door within 5 seconds.

(3) Unlock the driver side door twice with the UNLOCK switch of the key within 5 seconds.

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

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

(5) Unlock the driver side door twice with the UNLOCK switch of the key within 5 seconds.

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

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(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 procedures again. When the original condition is returned, the wireless door lock buzzer sounds once.



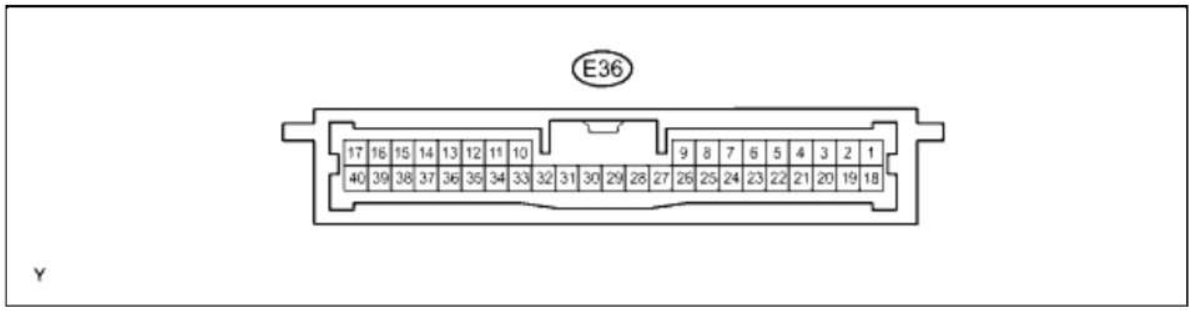
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Last Modified: 3-10-2010	6.4 U	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000XUA034X
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Entry Function): TERMINALS OF ECU (2010 Corolla)		

TERMINALS OF ECU

1. CHECK CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

(a) Disconnect the E36 certification ECU (smart key ECU assembly) 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
E36-1 (+B) - Body ground	W - Body ground*1 BR - Body ground*2	+B power supply	Always	11 to 14 V
E36-18 (IG) - Body ground	L - Body ground*1 B - Body ground*2	Ignition power supply	Engine switch off	Below 1 V
E36-18 (IG) - Body ground	L - Body ground*1 B - Body ground*2	Ignition power supply	Engine switch on (IG)	11 to 14 V
E36-17 (E) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
E36-19 (ACC) - Body ground	GR - Body ground	ACC power supply	Engine switch off	Below 1 V
E36-19 (ACC) - Body ground	GR - Body ground	ACC power supply	Engine switch on (ACC)	11 to 14 V
E36-3 (TSW1) - Body ground	V - Body ground	Entry lock switch (driver side) signal	Front lock switch not pushed	10 kΩ or higher

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TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
E36-3 (TSW1) - Body ground	V - Body ground	Entry lock switch (driver side) signal	Front lock switch pushed	Below 1 Ω
E36-4 (TSW2) - Body ground	R - Body ground*1 W - Body ground*2	Entry lock switch (passenger side) signal	Front lock switch not pushed	10 kΩ or higher
E36-4 (TSW2) - Body ground	R - Body ground*1 W - Body ground*2	Entry lock switch (passenger side) signal	Front lock switch pushed	Below 1 Ω
E36-10 (LIN) - Body ground	V - Body ground	LIN line	Always	10 kΩ or higher
E36-27 (CANH) - Body ground	SB - Body ground	CAN line	Always	10 kΩ or higher
E36-28 (CANL) - Body ground	W - Body ground	CAN line	Always	10 kΩ or higher
E36-40 (AGND) - Body ground	BR - Body ground*1 GR - Body ground*2	Ground	Always	Below 1 Ω
E36-7 (TSW5) - Body ground	V - Body ground*1 GR - Body ground*2	Luggage compartment door opener outer switch signal	Opener switch OFF	10 kΩ or higher
E36-7 (TSW5) - Body ground	V - Body ground*1 GR - Body ground*2	Luggage compartment door opener outer switch signal	Opener switch ON	Below 1 Ω

- *1: for TMC Made
- *2: Except for TMC Made

If the result is not as specified, the wire harness side may have a malfunction.

(c) Reconnect the E36 certification ECU (smart key ECU assembly) connector.

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

TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
E36-33 (CLG1) - E36-17 (E)	R - W-B*1 BR - W-B*2	Door electrical key oscillator (driver side) sensor signal	All doors closed, all doors locked and engine switch off	Alternating between 5 V and below 1 V

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TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
E36-33 (CLG1) - E36-17 (E)	R - W-B*1 BR - W-B*2	Door electrical key oscillator (driver side) sensor signal	Door unlocked or door open	Below 1 V
E36-22 (SEN1) - E36-17 (E)	R - W-B*1 LG - W-B*2	Touch sensor (driver side) detection signal	Outside door handle touched	Below 1 V
E36-22 (SEN1) - E36-17 (E)	R - W-B*1 LG - W-B*2	Touch sensor (driver side) detection signal	Outside door handle not touched (Have the key outside the cabin)	11 to 14 V
E36-5 (SEL1) - E36-17 (E)	Y - W-B	Touch sensor (driver side) activation control signal	The key is more than 5 m (16.4 ft.) away from the driver door.	11 to 14 V
E36-5 (SEL1) - E36-17 (E)	Y - W-B	Touch sensor (driver side) activation control signal	The key brought to the outside handle	Below 1 V
E36-35 (CLG2) - E36-17 (E)	B - W-B*1 R - W-B*2	Door electrical key oscillator (passenger side) sensor signal	All doors closed, all doors locked and engine switch off	Alternating between 5 V and below 1 V
E36-35 (CLG2) - E36-17 (E)	B - W-B*1 R - W-B*2	Door electrical key oscillator (passenger side) sensor signal	Door unlocked or door open	Below 1 V
E36-23 (SEN2) - E36-17 (E)	W - W-B*1 BR - W-B*2	Touch sensor (passenger side) detection signal	Outside door handle touched	Below 1 V
E36-23 (SEN2) - E36-17 (E)	W - W-B*1 BR - W-B*2	Touch sensor (passenger side) detection signal	Outside door handle not touched (Have the key outside the cabin)	11 to 14 V
E36-6 (SEL2) - E36-17 (E)	LG - W-B*1 B - W-B*2	Touch sensor (passenger side) activation control signal	The key is more than 5 m (16.4 ft.) away from the passenger door.	11 to 14 V
E36-6 (SEL2) - E36-17 (E)	LG - W-B*1 B - W-B*2	Touch sensor (passenger side) activation control signal	The key brought to the outside handle	Below 1 V
E36-11 (CLG5) - E36-12 (CG5B)	R - G*1 L - LG*2	Indoor electrical key oscillator (front) sensor signal	Within 30 seconds after driver side door opened and closed, engine switch off	Alternating between 5 V and below -5 V

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TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
E36-11 (CLG5) - E36-12 (CG5B)	R - G*1 L - LG*2	Indoor electrical key oscillator (front) sensor signal	Engine switch on (IG)	Below 1 V
E36-13 (CLG6) - E36-14 (CG6B)	W - B*1 W - BR*2	Indoor electrical key oscillator (rear) sensor signal	Within 30 seconds after driver side door opened and closed, engine switch off	Alternating between 5 V and below -5 V
E36-13 (CLG6) - E36-14 (CG6B)	W - B*1 W - BR*2	Indoor electrical key oscillator (rear) sensor signal	Engine switch on (IG)	Below 1 V
E36-15 (CLG7) - E36-16 (CG7B)	R - G*1 GR - W*2	Indoor electrical key oscillator (luggage compartment) sensor signal	Luggage compartment door opener switch ON	Alternating between 5 V and below -5 V
E36-15 (CLG7) - E36-16 (CG7B)	R - G*1 GR - W*2	Indoor electrical key oscillator (luggage compartment) sensor signal	Luggage compartment door opener switch OFF	Below 1 V
E36-31 (CLG8) - E36-32 (CG8B)	LG - P*1 SB- Y*2	Outside electrical key oscillator (luggage compartment) sensor signal	Luggage compartment door opener switch ON	Alternating between 5 V and below -5 V
E36-31 (CLG8) - E36-32 (CG8B)	LG - P*1 SB- Y*2	Outside electrical key oscillator (luggage compartment) sensor signal	Luggage compartment door opener switch OFF	Below 1 V
E36-29 (RC0) - E36-17 (E)	V - W-B*1 LG - W-B*2	Entry door control receiver power source	Engine switch off, all doors closed and key switch on	4.5 to 5.5 V
E36-29 (RC0) - E36-17 (E)	V - W-B*1 LG - W-B*2	Entry door control receiver power source	Engine switch off, all doors closed and key switch off	Below 1 V
E36-39 (RSSI) - E36-17 (E)	R - W-B*1 L - W-B*2	Entry door control receiver electric wave existence signal	Engine switch off, all doors closed, and the key is not in the detection area.	11 to 14 V
E36-39 (RSSI) - E36-17 (E)	R - W-B*1 L - W-B*2	Entry door control receiver electric wave existence signal	Engine switch off, all doors closed, and the key is in the detection area.	Below 1 V
E36-38 (RDA) - E36-17 (E)	Y - W-B*1 P - W-B*2	Entry door control receiver data input signal	Engine switch off, all doors closed and key switch off	11 to 14 V (Pulse generation)

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TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
E36-38 (RDA) - E36-17 (E)	Y - W-B*1 P - W-B*2	Entry door control receiver data input signal	Engine switch off, all doors closed and key switch on	Pulse generation
E36-38 (RDA) - Body ground	Y - Body ground*1 P - Body ground*2	Tuner input signal	Engine switch off, all doors closed, and the key is not in the detection area.	11 to 14 V (Pulse generation)
E36-38 (RDA) - Body ground	Y - Body ground*1 P - Body ground*2	Tuner input signal	The key is in the detection area.	Pulse generation
E36-37 (ASEL) - Body ground	L - Body ground*1 B - Body ground*2	Cabin / luggage receiver select signal	Engine switch off, luggage compartment door closed and the key is in the luggage detection area.	4.6 to 6.0 V
E36-37 (ASEL) - Body ground	L - Body ground*1 B - Body ground*2	Cabin / luggage receiver select signal	Engine switch off, luggage compartment door open	Below 1 V
E36-30 (VC5) - Body ground	SB - Body ground*1 BE - Body ground*2	Transponder key amplifier power supply	Key is not in the cabin.	Below 1 V
E36-30 (VC5) - Body ground	SB - Body ground*1 BE - Body ground*2	Transponder key amplifier power supply	The key is outside the cabin and the driver's door is open.	4.5 to 5.5 V
E36-8 (TXCT) - Body ground	L - Body ground*1 SB - Body ground*2	Transponder key amplifier output signal	Key is not in the cabin.	Below 1 V
E36-8 (TXCT) - Body ground	L - Body ground*1 SB - Body ground*2	Transponder key amplifier output signal	The key is outside the cabin and the driver's door is open.	Pulse generation (see waveform 1)
E36-9 (CODE) - Body ground	P - Body ground*1 G - Body ground*2	Transponder key amplifier communication signal	Key is not in the cabin.	Below 1 V
E36-9 (CODE) - Body ground	P - Body ground*1 G - Body	Transponder key amplifier communication signal	The key is outside the cabin and the driver's door is open. The key is close to	Pulse generation (see waveform 2)

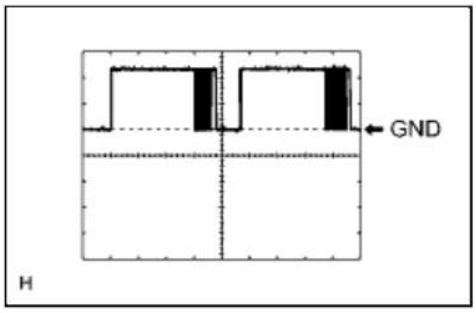
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TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
	ground*2		the engine switch with the brake pedal depressed.	
E36-21 (BZR) - Body ground	L - Body ground*1 R - Body ground*2	Wireless door lock buzzer signal	Wireless door lock buzzer OFF	Below 1 V
E36-21 (BZR) - Body ground	L - Body ground*1 R - Body ground*2	Wireless door lock buzzer signal	Wireless door lock buzzer ON	Pulse generation

- *1: for TMC Made
- *2: Except for TMC Made

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

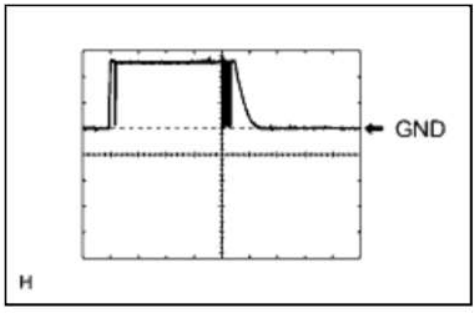
(e) Inspect using an oscilloscope.



Waveform 1 (Reference)

Tester Connection	E36-8 (TXCT) - Body ground
Tool Setting	2 V/DIV., 50 ms./DIV.
Condition	The key is outside the cabin and the driver's door is open.

(f) Inspect using an oscilloscope.



Waveform 2 (Reference)

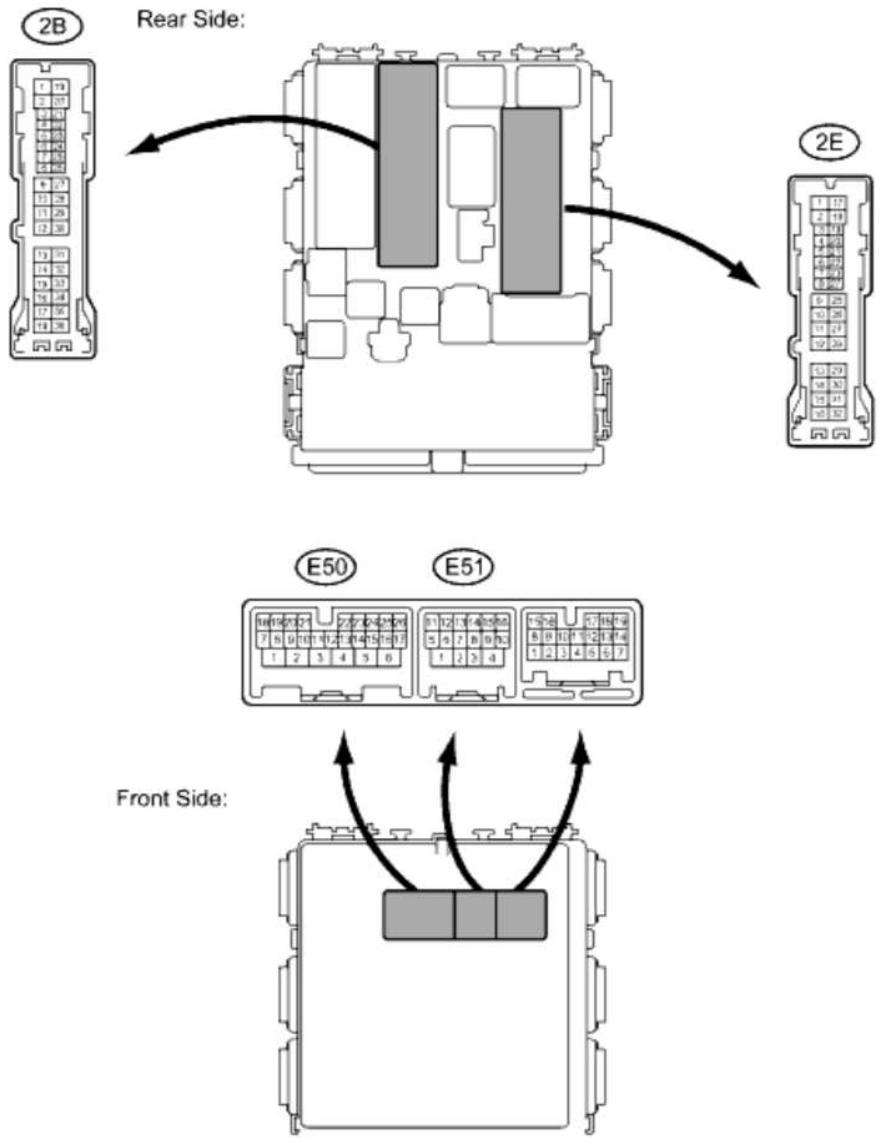
Tester Connection	E36-9 (CODE) - Body ground
Tool Setting	2 V/DIV., 50 ms./DIV.
Condition	The key is outside the cabin and the driver's door is open. The key is close to the engine switch with the brake pedal depressed.

2. MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)

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

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Main Body ECU (Instrument Panel Junction Block):



TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
2B-30 (BECU) - Body ground	W - Body ground	Battery power supply	Always	11 to 14 V
2E-17 (GND1) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
E51-4 (GND2) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
E51-12 (CANN) - Body ground	W - Body ground	CAN Line	Always	10 kΩ or higher

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TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
E51-11 (CANP) - Body ground	R - Body ground	CAN Line	Always	10 kΩ or higher
E50-14 (STP) - Body ground	L - Body ground	Stop light switch signal	Brake pedal depressed	11 to 14 V
E50-14 (STP) - Body ground	L - Body ground	Stop light switch signal	Brake pedal released	Below 1 V

If the result is not as specified, the junction block may have a malfunction.

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Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000XUB03FX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Entry Function): PROBLEM SYMPTOMS TABLE (2010 Corolla)		

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
All door entry lock / unlock functions and wireless functions do not operate	Power door lock control system	INFO
	Electrical key transmitter	-
	Transmitter battery	-
	Fuse (ECU-B2)	-
	Wire harness or connector	-
	Door control receiver	-
	Certification ECU (smart key ECU assembly)	-
All door entry lock / unlock functions do not operate, but wireless functions operate	Power door lock control system	INFO
	Electrical key transmitter	-
	Certification ECU (smart key ECU assembly)	-
Driver side door entry unlock function does not operate	Power door lock control system	INFO
	Door electrical key oscillator (for driver side)	-
	Front door outside handle (for driver side)	-
	Certification ECU (smart key ECU assembly)	-
	Wire harness or connector	-
Front passenger side door entry unlock function does not operate	Power door lock control system	INFO
	Door electrical key oscillator (for front passenger side)	-

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SYMPTOM	SUSPECTED AREA	SEE PAGE
	Front door outside handle (for front passenger side)	-
	Certification ECU (smart key ECU assembly)	-
	Wire harness or connector	-
Driver side door entry lock and unlock function does not operate	Power door lock control system	INFO
	Door electrical key oscillator (for driver side)	-
	Front door outside handle (for driver side)	-
	Certification ECU (smart key ECU assembly)	-
	Wire harness or connector	-
Front passenger side door entry lock and unlock function does not operate	Power door lock control system	INFO
	Door electrical key oscillator (for front passenger side)	-
	Front door outside handle (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
	Door electrical key oscillator (for driver side)	-
	Front door outside handle (for driver side)	-
	Certification ECU (smart key ECU assembly)	-
	Wire harness or connector	-
Front passenger side door entry lock function does not operate	Power door lock control system	INFO
	Door electrical key oscillator (for front passenger side)	-
	Front door outside handle (for front passenger side)	-
	Certification ECU (smart key ECU assembly)	-

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SYMPTOM	SUSPECTED AREA	SEE PAGE
	Wire harness or connector	-
Room oscillator does not recognize key	Indoor electrical key oscillator (for front)	INFO
	Indoor electrical key oscillator (for rear)	-
	Certification ECU (smart key ECU assembly)	-
	Wire harness or connector	-
	Electrical key transmitter	-
Luggage compartment door entry unlock function does not operate when key is outside luggage compartment	Outside electrical key oscillator (for luggage compartment)	INFO
	Luggage compartment door opener outer switch	-
	Luggage compartment door lock assembly	-
	Wire harness or connector	-
	Certification ECU (smart key ECU assembly)	-
Key luggage compartment lock-in prevention function does not operate	Indoor electrical key oscillator (for luggage compartment)	INFO
	Electrical key antenna (for luggage compartment)	-
	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 assembly)	-
Entry answer-back does not occur	Wireless door lock control system	INFO
	Certification ECU (smart key ECU assembly)	-

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Last Modified: 3-10-2010	6.4 U	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000XUF033X
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Entry Function): DATA LIST / ACTIVE TEST (2010 Corolla)		

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 engine 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 is touched OFF: Sensor is not touched	-
P-Door Touch Sensor	Front passenger side door touch sensor/ON or OFF	ON: Sensor is touched OFF: Sensor is not touched	-
D-Door Trigger SW	Driver side door lock switch/ON or OFF	ON: Switch is touched OFF: Switch is not touched	-
P-Door Trigger SW	Front passenger side door lock switch/ON or OFF	ON: Switch is touched OFF: Switch is not touched	-
Tr/B-Door Unlock SW	Luggage compartment door opener outer switch/ON or OFF	ON: Switch is pushed OFF: Switch is not pushed	-
Ignition Switch	Engine switch/ON or OFF	ON: Engine switch is on (IG) OFF: Engine switch is off	-
Unmatch V-ID	Unmatched vehicle-ID/YES or NO	YES: Key ID matches vehicle NO: Key ID does not match vehicle	-

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TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
No Response	No communication condition between vehicle and electrical key transmitter (response) / Yes or No	Yes: Key ID code not matched to vehicle, No: Key ID code matched to vehicle.	-
Unmatch Format	Unmatched response code and format/YES or NO	YES: Key ID code matches NO: Key ID code does not match	-
Low Battery	Low key battery/YES or NO	YES: Key battery voltage drops NO: Key battery voltage is normal	-
Power Save Cnt 10 Min	Power save counter - 10 minutes/Min.: 0; Max.: 255	Power save counter after door LOCK/UNLOCK-10 minutes	-
Power Save Cnt 5 Day	Power save counter - 5 days/Min.: 0; Max.: 255	Power save counter after door LOCK/UNLOCK-5 days	-
Power Save Cnt 14 Day	Power save counter - 14 days/Min.: 0; Max.: 255	Power save counter after door LOCK/UNLOCK-14 days	-
ACC Switch	Engine switch/ON or OFF	ON: Engine switch is on (ACC) OFF: Engine switch is off	-
Wrong Code	ID code difference/YES or NO	YES: Key ID code matches NO: Key ID code does not match	-
Wrong C Code	Challenge code difference (Response)/YES or NO	YES: Key ID code matches NO: Key ID code does not match	-
Wrong ID Code	ID code difference/YES or NO	YES: Key ID code matches NO: Key ID code does not match	-
Wrong Rol Code	Rolling code difference/YES or NO	YES: Key rolling code matches NO: Key rolling code does not match	-
Auto Entry Cancel Switch	Entry door lock function cancel/ON or OFF	Mode status is displayed	-
Trunk Open Mode	Luggage compartment door open mode with vehicle locked/ON or OFF	Customization status is displayed	-
Key Low Battery Warning	Low key battery warning/ON or OFF	Customization status is displayed	-

Main Body (Main Body ECU (Instrument Panel Junction Block))

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TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
IG SW	Engine switch/ON or OFF	ON: Engine switch is on (IG) OFF: Engine switch is off	-
D Door Courtesy SW	Driver side door courtesy light switch signal/ON or OFF	ON: Driver side door open OFF: Driver side door closed	-
P Door Courtesy SW	Front passenger side door courtesy light switch signal/ON or OFF	ON: Front passenger side door open OFF: Front passenger side door closed	-
RR Door Courtesy SW	Rear door courtesy light switch RH signal/ON or OFF	ON: Rear door open OFF: Rear door closed	-
RL Door Courtesy SW	Rear door courtesy light switch LH signal/ON or OFF	ON: Rear door open OFF: Rear door closed	-
Luggage Courtesy SW	Luggage compartment door courtesy light switch signal/ON or OFF	ON: Luggage compartment door open OFF: Luggage compartment door closed	-

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 engine 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	Entry door control receiver	ON/OFF	-

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TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Inside Luggage Tuner Power Supply ON	Luggage receiver	ON/OFF	-
Fr-Seat Inside Transmitter	Indoor electrical key oscillator (console)	ON/OFF	-
Rr-Seat Inside Transmitter	Indoor electrical key oscillator (rear seat)	ON/OFF	-
Inside Trunk/Backdoor Transmitter	Luggage compartment door inner oscillator	ON/OFF	-
Outside Trunk/Backdoor Transmitter	Luggage compartment door outer oscillator	ON/OFF	-
P-Seat Select	Front passenger side selection	ON/OFF	-
Wireless Buzzer	Wireless buzzer	ON/OFF	-
Security Indicator	Security indicator	ON/OFF	-

Main Body (Main Body ECU (Instrument Panel Junction Block))

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Trunk and Back-door Open	Luggage compartment door opener outer switch	ON/OFF	-



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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000XUD02UX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Entry Function): DIAGNOSIS SYSTEM (2010 Corolla)		

DIAGNOSIS SYSTEM

1. CHECK DLC3

(a) Check the DLC3 INFO .

2. INSPECT BATTERY VOLTAGE

(a) Measure the battery voltage.

Standard Voltage:
11 to 14 V

If the voltage is below 11 V, recharge or replace the battery before proceeding to the next step.

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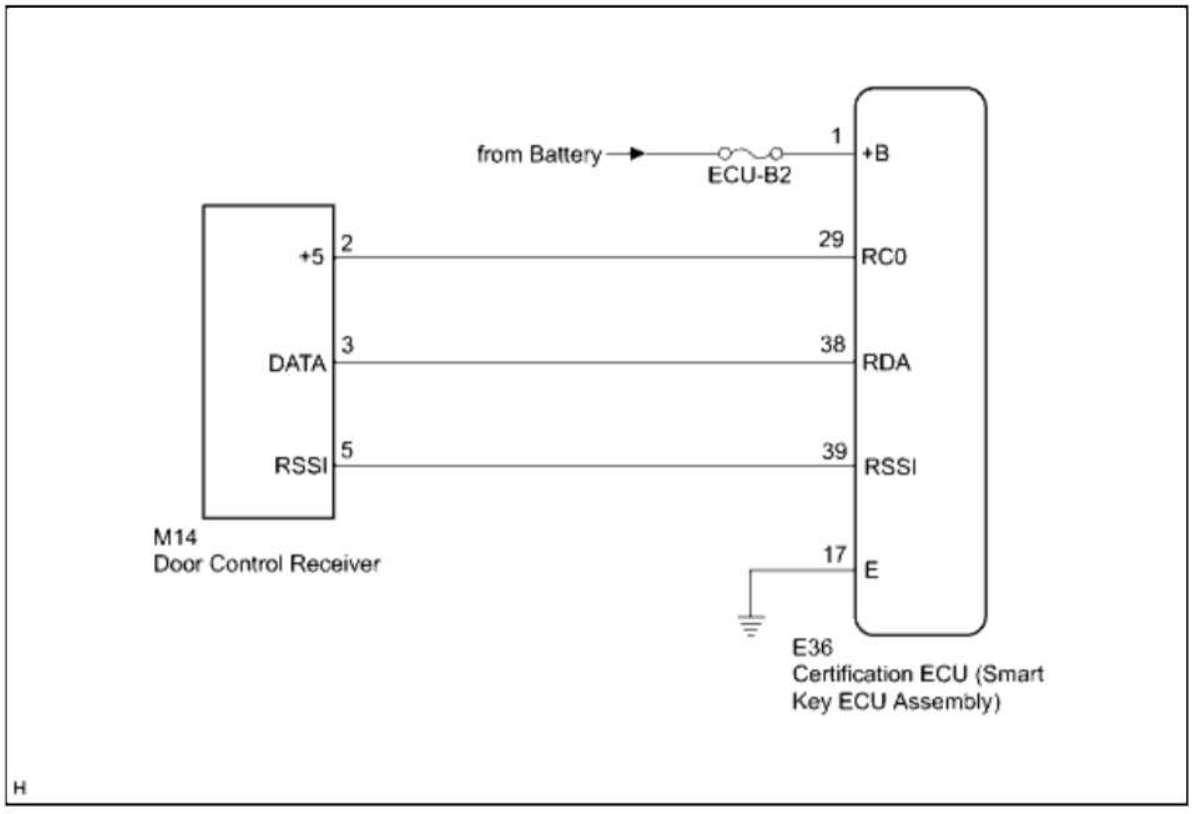
Last Modified: 3-10-2010	6.4 J	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000002VHD01QX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Entry Function): All Door Entry Lock/Unlock Functions and Wireless Functions do not Operate (2010 Corolla)		

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

DESCRIPTION

When the entry functions and wireless door lock functions do not operate, a malfunction or wave interference may be occurring in either of the following: 1) signal communication between the door control receiver and certification ECU (smart key ECU assembly) (communication shared by entry and wireless functions); or 2) electrical key transmitter.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- Check that there are not electrical key transmitters in the vehicle.
- Before performing the inspection, check that DTC B1242 (wireless door lock control) is not output INFO .

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PROCEDURE

1.	CHECK POWER DOOR LOCK OPERATION

(a) When the master switch assembly's door control switch 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

OK ▼

2.	CHECK ELECTRICAL KEY TRANSMITTER

(a) When another registered electrical key transmitter is used, check that the entry functions operate normally.

Result:

RESULT	PROCEED TO
Entry functions do not operate normally	A
Entry functions operate normally	B

A ▶ CHECK WAVE ENVIRONMENT

B ▼

3.	CHECK ELECTRICAL KEY TRANSMITTER (LED)

(a) Check that the transmitter's LED illuminates 3 times when the switch is pressed 3 times.

Result:

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RESULT	PROCEED TO
Transmitter's LED illuminates 3 times when switch is pressed 3 times	A
Transmitter's LED does not illuminate the second or third time	B
Transmitter's LED does not illuminate when switch is pressed 3 times	C

HINT:

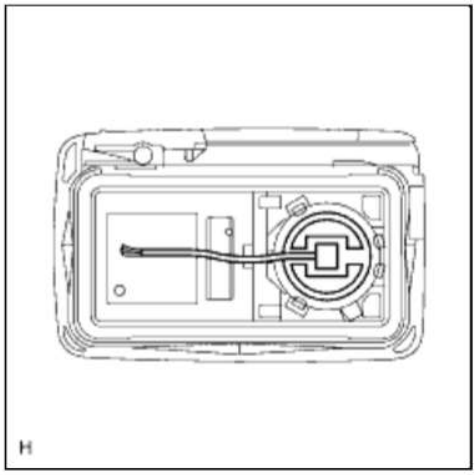
If the transmitter's LED does not illuminate the second or third time, replace the transmitter battery as it is depleted.

B ▶ **REPLACE ELECTRICAL TRANSMITTER BATTERY**

A ▶ **REPLACE ELECTRICAL KEY TRANSMITTER**

C ▼

4.	INSPECT ELECTRICAL TRANSMITTER BATTERY (VOLTAGE)



(a) Remove the battery from the electrical key transmitter 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.

NOTICE:

Do not wrap the lead wire around a 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.

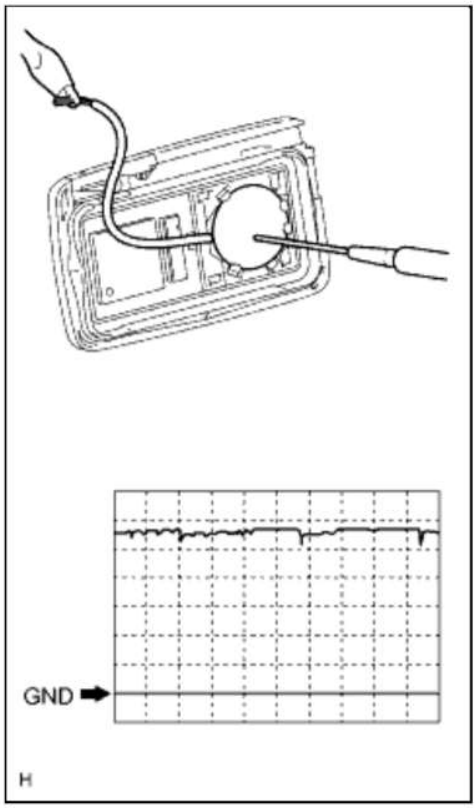
(b) Carefully pull the lead wire out from the position shown in the illustration and install the previously removed transmitter battery.

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

HINT:

When measuring the battery voltage, while operating the lock switch

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of a door outside handle, bring the electrical key transmitter 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	Engine switch off, all doors closed and lock switch pushed
Specified Condition	2.2 to 3.2 V (Refer to the waveform)

NG ▶ REPLACE ELECTRICAL TRANSMITTER BATTERY

OK ▶ REPLACE ELECTRICAL KEY TRANSMITTER

5.	CHECK WAVE ENVIRONMENT

(a) Bring the electrical key transmitter near the door control receiver, and perform a wireless operation check.

HINT:

When the electrical key transmitter 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.

Result:

RESULT	PROCEED TO
Operation check is normal	A
Operation check fails	B

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

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installed, remove them and perform the operation check.

A ▶ **AFFECTED BY WAVE INTERFERENCE**

B
▼

6.	**INSPECT FUSE (ECU-B2)**

(a) Remove the ECU-B2 fuse from the main body ECU (instrument panel junction block).

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

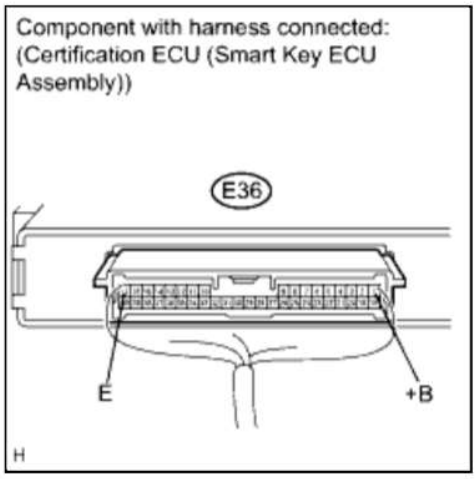
Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
ECU-B2 fuse	Always	Below 1 Ω

NG ▶ **REPLACE FUSE**

OK
▼

7.	**CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - BATTERY AND GROUND)**



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

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

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Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E36-1 (+B) - Body ground	Always	11 to 14 V

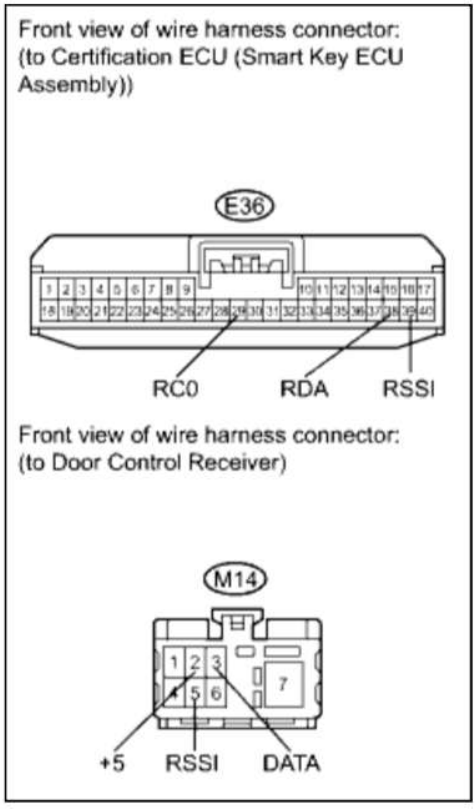
Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E36-17 (E) - Body ground	Always	Below 1 Ω

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

OK ▼

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



(a) Disconnect the door control receiver connector.

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

Standard Resistance:

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TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E36-39 (RSSI) - M14-5 (RSSI)	Always	Below 1 Ω
E36-38 (RDA) - M14-3 (DATA)	Always	Below 1 Ω
E36-29 (RC0) - M14-2 (+5)	Always	Below 1 Ω
E36-39 (RSSI) - Body ground	Always	10 kΩ or higher
E36-38 (RDA) - Body ground	Always	10 kΩ or higher
E36-29 (RC0) - Body ground	Always	10 kΩ or higher

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

OK ▼

9.	REPLACE DOOR CONTROL RECEIVER

(a) Replace the door control receiver INFO .

NEXT ▼

10.	CHECK DOOR CONTROL RECEIVER (OPERATION)

(a) Check that the entry functions operate normally.

OK:

Entry functions operate normally.

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

OK ▶ **END (DOOR CONTROL RECEIVER IS DEFECTIVE)**

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Last Modified: 3-10-2010	6.4 J	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000002WEG01GX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Entry Function): Entry Answer-back Buzzer does not Sound (2010 Corolla)		

Entry Answer-back Buzzer does not Sound

DESCRIPTION

The smart key system uses the wireless door lock buzzer to perform various vehicle exterior warnings. When each warning's conditions are met, the certification ECU (smart key ECU assembly) sends a buzzer signal to the wireless door lock buzzer, and the wireless door lock buzzer sounds.

INSPECTION PROCEDURE

PROCEDURE

1.	**CHECK WIRELESS DOOR LOCK BUZZER OPERATION**

(a) When the wireless operation is used to lock and unlock the doors, check that the wireless door lock buzzer sounds normally.

HINT:

Turn the wireless door lock buzzer controller ON.

Result:

RESULT	PROCEED TO
Buzzer does not sound	A
Buzzer sounds	B

A ▶ **GO TO WIRELESS DOOR LOCK CONTROL SYSTEM**

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

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Last Modified: 3-10-2010	6.4 J	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000XUH02BX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Entry Function): All Door Entry Lock/Unlock Functions do not Operate, but Wireless Functions Operate (2010 Corolla)		

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

DESCRIPTION

When the wireless functions can be used to lock and unlock the doors, communication between the door control receiver and certification ECU (smart key ECU assembly) is normal. When the entry functions do not operate, one of the following may be the cause: 1) entry cancel function is set through customization; 2) malfunction in smart key system communication (electrical key transmitter and vehicle); or 3) wave interference.

INSPECTION PROCEDURE

PROCEDURE

1.	**READ VALUE USING TECHSTREAM**

(a) Connect the Techstream to the DLC3.

(b) Turn the engine 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
Auto Entry Cancel SW	Entry function cancel / ON or OFF	Mode status is displayed	-

Result:

RESULT	PROCEED TO
Entry function is ON	A
Entry function is OFF	B

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A ▶ **PERFORM CANCELLATION OF ENTRY KEY CANCEL FUNCTION**

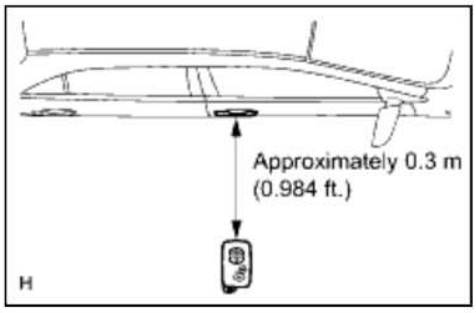
B ▼

2.	**CHECK WAVE ENVIRONMENT**

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

HINT:

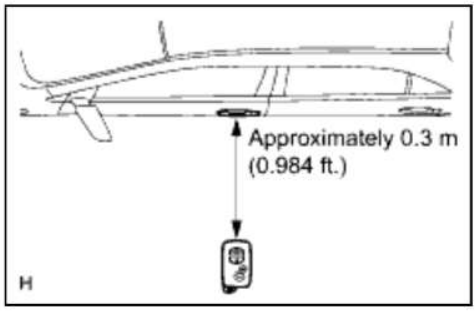
- When the electrical key transmitter is brought near the door outside handle or electrical key antenna, the possibility of wave interference decreases, and it can be determined if wave interference is causing the problem symptom.
- The transmitting waves of the wireless functions and entry functions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



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

NOTICE:

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



(c) Bring the electrical key transmitter near the front LH door outside handle, and perform a front LH door entry lock and unlock operation check.

NOTICE:

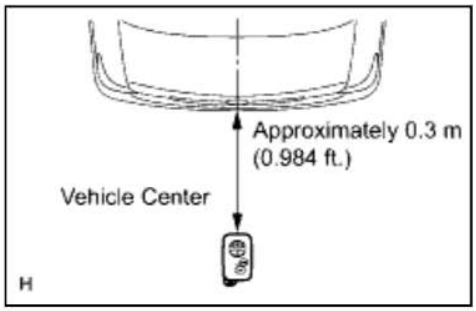
If the key is brought within 0.2 m (0.656 ft.) of the door handle, communication is not possible.

(d) Bring the electrical key transmitter near the electrical key antenna (in rear bumper), and perform an entry luggage compartment open function check.

NOTICE:

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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.

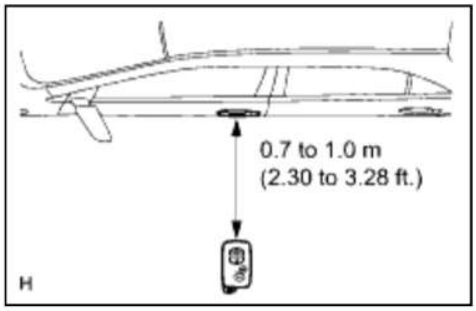
Result:

RESULT	PROCEED TO
Some operation checks are normal	A
All operation checks fail	B

A ▶ **AFFECTED BY WAVE INTERFERENCE**

B ▼

3.	PERFORM KEY DIAGNOSTIC MODE INSPECTION



(a) Diagnostic mode inspection

(1) Connect the Techstream to the DLC3.

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

(3) Turn the Techstream on.

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

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

(b) Diagnostic mode inspection

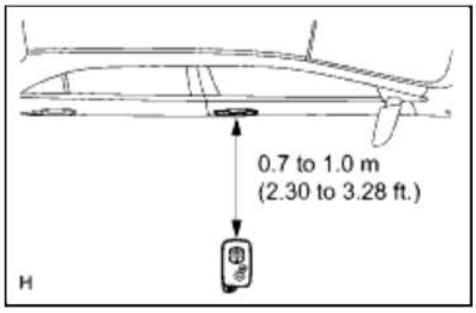
(1) Connect the Techstream to the DLC3.

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

(3) Turn the Techstream on.

(4) Enter the following menus: Body Electrical / Smart

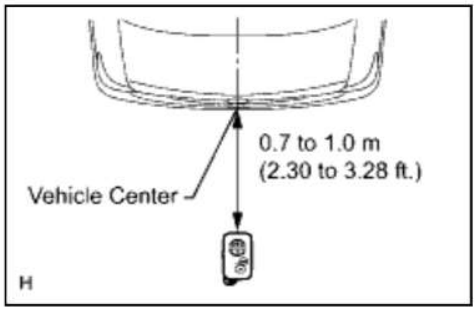
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Key / Utility / Communication Check (Key Diag Mode) / Overhead + Passenger Side.

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

(c) Diagnostic mode inspection



(1) Connect the Techstream to the DLC3.

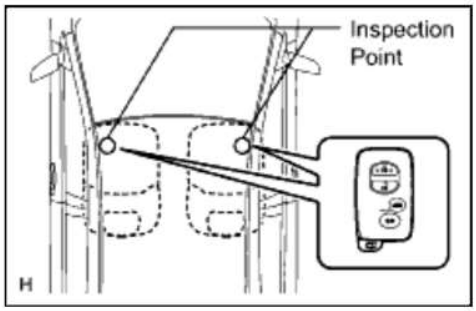
(2) Turn the engine switch on (IG).

(3) Turn the Techstream on.

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

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

(d) Diagnostic mode inspection



(1) Connect the Techstream to the DLC3.

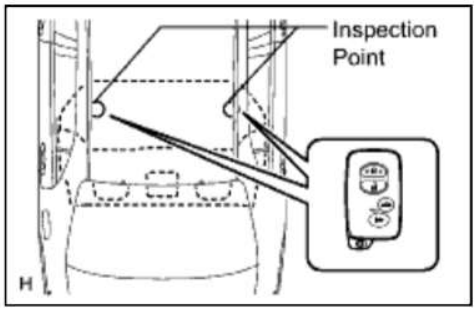
(2) Turn the engine switch on (IG).

(3) Turn the Techstream on.

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

(5) When the electrical key transmitter is placed on the driver seat or front passenger seat cushion, check that the wireless door lock buzzer sounds.

(e) Diagnostic mode inspection



(1) Connect the Techstream to the DLC3.

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

(3) Turn the Techstream on.

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

(5) When the electrical key transmitter is in the position

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shown in the illustration, check that the wireless door lock buzzer sounds.

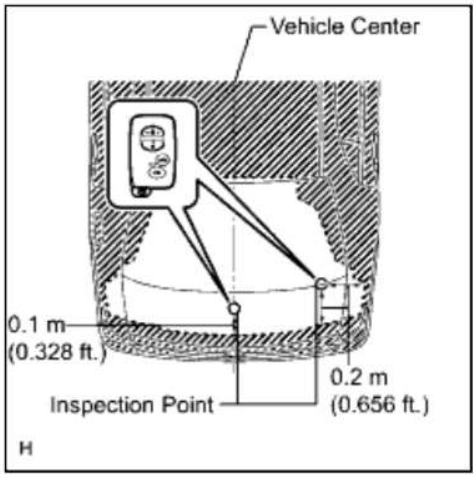
(f) Diagnostic mode inspection

(1) Connect the Techstream to the DLC3.

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

(3) Turn the Techstream on.

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



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

Result:

RESULT	PROCEED TO
Some diagnostic mode inspections fail (door)	A
Some diagnostic mode inspections fail (indoor)	B
Some diagnostic mode inspections fail (luggage compartment)	C
All diagnostic mode inspections are normal	D
All diagnostic mode inspections fail	E

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

C ▶ **GO TO OTHER PROBLEM**

B ▶ **GO TO OTHER PROBLEM**

A ▶ **GO TO OTHER PROBLEM (PROCEED TO PROBLEM SYMPTOM TABLE FOR EACH DOOR)**

E ▼

4.	**REPLACE ELECTRICAL KEY TRANSMITTER**

(a) Replace the electrical key transmitter.

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NEXT

5.	**REGISTER ELECTRICAL KEY TRANSMITTER**

(a) Register the electrical key transmitter INFO .

NEXT

6.	**CHECK OPERATION**

(a) Check that the entry functions operate normally.

OK:
Entry functions operate normally.

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

OK ▶ **END (ELECTRICAL KEY TRANSMITTER IS DEFECTIVE)**

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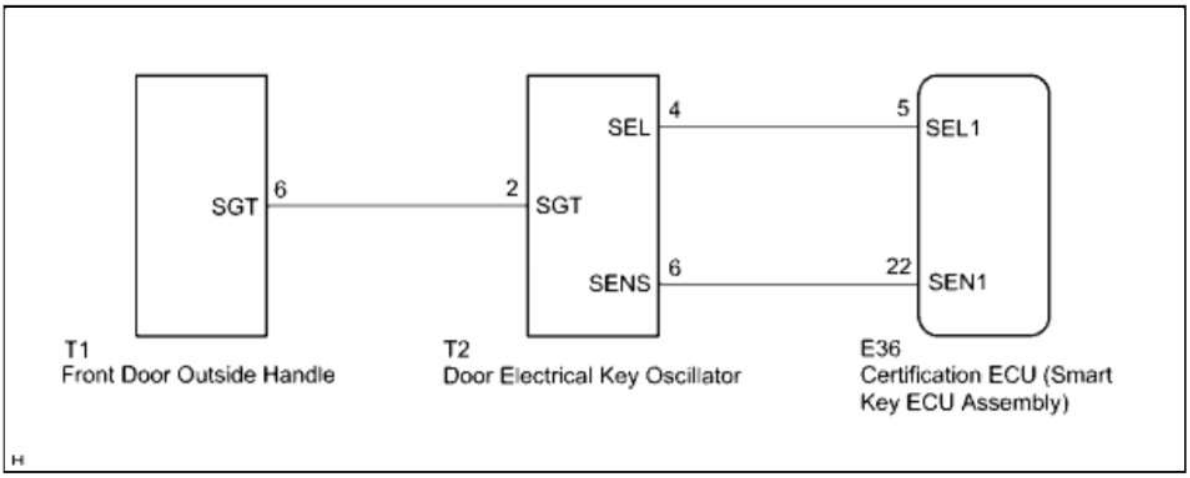
Last Modified: 3-10-2010	6.4 J	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000002WBW02CX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Entry Function): Driver Side Door Entry Unlock Function does not Operate (2010 Corolla)		

Driver Side Door Entry Unlock Function does not Operate

DESCRIPTION

If the driver door entry unlock function does not operate but the entry lock function operates, communication between the vehicle and electrical key transmitter is normal. As a result, the touch sensor circuit can be considered to be faulty (certification ECU (smart key ECU assembly) → driver side door outside handle → driver side door electrical key oscillator).

WIRING DIAGRAM



INSPECTION PROCEDURE

PROCEDURE

1.	**CHECK POWER DOOR LOCK OPERATION**

(a) When the master switch assembly's door control switch is operated, check that the locked doors unlock INFO .

OK:

Door locks operate normally.

NG ▶ **GO TO POWER DOOR LOCK CONTROL SYSTEM**

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OK

2.	**READ VALUE USING TECHSTREAM**

(a) Connect the Techstream to the DLC3.

(b) Turn the engine 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	Driver side door touch sensor/ON or OFF	ON: Sensor is touched OFF: Sensor is not touched	-

OK:
On the Techstream screen, the item changes between ON and OFF according to the chart above.

NG ▶ **CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - DOOR ELECTRICAL KEY OSCILLATOR)**

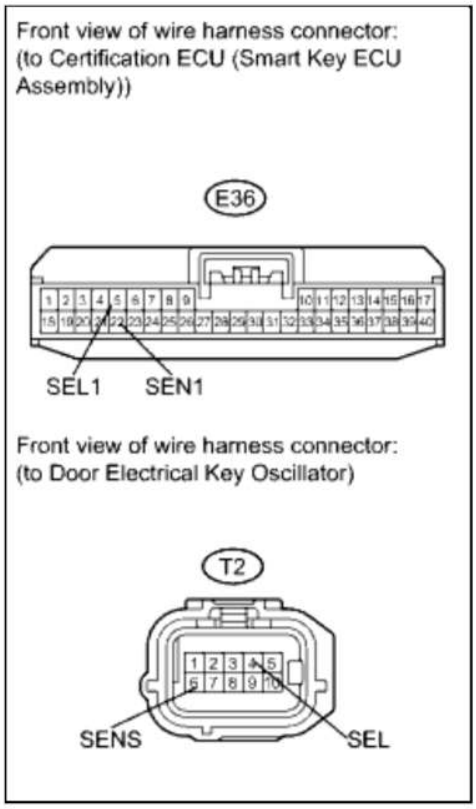
OK ▶ **REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)**

3.	**CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - DOOR ELECTRICAL KEY OSCILLATOR)**

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

(b) Disconnect the door electrical key oscillator 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
E36-5 (SEL1) - T2-4 (SEL)	Always	Below 1 Ω
E36-22 (SEN1) - T2-6 (SENS)	Always	Below 1 Ω
E36-5 (SEL1) - Body ground	Always	10 kΩ or higher
E36-22 (SEN1) - Body ground	Always	10 kΩ or higher

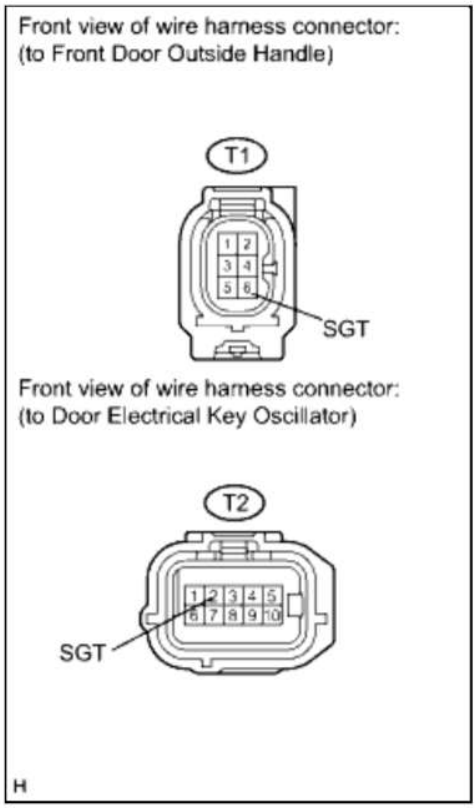
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

4.	**CHECK HARNESS AND CONNECTOR (DOOR ELECTRICAL KEY OSCILLATOR - FRONT DOOR OUTSIDE HANDLE)**

(a) Disconnect the front door outside handle connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
T1-6 (SGT) - T2-2 (SGT)	Always	Below 1 Ω
T1-6 (SGT) - Body ground	Always	10 kΩ or higher

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

OK ▼

5.	**REPLACE DOOR ELECTRICAL KEY OSCILLATOR**

(a) Replace the electrical key oscillator INFO .

NEXT

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▼

6.	CHECK DOOR ELECTRICAL KEY OSCILLATOR (OPERATION)

(a) Check that the entry functions operate normally.

OK:
Entry functions operate normally.

NG ▶ REPLACE FRONT DOOR OUTSIDE HANDLE

OK ▶ END (DOOR ELECTRICAL KEY OSCILLATOR IS DEFECTIVE)

7.	REPLACE FRONT DOOR OUTSIDE HANDLE

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

NEXT
▼

8.	CHECK FRONT DOOR OUTSIDE HANDLE (OPERATION)

(a) Check that the entry functions operate normally.

OK:
Entry functions operate normally.

NG ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

OK ▶ END (FRONT DOOR OUTSIDE HANDLE IS DEFECTIVE)

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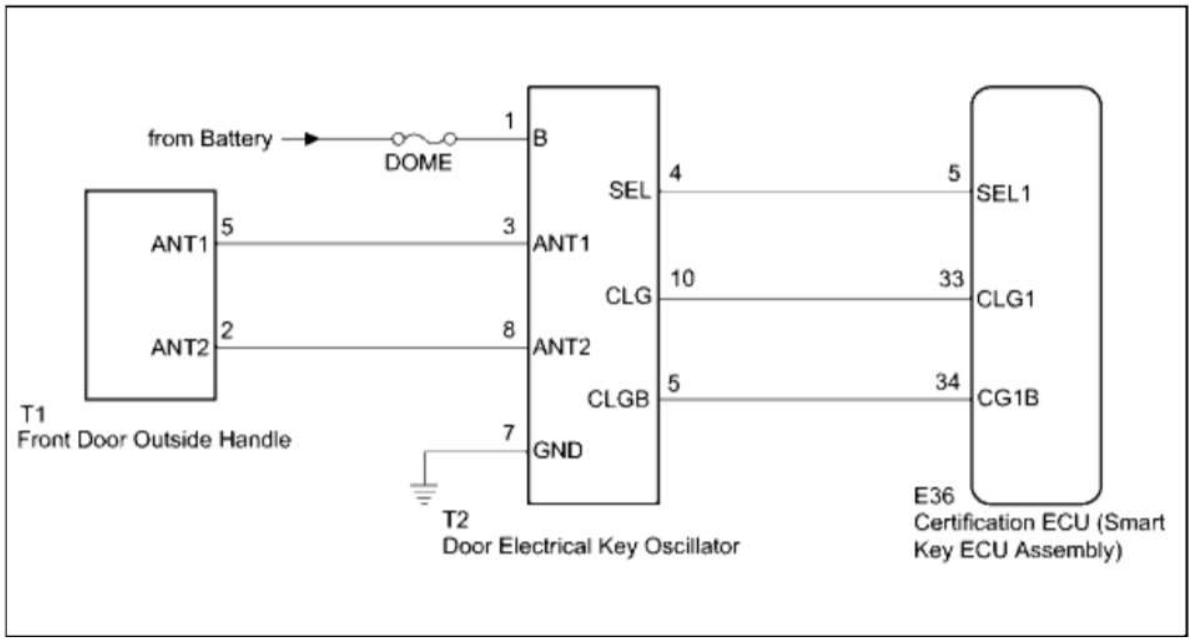
Last Modified: 3-10-2010	6.4 J	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000XUI02YX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Entry Function): Driver Side Door Entry Lock and Unlock Functions do not Operate (2010 Corolla)		

Driver Side Door Entry Lock and Unlock Functions do not Operate

DESCRIPTION

When the driver door entry lock and unlock functions do not operate, one of the following may be malfunctioning: 1) power door lock control system, 2) driver side door electrical key oscillator, or 3) certification ECU (smart key ECU assembly).

WIRING DIAGRAM



INSPECTION PROCEDURE

PROCEDURE

1.	**CHECK POWER DOOR LOCK OPERATION**

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

OK:

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Door locks operate normally.

NG ▶ GO TO POWER DOOR LOCK CONTROL SYSTEM

OK ▼

2.	READ VALUE USING TECHSTREAM

(a) Connect the Techstream to the DLC3

(b) Turn the engine 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	Driver side door touch sensor/ON or OFF	ON: Sensor is touched OFF: Sensor is not touched	-
D-Door Trigger SW	Driver side door lock switch/ON or OFF	ON: Switch is touched OFF: Switch is not touched	-

OK:
On the Techstream screen, each item changes between ON and OFF according to the chart above.

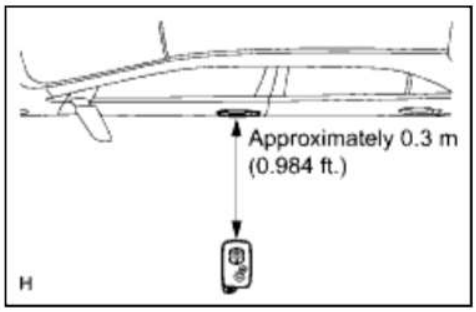
NG ▶ REPLACE FRONT DOOR OUTSIDE HANDLE

OK ▼

3.	CHECK WAVE ENVIRONMENT

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(a) Bring the electrical key transmitter near the driver door outside handle, 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 handle, communication is not possible.

HINT:

- When the electrical key transmitter is brought near the driver door outside handle, 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 ▶ **PERFORM KEY DIAGNOSTIC MODE INSPECTION**

OK ▶ **AFFECTED BY WAVE INTERFERENCE**

4.	PERFORM KEY DIAGNOSTIC MODE INSPECTION

(a) Diagnostic mode inspection

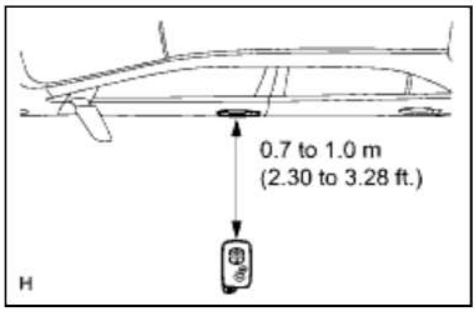
(1) Connect the Techstream to the DLC3.

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

(3) Turn the Techstream on.

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

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



HINT:

If the buzzer sounds, it can be determined that the driver seat outside transmitter is operating normally.

OK:

Wireless door lock buzzer sounds.

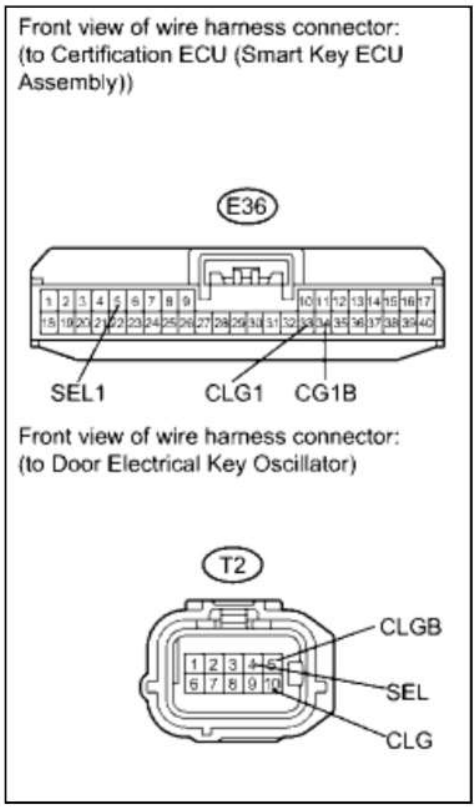
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NG ▶ **CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - DOOR ELECTRICAL KEY OSCILLATOR)**

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

5.	**CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - DOOR ELECTRICAL KEY OSCILLATOR)**

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



(b) Disconnect the door electrical key oscillator connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E36-5 (SEL1) - T2-4 (SEL)	Always	Below 1 Ω
E36-33 (CLG1) - T2-10 (CLG)	Always	Below 1 Ω
E36-34 (CG1B) - T2-5 (CLGB)	Always	Below 1 Ω
E36-5 (SEL1) - Body ground	Always	10 kΩ or higher

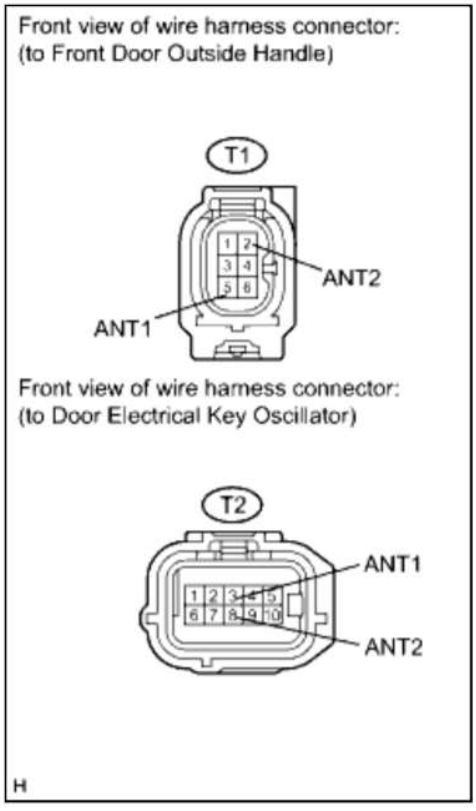
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TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E36-33 (CLG1) - Body ground	Always	10 kΩ or higher
E36-34 (CG1B) - Body ground	Always	10 kΩ or higher

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

OK ▼

6.	**CHECK HARNESS AND CONNECTOR (DOOR ELECTRICAL KEY OSCILLATOR - FRONT DOOR OUTSIDE HANDLE)**



(a) Disconnect the front door outside handle connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
T1-2 (ANT2) - T2-8 (ANT2)	Always	Below 1 Ω

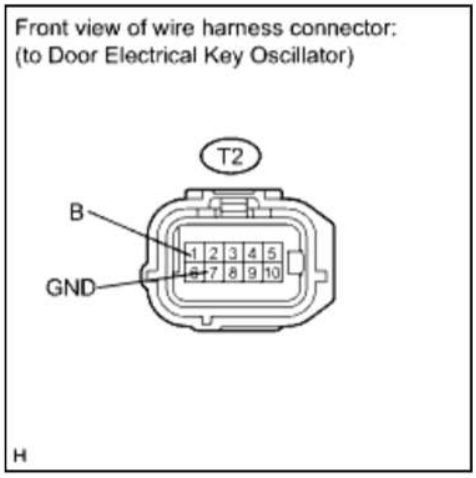
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TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
T1-5 (ANT1) - T2-3 (ANT1)	Always	Below 1 Ω
T1-2 (ANT2) - Body ground	Always	10 kΩ or higher
T1-5 (ANT1) - Body ground	Always	10 kΩ or higher

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

OK ▼

7.	**CHECK HARNESS AND CONNECTOR (DOOR ELECTRICAL KEY OSCILLATOR - BATTERY AND BODY GROUND)**



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

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
T2-1 (B) - T2-7 (GND)	Always	11 to 14 V

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

OK ▼

8.	**REPLACE DOOR ELECTRICAL KEY OSCILLATOR**

(a) Replace the door electrical key oscillator INFO.

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NEXT

9.	**CHECK DOOR ELECTRICAL KEY OSCILLATOR (OPERATION)**

(a) Check that the entry functions operate normally.

OK:

Entry functions operate normally.

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

OK ▶ **END (DOOR ELECTRICAL KEY OSCILLATOR IS DEFECTIVE)**

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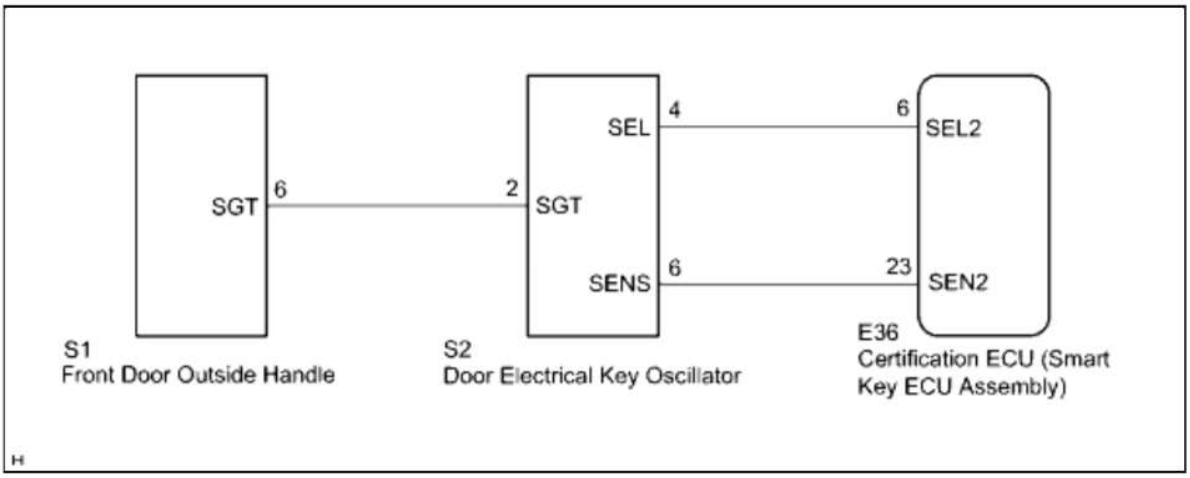
Last Modified: 3-10-2010	6.4 J	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000002WBX013X
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Entry Function): Front Passenger Side Door Entry Unlock Function does not Operate (2010 Corolla)		

Front Passenger Side Door Entry Unlock Function does not Operate

DESCRIPTION

If the front passenger door entry unlock function does not operate but the entry lock function operates, communication between the vehicle and electrical key transmitter is normal. As a result, the touch sensor circuit can be considered to be faulty (certification ECU (smart key ECU assembly) → front passenger side outside handle → front passenger side door electrical key oscillator).

WIRING DIAGRAM



INSPECTION PROCEDURE

PROCEDURE

1.	**CHECK POWER DOOR LOCK OPERATION**

(a) When the master switch assembly's door control switch is operated, check that the locked doors unlock INFO .

OK:

Door locks operate normally.

NG ▶ **GO TO POWER DOOR LOCK CONTROL SYSTEM**

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OK

2.	**READ VALUE USING TECHSTREAM**

(a) Connect the Techstream to the DLC3.

(b) Turn the engine 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	Front passenger side door touch sensor/ON or OFF	ON: Sensor is touched OFF: Sensor is not touched	-

OK:
On the Techstream screen, the item changes between ON and OFF according to the chart above.

NG ▶ **CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - DOOR ELECTRICAL KEY OSCILLATOR)**

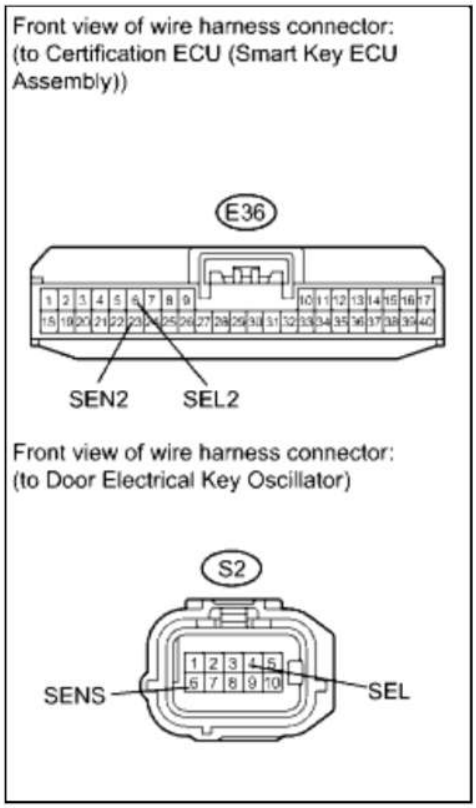
OK ▶ **REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)**

3.	**CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - DOOR ELECTRICAL KEY OSCILLATOR)**

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

(b) Disconnect the door electrical key oscillator 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
E36-6 (SEL2) - S2-4 (SEL)	Always	Below 1 Ω
E36-23 (SEN2) - S2-6 (SENS)	Always	Below 1 Ω
E36-6 (SEL2) - Body ground	Always	10 kΩ or higher
E36-23 (SEN2) - Body ground	Always	10 kΩ or higher

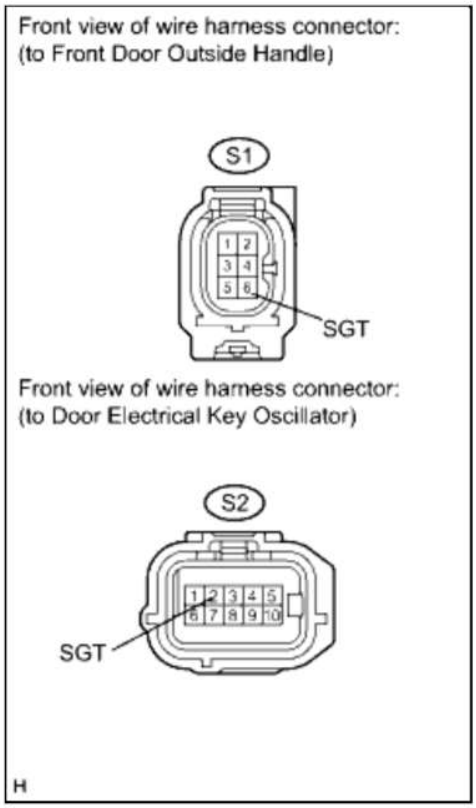
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

4.	**CHECK HARNESS AND CONNECTOR (DOOR ELECTRICAL KEY OSCILLATOR - FRONT DOOR OUTSIDE HANDLE)**

(a) Disconnect the front door outside handle connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
S1-6 (SGT) - S2-2 (SGT)	Always	Below 1 Ω
S1-6 (SGT) - Body ground	Always	10 kΩ or higher

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

OK ▼

5.	**REPLACE DOOR ELECTRICAL KEY OSCILLATOR**

(a) Replace the door electrical key oscillator INFO .

NEXT

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6.	CHECK DOOR ELECTRICAL KEY OSCILLATOR (OPERATION)

(a) Check that the entry functions operate normally.

OK:
Entry functions operate normally.

NG ▶ REPLACE FRONT DOOR OUTSIDE HANDLE

OK ▶ END (DOOR ELECTRICAL KEY OSCILLATOR IS DEFECTIVE)

7.	REPLACE FRONT DOOR OUTSIDE HANDLE

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

NEXT

8.	CHECK FRONT DOOR OUTSIDE HANDLE (OPERATION)

(a) Check that the entry functions operate normally.

OK:
Entry functions operate normally.

NG ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

OK ▶ END (FRONT DOOR OUTSIDE HANDLE IS DEFECTIVE)

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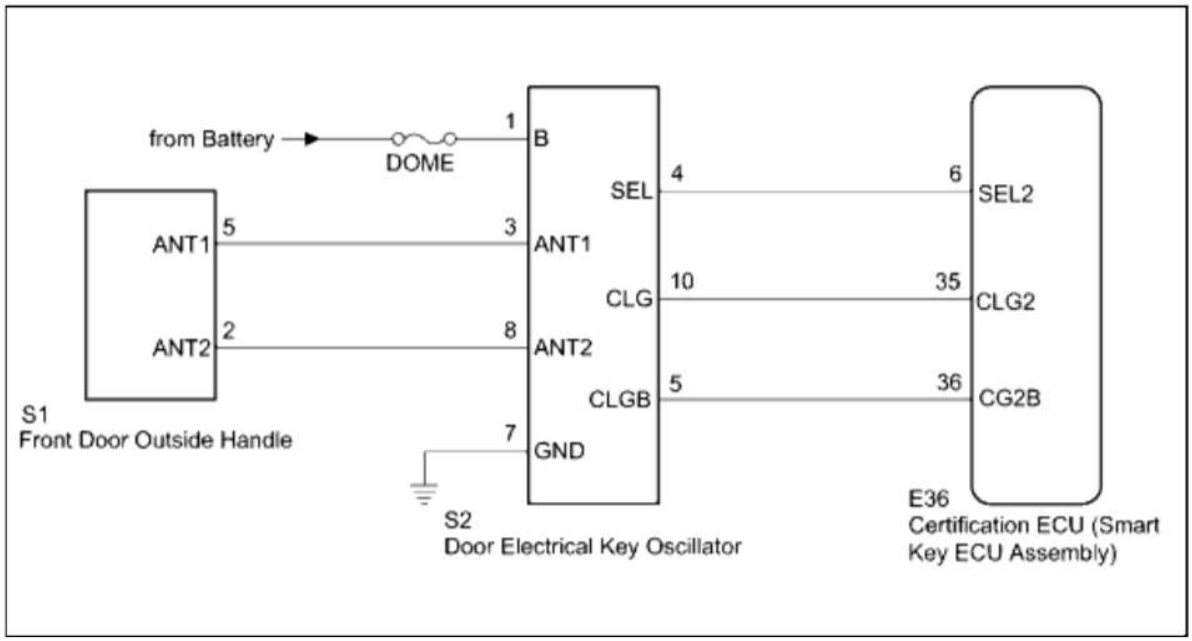
Last Modified: 3-10-2010	6.4 J	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000XUJ01OX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Entry Function): Front Passenger Side Door Entry Lock and Unlock Functions do not Operate (2010 Corolla)		

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

DESCRIPTION

When the front passenger door entry lock and unlock functions do not operate, one of the following may be malfunctioning: 1) power door lock control system, 2) door electrical key oscillator front passenger side, or 3) certification ECU (smart key ECU assembly).

WIRING DIAGRAM



INSPECTION PROCEDURE

PROCEDURE

1.	**CHECK POWER DOOR LOCK OPERATION**

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

OK:

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Door locks operate normally.

NG ▶ GO TO POWER DOOR LOCK CONTROL SYSTEM

OK ▼

2.	READ VALUE USING TECHSTREAM

(a) Connect the Techstream to the DLC3.

(b) Turn the engine 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	Front passenger side door touch sensor/ON or OFF	ON: Sensor is touched OFF: Sensor is not touched	-
P-Door Trigger SW	Front passenger side door lock switch/ON or OFF	ON: Switch is touched OFF: Switch is not touched	-

OK:
On the Techstream screen, each item changes between ON and OFF according to the chart above.

NG ▶ REPLACE FRONT DOOR OUTSIDE HANDLE

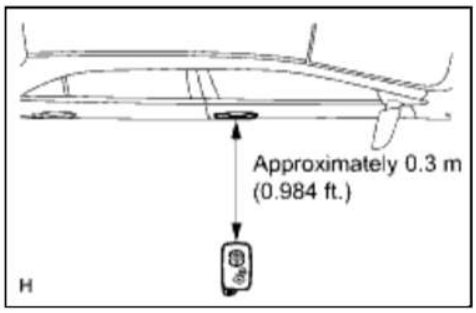
OK ▼

3.	CHECK WAVE ENVIRONMENT

(a) Bring the electrical key transmitter near the front

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passenger door outside handle, 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 handle, communication is not possible.

HINT:

- When the electrical key transmitter is brought near the front passenger door outside handle, 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 ▶ **PERFORM KEY DIAGNOSTIC MODE INSPECTION**

OK ▶ **AFFECTED BY WAVE INTERFERENCE**

4.	PERFORM KEY DIAGNOSTIC MODE INSPECTION

(a) Diagnostic mode inspection

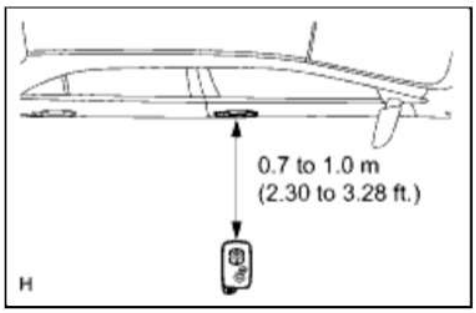
(1) Connect the Techstream to the DLC3.

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

(3) Turn the Techstream on.

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

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



HINT:

If the buzzer sounds, it can be determined that the front passenger seat outside transmitter is operating normally.

OK:

Wireless door lock buzzer sounds.

NG ▶ **CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - DOOR ELECTRICAL KEY**

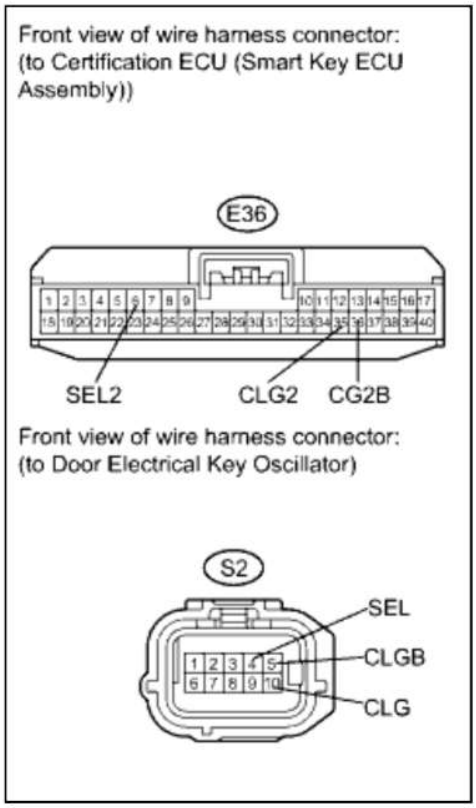
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OSCILLATOR)

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

5.	**CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - DOOR ELECTRICAL KEY OSCILLATOR)**

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



(b) Disconnect the door electrical key oscillator connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E36-6 (SEL2) - S2-4 (SEL)	Always	Below 1 Ω
E36-35 (CLG2) - S2-10 (CLG)	Always	Below 1 Ω
E36-36 (CG2B) - S2-5 (CLGB)	Always	Below 1 Ω
E36-6 (SEL2) - Body ground	Always	10 kΩ or higher
E36-35 (CLG2) - Body ground	Always	10 kΩ or higher

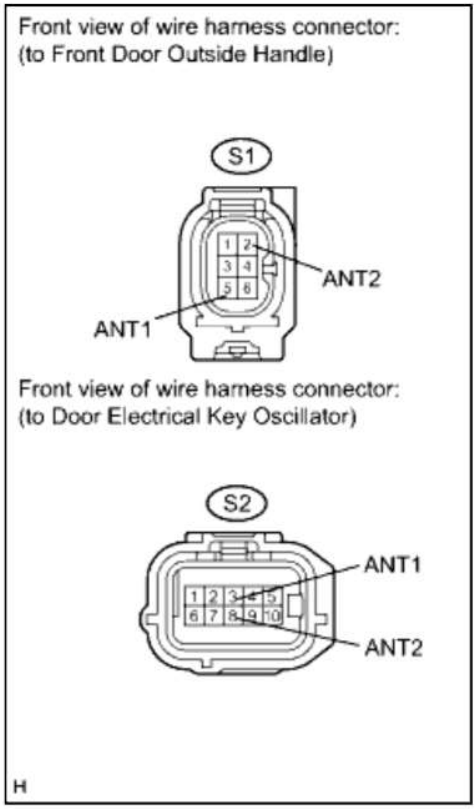
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TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E36-36 (CG2B) - Body ground	Always	10 kΩ or higher

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

OK ▼

6.	**CHECK HARNESS AND CONNECTOR (DOOR ELECTRICAL KEY OSCILLATOR - FRONT DOOR OUTSIDE HANDLE)**



(a) Disconnect the front door outside handle connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
S1-2 (ANT2) - S2-8 (ANT2)	Always	Below 1 Ω
S1-5 (ANT1) - S2-3 (ANT1)	Always	Below 1 Ω

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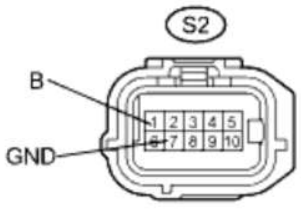
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
S1-2 (ANT2) - Body ground	Always	10 kΩ or higher
S1-5 (ANT1) - Body ground	Always	10 kΩ or higher

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

OK ▼

7.	**CHECK HARNESS AND CONNECTOR (DOOR ELECTRICAL KEY OSCILLATOR - BATTERY AND BODY GROUND)**

Front view of wire harness connector:
(to Door Electrical Key Oscillator)



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

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
S2-1 (B) - S2-7 (GND)	Always	11 to 14 V

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

OK ▼

8.	**REPLACE DOOR ELECTRICAL KEY OSCILLATOR**

(a) Replace the door electrical key oscillator INFO .

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NEXT

9.	**CHECK DOOR ELECTRICAL KEY OSCILLATOR (OPERATION)**

(a) Check that the entry functions operate normally.

OK:

Entry functions operate normally.

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

OK ▶ **END (DOOR ELECTRICAL KEY OSCILLATOR IS DEFECTIVE)**

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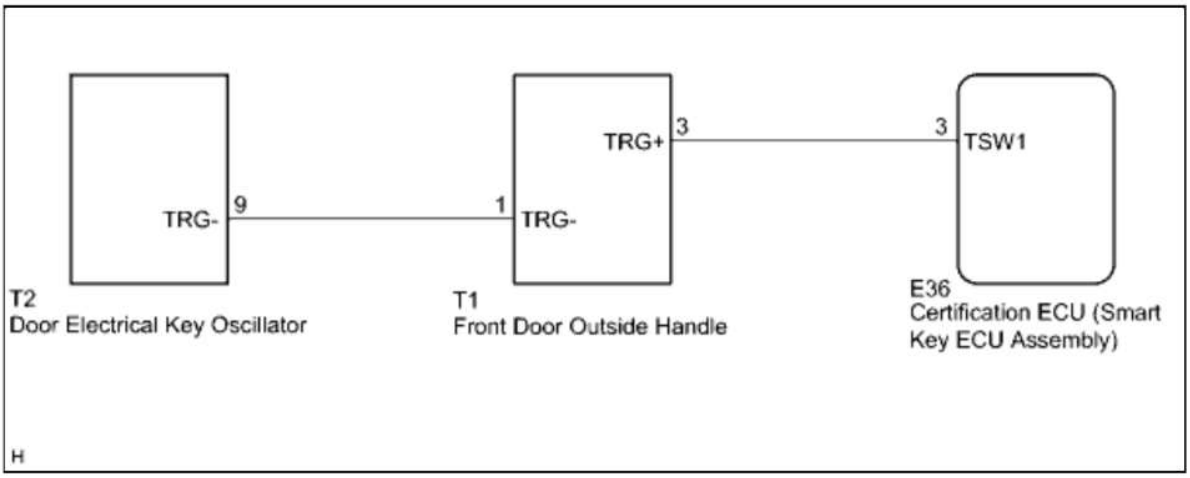
Last Modified: 3-10-2010	6.4 J	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000XUQ02XX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Entry Function): Driver Side Door Entry Lock Function does not Operate (2010 Corolla)		

Driver Side Door Entry Lock Function does not Operate

DESCRIPTION

If the driver door entry lock function does not operate but the entry unlock function operates, communication between the vehicle and electrical key transmitter is normal. As a result, the entry lock switch circuit can be considered to be faulty (certification ECU (smart key ECU assembly) → driver side outside handle (entry lock switch) → driver side door electrical key oscillator).

WIRING DIAGRAM



INSPECTION PROCEDURE

PROCEDURE

1.	**CHECK POWER DOOR LOCK OPERATION**

(a) When the master switch assembly's door control switch is operated, check that the doors lock INFO .

OK:

Door locks operate normally.

NG ▶ **GO TO POWER DOOR LOCK CONTROL SYSTEM**

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OK

2.	**READ VALUE USING TECHSTREAM (OUTSIDE HANDLE)**

(a) Connect the Techstream to the DLC3.

(b) Turn the engine 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: Switch is touched OFF: Switch is not touched	-

OK:
On the Techstream screen, the item changes between ON and OFF according to the chart above.

NG ▶ **CHECK HARNESS AND CONNECTOR (FRONT DOOR OUTSIDE HANDLE - DOOR ELECTRICAL KEY OSCILLATOR)**

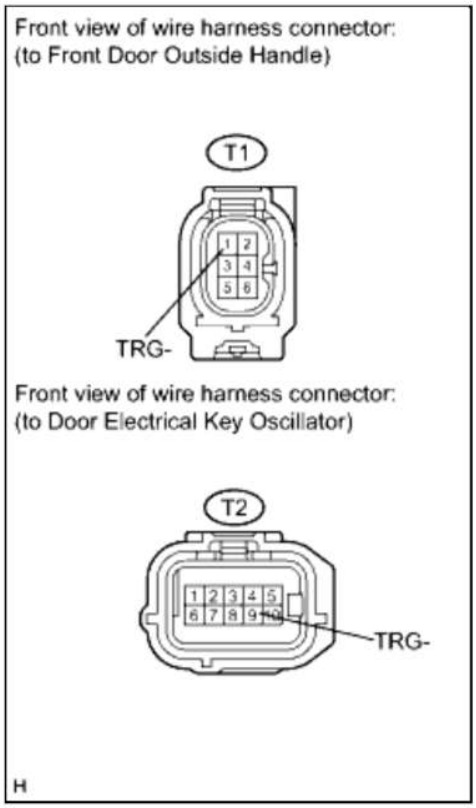
OK ▶ **REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)**

3.	**CHECK HARNESS AND CONNECTOR (FRONT DOOR OUTSIDE HANDLE - DOOR ELECTRICAL KEY OSCILLATOR)**

(a) Disconnect the front door outside handle.

(b) Disconnect the door electrical key oscillator 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
T2-9 (TRG-) - T1-1 (TRG-)	Always	Below 1 Ω
T2-9 (TRG-) - Body ground	Always	10 kΩ or higher

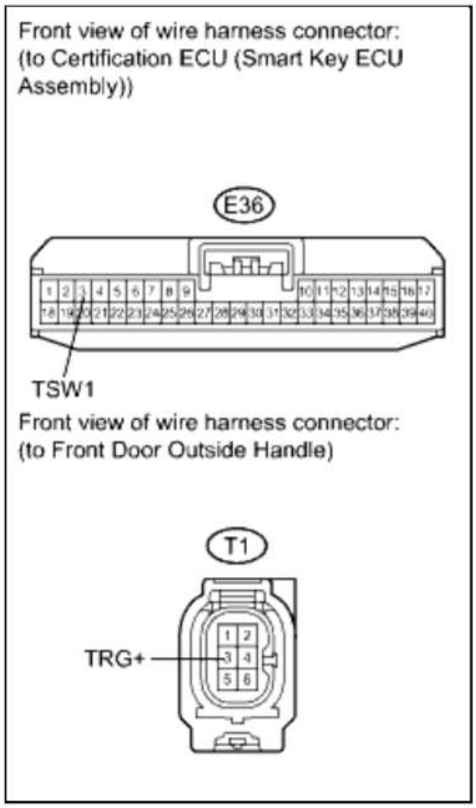
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

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

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

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E36-3 (TSW1) - T1-3 (TRG+)	Always	Below 1 Ω
E36-3 (TSW1) - Body ground	Always	10 kΩ or higher

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

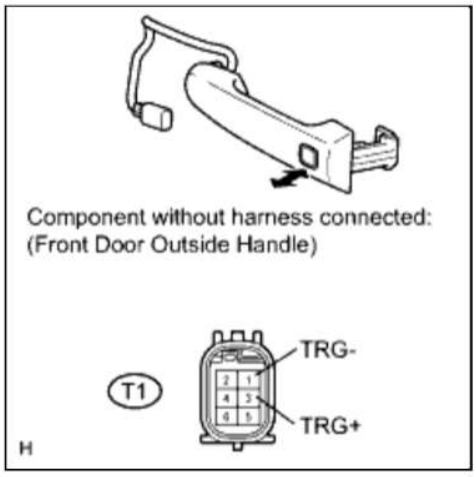
OK ▼

5.	**INSPECT FRONT DOOR OUTSIDE HANDLE (for Driver Side)**

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

Standard Resistance:

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TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
T1-1 (TRG-) - T1-3 (TRG+)	Lock switch not pushed	10 kΩ or higher
T1-1 (TRG-) - T1-3 (TRG+)	Lock switch pushed	Below 1 Ω

NG ▶ **REPLACE FRONT DOOR OUTSIDE HANDLE**

OK
▼

6.	REPLACE DOOR ELECTRICAL KEY OSCILLATOR

(a) Replace the door electrical key oscillator INFO .

NEXT
▼

7.	CHECK DOOR ELECTRICAL KEY OSCILLATOR (OPERATION)

(a) Check that the entry functions operate normally.

OK:
Entry functions operate normally.

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

OK ▶ **END (DOOR ELECTRICAL OSCILLATOR IS DEFECTIVE)**

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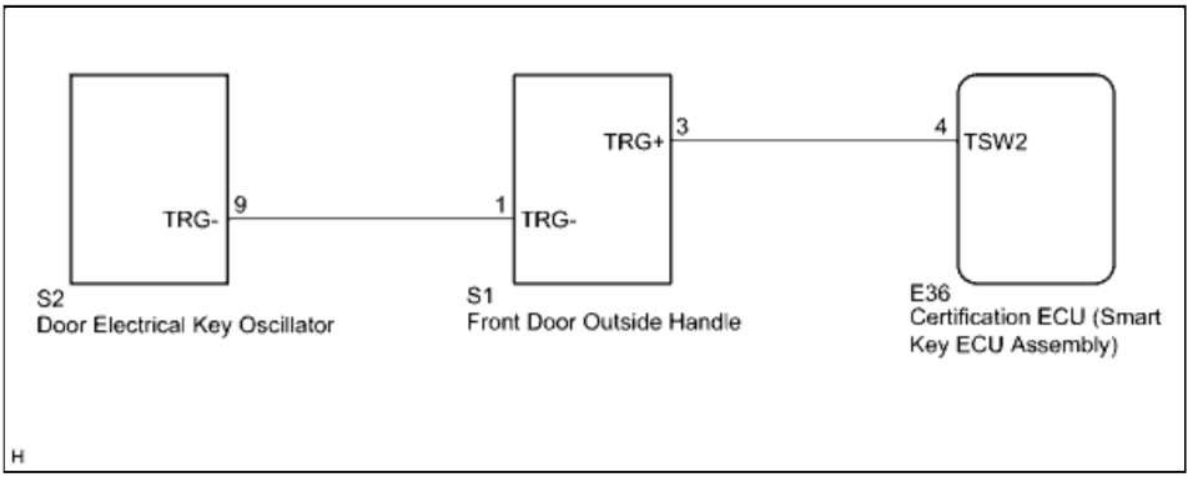
Last Modified: 3-10-2010	6.4 J	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000XUR01NX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Entry Function): Front Passenger Side Door Entry Lock Function does not Operate (2010 Corolla)		

Front Passenger Side Door Entry Lock Function does not Operate

DESCRIPTION

If the front passenger door entry lock function does not operate but the entry unlock function operates, communication between the vehicle and electrical key transmitter is normal. As a result, the entry lock switch circuit can be considered to be faulty (certification ECU (smart key ECU assembly) → passenger side outside handle (entry lock switch) → front passenger side door electrical key oscillator).

WIRING DIAGRAM



INSPECTION PROCEDURE

PROCEDURE

1.	**CHECK POWER DOOR LOCK OPERATION**

(a) When the master switch assembly's door control switch is operated, check that the doors lock INFO .

OK:

Door locks operate normally.

NG ▶ **GO TO POWER DOOR LOCK CONTROL SYSTEM**

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OK

2.	READ VALUE USING TECHSTREAM (OUTSIDE HANDLE)

(a) Connect the Techstream to the DLC3.

(b) Turn the engine 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: Switch is touched OFF: Switch is not touched	-

OK:
On the Techstream screen, the item changes between ON and OFF according to the chart above.

NG ▶ **CHECK HARNESS AND CONNECTOR (FRONT DOOR OUTSIDE HANDLE - DOOR ELECTRICAL KEY OSCILLATOR)**

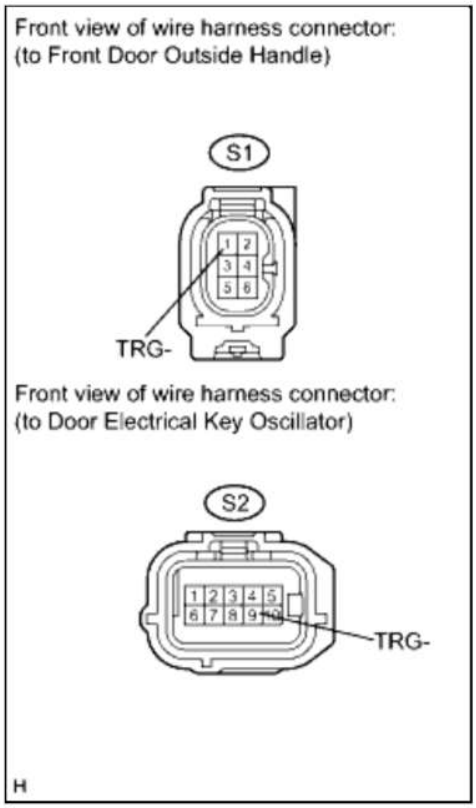
OK ▶ **REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)**

3.	CHECK HARNESS AND CONNECTOR (FRONT DOOR OUTSIDE HANDLE - DOOR ELECTRICAL KEY OSCILLATOR)

(a) Disconnect the front door outside handle connector.

(b) Disconnect the door electrical key oscillator 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
S2-9 (TRG-) - S1-1 (TRG-)	Always	Below 1 Ω
S2-9 (TRG-) - Body ground	Always	10 kΩ or higher

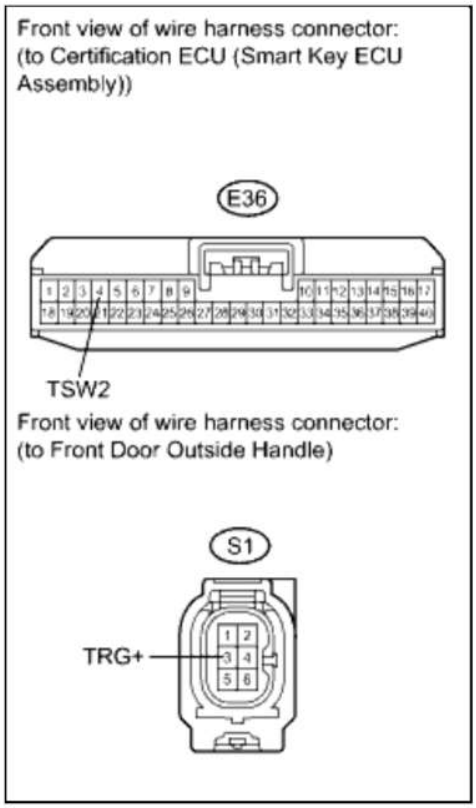
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

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

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

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E36-4 (TSW2) - S1-3 (TRG+)	Always	Below 1 Ω
E36-4 (TSW2) - Body ground	Always	10 kΩ or higher

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

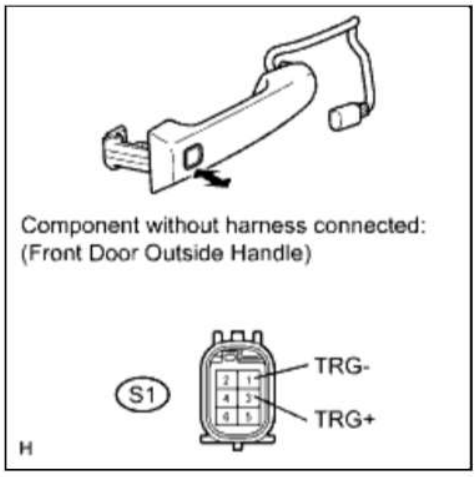
OK ▼

5.	**INSPECT FRONT DOOR OUTSIDE HANDLE (for Front Passenger Side)**

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

Standard Resistance:

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TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
S1-1 (TRG-) - S1-3 (TRG+)	Lock switch not pushed	10 kΩ or higher
S1-1 (TRG-) - S1-3 (TRG+)	Lock switch pushed	Below 1 Ω

NG ▶ **REPLACE FRONT DOOR OUTSIDE HANDLE**

OK
▼

6.	REPLACE DOOR ELECTRICAL KEY OSCILLATOR

(a) Replace the door electrical key oscillator INFO .

NEXT
▼

7.	CHECK DOOR ELECTRICAL KEY OSCILLATOR (OPERATION)

(a) Check that the entry functions operate normally.

OK:
Entry functions operate normally.

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

OK ▶ **END (DOOR ELECTRICAL KEY OSCILLATOR IS DEFECTIVE)**

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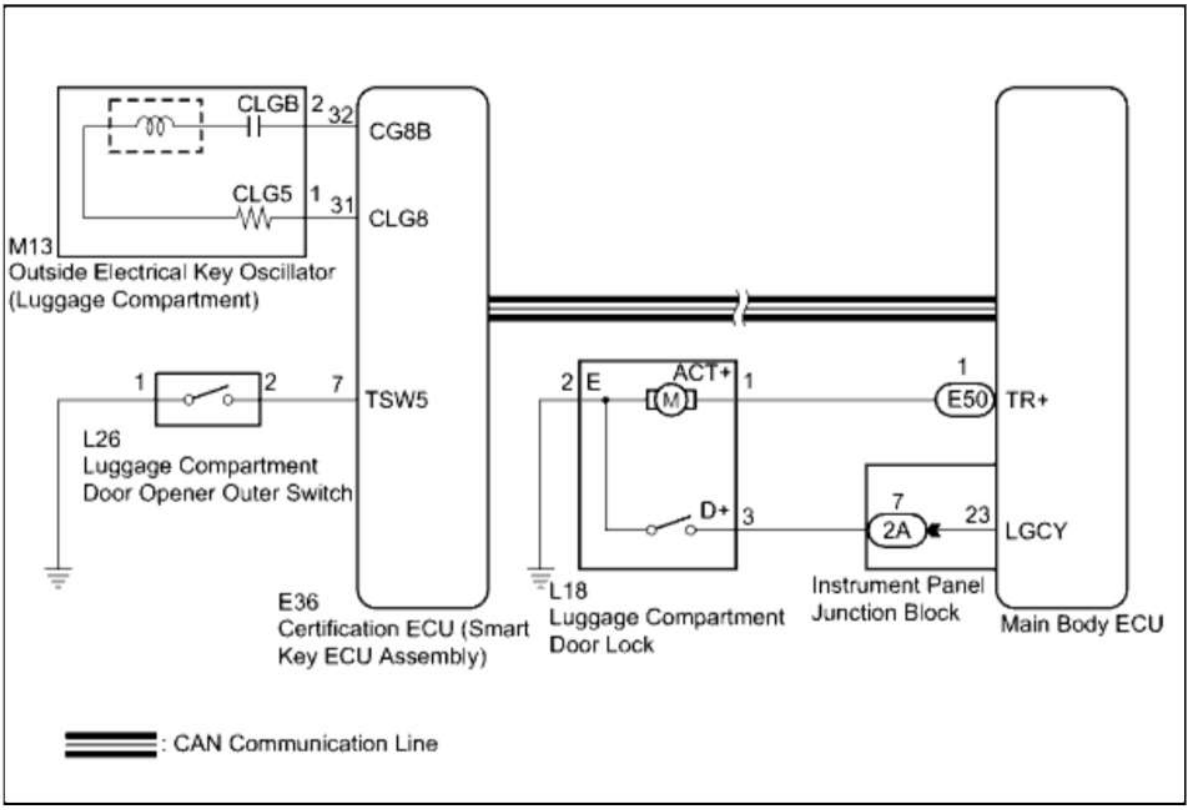
Last Modified: 3-10-2010	6.4 J	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000XUV01JX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Entry Function): Luggage Compartment Door Entry Unlock Function does not Operate when Key is Outside Luggage Compartment (2010 Corolla)		

Luggage Compartment Door Entry Unlock Function does not Operate when Key is Outside Luggage Compartment

DESCRIPTION

When the luggage compartment door entry unlock function does not operate, one of the following may be the cause: 1) luggage compartment door opener outer switch malfunction; 2) communication malfunction between the electrical key antenna and electrical key transmitter; 3) the main body ECU (instrument panel junction block) receives the luggage compartment door opener outer switch ON signal, but is unable to send the signal to the certification ECU (smart key ECU assembly) through CAN communication; or 4) certification ECU (smart key ECU assembly) malfunction.

WIRING DIAGRAM



INSPECTION PROCEDURE

PROCEDURE

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1.	CHECK SMART KEY SYSTEM (Entry Function)

(a) Check that entry lock and unlock functions can be operated at each door.

OK:
Entry lock and unlock functions operate normally.

NG ▶ **GO TO OTHER PROBLEM (PROBLEM SYMPTOMS TABLE)**

OK
▼

2.	READ VALUE USING TECHSTREAM (LUGGAGE COMPARTMENT DOOR OPENER SWITCH)

(a) Connect the Techstream to the DLC3.

(b) Turn the engine 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
Tr/B-Door Unlock SW	Luggage compartment door opener switch / ON or OFF	ON: Luggage compartment door opener outer switch is pushed OFF: Luggage compartment door opener outer switch is not pushed	-

OK:
On the Techstream screen, the item changes between ON and OFF according to above chart.

NG ▶ **INSPECT LUGGAGE COMPARTMENT DOOR OPENER OUTER SWITCH**

OK

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3.	PERFORM ACTIVE TEST USING TECHSTREAM

(a) Connect the Techstream to the DLC3.

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

(c) Turn the Techstream on.

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

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

Main Body (Main Body ECU (Instrument Panel Junction Block))

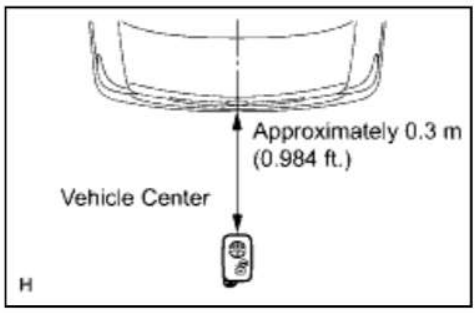
TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Trunk and Back-door Open	Luggage compartment open switch	ON/OFF	-

OK:
Luggage compartment door lock motor operates according to the Techstream operation.

NG ▶ **INSPECT LUGGAGE COMPARTMENT DOOR LOCK ASSEMBLY**

OK

4.	CHECK WAVE ENVIRONMENT



(a) Bring the electrical key transmitter near the outside electrical key oscillator (luggage compartment), and perform an entry luggage compartment open function check.

NOTICE:

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

HINT:

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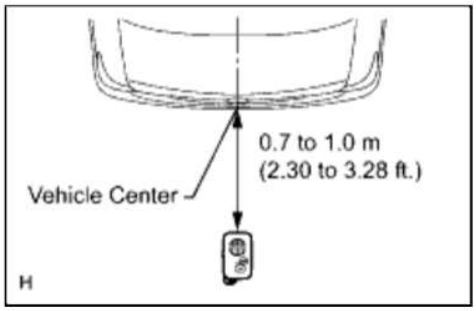
- When the electrical key transmitter is brought near the electrical key antenna, the possibility of wave interference decreases, and it can be determined if wave interference is causing the problem symptom.
- If the operation is normal, the possibility of wave interference is high. Also, added vehicle components may cause wave interference. If installed, remove them and perform the operation check.

OK:
Entry functions operate normally.

NG ▶ **PERFORM KEY DIAGNOSTIC MODE INSPECTION**

OK ▶ **AFFECTED BY WAVE INTERFERENCE**

5.	PERFORM KEY DIAGNOSTIC MODE INSPECTION



(a) Diagnostic mode inspection (outside electrical key oscillator (luggage compartment))

(1) Connect the Techstream to the DLC3.

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

(3) Turn the Techstream on.

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

(5) When the electrical key transmitter is held at the same height as the rear bumper upper surface aligning it with the center of the rear of the vehicle, check that the wireless door lock buzzer sounds.

HINT:

If the buzzer sounds, it can be determined that the luggage compartment exterior transmitter is operating normally.

OK:
Wireless door lock buzzer sounds.

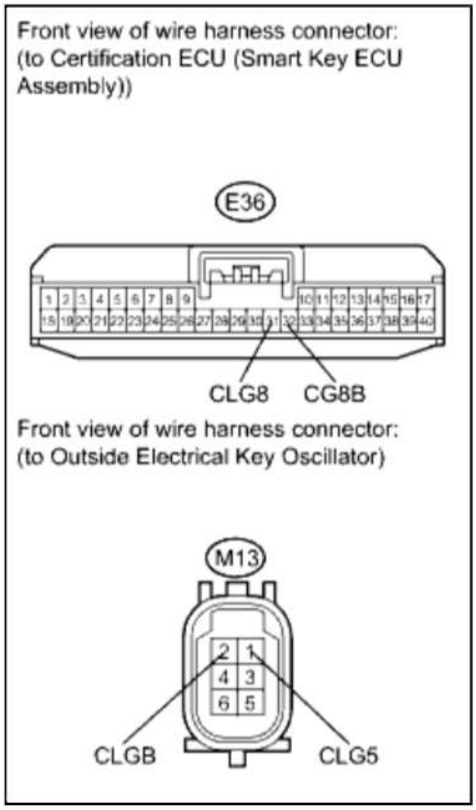
NG ▶ **CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - OUTSIDE ELECTRICAL KEY OSCILLATOR)**

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

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6.	**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 connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E36-32 (CG8B) - M13-2 (CLGB)	Always	Below 1 Ω
E36-31 (CLG8) - M13-1 (CLG5)	Always	Below 1 Ω
E36-32 (CG8B) - Body ground	Always	10 kΩ or higher
E36-31 (CLG8) - Body ground	Always	10 kΩ or higher

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

OK ▼

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7.	REPLACE OUTSIDE ELECTRICAL KEY OSCILLATOR (Luggage Compartment)

(a) Replace the outside electrical key oscillator (luggage compartment) INFO .

NEXT

8.	CHECK OUTSIDE ELECTRICAL KEY OSCILLATOR (OPERATION)

(a) Check that the entry functions operate normally.

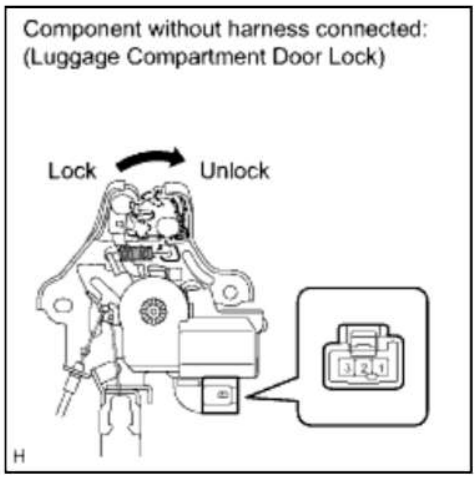
OK:

Entry functions operate normally.

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

OK ▶ **END (OUTSIDE ELECTRICAL KEY OSCILLATOR IS DEFECTIVE)**

9.	INSPECT LUGGAGE COMPARTMENT DOOR LOCK ASSEMBLY



(a) Remove the luggage compartment door lock assembly INFO .

(b) Check the operation of the door lock motor.

(1) Move the door lock to the lock position.

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(2) Apply battery voltage to the door lock motor and check the operation of the door lock motor.

OK:

MEASUREMENT CONDITION	SPECIFIED CONDITION
Battery positive (+) → Terminal 1 Battery negative (-) → Terminal 2	Unlock

(c) Check the operation of the door courtesy switch.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
2 - 3	Unlock	Below 1 Ω
2 - 3	Lock	10 kΩ or higher

NG ▶ **REPLACE LUGGAGE COMPARTMENT DOOR LOCK ASSEMBLY**

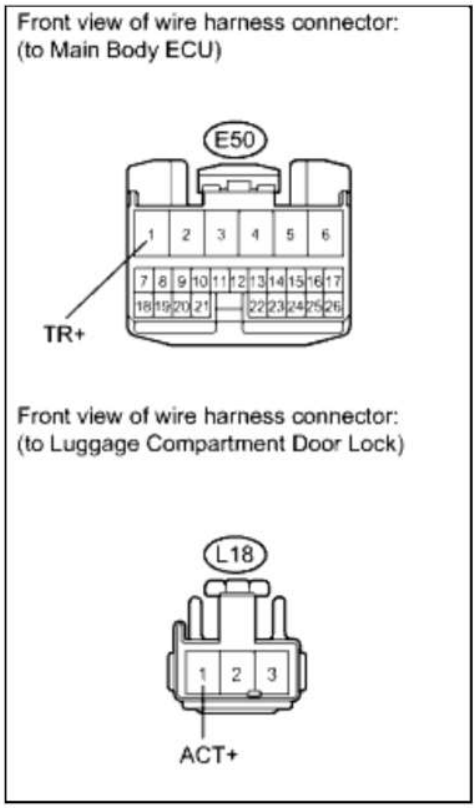
OK ▼

10.	**CHECK HARNESS AND CONNECTOR (MAIN BODY ECU - LUGGAGE COMPARTMENT DOOR LOCK)**

(a) Luggage compartment door lock motor:

(1) Disconnect the main body ECU (instrument panel junction block) connector.

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

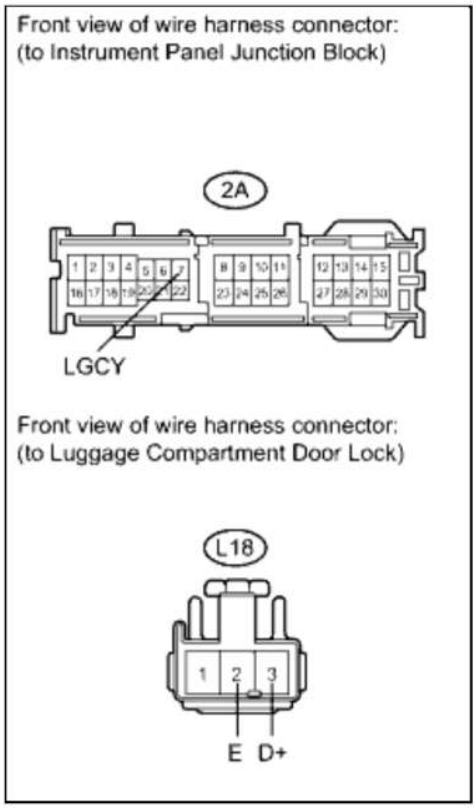
Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E50-1 (TR+) - L18-1 (ACT+)	Always	Below 1 Ω
E50-1 (TR+) - Body ground	Always	10 kΩ or higher

(b) Luggage compartment door courtesy switch:

(1) Disconnect the instrument panel junction block connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
L18-2 (E) - Body ground	Always	Below 1 Ω
2A-7 (LGCY) - L18-3 (D+)	Always	Below 1 Ω
2A-7 (LGCY) - Body ground	Always	10 kΩ or higher

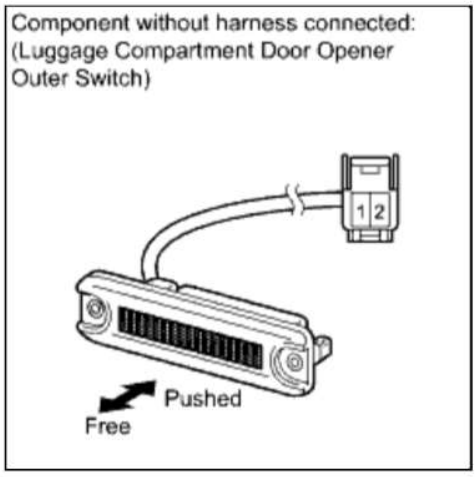
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)**

11.	**INSPECT LUGGAGE COMPARTMENT DOOR OPENER OUTER SWITCH**

(a) Disconnect the luggage compartment door opener outer switch connector.

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

Standard Resistance:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
1 - 2	Luggage compartment door opener outer switch not pushed (OFF)	10 kΩ or higher
1 - 2	Luggage compartment door opener outer switch pushed (ON)	Below 1 Ω

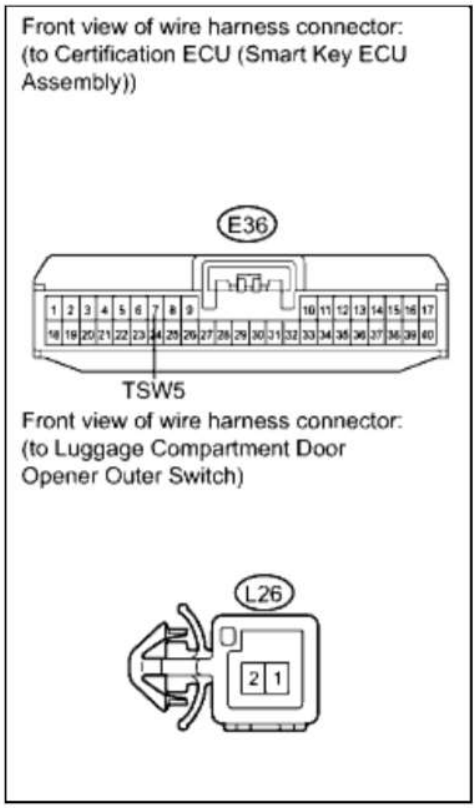
NG ▶ **REPLACE LUGGAGE COMPARTMENT DOOR OPENER OUTER SWITCH**

OK ▼

12.	**CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - LUGGAGE COMPARTMENT DOOR OPENER SWITCH)**

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

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
L26-1 - Body ground	Always	Below 1 Ω
L26-2 - E36-7 (TSW5)	Always	Below 1 Ω
L26-2 - Body ground	Always	10 kΩ or higher

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

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

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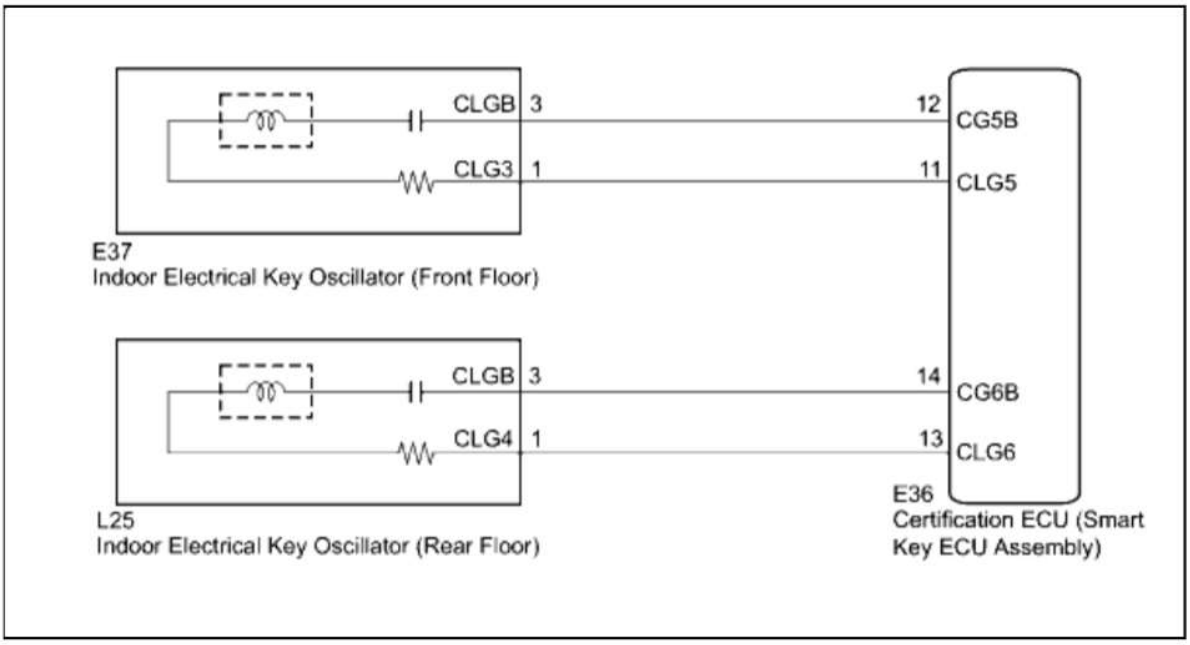
Last Modified: 3-10-2010	6.4 J	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000XUU02KX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Entry Function): Room Oscillator does not Recognize Key (2010 Corolla)		

Room Oscillator does not Recognize Key

DESCRIPTION

If the indoor electrical key oscillator does not recognize a key, either of the following may be the cause: 1) communication between the indoor electrical key oscillator (front floor) and electrical key transmitter cannot be performed; or 2) communication between the indoor electrical key oscillator (rear floor) and electrical key transmitter cannot be performed.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

When using the Techstream to troubleshoot with the engine switch off: Connect the Techstream to the vehicle, 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 (Entry Function)**

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(a) Check that entry lock and unlock functions can be operated at each door.

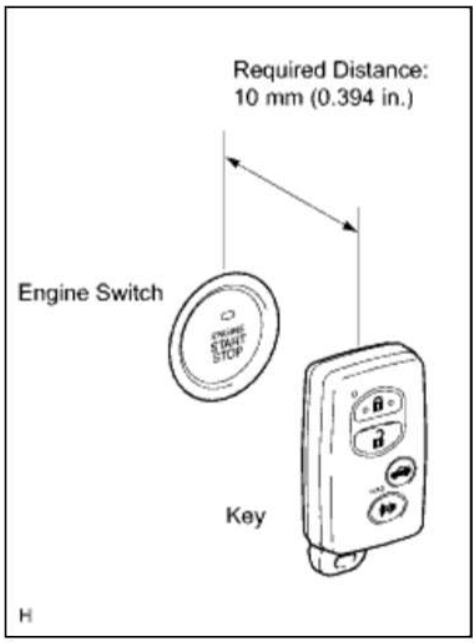
OK:

Entry lock and unlock functions operate normally.

NG ▶ **GO TO OTHER PROBLEM (PROCEED TO PROBLEM SYMPTOMS TABLE FOR EACH DOOR)**

OK ▼

2.	**CHECK SMART KEY SYSTEM (Start Function)**



(a) Remove the battery of the electrical key transmitter INFO .

(b) With the brake pedal depressed, face the logo side of the key to the engine switch.

(c) When operating the engine switch, check whether the power source mode changes.

OK:

Power source mode changes.

HINT:

- When the electrical key transmitter cannot be verified even though it is within the specified range, the engine start check can be performed by removing the transmitter battery from the electrical key transmitter and holding the transmitter against the engine switch.
- When performing the check, if the power source mode changes, there is a problem with key certification inside the cabin.

NG ▶ **GO TO SMART KEY SYSTEM (Power Source Mode**

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does not Change)

OK

3.	CHECK WAVE ENVIRONMENT

(a) Install the battery to the electrical key transmitter.

(b) Bring the electrical key transmitter near the indoor electrical key oscillator (front floor), and check that the engine can be started.

NOTICE:

If the key is brought within 0.2 m (0.656 ft.) of the indoor electrical key oscillator (front floor), communication is not possible.

(c) Bring the electrical key transmitter near the indoor electrical key oscillator (rear floor), and check that the engine can be started.

NOTICE:

If the key is brought within 0.2 m (0.656 ft.) of the indoor electrical key oscillator (rear floor), communication is not possible.

HINT:

- When the electrical key transmitter 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 engine starts.

NG ▶ **PERFORM KEY DIAGNOSTIC MODE INSPECTION**

OK ▶ **AFFECTED BY WAVE INTERFERENCE**

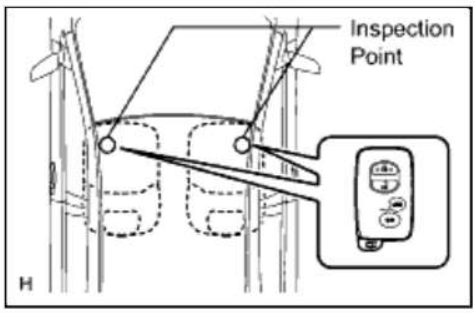
4.	PERFORM KEY DIAGNOSTIC MODE INSPECTION

(a) Diagnostic mode inspection (indoor electrical key oscillator (front floor))

(1) Connect the Techstream to the DLC3.

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

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(3) Turn the Techstream on.

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

(5) When the electrical key transmitter is placed on the driver seat or front passenger seat cushion, check that the wireless door lock buzzer sounds.

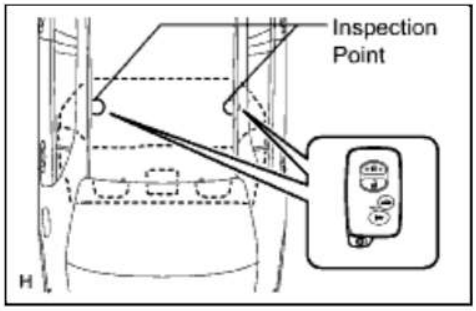
(b) Diagnostic mode inspection (indoor electrical key oscillator (rear floor))

(1) Connect the Techstream to the DLC3.

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

(3) Turn the Techstream on.

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



(5) When the electrical key transmitter is placed on the rear seat cushion, check that the wireless door lock buzzer sounds.

HINT:

If the buzzer sounds, it can be determined that the indoor electrical key oscillators are operating normally.

Result:

RESULT	PROCEED TO
Front and rear operation checks are normal or fail	A
Rear operation check is normal	B
Front operation check is normal	C

B ▶ **CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - INDOOR ELECTRICAL KEY OSCILLATOR)**

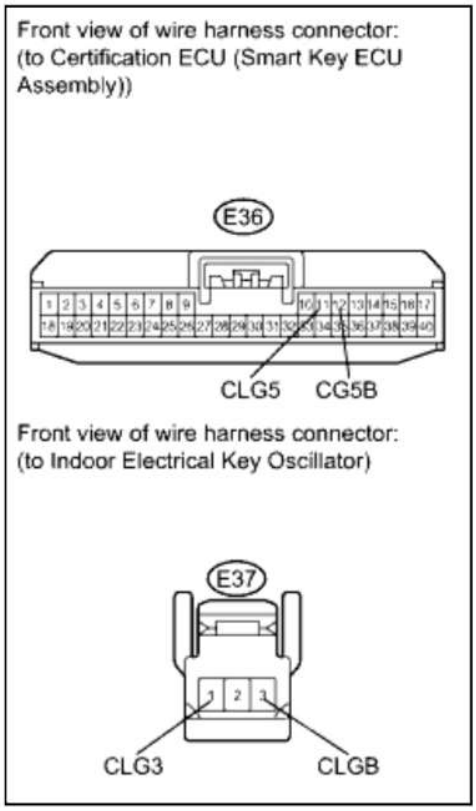
A ▶ **REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)**

C

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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 (front floor) connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E36-11 (CLG5) - E37-1 (CLG3)	Always	Below 1 Ω
E36-12 (CG5B) - E37-3 (CLGB)	Always	Below 1 Ω
E36-11 (CLG5) - Body ground	Always	10 kΩ or higher
E36-12 (CG5B) - Body ground	Always	10 kΩ or higher

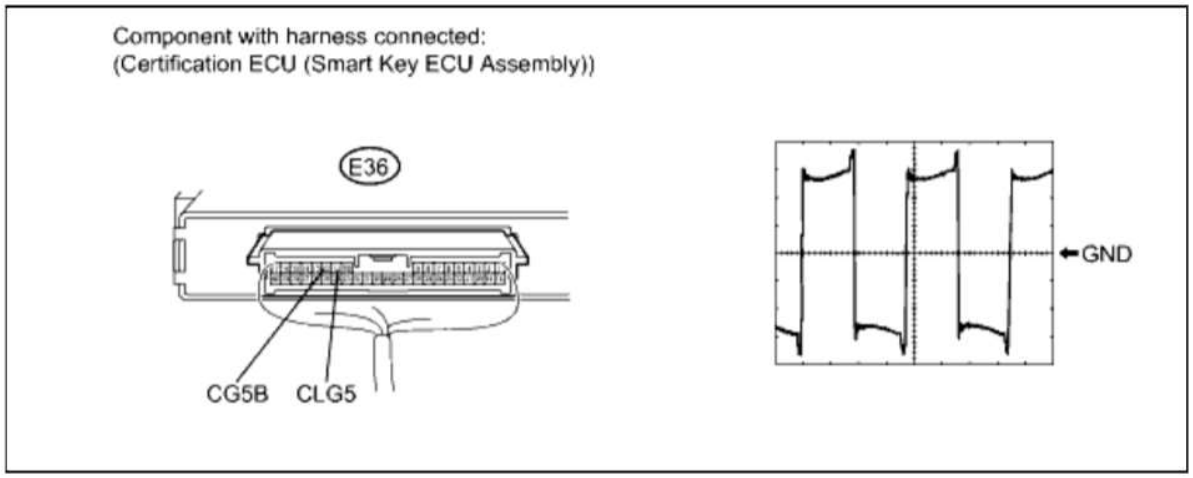
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

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OK

6.	**INSPECT INDOOR ELECTRICAL KEY OSCILLATOR (FRONT FLOOR)**

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



Standard:

TESTER CONNECTION	TOOL SETTING	SWITCH CONDITION	SPECIFIED CONDITION
E36-11 (CLG5) - E36-12 (CG5B)	2 V/DIV, 2 µs/DIV. (Reference)	Engine switch on (IG)	Pulse generation

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

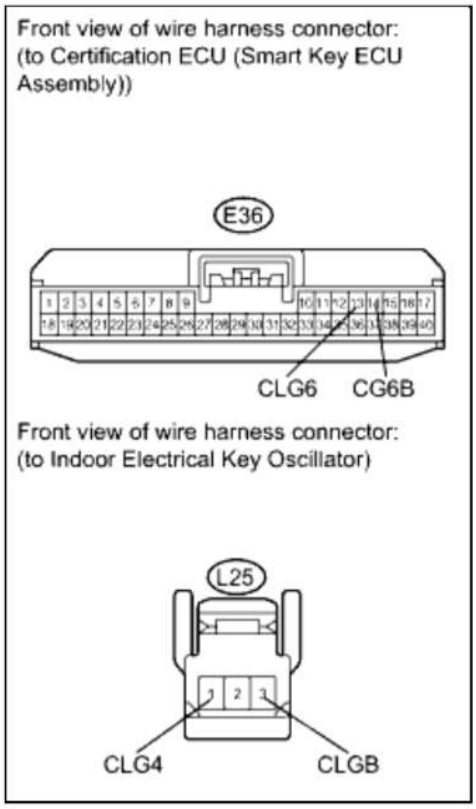
OK ▶ **REPLACE INDOOR ELECTRICAL KEY OSCILLATOR (Front Side)**

7.	**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 (rear

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floor) connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E36-13 (CLG6) - L25-1 (CLG4)	Always	Below 1 Ω
E36-14 (CG6B) - L25-3 (CLGB)	Always	Below 1 Ω
E36-13 (CLG6) - Body ground	Always	10 kΩ or higher
E36-14 (CG6B) - Body ground	Always	10 kΩ or higher

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

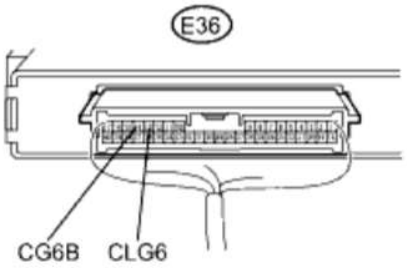
OK ▼

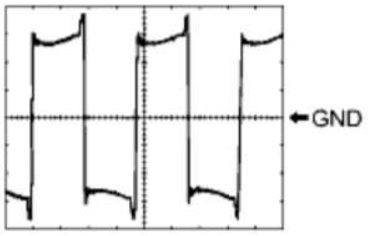
8.	**INSPECT INDOOR ELECTRICAL KEY OSCILLATOR (REAR FLOOR)**

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

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Component with harness connected:
(Certification ECU (Smart Key ECU Assembly))





Standard:

TESTER CONNECTION	TOOL SETTING	SWITCH CONDITION	SPECIFIED CONDITION
E36-13 (CLG6) - E36-14 (CG6B)	2 V/DIV, 2 µs/DIV. (Reference)	Engine switch on (IG)	Pulse generation

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

OK ▶ **REPLACE INDOOR ELECTRICAL KEY OSCILLATOR (Rear Side)**

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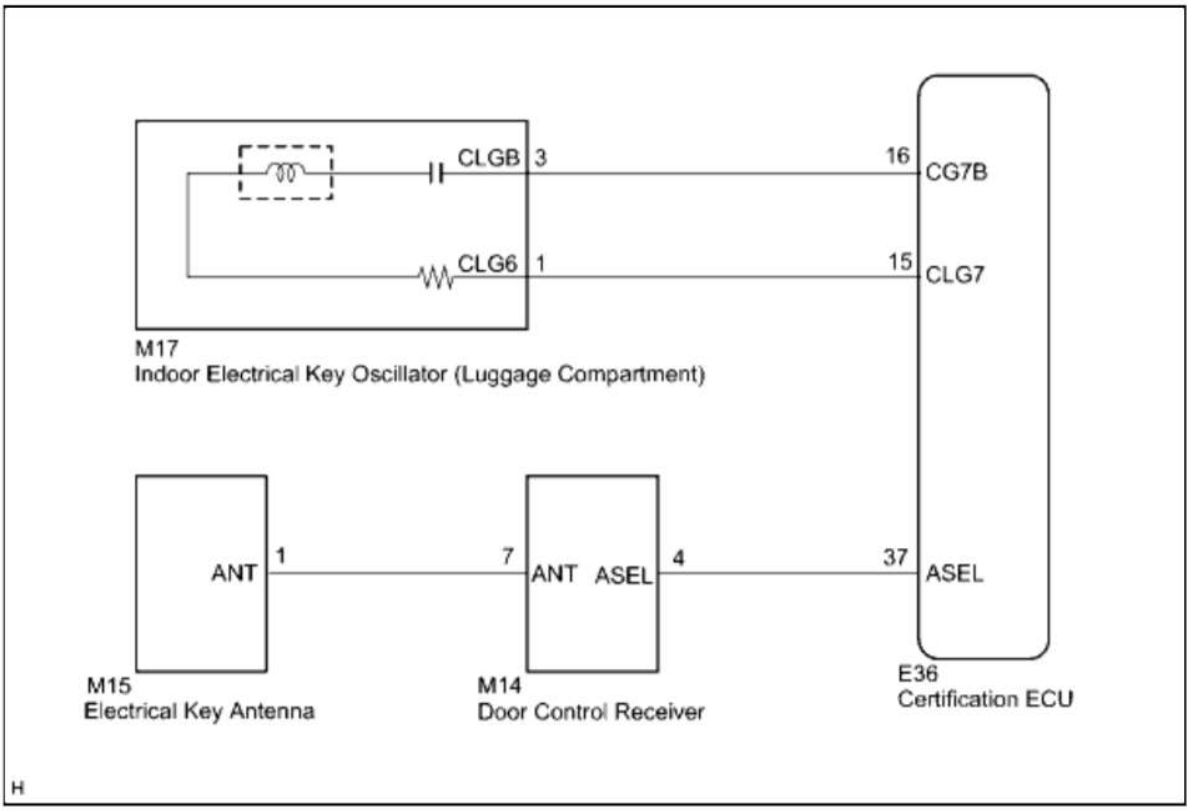
Last Modified: 3-10-2010	6.4 J	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000XUW01OX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Entry Function): Key Luggage Compartment Lock-in Prevention Function does not Operate (2010 Corolla)		

Key Luggage Compartment Lock-in Prevention Function does not Operate

DESCRIPTION

If the key luggage compartment lock-in prevention function does not operate, either of the following may be the cause: 1) communication between the indoor electrical key oscillator (luggage compartment) and electrical key transmitter cannot be performed; or 2) a malfunction in the certification ECU (smart key ECU assembly).

WIRING DIAGRAM



INSPECTION PROCEDURE

PROCEDURE

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1.	CHECK SMART KEY SYSTEM (Entry Function)

(a) Check that the luggage compartment door entry unlock function operates.

Result:

RESULT	PROCEED TO
Luggage compartment door entry unlock function does not operate	A
Luggage compartment door entry unlock function operates	B

A ▶ **GO TO OTHER PROBLEM**

B ▼

2.	CHECK WAVE ENVIRONMENT

(a) Bring the electrical key transmitter near the indoor electrical key oscillator (luggage compartment), and check that the key luggage compartment lock-in prevention function operates.

NOTICE:

If the key is brought within 0.2 m (0.656 ft.) of the indoor electrical key oscillator, communication is not possible.

HINT:

- When the electrical key transmitter is brought near the indoor electrical key oscillator (luggage compartment), 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:

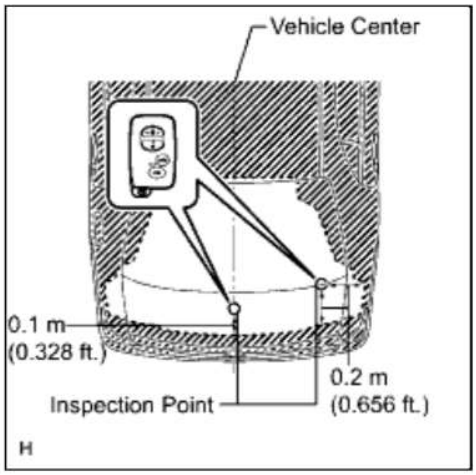
Key lock-in prevention function operates normally.

NG ▶ **PERFORM KEY DIAGNOSTIC MODE INSPECTION**

OK ▶ **AFFECTED BY WAVE INTERFERENCE**

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3.	PERFORM KEY DIAGNOSTIC MODE INSPECTION



(a) Diagnostic mode inspection (indoor electrical key oscillator)

(1) Connect the Techstream to the DLC3.

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

(3) Turn the Techstream on.

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

(5) When the electrical key transmitter is held at the same height as the rear bumper upper surface aligning it with the center of the rear of the vehicle, check that the wireless door lock buzzer sounds.

HINT:

If the buzzer sounds, it can be determined that the luggage compartment interior transmitter is operating normally.

OK:
Wireless door lock buzzer sounds.

NG ▶ **CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - INDOOR ELECTRICAL KEY OSCILLATOR)**

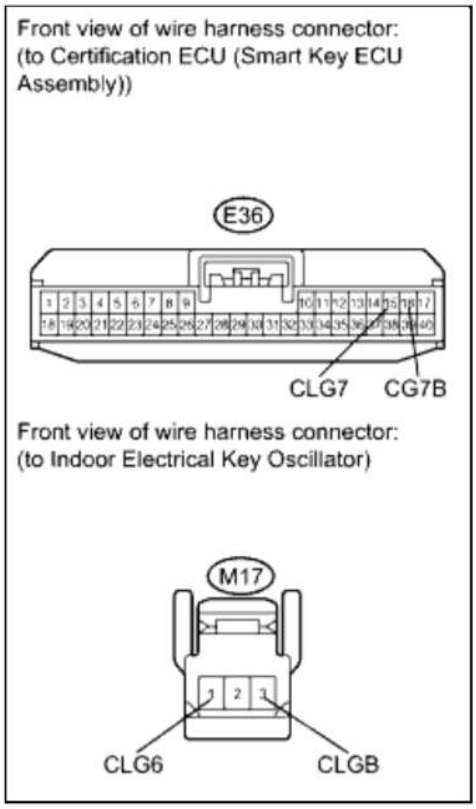
OK ▶ **REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)**

4.	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 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
E36-16 (CG7B) - M17-3 (CLGB)	Always	Below 1 Ω
E36-15 (CLG7) - M17-1 (CLG6)	Always	Below 1 Ω
E36-16 (CG7B) - Body ground	Always	10 kΩ or higher
E36-15 (CLG7) - Body ground	Always	10 kΩ or higher

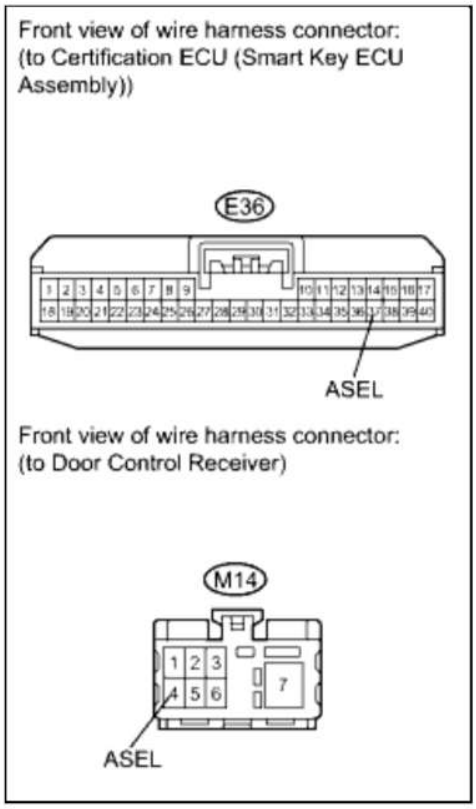
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

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

(a) Disconnect the door control receiver connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E36-37 (ASEL) - M14-4 (ASEL)	Always	Below 1 Ω
E36-37 (ASEL) - Body ground	Always	10 kΩ or higher

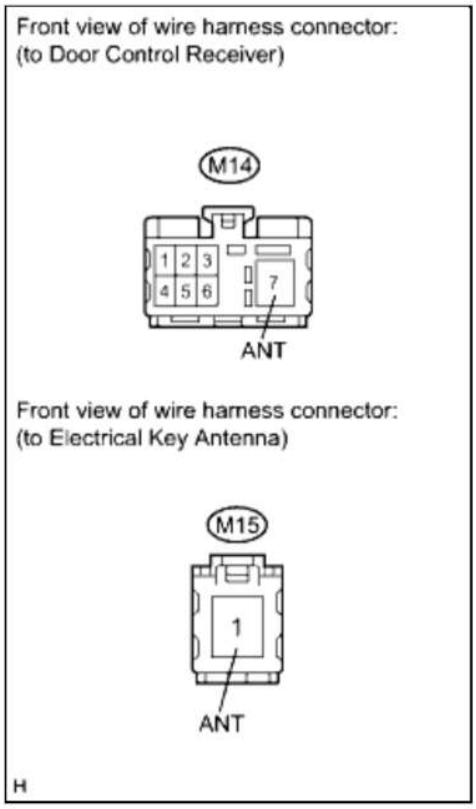
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

6.	**CHECK HARNESS AND CONNECTOR (DOOR CONTROL RECEIVER - ELECTRICAL KEY ANTENNA)**

(a) Disconnect the electrical key antenna connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
M14-7 (ANT) - M15-1 (ANT)	Always	Below 1 Ω
M14-7 (ANT) - Body ground	Always	10 kΩ or higher

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

OK ▼

7.	**REPLACE INDOOR ELECTRICAL KEY OSCILLATOR (Luggage Compartment)**

(a) Replace the indoor electrical key oscillator (luggage compartment) INFO .

NEXT

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8.	CHECK INDOOR ELECTRICAL KEY OSCILLATOR (OPERATION)

(a) Check that the entry functions operate normally.

OK:
Entry functions operate normally.

NG ▶ REPLACE ELECTRICAL KEY ANTENNA

OK ▶ END (INDOOR ELECTRICAL KEY OSCILLATOR IS DEFECTIVE)

9.	REPLACE ELECTRICAL KEY ANTENNA

(a) Replace the indoor electrical key antenna.

NEXT

10.	CHECK ELECTRICAL KEY ANTENNA (OPERATION)

(a) Check that the entry functions operate normally.

OK:
Entry functions operate normally.

NG ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

OK ▶ END (ELECTRICAL KEY ANTENNA IS DEFECTIVE)

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Last Modified: 3-10-2010	6.4 J	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000XUX02CX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Entry Function): Entry Interior Alarm does not Sound (2010 Corolla)		

Entry Interior Alarm does not Sound

DESCRIPTION

The smart key system uses the combination meter buzzer to perform various vehicle interior warnings. When each warning's conditions are met, the certification ECU (smart key ECU assembly) sends a buzzer signal to the meter ECU, and the combination meter buzzer sounds.

INSPECTION PROCEDURE

PROCEDURE

1.	**CHECK COMBINATION METER ASSEMBLY (OPERATION)**

(a) Turn the engine switch on (IG). Place luggage on the front passenger seat to cause the front passenger seat belt warning light to blink.

(b) When driving the vehicle at 15 km/h (9 mph) or higher, check that the seat belt warning buzzer sounds to inform that the passenger seat belt is not fastened.

HINT:

The smart key system sounds the buzzer built into the combination meter for indoor warnings. This buzzer is also used for the seat belt warning system. Therefore, check the operation of the combination meter buzzer by checking if the buzzer sounds to inform that the seat belt is not fastened.

OK:
Combination meter buzzer sounds.

NG ▶ **GO TO METER / GAUGE SYSTEM**

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

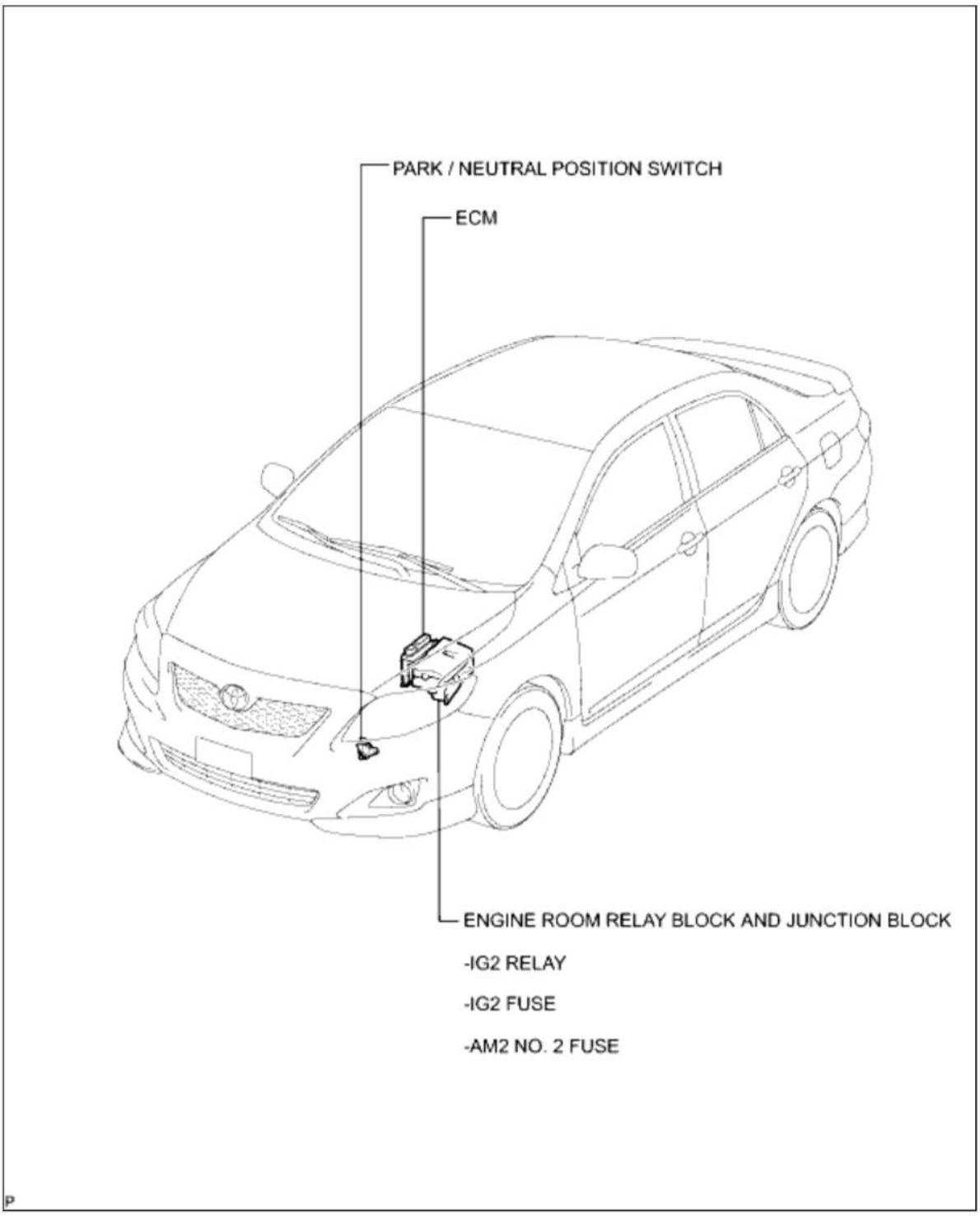
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Last Modified: 3-10-2010	6.4 R	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000YEE041X
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): PARTS LOCATION (2010 Corolla)		

PARTS LOCATION

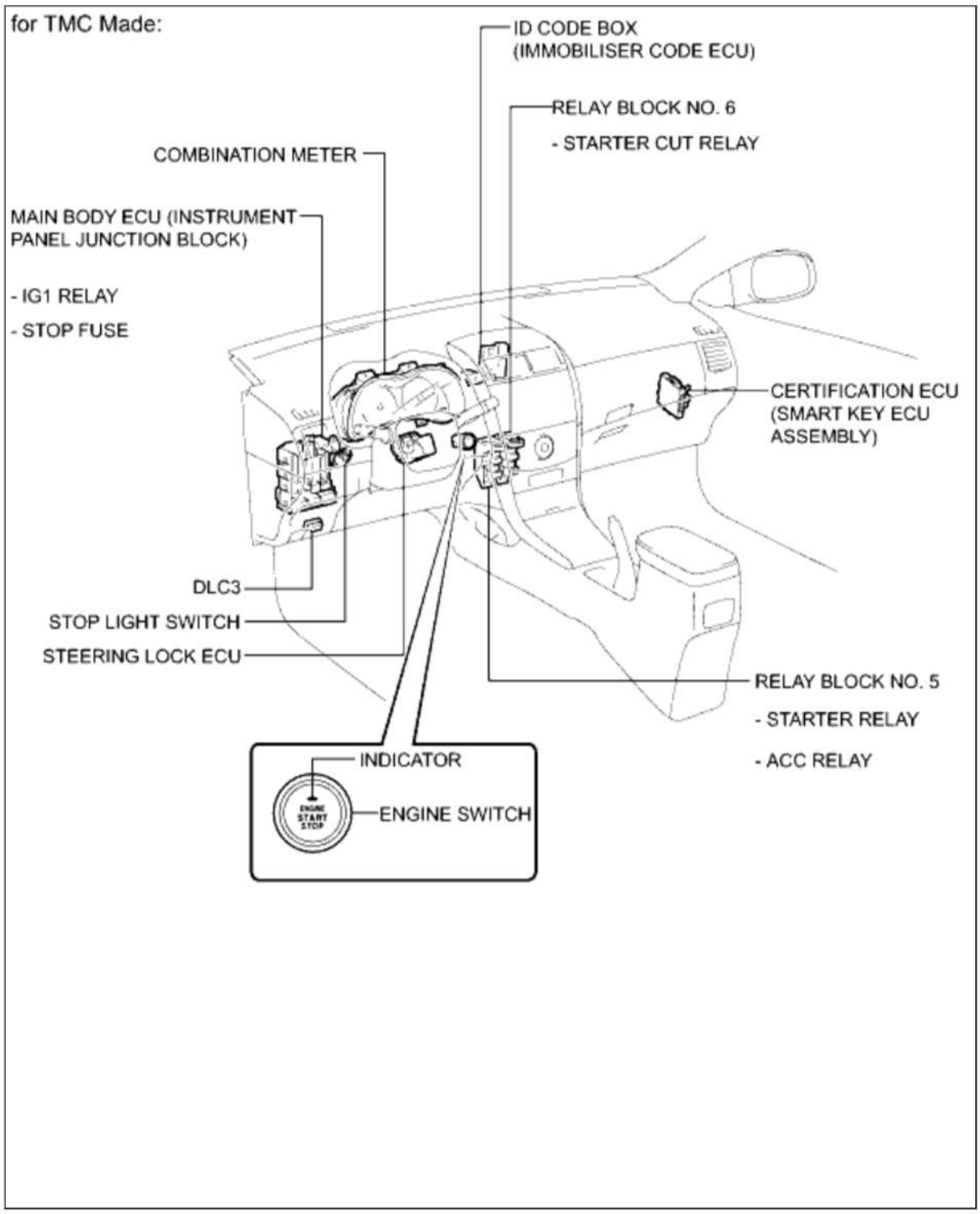
ILLUSTRATION

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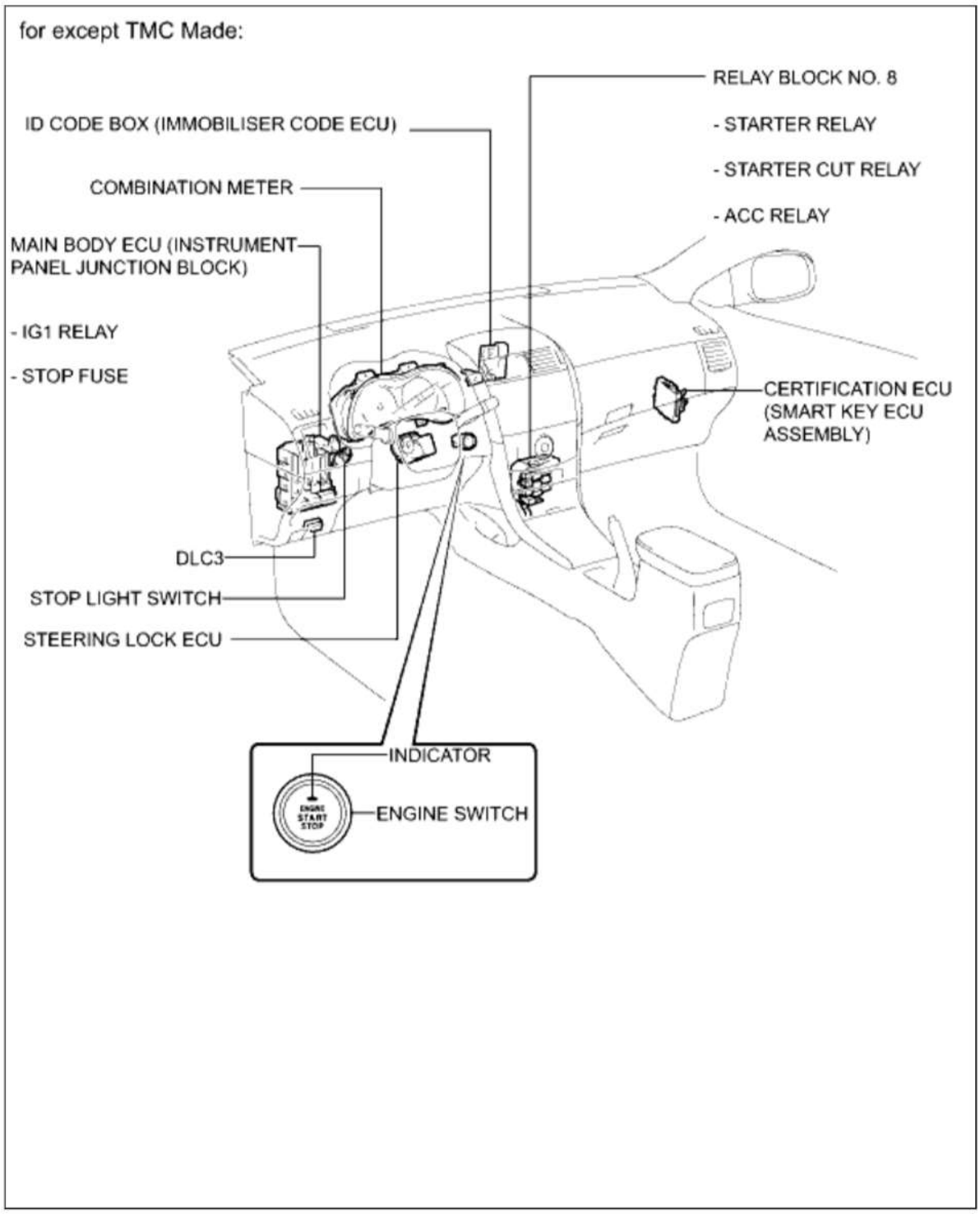
ILLUSTRATION

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ILLUSTRATION

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Last Modified: 3-10-2010	6.4 L	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000YED053X
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): PRECAUTION (2010 Corolla)		

PRECAUTION

1. EMERGENCY ENGINE 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 main body ECU (instrument panel junction block). This may result in the engine not starting even if the engine switch is pressed while the brake pedal is depressed and the shift lever is in the P or N.

To activate the starter:

(1) Turn the engine switch from off to on (ACC).

(2) Press and hold the engine switch for 15 seconds.

2. PRECAUTIONS FOR PUSH-BUTTON START FUNCTION:

(a) Before starting the engine, firmly depress the brake pedal until the indicator in the engine switch turns green.

(b) The power source mode (off, on (ACC), on (IG)) is always retained in memory by the vehicle. If the battery is disconnected, the power source mode that was present before disconnection will be restored after the battery is reconnected. Be sure to turn the engine switch off before disconnecting the cable from the negative battery terminal. Be careful if the power source mode of a vehicle with a discharged battery is not known.

(c) After the battery is reconnected, be sure to wait 10 seconds or more before attempting to start the engine. The engine may not start immediately after the battery is reconnected.

(d) If the electrical key is held near the engine switch to start the engine when the electrical key battery is depleted, the following warnings will sound:

(1) Driver's door open → closed

- An exit warning will sound if 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.

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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000XI304RX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): SYSTEM DESCRIPTION (2010 Corolla)		

SYSTEM DESCRIPTION

1. PUSH-BUTTON START FUNCTION DESCRIPTION

(a) The push-button start function uses a push-type engine switch, which the driver can operate by merely carrying the electrical key. This system consists primarily of the main body ECU (instrument panel junction block), engine switch, ID code box (immobiliser code ECU), steering lock ECU, electrical key, ACC relay, IG1 relay, IG2 relay and certification ECU (smart key ECU assembly). The main body ECU (instrument panel junction block) controls the function. This function operates in cooperation with the smart key system.

2. FUNCTION OF COMPONENT

COMPONENT	FUNCTION
Engine switch • Transponder key amplifier	• Transmits engine switch signal to main body ECU (instrument panel junction block). • Informs driver of power source mode or system abnormality with illumination 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 door control receiver.
Indoor oscillator • Front and rear	Receives request signals from certification ECU (smart key ECU assembly) and forms detection area in vehicle interior.
Steering lock ECU	Receives lock/unlock request signals from certification ECU (smart key ECU assembly) and main body ECU (instrument panel junction block).
Stop light switch	Outputs state of brake pedal to main body ECU (instrument panel junction block).
Door control receiver	Receives ID code from electrical key and transmits it to certification ECU (smart key ECU assembly).
Main body ECU (instrument panel junction block)	• Changes power source mode in 4 stages (off, on (ACC), on (IG), start) 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.
Certification ECU (smart key ECU assembly)	Certifies ID code received from door control receiver and transmits certification results to ID code box (immobiliser code ECU) and steering lock ECU.

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COMPONENT	FUNCTION
ID code box (immobiliser code ECU)	Receives steering unlock or engine immobiliser unset signals from certification ECU (smart key ECU assembly), certifies them, and transmits each unset signal to steering lock ECU or ECM.
ECM	• Receives engine start request signal from main body ECU (instrument panel junction block), turns ON starter relay, and starts engine. • Receives signal from ID code box (immobiliser code ECU) and performs engine ignition and injection.

3. SYSTEM FUNCTION

The electric controls of the push-button start function are described below:

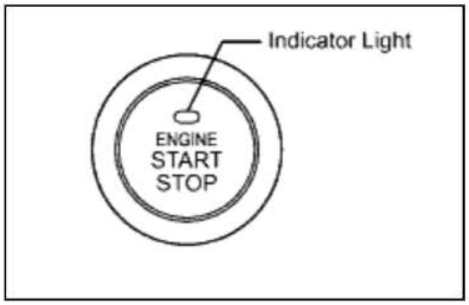
CONTROL	OUTLINE
Engine switch control	When driver operates engine switch with electrical key in driver's possession, certification ECU (smart key ECU assembly) starts indoor oscillator, which transmits request signal to electrical key. Upon receiving this signal, the electrical key transmits ID code matching result signal to main body ECU (instrument panel junction block).
Diagnosis	When main body ECU (instrument panel junction block) detects malfunction, main body ECU (instrument panel junction block) diagnoses and memorizes failed section.

4. CONSTRUCTION AND OPERATION

(a) Engine Switch

The engine switch consists of a momentary type switch, 2 color (amber, green) LEDs, and a transponder key amplifier.

- The amber and green LEDs are for the indicator lights. The driver can check the present power source mode and whether the engine can start in accordance with the illumination state of the indicator light.
- When the main body ECU (instrument panel junction block) detects an abnormality in the push-button start function, it makes the amber indicator light flash. If the engine is stopped in this state, it may not be possible to restart it.



(b) Indicator Light Condition

Engine Switch Indicator Light Condition

POWER SOURCE	INDICATOR LIGHT CONDITION

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MODE/CONDITION		
	BRAKE PEDAL RELEASED	BRAKE PEDAL DEPRESSED, SHIFT LEVER IN P OR N
off	OFF	ON (Green) (When key and vehicle IDs match)
on (ACC, IG)	ON (Amber)	ON (Green)
Engine running	OFF	OFF
Steering lock not unlocked	Flashes (Green) for 15 sec.	Flashes (Green) for 15 sec.
System malfunction	Flashes (Amber) for 15 sec.	Flashes (Amber) for 15 sec.

(c) Main body ECU (instrument panel junction block)

The main body ECU (instrument panel junction block) consists of the IG1 and IG2 relay actuation circuits and CPU.

HINT:

Before removing the battery, make sure to turn the engine switch off. The main body ECU (instrument panel junction block) constantly stores the present power source mode in its memory. Therefore, if the main body ECU (instrument panel junction block) is interrupted by disconnecting the battery, the main body ECU (instrument panel junction block) restores the power source mode after the battery is reconnected. For this reason, if the battery is disconnected when the engine switch is not off, the power will be restored to the vehicle at the same time the power is restored to the main body ECU (instrument panel junction block) (by reconnecting the 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.

BRAKE PEDAL	SHIFT LEVER	POWER SOURCE MODE PATTERN
Depressed	P or N	When the engine switch is pushed once. • off → engine start • on (ACC) → engine start • on (IG) → engine start

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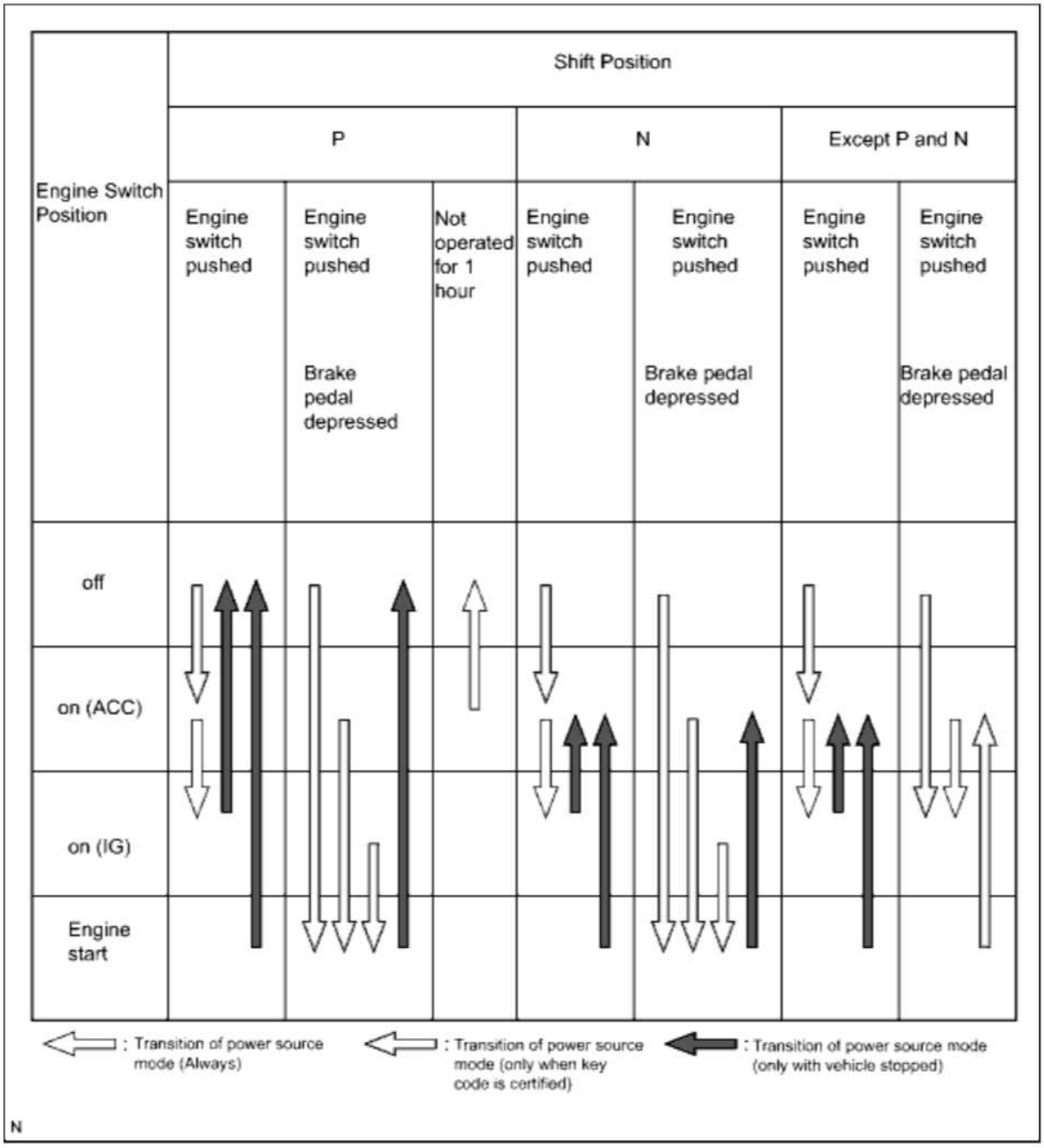
BRAKE PEDAL	SHIFT LEVER	POWER SOURCE MODE PATTERN
Not depressed	P	Each time the engine switch is pushed. • off → on (ACC) → on (IG) → off
	Except P	Each time the engine switch is pushed. • off → on (ACC) → on (IG) → on (ACC)
-	P	When the engine switch is pushed with power source mode on (IG) (engine running). • on (IG) → off
-	Except P	When the engine switch is pushed with power source mode on (IG) (engine running). • on (IG) → on (ACC)

When the battery of the key is low, the push-button start function can be operated by holding the key against the engine switch.

- After approximately 1 hour has passed with the engine switch on (ACC) and the shift position in P, the main body ECU (instrument panel junction block) will automatically cut the power supply (the power source mode changes to off).
- The illustration below shows the transition of power source modes.

Transition of power source mode:

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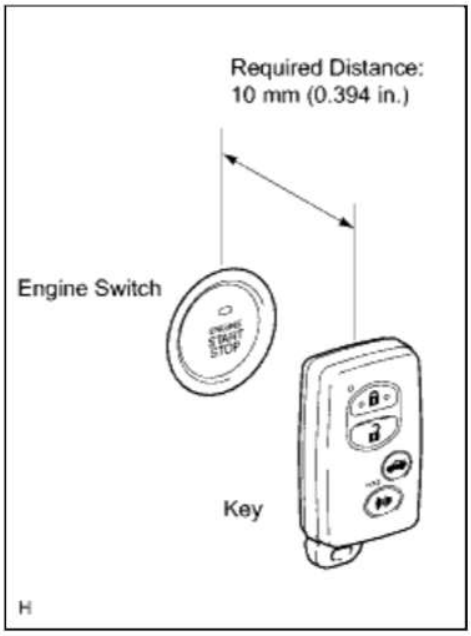
HINT:

While the vehicle is being driven normally, operation of the engine switch is disabled. However, if the engine must be stopped in an emergency while the vehicle is being driven, pressing the engine switch for 3 seconds or more stops the engine. Power source mode changes from start to on (ACC).

6. WHEN KEY BATTERY IS LOW

(a) To operate the push-button start function when the key battery is low, hold the key close to the engine switch with the brake pedal depressed.

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(b) The main body ECU (instrument panel junction block) transmits a key verification request signal to the certification ECU (smart key ECU assembly).

(c) The certification ECU (smart key ECU assembly) does not receive an ID code response from the door control receiver, so it actuates the transponder key amplifier built into the engine 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 main body ECU (instrument panel junction block). The buzzer in the combination meter sounds at the same time.

(h) After the buzzer sounds, if the engine switch is pressed within 5 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.

7. DIAGNOSIS

The main body ECU (instrument panel junction block) can detect malfunctions in the push-button start function when the power source mode is on (IG).

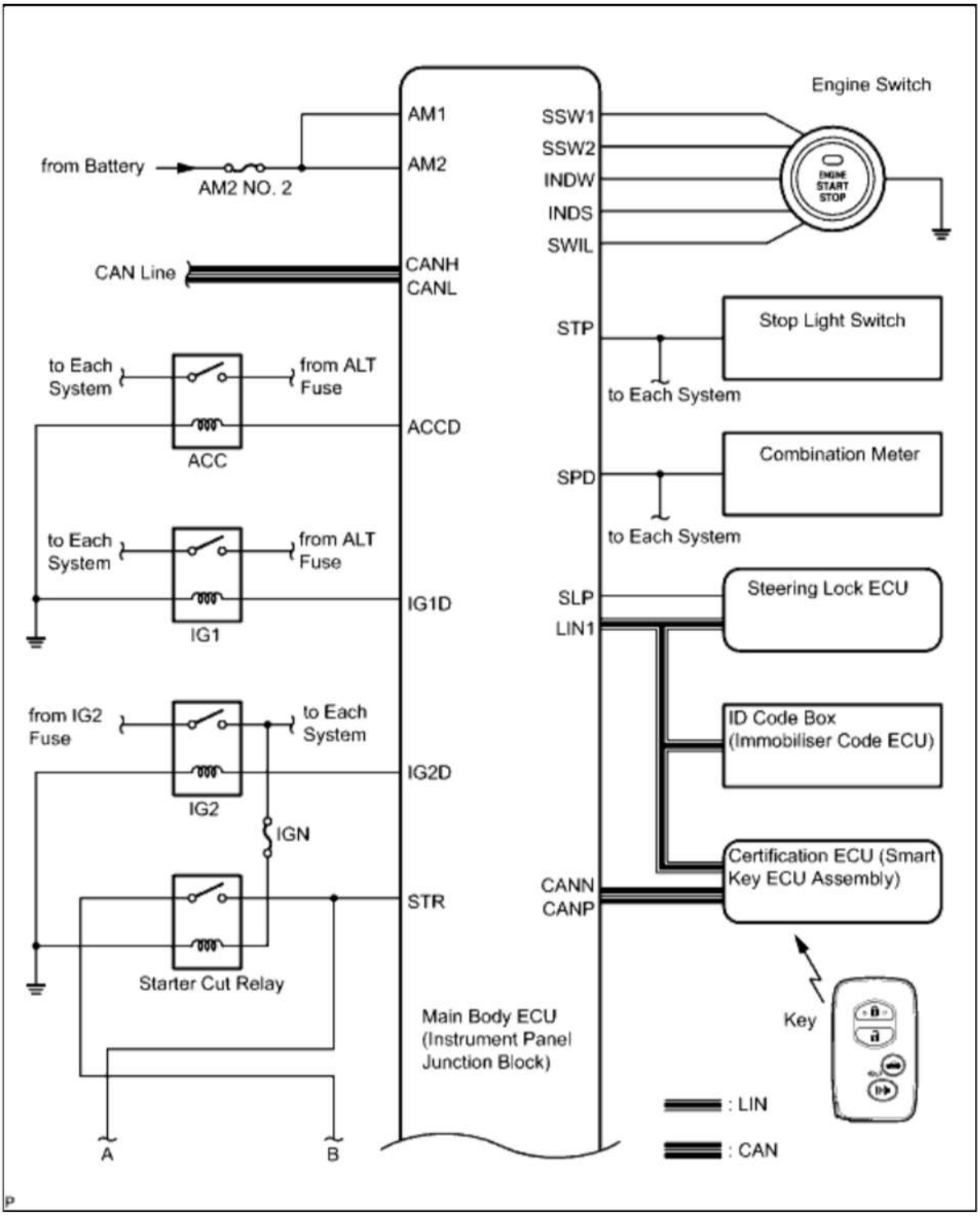
When the ECU detects a malfunction, the amber or green indicator light of the engine switch flashes to warn the driver. At the same time, the ECU stores a 5-digit DTC (Diagnostic Trouble Code) in the memory.

- 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.

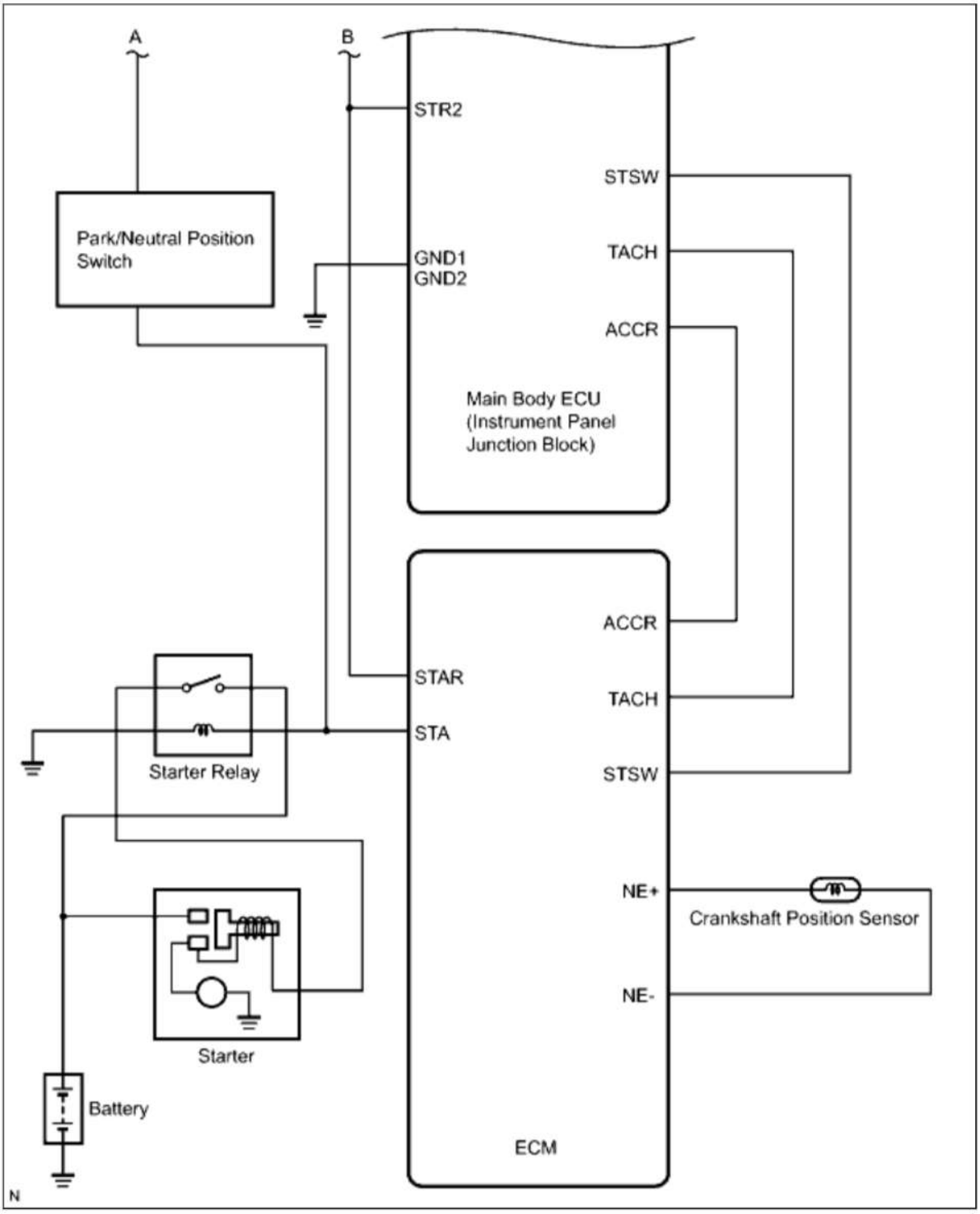
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Last Modified: 3-10-2010	6.4 U	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000XI4045X
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): SYSTEM DIAGRAM (2010 Corolla)		

SYSTEM DIAGRAM



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Communication Table

TRANSMITTING ECU (TRANSMITTER)	RECEIVING ECU (RECEIVER)	SIGNAL	COMMUNICATION METHOD
Combination meter	Main body ECU (instrument panel junction block)	Vehicle speed signal	CAN/Local communication
Steering lock ECU	Main body ECU (instrument panel junction block)	Steering lock/unlock signal	LIN/Local communication

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TRANSMITTING ECU (TRANSMITTER)	RECEIVING ECU (RECEIVER)	SIGNAL	COMMUNICATION METHOD
ECM	Main body ECU (instrument panel junction block)	Starter signal	CAN
		Shift position signal	
		Engine revolution speed signal	CAN/Local communication
Main body ECU (instrument panel junction block)	Certification ECU (smart key ECU assembly)	Engine switch position signal	CAN
		Courtesy light switch signal	
		Wireless door lock buzzer request signal	
Certification ECU (smart key ECU assembly)	Main body ECU (instrument panel junction block)	Illumination light request signal	CAN
Certification ECU (smart key ECU assembly)	Main body ECU (instrument panel junction block)	Light answer back signal	CAN
Certification ECU (smart key ECU assembly)	Combination meter	Meter buzzer single-shot request signal	CAN
		Meter buzzer intermittence request signal	
		Meter buzzer continuation request signal	
		Door open display signal	
		Key loss warning signal	
		Low key battery warning signal	
		Shift position warning signal	
		Steering lock abnormal warning	
		Steering lock unlock warning	

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TRANSMITTING ECU (TRANSMITTER)	RECEIVING ECU (RECEIVER)	SIGNAL	COMMUNICATION METHOD
Combination meter	Certification ECU (smart key ECU assembly) / Main body ECU (instrument panel junction block)	Vehicle speed signal	CAN
Certification ECU (smart key ECU assembly)	Main body ECU (instrument panel junction block)	Key ID matching request signal	LIN
Main body ECU (instrument panel junction block)	Certification ECU (smart key ECU assembly)	ID required signal	LIN



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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000YEF057X
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): HOW TO PROCEED WITH TROUBLESHOOTING (2010 Corolla)		

HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

- Use the following procedures to troubleshoot the push-button 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 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

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3.	INSPECT BATTERY VOLTAGE

Standard voltage:
11 to 14 V

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

NEXT

4.	INSPECT COMMUNICATION FUNCTION OF CAN COMMUNICATION SYSTEM*

(a) Use the Techstream to check if the CAN Communication System is functioning normally INFO .

Result:

RESULT	PROCEED TO
CAN DTC is not output	A
CAN DTC is output	B

B INFO **GO TO CAN COMMUNICATION SYSTEM**

A

5.	CHECK FOR DTC*

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

(b) Clear the DTCs.

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(c) Recheck for DTCs.

Result:

RESULT	PROCEED TO
DTC does not reoccur	A
DTC reoccurs	B

B ▶ INFO **GO TO DIAGNOSTIC TROUBLE CODE CHART**

A

▼

6.	INSPECT BASIC OPERATION

(a) Turn the engine switch on (START) and check that the engine starts normally. Make sure that the brake pedal is depressed and the shift position is P at this time.

(b) Check that the engine switch mode can be changed by pushing the engine switch.

HINT:

Without depressing the brake pedal, push the engine switch repeatedly. Engine switch mode should turn from off to on (ACC) to on (IG) and back to off.

With the brake pedal depressed, push the engine switch repeatedly. Engine switch mode should turn to ENGINE START from any status.

OK:
Engine can start normally.

NEXT

▼

7.	PROBLEM SYMPTOMS TABLE

Result:

RESULT	PROCEED TO
Fault is not listed in the problem symptoms table	A

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RESULT	PROCEED TO
Fault is listed in the problem symptoms table	B

B ▶ **Go to step 9**

A
▼

8.	OVERALL ANALYSIS AND TROUBLESHOOTING*

(a) Terminal of ECU INFO .

(b) Data List/Active Test INFO .

NEXT
▼

9.	REPAIR OR REPLACE

NEXT
▼

10.	CONFIRMATION TEST

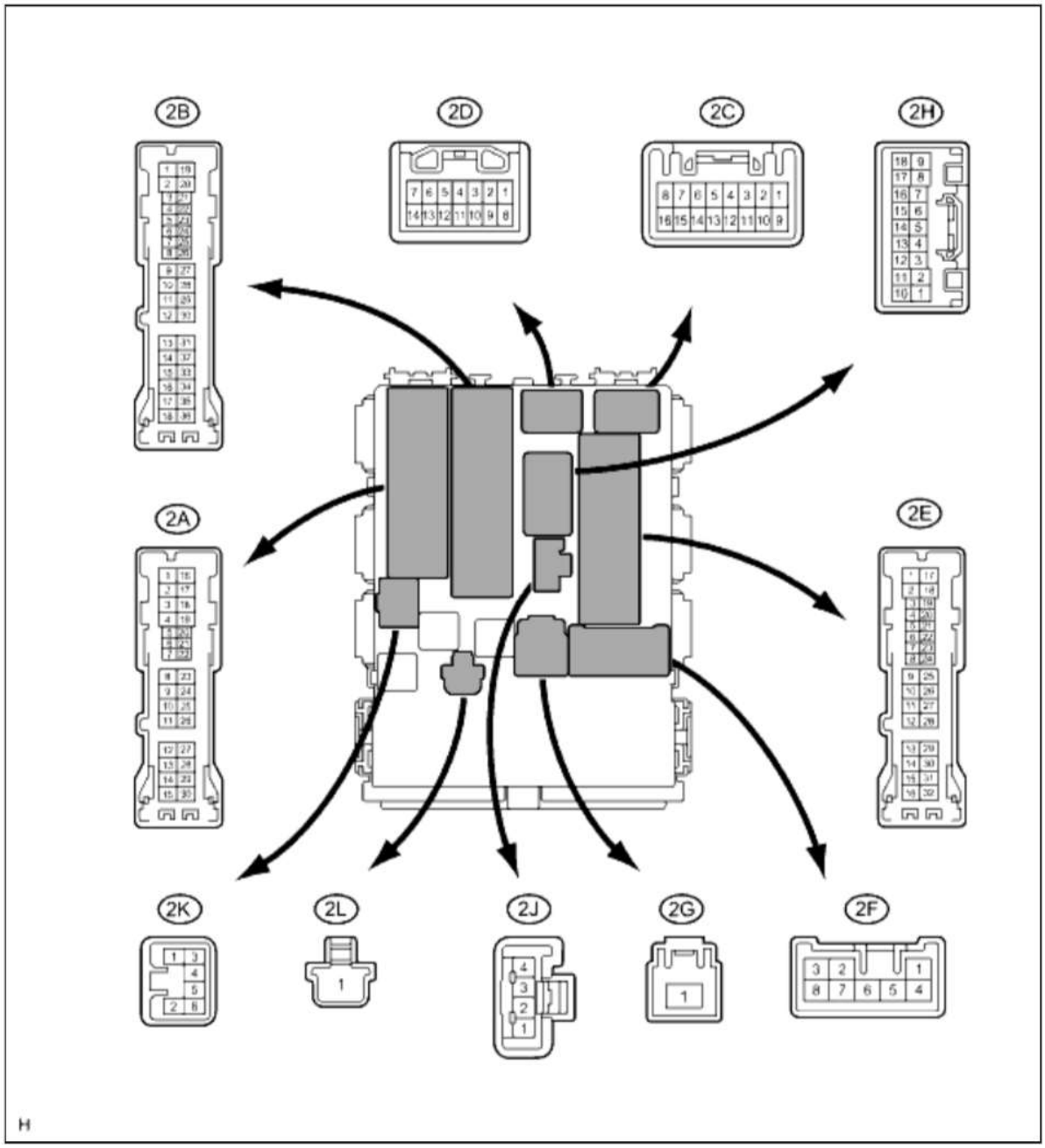
NEXT ▶ **END**

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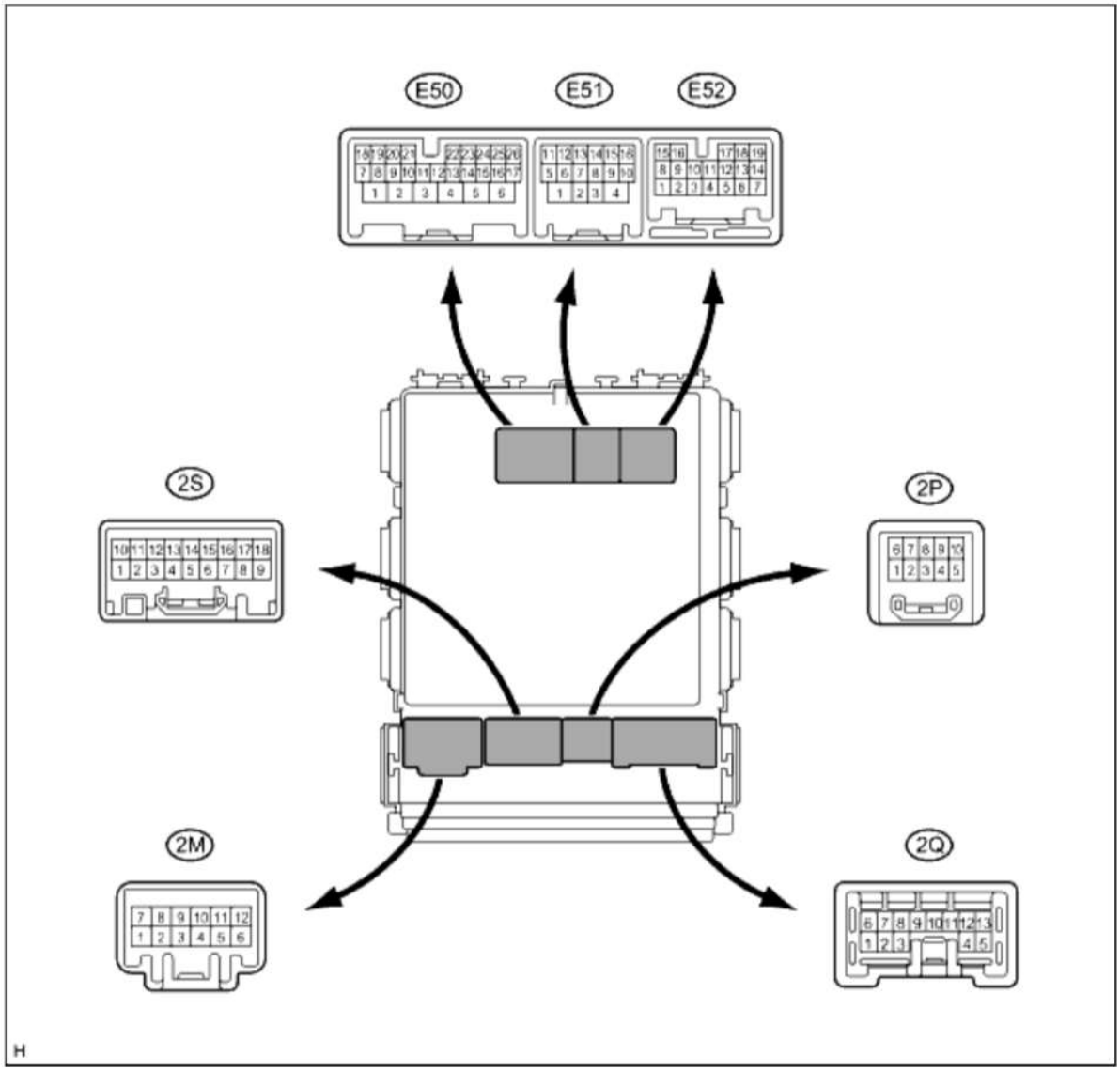
Last Modified: 3-10-2010	6.4 U	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000XI204FX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): TERMINALS OF ECU (2010 Corolla)		

TERMINALS OF ECU

1. CHECK MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)



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(a) Disconnect the E50, E51, E52, 2E and 2C ECU connectors.

(b) Measure the voltage and resistance of the wire harness side connector.

TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
E51-1 (AM1) - Body ground	Y - Body ground*4 L - Body ground*5	+B power supply	Always	11 to 14 V
E50-6 (AM2) - Body ground	W - Body ground*4 L - Body ground*5	+B power supply	Always	11 to 14 V
E51-9 (SSW2) - Body ground	B - Body ground*4 R - Body	Engine switch signal	Engine switch pushed	Below 1 Ω

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TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
	ground*5			
E51-9 (SSW2) - Body ground	B - Body ground*4 R - Body ground*5	Engine switch signal	Engine switch not pushed	10 kΩ or higher
E51-10 (SSW1) - Body ground	W - Body ground	Engine switch signal	Engine switch pushed	Below 1 Ω
E51-10 (SSW1) - Body ground	W - Body ground	Engine switch signal	Engine switch not pushed	10 kΩ or higher
E51-4 (GND2) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
E52-15 (CANH) - Body ground	R - Body ground	CAN Line	Always	10 kΩ or higher
E52-16 (CANL) - Body ground	W - Body ground	CAN Line	Always	10 kΩ or higher
E51-12 (CANN) - Body ground	W - Body ground	CAN Line	Always	10 kΩ or higher
E51-11 (CANP) - Body ground	R - Body ground	CAN Line	Always	10 kΩ or higher
2E-17 (GND1) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
2C-12 (LIN1) - Body ground	V - Body ground	LIN line	Always	10 kΩ or higher

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

(c) Reconnect the ECU connectors.

(d) Measure the voltage of the connector.

TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
E52-11 (ACCR) - E51-4 (GND2)	P - W-B	Starter assist signal (ACC cut signal)	Brake pedal depressed, shift lever P, engine switch is pushed once → on (IG)	0.1 to 0.8 V*1 → Output voltage at terminal AM1 or AM2 is -2 V or more.
E51-5 (IG2D) - E51-4 (GND2)	GR - W-B*4 BR - W-B*5	IG2 signal	Engine switch on (IG)	Output voltage at terminal AM1 or AM2 is -2 V or more.

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TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
E51-5 (IG2D) - E51-4 (GND2)	GR - W-B*4 BR - W-B*5	IG2 signal	Engine switch on (ACC)	Below 1 V
E51-6 (IG1D) - E51-4 (GND2)	W - W-B*4 G - W-B*5	IG1 signal	Engine switch on (IG)	Output voltage at terminal AM1 or AM2 is -2 V or more.
E51-6 (IG1D) - E51-4 (GND2)	W - W-B*4 G - W-B*5	IG1 signal	Engine switch on (ACC)	Below 1 V
E52-3 (STR) - E51-4 (GND2)	BR - W-B*4 W - W-B*5	Park/Neutral position switch signal	Engine switch on (IG), shift lever except P or N → P or N	Below 2 V → Pulse generation*3
E50-18 (SLP) - E51-4 (GND2)	G - W-B*4 BR - W-B*5	Steering lock actuator position signal	Steering lock is locked	Pulse generation (See waveform 3)
E50-18 (SLP) - E51-4 (GND2)	G - W-B*4 BR - W-B*5	Steering lock actuator position signal	Steering lock is released	Pulse generation (See waveform 3)
E50-7 (SLR+) - E51-4 (GND2)	P - W-B*4 LG - W-B*5	Steering lock motor signal	Steering lock motor operating	Below 1 V
E50-7 (SLR+) - E51-4 (GND2)	P - W-B*4 LG - W-B*5	Steering lock motor signal	Steering lock motor does not operate	Output voltage at terminal AM1 or AM2 is -2 V or more.
E50-4 (ACCD) - E51-4 (GND2)	GR - W-B	ACC signal	Engine switch on (ACC)	Output voltage at terminal AM1 or AM2 is -2 V or more.
E50-4 (ACCD) - E51-4 (GND2)	GR - W-B	ACC signal	Engine switch off	Below 1 V
E51-8 (SWIL) - E51-4 (GND2)	G - W-B*4 L - W-B*5	Illumination signal	Light control switch TAIL or HEAD	Output voltage at terminal AM1 or AM2 is -2 V or more.
E52-2 (TACH) - E51-4 (GND2)	GR - W-B	Tachometer signal	Engine running	Pulse generation (See waveform 2)
2C-8 (SPD) - E51-4 (GND2)	V - W-B	Vehicle speed signal	Engine switch on (IG), rotate rear wheel slowly	Pulse generation (See waveform 1)
E52-4 (STSW) - E51-4 (GND2)	W - W-B*4 B - W-B*5	Starter activation request signal	Brake pedal depressed, engine switch held on (ST)	Output voltage at terminal AM1 or AM2 is -2 V or more.

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TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
E52-14 (STR2) - E51-4 (GND2)	W - W-B*4 Y - W-B*5	Starter signal (Sub)	Brake pedal depressed, shift lever P or N, engine switch on (ST)	Output voltage at terminal AM1 or AM2 is -3.5 V or more.*2
2F-5 (ACC) - Body ground	W - Body ground*4 L - Body ground*5	ACC power supply	Always	11 to 14 V
2G-1 (IG) - Body ground	W - Body ground	IG power supply	Always	11 to 14 V
E50-14 (STP) - E51-4 (GND2)	L - W-B	Stop light signal	Brake pedal depressed	Output voltage at terminal AM1 or AM2 is -2 V or more.
E50-14 (STP) - E51-4 (GND2)	L - W-B	Stop light signal	Brake pedal released	Below 1 V

HINT:

***1: Voltage is output only when the engine is cranking.**

***2: Voltage is output for 0.3 seconds when the engine is cranking to start. Disconnect the B31 connector from the ECM and starter cut relay before measuring the voltage.**

***3: Remove the starter cut relay before measuring the voltage.**

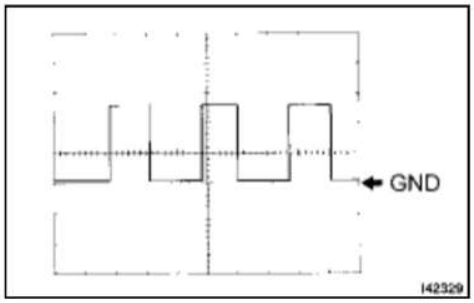
***4: for TMC Made**

***5: for except TMC Made**

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



Waveform 1 (Reference)

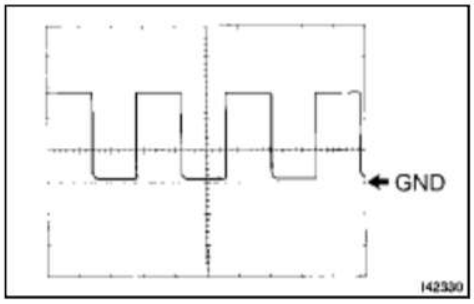
Terminal No.	2C-8 (SPD) - E51-4 (GND2)
Tool Setting	5 V/DIV., 10 ms./DIV.
Vehicle Condition	Driving at approx. 20 km/h (12 mph)

HINT:

As the vehicle speed increases, the wavelength shortens.

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(2) Waveform 2



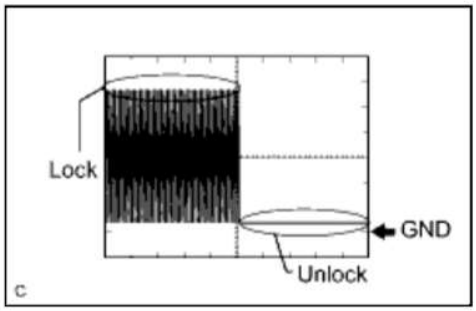
Waveform 2 (Reference)

Terminal No.	E52-2 (TACH) - E51-4 (GND2)
Tool Setting	5 V/DIV., 10 ms./DIV.
Vehicle Condition	Engine idling

HINT:

As the engine revolution speed increases, the wavelength shortens.

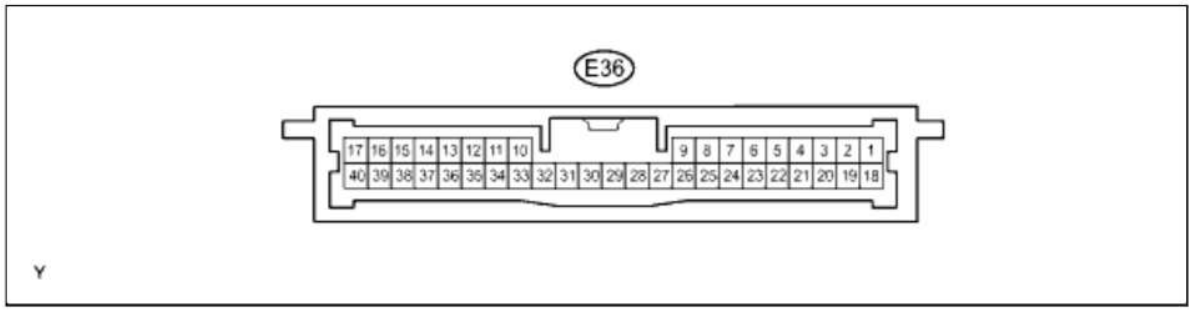
(3) Waveform 3



Waveform 3 (Reference)

Terminal No.	E50-18 (SLP) - E51-4 (GND2)
Tool Setting	2 V/DIV., 100 ms./DIV.
Vehicle Condition	Steering lock/unlock

2. CHECK CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)



(a) Disconnect the E36 ECU connector.

(b) Measure the voltage and resistance of the wire harness side connector.

TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
E36-1 (+B) - Body ground	W - Body ground*1 BR - Body ground*2	+B power supply	Always	11 to 14 V

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TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
E36-10 (LIN) - Body ground	V - Body ground	LIN line	Always	10 kΩ or higher
E36-17 (E) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω

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

(c) Reconnect the ECU connector.

(d) Measure the voltage of the connector.

TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
E36-18 (IG) - Body ground	L - Body ground*1 B - Body ground*2	Ignition power supply	Engine switch on (IG)	11 to 14 V
E36-18 (IG) - Body ground	L - Body ground*1 B - Body ground*2	Ignition power supply	Engine switch off	Below 1 V

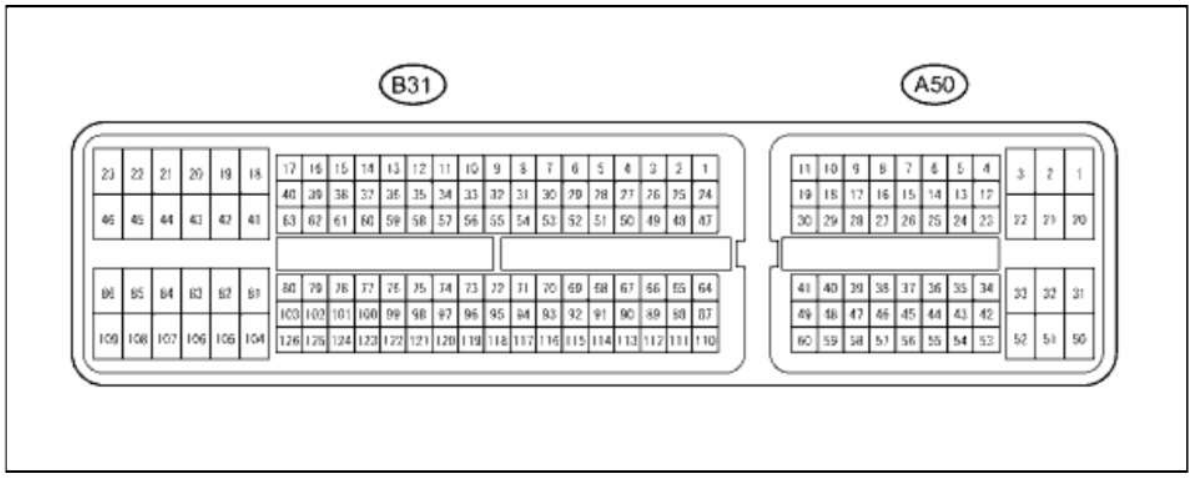
HINT:

***1: for TMC Made**

***2: for except TMC Made**

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

3. CHECK ECM



(a) Disconnect the B31 and A50 ECM connectors.

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(b) Measure the voltage and resistance of the wire harness side connectors.

TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
A50-1 (+B2) - Body ground	B - Body ground	Power source of ECM	Engine switch on (IG)	11 to 14 V
A50-2 (+B) - Body ground	B - Body ground	Power source of ECM	Engine switch on (IG)	11 to 14 V
A50-28 (IGSW) - Body ground	B - Body ground	Engine switch signal	Engine switch on (IG)	11 to 14 V
B31-43 (ME01) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
B31-44 (E02) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
B31-45 (E01) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
B31-46 (E04) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
A50-32 (EC) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
B31-104 (E1) - Body ground	BR - Body ground	Ground	Always	Below 1 Ω
B31-86 (E03) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω

(c) Reconnect the ECM connectors.

(d) Measure the voltage of the connectors.

TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
A50-13 (ACCR) - B31-104 (E1)	L-Y - BR	ACC relay cut signal (output)	Brake pedal depressed, shift lever P or N, engine switch is pushed once → on (IG)	0.1 to 0.8 V* → Output voltage at terminal AM1 or AM2 is -2 V or more.
A50-14 (STSW) - B31-104 (E1)	W-G - BR	Starter activation request signal	Brake pedal depressed, engine switch held (IG)	Output voltage at terminal AM1 or AM2 is -2 V or more.
A50-15 (TACH) - B31-104 (E1)	GR - BR	Engine revolution signal (output)	Idling	Pulse generation (see waveform 1)
A50-36 (STP) - B31-104 (E1)	L - BR	Stop light switch signal (input)	Brake pedal depressed	7.5 to 14 V

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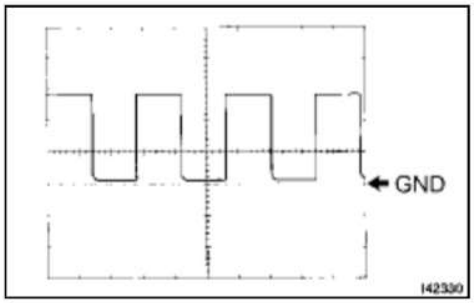
TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
A50-36 (STP) - B31-104 (E1)	L - BR	Stop light switch signal (input)	Brake pedal released	Below 1.5 V
A50-48 (STA) - B31-104 (E1)	LG - BR	Starter relay operation signal	Cranking	11 to 14 V
B31-52 (STAR) - B31-104 (E1)	W - BR	Starter signal (Main)	Brake pedal depressed, shift lever P or N, engine switch on (ST)	11 to 14 V

HINT:

***: Voltage is output only when the engine is cranking.**

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

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



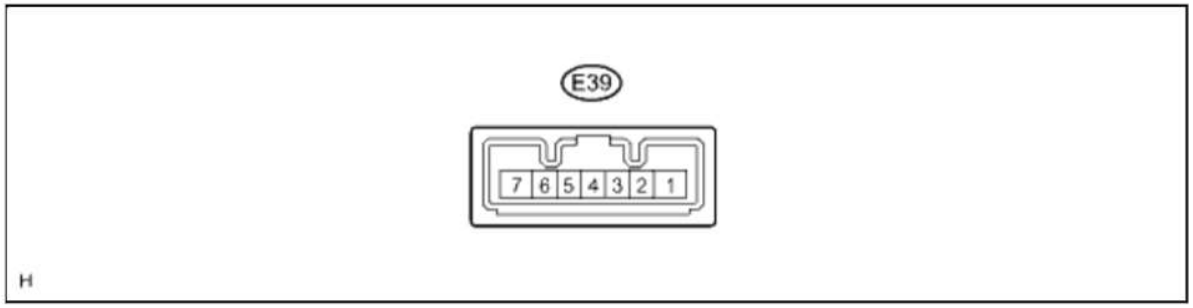
Waveform 1 (Reference)

Terminal No.	A50-15 (TACH) - B31-104 (E1)
Tool Setting	5 V/DIV., 10 ms./DIV.
Vehicle Condition	Engine idling

HINT:

As the vehicle speed increases, the wavelength shortens.

4. CHECK STEERING LOCK ECU



(a) Disconnect the E39 ECU connector.

(b) Measure the voltage and resistance of the wire harness side connector.

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TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
E39-1 (GND) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
E39-2 (SGND) - Body ground	BR - Body ground*1 W-B - Body ground*2	Ground	Always	Below 1 Ω
E39-6 (IG2) - Body ground	B - Body ground	Ignition power supply	Engine switch on (IG)	11 to 14 V
E39-6 (IG2) - Body ground	B - Body ground	Ignition power supply	Engine switch off	Below 1 V
E39-7 (B) - Body ground	L - Body ground	+B power supply	Always	11 to 14 V

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

(c) Reconnect the E39 ECU connector.

(d) Measure the voltage of the connector.

TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
E39-4 (SLP1) - E39-1 (GND)	G - W-B*1 BR - W-B*2	Steering lock actuator position signal	Steering is locked	11 to 14 V
E39-4 (SLP1) - E39-1 (GND)	G - W-B*1 BR - W-B*2	Steering lock actuator position signal	Steering is released	Below 1 V

- If the result is not as specified, the ECU may have a malfunction.

HINT:

***1: for TMC Made**

***2: for except TMC Made**

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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000367300QX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): CUSTOMIZE PARAMETERS (2010 Corolla)		

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.

HINT:

The following functions' default settings are ON. Part of these functions can be customized.

Smart Key / Access

DISPLAY (ITEM)	DEFAULT	CONTENT	SETTING
Ignition Available Area (Entry ignition available area)	All	Function to choose the available area for electrical key to start E/G and cancel the steering lock.	Front / All

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Last Modified: 3-10-2010	6.4 T	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000XI605ZX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): PROBLEM SYMPTOMS TABLE (2010 Corolla)		

PROBLEM SYMPTOMS TABLE

HINT:

- Use the table below to help determine the cause of problem symptom. 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 the system before inspecting the suspected areas below.

Smart Key System

SYMPTOM	SUSPECTED AREA	SEE PAGE
Power source mode does not change.	AM2 NO. 2 fuse	INFO
	IG1 relay	-
	IG2 relay	-
	Engine switch	-
	Wire harness or connector	-
	Smart key system (entry function)	-
	Main body ECU (instrument panel junction block)	-
	Certification ECU (smart key ECU assembly)	-
	ID code box (immobiliser code ECU)	-
	Steering lock ECU	-
Engine does not start.	Smart key system (entry function)	INFO
	Engine switch	-
	Park/Neutral position switch	-
	STOP fuse	-
	Stop light switch	-
	Electrical steering lock function	-
	Starter cut relay	-
	Starter relay	-
	ECM	-
	Engine immobiliser system	-

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SYMPTOM	SUSPECTED AREA	SEE PAGE
	Main body ECU (instrument panel junction block)	-
	Wire harness or connector	-
Engine switch indicator light does not come on.	Engine switch indicator light circuit	INFO

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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000YEG04QX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): DIAGNOSIS SYSTEM (2010 Corolla)		

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 BATTERY VOLTAGE

Standard voltage:
11 to 14 V

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



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Last Modified: 3-10-2010	6.4 U	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000XI504UX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): DATA LIST / ACTIVE TEST (2010 Corolla)		

DATA LIST / ACTIVE TEST

1. READ 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.

(a) Connect the Techstream to the DLC3.

When using the Techstream with the engine switch off, turn on and off any of the door courtesy light switches repeatedly at 1.5 or less second intervals until communication between the tester and vehicle starts.

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

(c) Read the Data List according to the displays on the Techstream.

Main Body

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
ACC SW	Engine switch on (ACC) / ON or OFF	ON: Engine switch on (ACC) OFF: Engine switch off	-
IG SW	Engine switch on (IG) / ON or OFF	ON: Engine switch on (IG) OFF: Engine switch off	-
Stop Light SW	Stop light switch / ON or OFF	ON: Brake pedal depressed OFF: Brake pedal released	-
Start Switch 1	Start switch 1 / ON or OFF	ON: Engine switch is pushed OFF: Engine switch is not pushed	-
Start Switch 2	Start switch 2 / ON or OFF	ON: Engine switch is pushed OFF: Engine switch is not pushed	-

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TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Steering Unlock Switch	Steering lock condition / ON or OFF	ON: Steering is unlocked (Engine switch on (ACC)) OFF: Steering is locked (Engine switch off)	-
Neutral SW / Clutch SW	Park/Neutral position switch / ON or OFF	ON: Shift position is N OFF: Shift position is except N	-
Shift P Signal	Shift P position signal / ON or OFF	ON: Shift position is P OFF: Shift position is not P	-
Vehicle Speed Signal	Vehicle speed signal / Stop or Run	Stop: Vehicle is stopped Run: Vehicle is running	-
Engine Condition	Engine condition / Stop or Run	Stop: Engine is stopped Run: Engine is running	-
IG1 Relay Monitor (Outside)	IG1 relay monitor (outer) / ON or OFF	ON: Engine switch on (IG) OFF: Engine switch off	-
IG2 Relay Monitor (Outside)	IG2 relay monitor (outer) / ON or OFF	ON: Engine switch on (IG) OFF: Engine switch off	-
IG1 Relay Monitor (Inside)	IG1 relay monitor (inner) / ON or OFF	ON: Engine switch on (IG) OFF: Engine switch off	-
IG2 Relay Monitor (Inside)	IG2 relay monitor (inner) / ON or OFF	ON: Engine switch on (IG) OFF: Engine switch off	-
ACC Relay Monitor	ACC relay monitor / ON or OFF	ON: Engine switch on (ACC) OFF: Engine switch off	-
Latch Circuit	Ratch circuit / ON or OFF	ON: Engine switch on (IG) or engine running OFF: Engine switch off or on (ACC)	-
Starter Request Signal	Starter request signal monitor / ON or OFF	ON: Starter relay is ON OFF: Starter relay is OFF	Engine switch pressed and held with shift lever in P or N

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TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Power Supply Condition	Power supply condition / All, ACC ON, IG1 IG2, ST ON	All: All relays are OFF ACC ON: ACC relay is ON IG1: IG1 relay is ON IG2: IG2 relay is ON ST ON: ST request signal is ON	-
ACC Relay Cut Signal	ACC relay cut signal / ON or OFF	ON: Engine is cranking OFF: Engine is not cranking	-
Starter Relay Monitor	STARTER relay monitor / ON or OFF	ON: Engine is cranking OFF: Engine is not cranking	Engine is cranking with engine switch on (IG) and shift lever in P or N
Communication Entry&Start	Communication for certification ECU (smart key ECU assembly) / OK or Stop	OK: Communication Stop: No communication	-

2. PERFORM ACTIVE TEST

HINT:

Using the Techstream to perform Active Test allows the 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 the Active Test early in troubleshooting is one way to save diagnostic time. The Data List can be displayed while performing Active Tests.

(a) Connect the Techstream to the DLC3.

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

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

Main Body

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Indicator for Lighting	Indicator for lighting	ON / OFF	-
Indicator Condition	Engine switch indicator	Green / Amber / No Sig	-
P Supply for Steering lock	Power supply for steering lock ECU	ON / OFF	-

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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000YEH04XX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): DTC CHECK / CLEAR (2010 Corolla)		

DTC CHECK / CLEAR

1. CHECK DTC

(a) Connect the Techstream to the DLC3.

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

(c) 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 engine switch on (IG).

(c) 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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Last Modified: 3-10-2010	6.4 S	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000XIZ051X
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): DIAGNOSTIC TROUBLE CODE CHART (2010 Corolla)		

DIAGNOSTIC TROUBLE CODE CHART

Smart Key System

DTC CODE	DETECTION ITEM	TROUBLE AREA	SEE PAGE
B2271	Ignition Hold Monitor Malfunction	1. AM2 NO. 2 fuse 2. Main body ECU (instrument panel junction block) 3. Wire harness or connector	INFO
B2272	Ignition 1 Monitor Malfunction	1. IG1 relay 2. Main body ECU (instrument panel junction block) 3. Wire harness or connector	INFO
B2273	Ignition 2 Monitor Malfunction	1. IG2 relay 2. Main body ECU (instrument panel junction block) 3. Wire harness or connector	INFO
B2274	ACC Monitor Malfunction	1. ACC relay 2. Main body ECU (instrument panel junction block) 3. Wire harness or connector	INFO
B2275	STSW Monitor Malfunction	1. ECM 2. Main body ECU (instrument panel junction block) 3. Wire harness or connector	INFO
B2276	ACCR Signal Circuit Malfunction	1. Main body ECU (instrument panel junction block) 2. ECM 3. Wire harness or connector	INFO
B2277	Detecting Vehicle Submersion	Main body ECU (instrument panel junction block)	INFO
B2278	Engine Switch Circuit Malfunction	1. Engine switch 2. Main body ECU (instrument panel junction block) 3. Wire harness or connector	INFO
B2281	"P" Signal Malfunction	1. Main body ECU (instrument panel junction block) 2. Shift lock control ECU	INFO

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DTC CODE	DETECTION ITEM	TROUBLE AREA	SEE PAGE
		3. Wire harness connector	
B2282	Vehicle Speed Signal Malfunction	1. CAN communication system 2. Combination meter system 3. Main body ECU (instrument panel junction block) 4. Wire harness or connector	INFO
B2283	Vehicle Speed Sensor Malfunction	1. DTC B2282 detection area 2. Combination meter 3. Speed sensor 4. Skid control ECU 5. Main body ECU (instrument panel junction block) 6. Wire harness or connector	INFO
B2284	Brake Signal Malfunction	1. Stop light switch 2. CAN communication system 3. ECM 4. Main body ECU (instrument panel junction block) 5. Wire harness or connector	INFO
B2285	Steering Lock Position Signal Circuit Malfunction	1. Main body ECU (instrument panel junction block) 2. Steering lock ECU 3. Wire harness or connector	INFO
B2286	Runnable Signal Malfunction	1. CAN communication system 2. ECM 3. Main body ECU (instrument panel junction block) 4. Wire harness or connector	INFO
B2287	LIN Communication Master Malfunction	1. Main body ECU (instrument panel junction block) 2. Certification ECU (smart key ECU assembly) 3. Wire harness or connector	INFO
B2288	Steering Lock Signal Circuit Malfunction	1. Main body ECU (instrument panel junction block) 2. Steering lock ECU 3. Wire harness or connector	INFO
B2289	Key Collation Waiting Time Over	1. Main body ECU (instrument panel junction block) 2. Smart key system (entry function) 3. Wire harness or connector 4. Certification ECU (smart key ECU	INFO

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DTC CODE	DETECTION ITEM	TROUBLE AREA	SEE PAGE
		assembly)	



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Last Modified: 3-10-2010	6.4 G	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000YL1038X
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): ON-VEHICLE INSPECTION (2010 Corolla)		

ON-VEHICLE INSPECTION

1. CHECK POWER SOURCE MODE CHANGE FUNCTION

(a) Check the function of the engine 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 or N	When the engine switch is pushed once. • off → engine start • on (ACC) → engine start • on (IG) → engine start
Not depressed	P	Each time the engine switch is pushed. • off → on (ACC) → on (IG) → off
	Except P	Each time the engine switch is pushed. • off → on (ACC) → on (IG) → on (ACC)
-	P	When the engine switch is pushed with power source mode on (IG) (engine running). • on (IG) → off
-	Except P	When the engine switch is pushed with power source mode on (IG) (engine running). • on (IG) → on (ACC)

(b) Check if power source mode changes without pressing the engine switch.

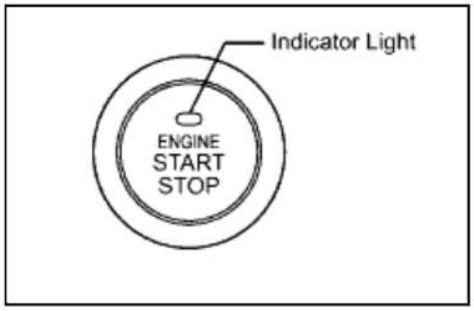
(1) With power source mode on (ACC) and the shift position in P, wait for at least 1 hour. Check that power source mode changes from on (ACC) to off automatically.

2. CHECK INDICATOR CONDITION

(a) Check the indicator on the engine switch.

(1) Check that the engine switch indicator turns on and changes color according to the table below.

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POWER SOURCE MODE/CONDITION	INDICATOR LIGHT CONDITION	
	BRAKE PEDAL RELEASED	BRAKE PEDAL DEPRESSED, SHIFT LEVER IN P OR N
off	OFF	ON (Green) (When key and vehicle IDs match)
on (ACC, IG)	ON (Amber)	ON (Green)
Engine running	OFF	OFF
Steering lock not unlocked	Flashes (Green) for 15 sec.	Flashes (Green) for 15 sec.
System malfunction	Flashes (Amber) for 15 sec.	Flashes (Amber) for 15 sec.

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001LUV01UX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): B2271: Ignition Hold Monitor Malfunction (2010 Corolla)		

DTC	**B2271**	**Ignition Hold Monitor Malfunction**

DESCRIPTION

This DTC is output when a problem such as an open in the AM2 NO. 2 fuse, an open or short in the wire harness between the fuse and main body ECU (instrument panel junction block), a short in the IG output circuit inside the main body ECU (instrument panel junction block), a short between the main body ECU (instrument panel junction block) and relay, and a short in the relay is detected.

HINT:

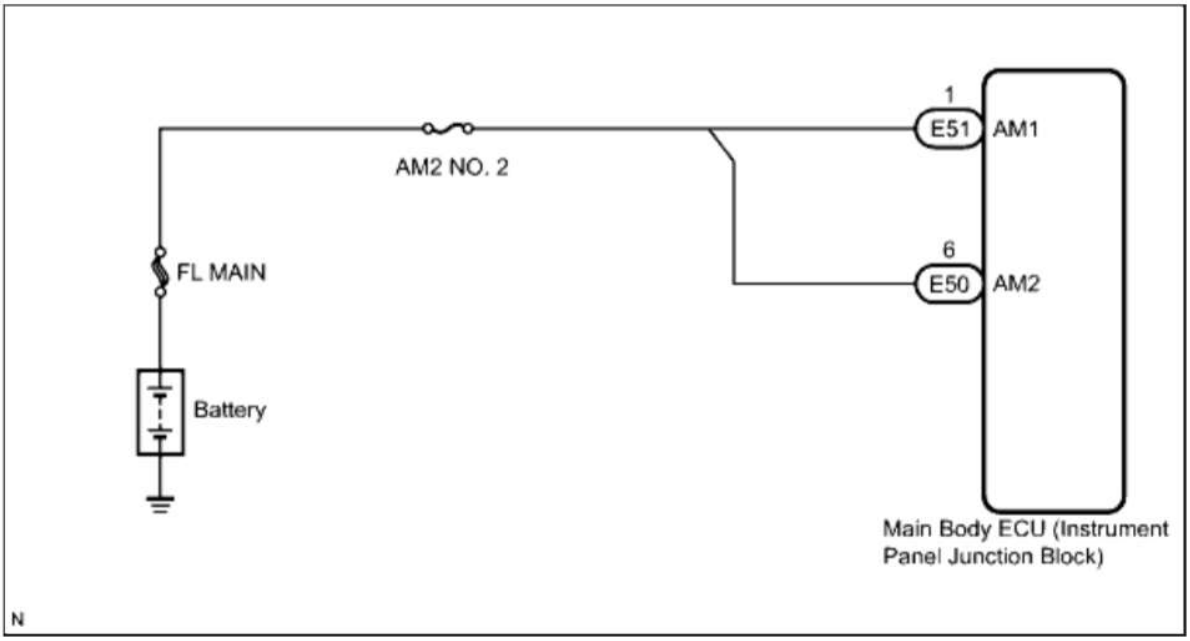
When the main body ECU (instrument panel junction block) is replaced with a new one and the cable from the negative (-) battery terminal is connected, the power source mode becomes the IG-ON mode. When the battery is removed and reinstalled, the power source mode that was selected when the battery was removed is restored.

After the main body ECU (instrument panel junction block) is replaced, perform the registration procedures for the engine immobiliser system INFO **.**

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B2271	Hold circuit, IG1 relay actuation circuit or IG2 relay actuation circuit inside main body ECU (instrument panel junction block) is open or shorted	• AM2 NO. 2 fuse • Main body ECU (instrument panel junction block) • Wire harness or connector

WIRING DIAGRAM

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INSPECTION PROCEDURE

PROCEDURE

1.	CHECK FOR DTC

(a) Clear the DTCs INFO.

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

(c) Check for DTCs again.

OK:
DTC is not output.

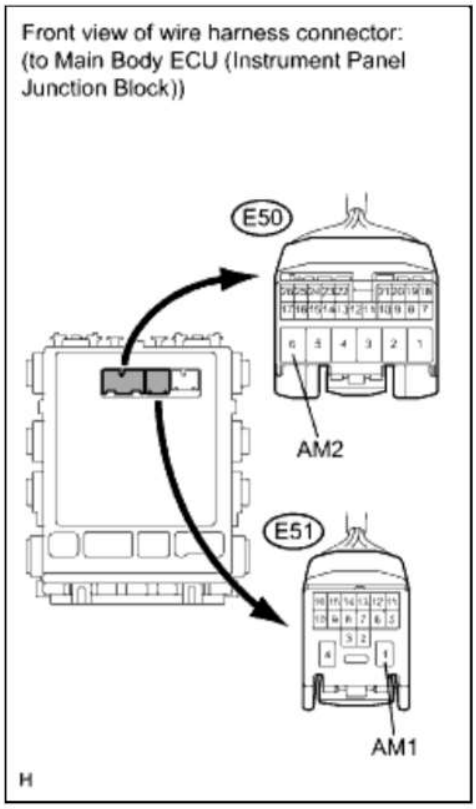
NG ▶ CHECK HARNESS AND CONNECTOR (MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK) - BATTERY)

OK ▶ USE SYMPTOM METHOD TO CHECK

2.	CHECK HARNESS AND CONNECTOR (MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK) - BATTERY)

(a) Disconnect the E50 and E51 ECU connectors.

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

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E51-1 (AM1) - Body ground	Always	11 to 14 V
E50-6 (AM2) - Body ground	Always	11 to 14 V

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

OK ▶ **REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001LUW024X
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): B2272: Ignition 1 Monitor Malfunction (2010 Corolla)		

DTC	**B2272**	**Ignition 1 Monitor Malfunction**

DESCRIPTION

This DTC is output when there is a problem in the IG1D output circuit, which is from the inside of the main body ECU (instrument panel junction block) to the IG1 relay.

HINT:

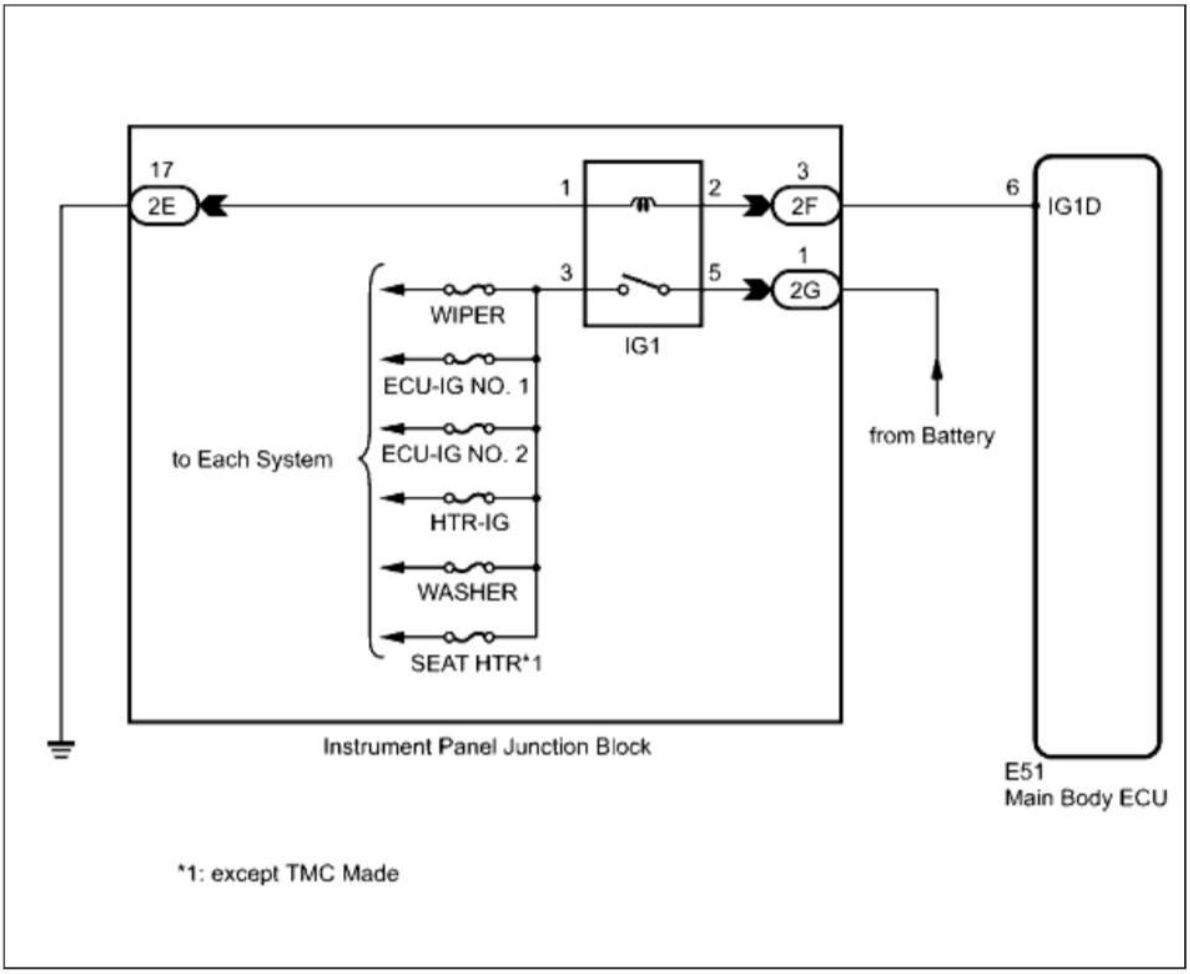
When the main body ECU (instrument panel junction block) is replaced with a new one and the cable from the negative (-) battery terminal is connected, the power source mode becomes the IG-ON mode. When the battery is removed and reinstalled, the power source mode that was selected when the battery was removed is restored.

After the main body ECU (instrument panel junction block) is replaced, perform the registration procedures for the engine immobiliser system INFO **.**

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B2272	IG1 relay actuation circuit inside main body ECU (instrument panel junction block) or other related circuit is malfunctioning	• Main body ECU (instrument panel junction block) • IG1 relay • Wire harness or connector

WIRING DIAGRAM

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INSPECTION PROCEDURE

PROCEDURE

1.	READ VALUE USING TECHSTREAM

(a) Connect the Techstream to the DLC3.

(b) Turn the engine switch on (IG) and turn the Techstream on.

(c) Select the item below in the Data List, and read the display on the Techstream.

HINT:

When using the Techstream with the engine switch off, turn on and off any of the door courtesy light switches repeatedly at 1.5 second intervals or less until communication between the Techstream and vehicle starts.

Main Body

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC

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			NOTE
IG1 Relay Monitor (Outside)	Status of IG1 relay monitor (outer) / ON or OFF	ON: Engine switch on (IG) (IG1 relay is ON) OFF: Engine switch off (IG1 relay is OFF)	-

OK:
"ON" (engine switch on (IG)) appears on the screen.

NG ▶ **INSPECT RELAY (IG1 RELAY)**

OK ▼

2.	CHECK FOR DTC

(a) Clear the DTC [INFO].

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

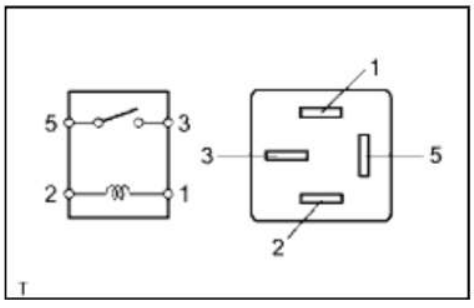
(c) After 10 seconds have elapsed, check if the trouble occurs again.

OK:
DTC B2272 is not output.

NG ▶ **REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)**

OK ▶ **USE SIMULATION METHOD TO CHECK**

3.	INSPECT RELAY (IG1 RELAY)



(a) Remove the IG1 relay from the instrument panel junction block.

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

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Standard Resistance:

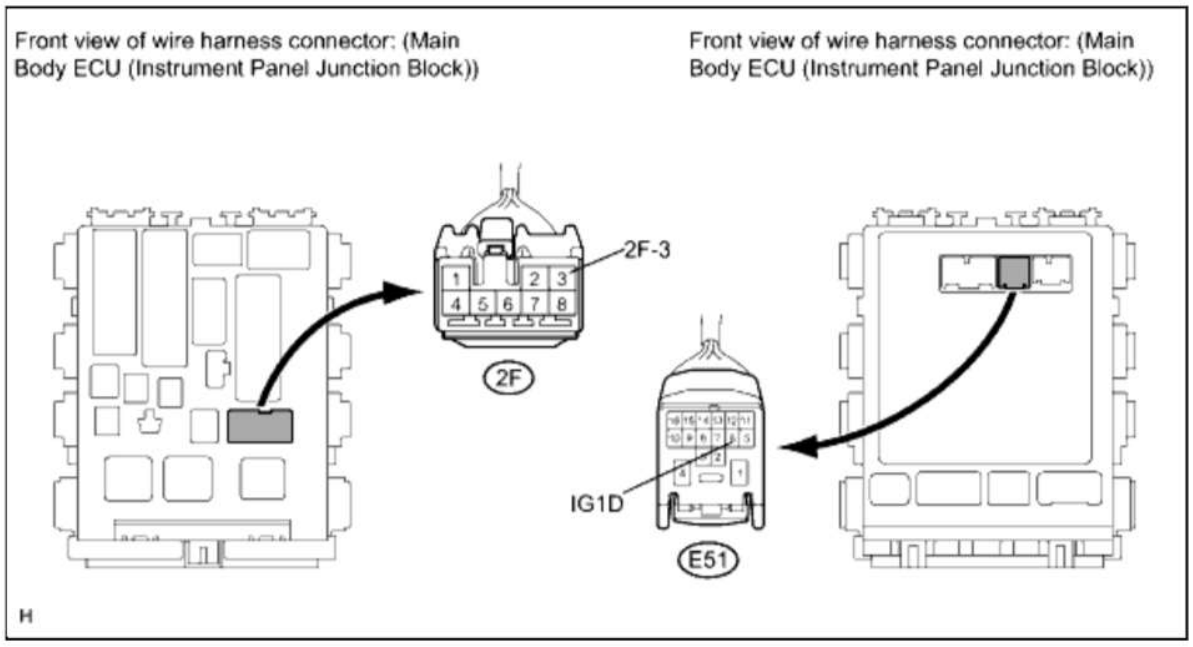
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
3 - 5	When battery voltage is not applied to terminals 1 and 2	10 kΩ or higher
3 - 5	When battery voltage is applied to terminals 1 and 2	Below 1 Ω

NG ▶ **REPLACE IG1 RELAY**

OK ▼

4.	**CHECK HARNESS AND CONNECTOR (INSTRUMENT PANEL JUNCTION BLOCK - MAIN BODY ECU)**

(a) Disconnect the 2F junction block connector.



(b) Disconnect the E51 ECU connector.

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

Standard Resistance:

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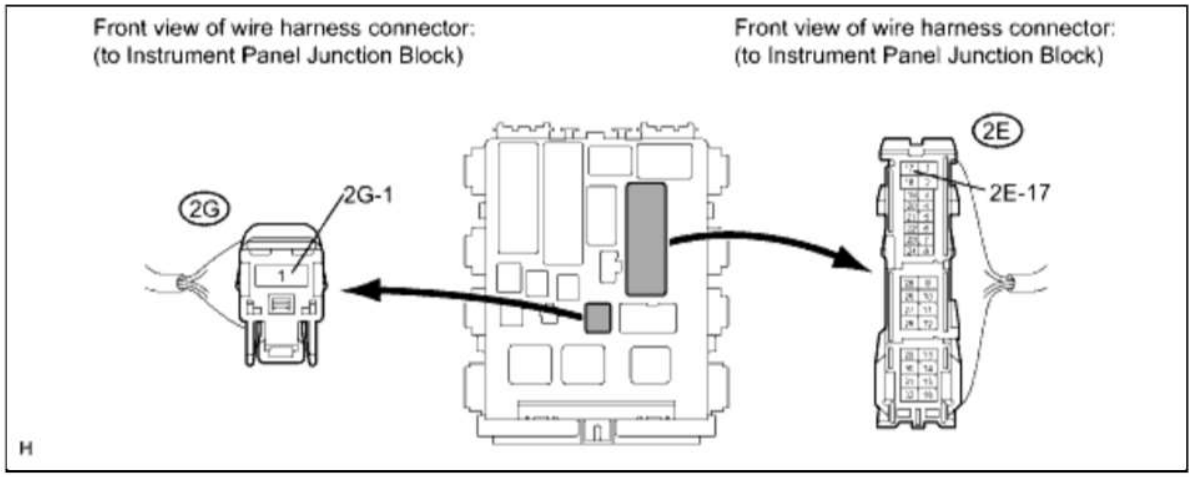
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
2F-3 - E51-6 (IG1D)	Always	Below 1 Ω
E51-6 (IG1D) - Body ground	Always	10 kΩ or higher

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (INSTRUMENT PANEL JUNCTION BLOCK - MAIN BODY ECU)**

OK ▼

5.	**CHECK HARNESS AND CONNECTOR (INSTRUMENT PANEL JUNCTION BLOCK - BATTERY AND BODY GROUND)**

(a) Disconnect the 2E and 2G junction block connectors.



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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
2E-17 - Body ground	Always	Below 1 Ω

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

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION

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TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
2G-1 - Body ground	Always	11 to 14 V

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (INSTRUMENT PANEL JUNCTION BLOCK - BATTERY AND BODY GROUND)**

OK ▶ **REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001LUX024X
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): B2273: Ignition 2 Monitor Malfunction (2010 Corolla)		

DTC	**B2273**	**Ignition 2 Monitor Malfunction**

DESCRIPTION

This DTC is output when there is a problem in the IG2D output circuit, which is from the inside of the main body ECU (instrument panel junction block) to the IG2 relay.

HINT:

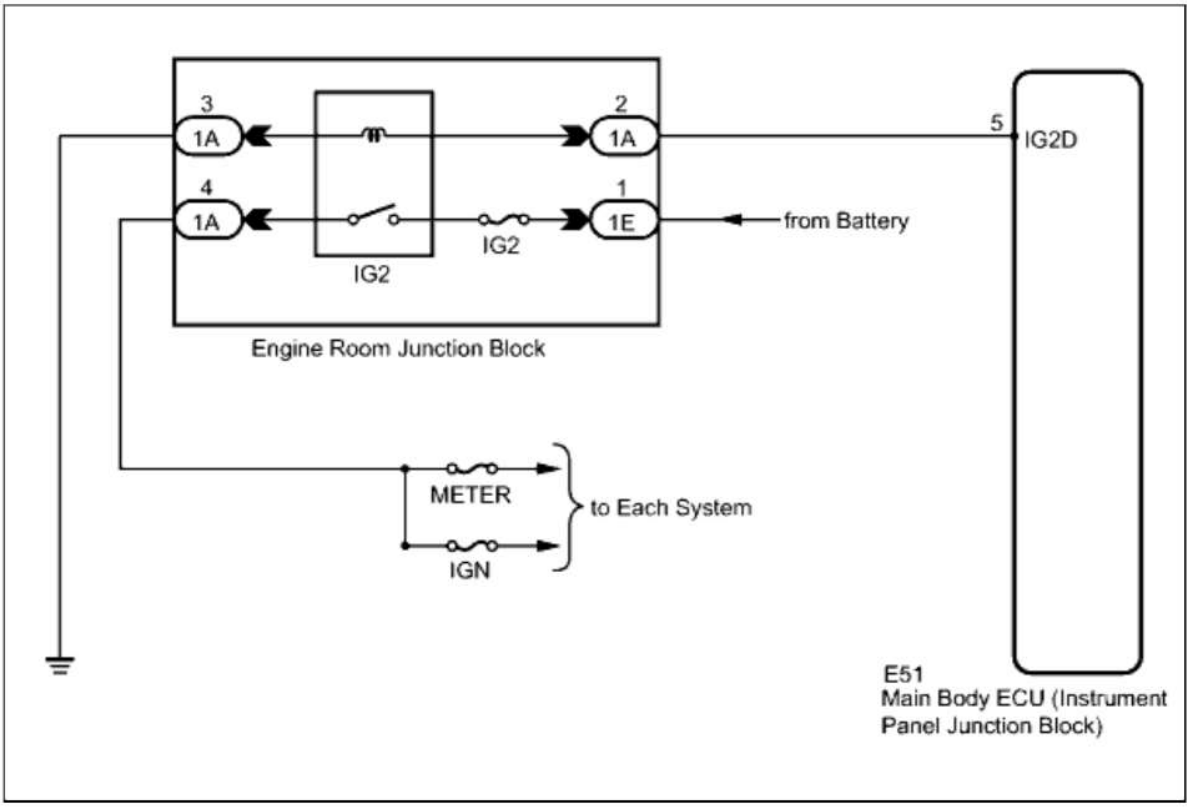
When the main body ECU (instrument panel junction block) is replaced with a new one and the cable from the negative (-) battery terminal is connected, the power source mode becomes the IG-ON mode. When the battery is removed and reinstalled, the power source mode that was selected when the battery was removed is restored.

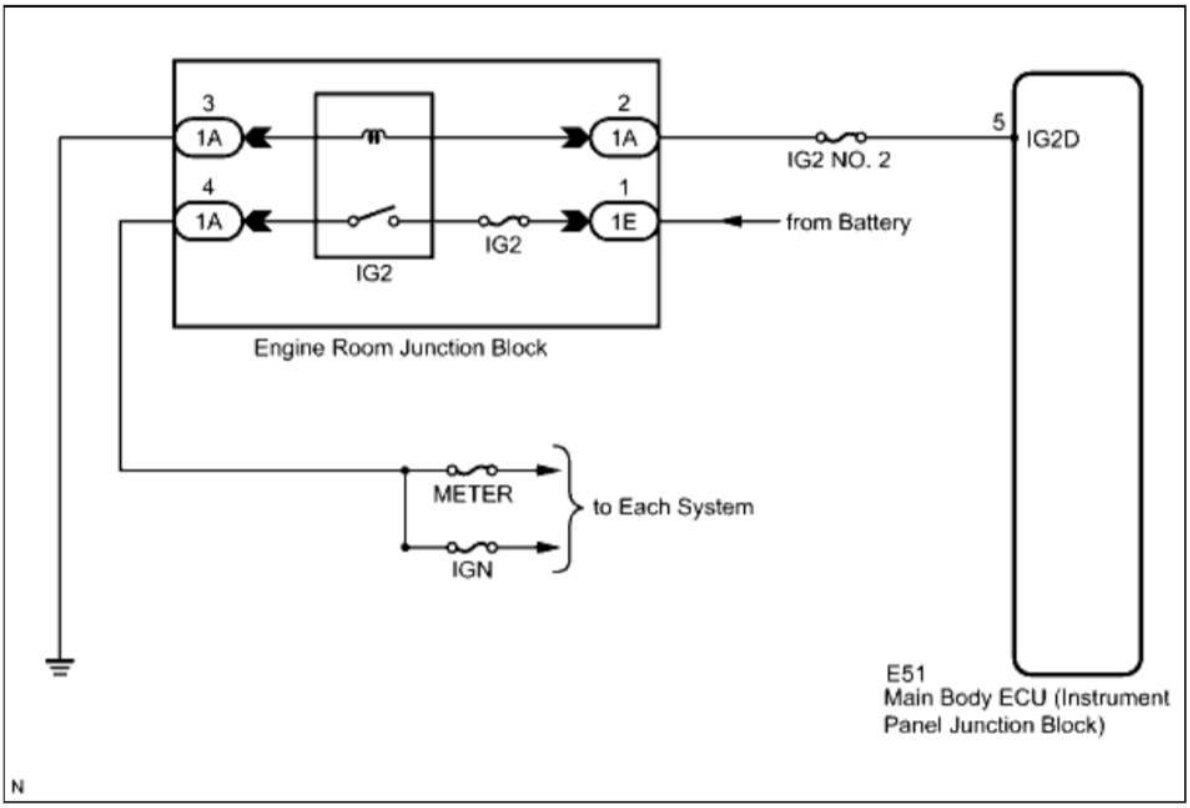
After the main body ECU (instrument panel junction block) is replaced, perform the registration procedures for the engine immobiliser system INFO **.**

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B2273	IG2 relay actuation circuit inside main body ECU (instrument panel junction block) or other related circuit is malfunctioning	• Main body ECU (instrument panel junction block) • IG2 relay • Wire harness or connector

WIRING DIAGRAM

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INSPECTION PROCEDURE

PROCEDURE

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1.	READ VALUE USING TECHSTREAM

(a) Connect the Techstream to the DLC3.

(b) Turn the engine switch on (IG) and turn the Techstream on.

(c) Read the Data List according to the displays on the Techstream.

HINT:

When using the Techstream with the engine switch off, turn on and off any of the door courtesy light switches repeatedly at 1.5 second intervals or less until communication between the Techstream and vehicle starts.

Main Body

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
IG2 Relay Monitor (Outside)	Status of IG2 relay monitor (outer) / ON or OFF	ON: Engine switch on (IG) (IG2 relay is ON) OFF: Engine switch off (IG2 relay is OFF)	-

OK:
"ON" (Engine switch on (IG)) appears on the screen.

NG ▶ **CHECK HARNESS AND CONNECTOR (ENGINE ROOM JUNCTION BLOCK - MAIN BODY ECU AND BODY GROUND)**

OK
▼

2.	CHECK FRO DTC

(a) Clear the DTC INFO.

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

(c) After 10 seconds have elapsed, check if the trouble occurs again.

OK:
DTC B2273 is not output.

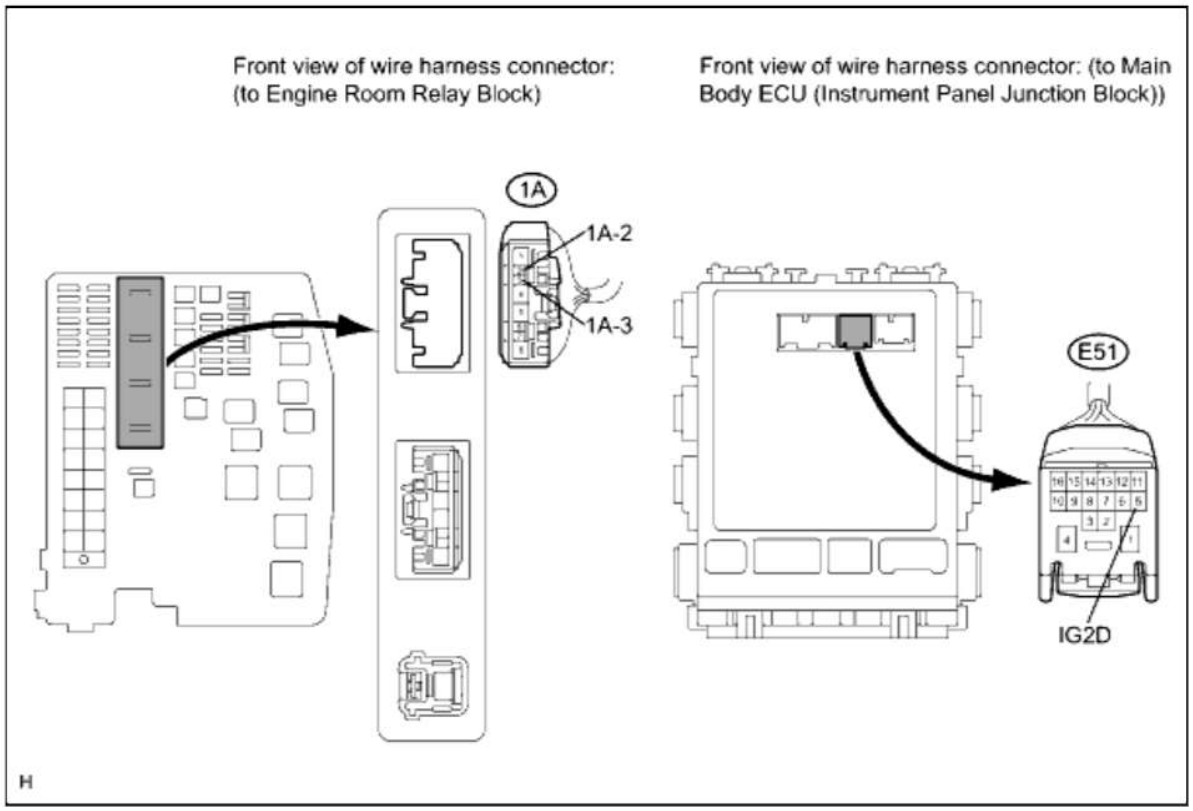
NG ▶ **REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)**

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OK ▶ **USE SIMULATION METHOD TO CHECK**

3.	**CHECK HARNESS AND CONNECTOR (ENGINE ROOM JUNCTION BLOCK - MAIN BODY ECU AND BODY GROUND)**

(a) Disconnect the 1A connector from the engine room junction block.



(b) Disconnect the E51 ECU connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1A-2 - E51-5 (IG2D)	Always	Below 1 Ω
1A-2 - Body ground	Always	10 kΩ or higher
1A-3 - Body ground	Always	Below 1 Ω

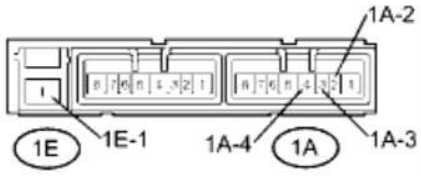
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (ENGINE ROOM JUNCTION BLOCK - MAIN BODY ECU AND BODY GROUND)**

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OK

4.	**INSPECT ENGINE ROOM JUNCTION BLOCK (IG2 RELAY)**

Component without harness connected:
(Engine Room Relay Block)



(a) Disconnect the 1E connector from the engine room relay block.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1A-4 - 1E-1	When battery voltage is not applied to terminals 1A-3 and 1A-2	10 kΩ or higher
1A-4 - 1E-1	When battery voltage is applied to terminals 1A-3 and 1A-2	Below 1 Ω

NG ▶ **REPLACE ENGINE ROOM JUNCTION BLOCK**

OK ▶ **REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001LUY024X
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): B2274: ACC Monitor Malfunction (2010 Corolla)		

DTC	**B2274**	**ACC Monitor Malfunction**

DESCRIPTION

This DTC is output when there is a problem in the ACCD output circuit, which is from the inside of the main body ECU (instrument panel junction block) to the ACC relay.

HINT:

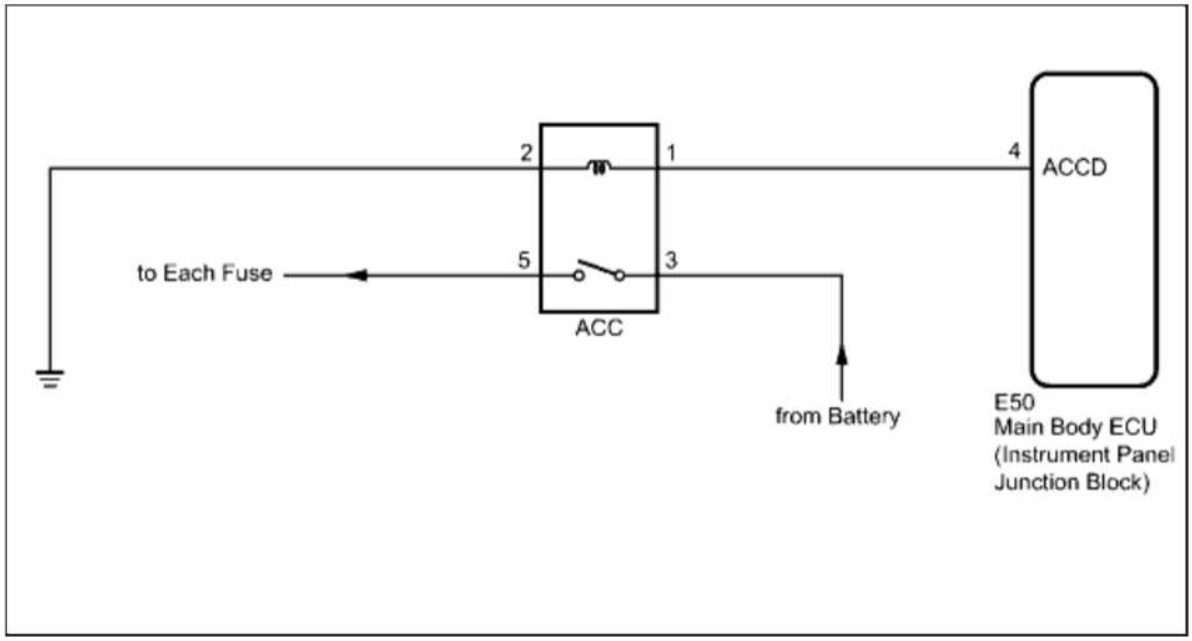
When the main body ECU (instrument panel junction block) is replaced with a new one and the cable from the negative (-) battery terminal is connected, the power source mode becomes the IG-ON mode. When the battery is removed and reinstalled, the power source mode that was selected when the battery was removed is restored.

After the main body ECU (instrument panel junction block) is replaced, perform the registration procedures for the engine immobiliser system  **.**

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B2274	ACC relay actuation circuit inside main body ECU (instrument panel junction block) or other related circuit is malfunctioning	• Main body ECU (instrument panel junction block) • ACC relay • Wire harness or connector

WIRING DIAGRAM

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INSPECTION PROCEDURE

PROCEDURE

1.	**READ VALUE USING TECHSTREAM**

(a) Connect the Techstream to the DLC3.

(b) Turn the engine switch on (IG) and turn the Techstream on.

(c) Read the Data List according to the displays on the Techstream.

HINT:

When using the Techstream with the engine switch off, turn on and off any of the door courtesy light switches repeatedly at 1.5 second intervals or less until communication between the Techstream and vehicle starts.

Main Body

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
ACC Relay Monitor	Status of ACC Relay Monitor / ON or OFF	ON: Engine switch on (ACC) OFF: Engine switch off	-

OK:
"ON" (engine switch on (ACC)) appears on the screen.

NG ▶ **INSPECT RELAY (ACC RELAY)**

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OK

▼

2.	CHECK FOR DTC

(a) Clear the DTC INFO.

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

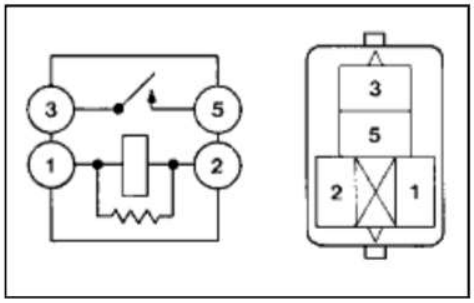
(c) After 10 seconds have elapsed, check if the trouble occurs again.

OK:
DTC B2273 is not output.

NG ▶ **REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)**

OK ▶ **USE SIMULATION METHOD TO CHECK**

3.	INSPECT RELAY (ACC RELAY)



(a) Remove the ACC relay from the relay block No. 5*1.

(b) Remove the ACC relay from the relay block No. 8*2.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
3 - 5	When battery voltage is not applied to terminals 1 and 2	10 kΩ or higher
3 - 5	When battery voltage is applied to terminals 1 and 2	Below 1 Ω

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HINT:

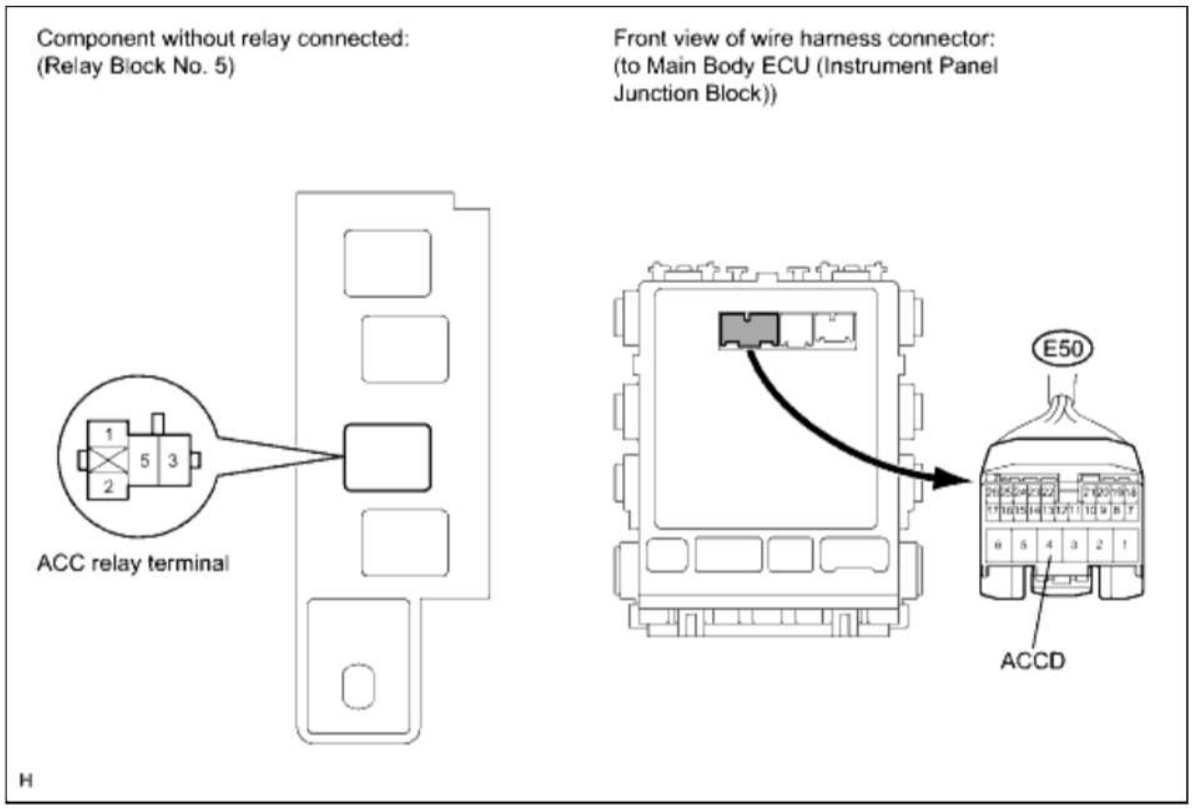
- *1: for TMC Made
- *2: for except TMC Made

NG ▶ **REPLACE ACC RELAY**

OK ▼

4.	**CHECK HARNESS AND CONNECTOR (ACC RELAY - MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)**

(a) for TMC Made:



(1) Disconnect the E50 ECU connector.

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

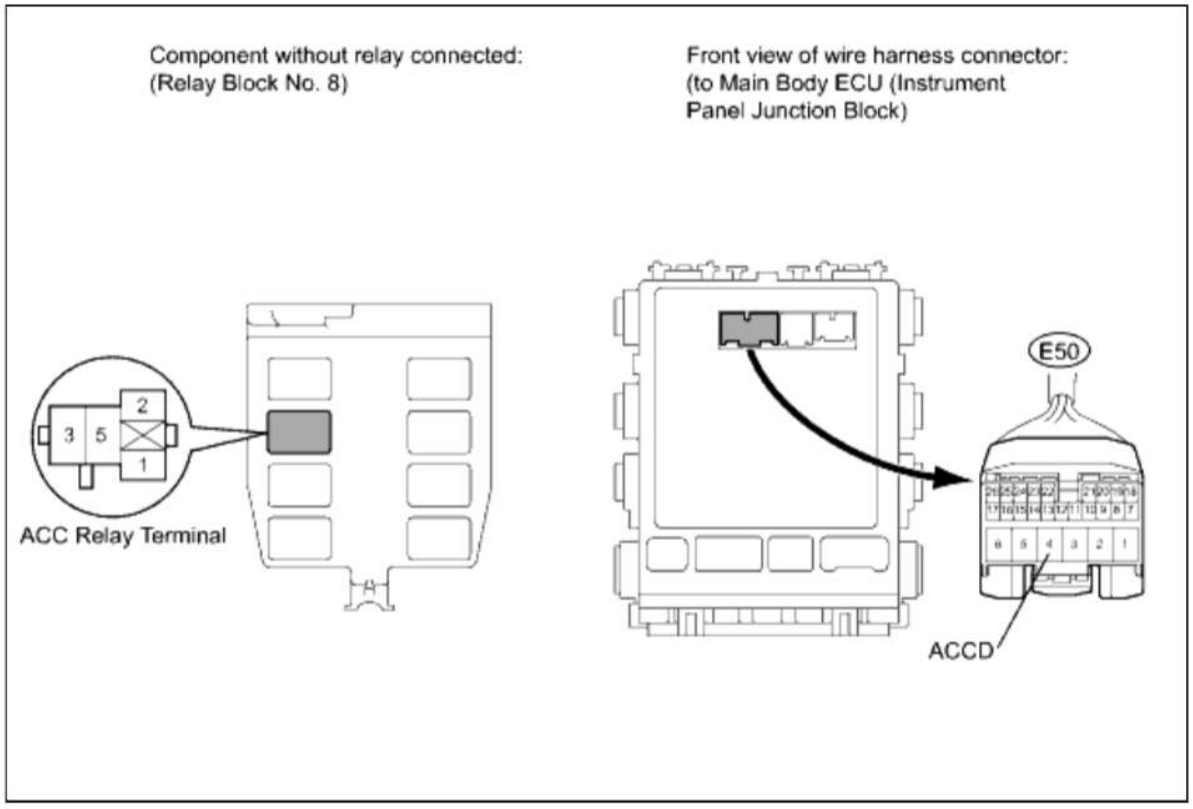
Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED

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		CONDITION
Relay block No. 5 ACC relay terminal 1 - E50-4 (ACCD)	Always	Below 1 Ω
E50-4 (ACCD) or Relay block No. 5 ACC relay terminal 1 - Body ground	Always	10 kΩ or higher

(b) for except TMC Made:



(1) Disconnect the E50 connector.

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

Standard Resistance:

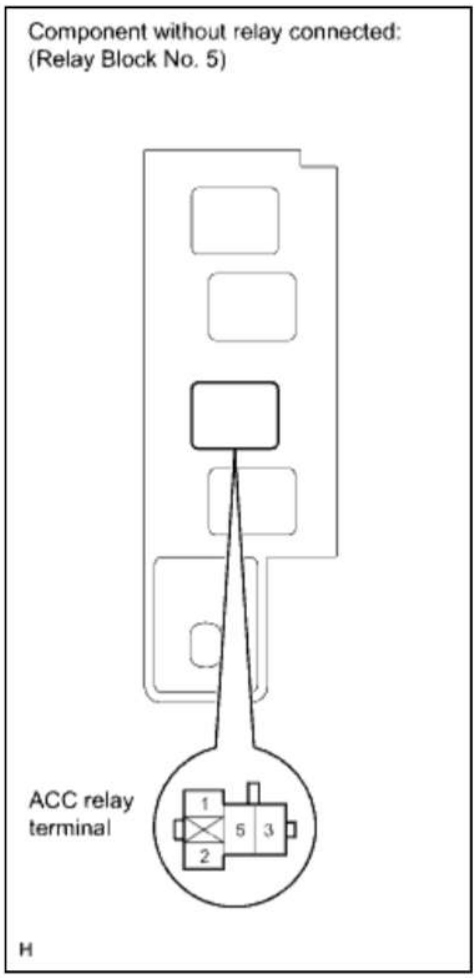
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Relay block No. 8 ACC relay terminal 1 - E50-4 (ACCD)	Always	Below 1 Ω
Relay block No. 8 ACC relay terminal 1 or E50-4 (ACCD) - Body ground	Always	10 kΩ or higher

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (ACC RELAY - MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)**

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OK

5.	CHECK HARNESS AND CONNECTOR (ACC RELAY - BATTERY AND BODY GROUND)



(a) for TMC Made:

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Relay block No. 5 ACC relay terminal 2 - Body ground	Always	Below 1 Ω

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

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Relay block No. 5 ACC relay terminal 3 - Body ground	Always	11 to 14 V

(b) for except TMC Made:

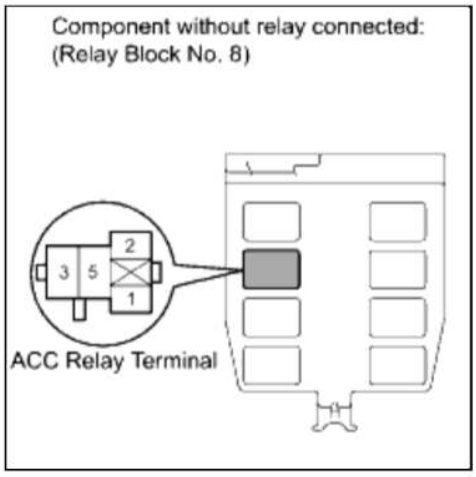
(1) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Relay block No. 8 ACC relay terminal 2 - Body ground	Always	Below 1 Ω

(2) Measure the voltage according to the value(s) in

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the table below.

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Relay block No. 8 ACC relay terminal 3 - Body ground	Always	11 to 14 V

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (ACC RELAY - BATTERY AND BODY GROUND)**

OK ▶ **REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001LUZ024X
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): B2275: STSW Monitor Malfunction (2010 Corolla)		

DTC	**B2275**	**STSW Monitor Malfunction**

DESCRIPTION

This DTC is output when there is an open, short, or any other problem in the engine start request output circuit inside the main body ECU (instrument panel junction block) or in the external circuit.

HINT:

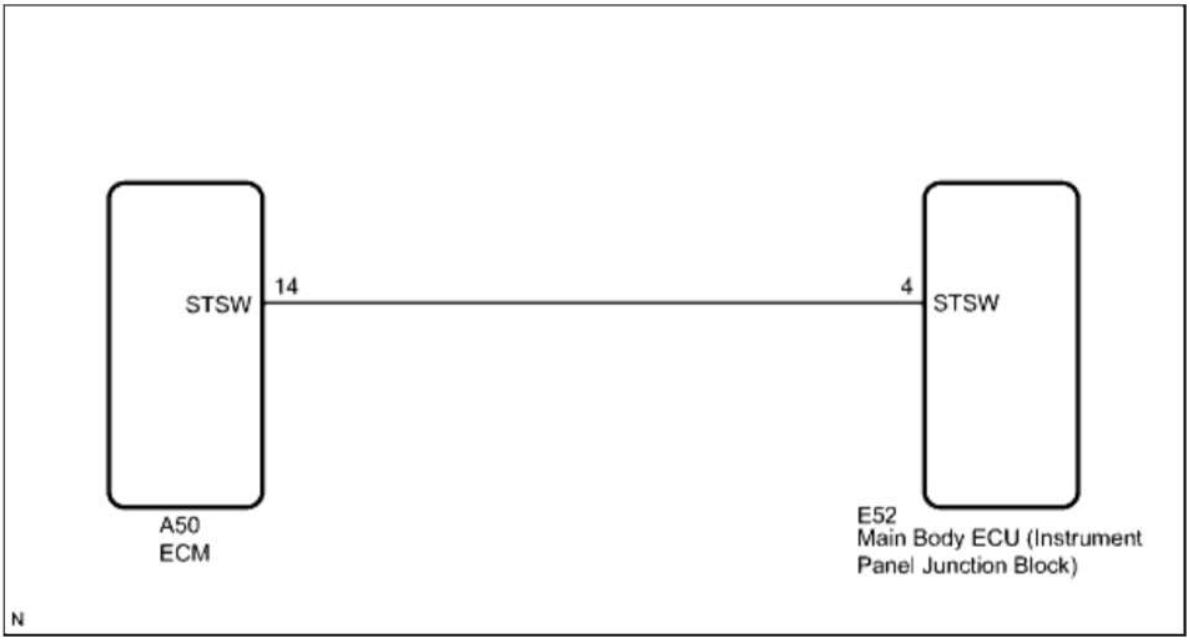
When the main body ECU (instrument panel junction block) is replaced with a new one and the cable from the negative (-) battery terminal is connected, the power source mode becomes the IG-ON mode. When the battery is removed and reinstalled, the power source mode that was selected when the battery was removed is restored.

After the main body ECU (instrument panel junction block) is replaced, perform the registration procedures for the engine immobiliser system INFO **.**

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B2275	STSW output circuit (engine starting request signal circuit) inside main body ECU (instrument panel junction block) or other related circuit is malfunctioning	• Main body ECU (instrument panel junction block) • ECM • Wire harness or connector

WIRING DIAGRAM

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INSPECTION PROCEDURE

PROCEDURE

1.	CHECK FOR DTC

(a) Clear the DTC INFO.

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

(c) After 15 seconds have elapsed, check if the trouble occurs again.

OK:
DTC B2273 is not output.

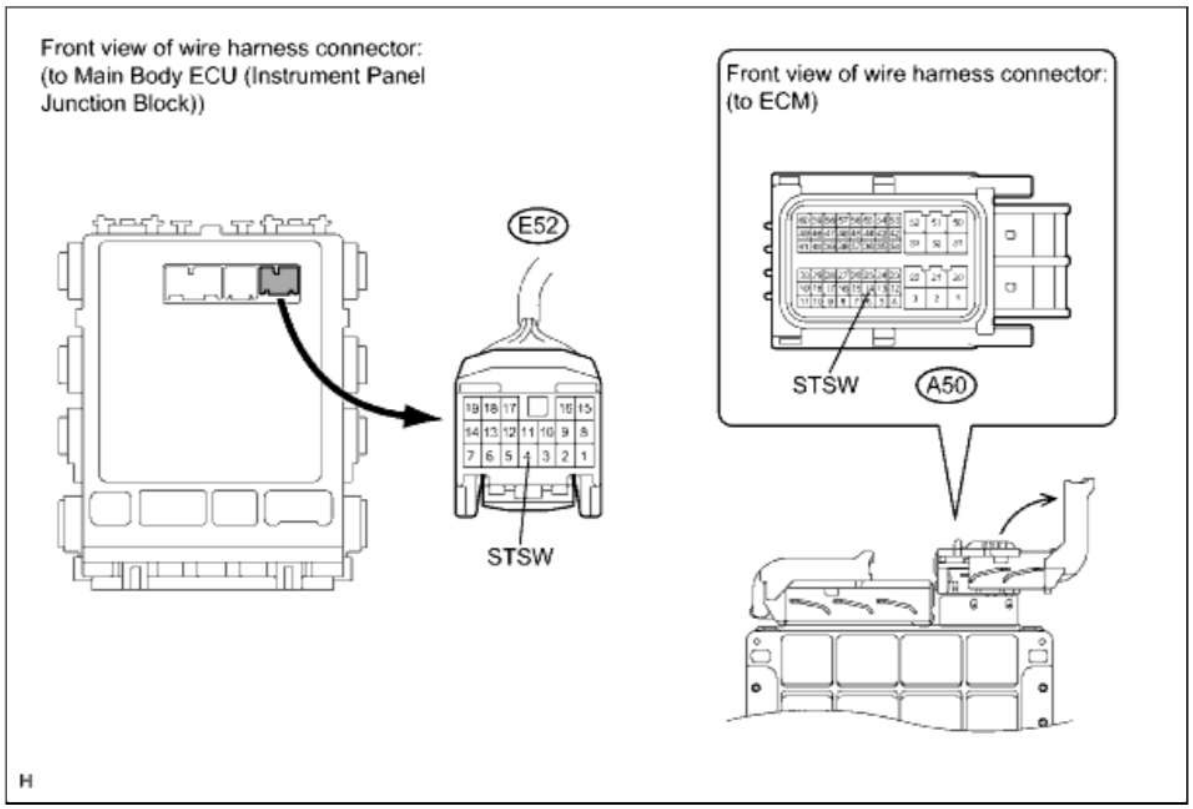
NG ▶ CHECK HARNESS AND CONNECTOR (MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK) - ECM)

OK ▶ USE SIMULATION METHOD TO CHECK

2.	CHECK HARNESS AND CONNECTOR (MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK) - ECM)

(a) Disconnect the E52 ECU connector.

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(b) Disconnect the A50 ECM connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E52-4 (STSW) - A50-14 (STSW)	Always	Below 1 Ω
E52-4 (STSW) - Body ground	Always	10 kΩ or higher

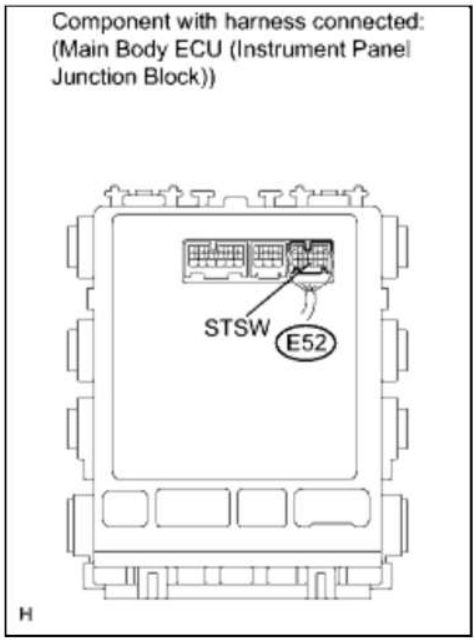
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK) - ECM)**

OK ▼

3.	**INSPECT MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)**

(a) Reconnect the E52 connector.

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

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E52-4 (STSW) - Body ground	Brake pedal depressed, Engine switch hold on (ST)	Output voltage at terminal AM1 or AM2 is -2 V or more.

NG ▶ **REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)**

OK ▶ **REPLACE ECM**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001LV8020X
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): B2276: ACCR Signal Circuit Malfunction (2010 Corolla)		

DTC	**B2276**	**ACCR Signal Circuit Malfunction**

DESCRIPTION

The main body ECU (instrument panel junction block) will set this DTC if the ACCR signal sent from the ECM is ON for 40 seconds or more.

HINT:

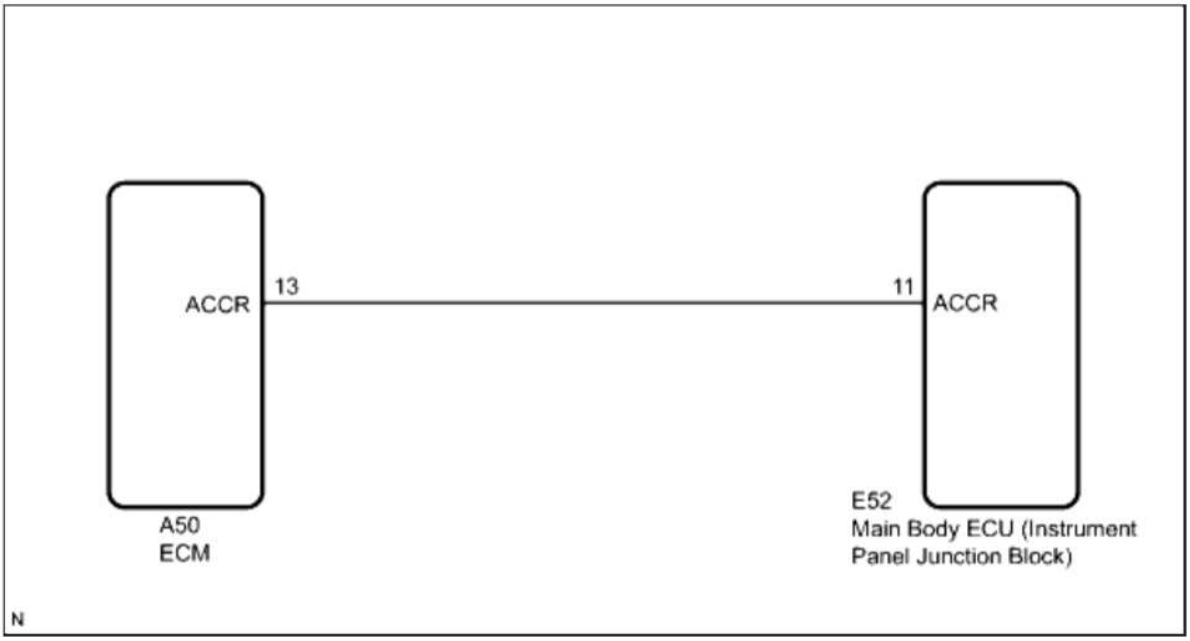
When the main body ECU (instrument panel junction block) is replaced with a new one and the cable from the negative (-) battery terminal is connected, the power source mode becomes the IG-ON mode. When the battery is removed and reinstalled, the power source mode that was selected when the battery was removed is restored.

After the main body ECU (instrument panel junction block) is replaced, perform the registration procedures for the engine immobiliser system  **.**

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B2276	ACCR output circuit inside main body ECU (instrument panel junction block) or other related circuit is malfunctioning	• Main body ECU (instrument panel junction block) • ECM • Wire harness or connector

WIRING DIAGRAM

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INSPECTION PROCEDURE

PROCEDURE

1.	**CHECK DTC OUTPUT**

(a) Clear the DTCs INFO.

(b) After all DTCs are cleared, check if the trouble occurs again 50 seconds after the engine switch is turned on (IG).

(c) Check for DTCs again.

OK:

No DTC B2276 is output.

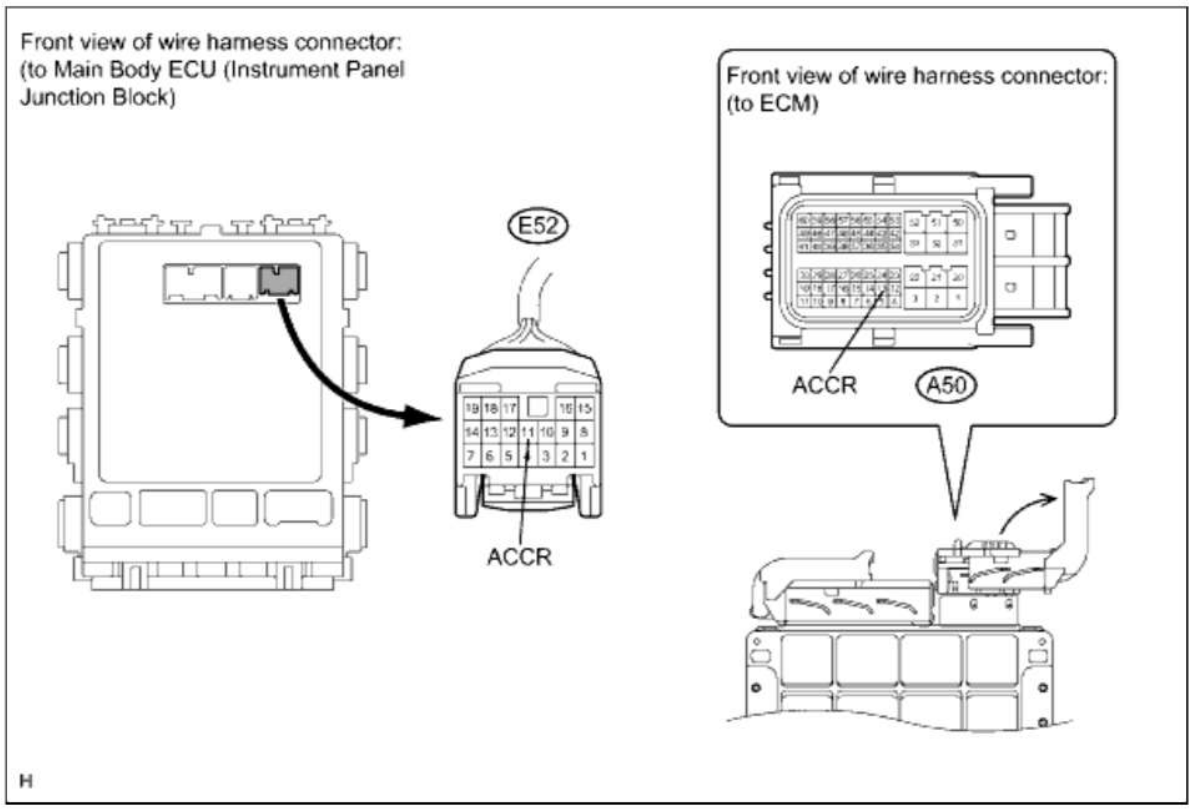
NG ▶ **CHECK HARNESS AND CONNECTOR (MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK) - ECM)**

OK ▶ **USE SIMULATION METHOD TO CHECK**

2.	**CHECK HARNESS AND CONNECTOR (MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK) - ECM)**

(a) Disconnect the E52 ECU connector.

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(b) Disconnect the A50 ECM connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E52-11 (ACCR) - A50-13 (ACCR)	Always	Below 1 Ω
E52-11 (ACCR) - Body ground	Always	10 kΩ or higher

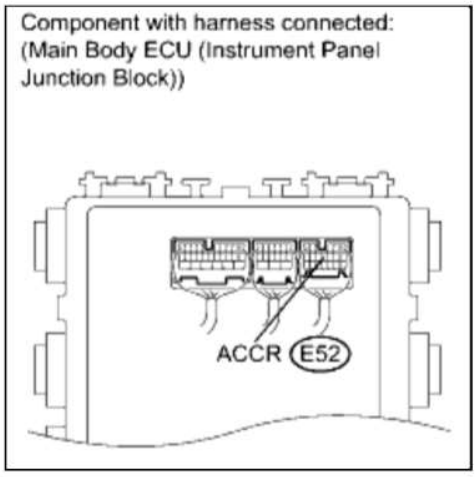
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK) - ECM)**

OK ▼

3.	**INSPECT MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)**

(a) Reconnect the E52 connector.

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

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E52-11 (ACCR) - Body ground	Brake pedal depressed, shift P, engine switch is pushed once → on (IG)	0.1 to 0.8 V*1 → output voltage at terminal AM1 or AM2 is -2 V or more.

HINT:

***1: Voltage is output only when the engine is cranking.**

NG ▶ **REPLACE ECM**

OK ▶ **REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000Y7Z04VX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): B2278: Engine Switch Circuit Malfunction (2010 Corolla)		

DTC	**B2278**	**Engine Switch Circuit Malfunction**

DESCRIPTION

This DTC is output when 1) a malfunction is detected between the main body ECU (instrument panel junction block) and the engine switch; or 2) either of the switches inside the engine switch is malfunctioning.

HINT:

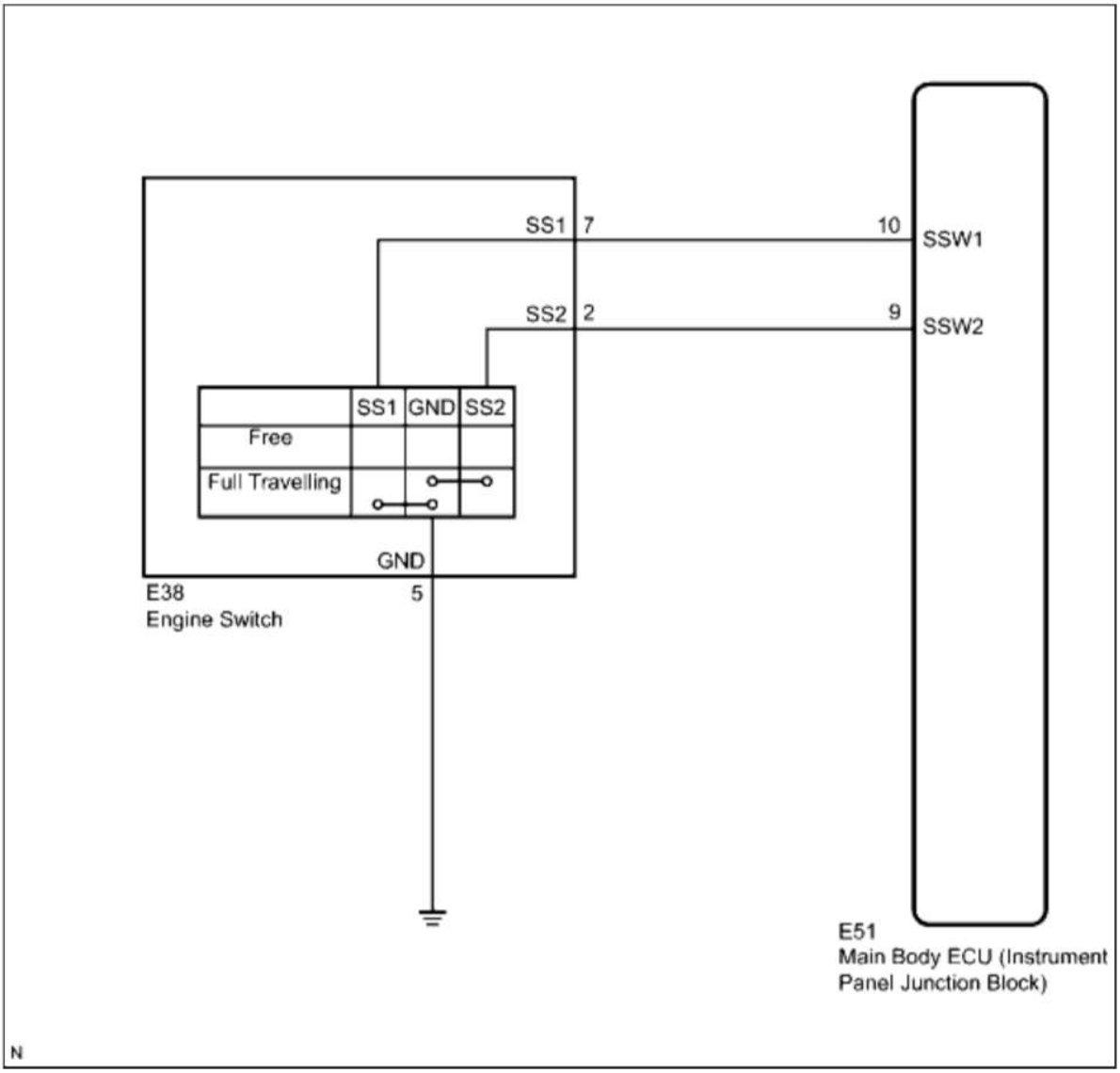
When the main body ECU (instrument panel junction block) is replaced with a new one and the cable from the negative (-) battery terminal is connected, the power source mode becomes the IG-ON mode. When the battery is removed and reinstalled, the power source mode that was selected when the battery was removed is restored.

After the main body ECU (instrument panel junction block) is replaced, perform the registration procedures for the engine immobiliser system INFO .

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B2278	Communication is abnormal between the main body ECU (instrument panel junction block) and engine switch or the engine switch is defective	• Engine switch • Main body ECU (instrument panel junction block) • Wire harness or connector

WIRING DIAGRAM

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INSPECTION PROCEDURE

PROCEDURE

1.	**READ VALUE USING TECHSTREAM (START SWITCH)**

(a) Connect the Techstream to the DLC3.

(b) Check the Data List for proper functioning of the start switch.

HINT:

When using the Techstream with the engine switch off, turn on and off any of the door courtesy light switches repeatedly at 1.5 second intervals or less until communication between the Techstream and vehicle starts.

Main Body

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TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Start Switch 1	Start Switch 1 / ON or OFF	ON: Engine switch is pushed OFF: Engine switch is not pushed	-
Start Switch 22	Start Switch 2 / ON or OFF	ON: Engine switch is pushed OFF: Engine switch is not pushed	-

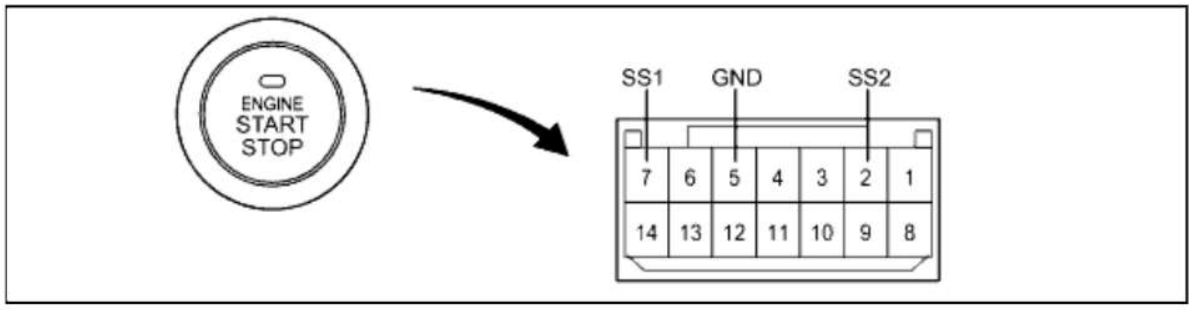
OK:
ON (engine switch is pushed) and OFF (engine switch is not pushed) appear on the screen.

NG ▶ **INSPECT ENGINE SWITCH**

OK ▶ **REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)**

2.	**INSPECT ENGINE SWITCH**

(a) Remove the engine switch INFO.



(b) Disconnect the switch connector.

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

Standard Resistance:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
7 (SS1) - 5 (GND)	Pushed	Below 1 Ω
2 (SS2) - 5 (GND)	Pushed	Below 1 Ω
7 (SS1) - 5 (GND)	Not pushed	10 kΩ or higher
2 (SS2) - 5 (GND)	Not pushed	10 kΩ or higher

HINT:

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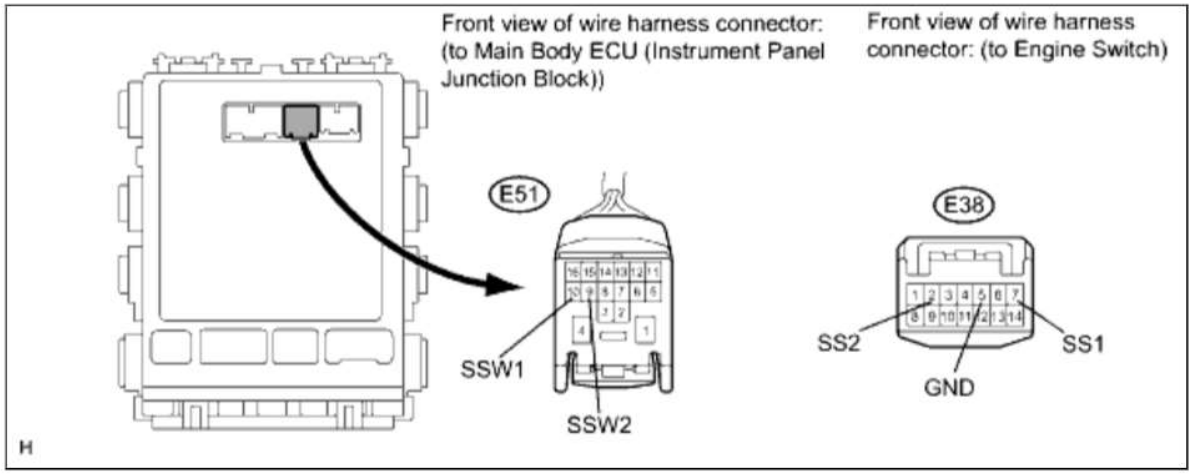
This switch is a momentary type switch.

NG ▶ **REPLACE ENGINE SWITCH**

OK ▼

3.	**CHECK HARNESS AND CONNECTOR (ENGINE SWITCH - MAIN BODY ECU AND BODY GROUND)**

(a) Disconnect the E51 ECU connector.



(b) Disconnect the E38 switch connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E38-7 (SS1) - E51-10 (SSW1)	Always	Below 1 Ω
E38-2 (SS2) - E51-9 (SSW2)	Always	Below 1 Ω
E38-5 (GND) - Body ground	Always	Below 1 Ω
E38-7 (SS1) or E51-10 (SSW1) - Body ground	Always	10 kΩ or higher
E38-2 (SS2) or E51-9 (SSW2) - Body ground	Always	10 kΩ or higher

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (ENGINE SWITCH - MAIN BODY ECU AND BODY GROUND)**

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OK ▶ REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)



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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001LV001UX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): B2277: Detecting Vehicle Submersion (2010 Corolla)		

DTC	**B2277**	**Detecting Vehicle Submersion**

DESCRIPTION

This DTC is output when the submersion circuit monitor inside the main body ECU (instrument panel junction block) detects that the vehicle is submerged in water.

HINT:

When the main body ECU (instrument panel junction block) is replaced with a new one and the cable from the negative (-) battery terminal is connected, the power source mode becomes the IG-ON mode. When the battery is removed and reinstalled, the power source mode that was selected when the battery was removed is restored.

After the main body ECU (instrument panel junction block) is replaced, perform the registration procedures for the engine immobiliser system INFO **.**

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B2277	Submersion circuit monitor inside main body ECU (instrument panel junction block) detects that vehicle is submerged in water	Main body ECU (instrument panel junction block)

INSPECTION PROCEDURE

PROCEDURE

1.	**CHECK FOR WATER DAMAGE**

(a) Check the main body ECU (instrument panel junction block), peripheral components, and wire harnesses for traces of water.

OK:

There are no traces of water.

NG ▶ **TAKE APPROPRIATE MEASURES AGAINST CAUSE OF WATER DAMAGE AND REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)**

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OK

2.	**CHECK FOR DTC**

(a) Clear the DTC INFO.

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

(c) After 330 seconds have elapsed, check if the trouble occurs again.

OK:
DTC B2277 is not output.

NG ▶ **REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)**

OK ▶ **USE SIMULATION METHOD TO CHECK**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000XEV055X
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): B2282,B2283: Vehicle Speed Signal Malfunction (2010 Corolla)		

DTC	**B2282**	**Vehicle Speed Signal Malfunction**

DTC	**B2283**	**Vehicle Speed Sensor Malfunction**

DESCRIPTION

The skid control ECU converts these signals into 4-pulse signals and sends them to the combination meter. After this signal is converted into a more precise rectangular waveform by the waveform shaping circuit inside the combination meter, it is then transmitted to the main body ECU (instrument panel junction block). The main body ECU (instrument panel junction block) determines the vehicle speed based on the frequency of these pulse signals.

The main body ECU (instrument panel junction block) and the combination meter are connected by a cable and the CAN. DTC B2282 is output when the cable information and CAN information are inconsistent.

HINT:

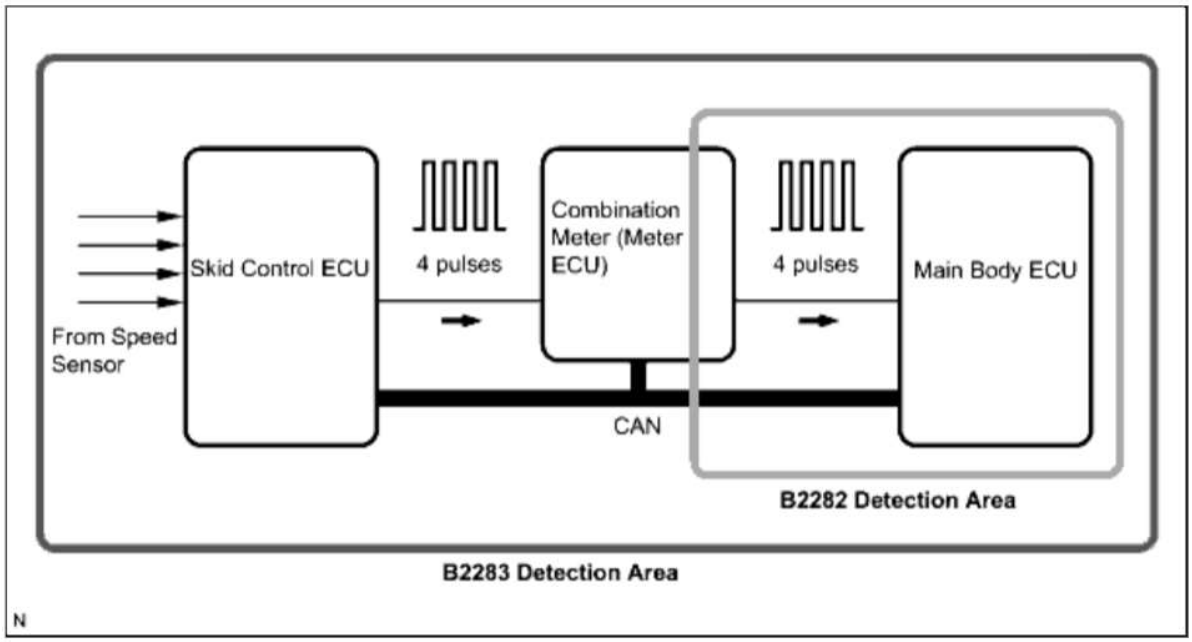
When the main body ECU (instrument panel junction block) is replaced with a new one and the cable from the negative (-) battery terminal is connected, the power source mode becomes the IG-ON mode. When the battery is removed and reinstalled, the power source mode that was selected when the battery was removed is restored.

After the main body ECU (instrument panel junction block) is replaced, perform the registration procedures for the engine immobiliser system INFO **.**

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B2282	Cable information and CAN information between the main body ECU (instrument panel junction block) and the combination meter are inconsistent	• CAN communication system • Combination meter system • Main body ECU (instrument panel junction block) • Wire harness or connector

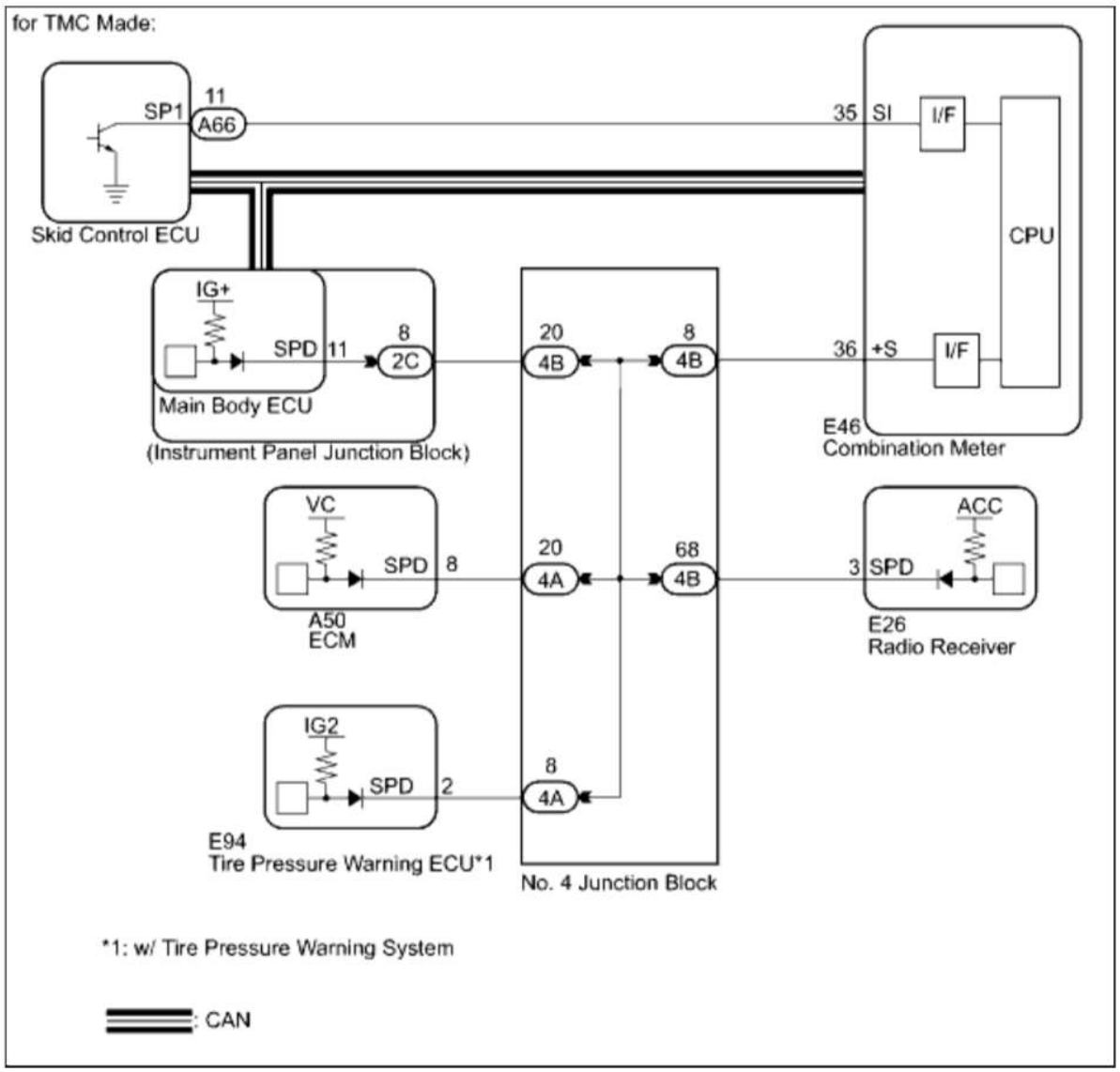
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DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B2283	When either of conditions below is met: • Over-deceleration in vehicle speed • Vehicle speed and engine speed do not match	• DTC B2282 detection area • Combination meter • Speed sensor • Skid control ECU • Main body ECU (instrument panel junction block) • Wire harness or connector

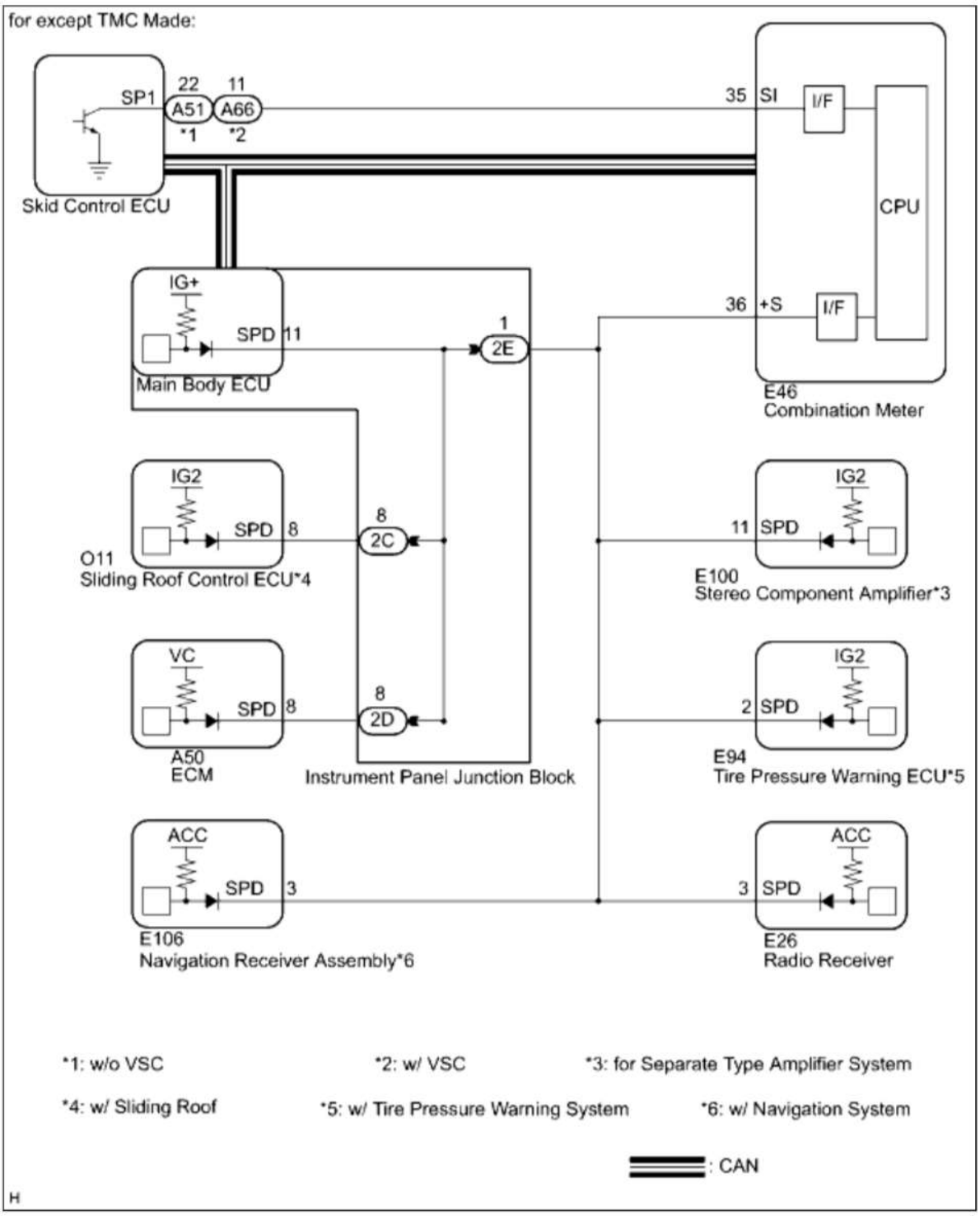


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HINT:

- 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

PROCEDURE

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1.	CHECK CAN COMMUNICATION SYSTEM

(a) Check for CAN communication system DTCs INFO .

HINT:

If the DTCs for the CAN communication system malfunction are output, inspect those DTCs first.

Result:

RESULT	PROCEED TO
CAN communication DTC is not output	A
CAN communication DTC is output	B

B ▶ GO TO CAN COMMUNICATION SYSTEM

A ▼

2.	CHECK SPEEDOMETER OPERATION

(a) Connect the Techstream to the DLC3.

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

(c) Enter the following menus: Body Electrical / Combination Meter / Data List.

(d) Check the values by referring to the values in the table below.

Combination Meter

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Vehicle Speed Meter	Vehicle speed/Min.: 0 km/h (0mph), Max.: 255 km/h (158 mph)	Almost same as actual speed (When driving)	-

OK:
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)

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OK

3.	READ VALUE USING TECHSTREAM (VEHICLE SPEED SIGNAL)

(a) Connect the Techstream to the DLC3.

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

(c) Read the Data List according to the displays on the Techstream.

Main Body

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Vehicle Speed Signal	Vehicle speed signal / STOP or RUN	STOP: Vehicle is stopped Run: Vehicle is running	-

OK:
"STOP" (Vehicle is stopped) and "OFF" (Vehicle is running) appear on the screen.

(d) Proceed to the next step based on the inspection result.

Result:

RESULT	PROCEED TO
OK	A
NG (TMC made)	B
NG (except TMC Made)	C

C ▶ **CHECK HARNESS AND CONNECTOR (COMBINATION METER - INSTRUMENT PANEL JUNCTION BLOCK)**

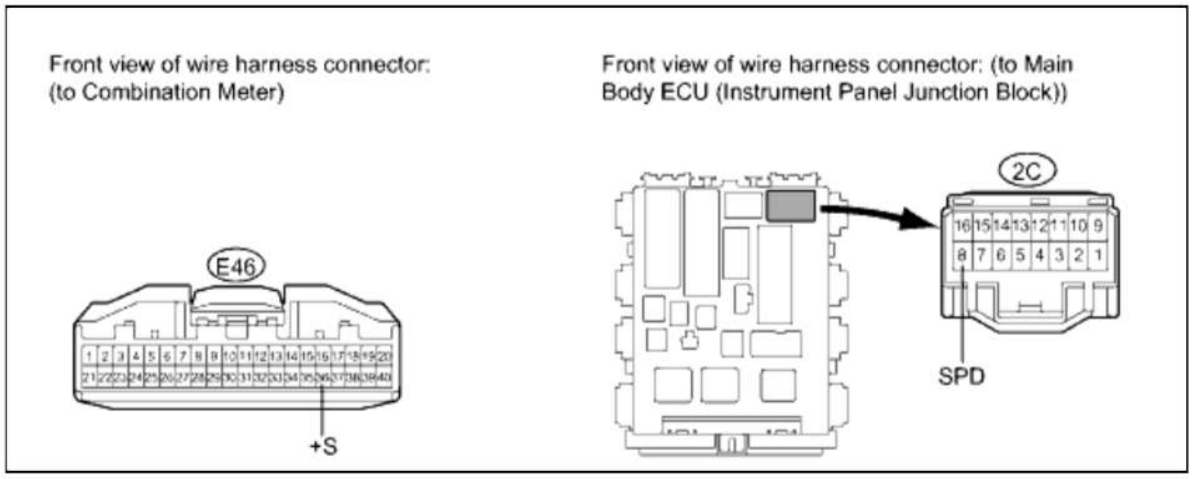
B ▶ **CHECK HARNESS AND CONNECTOR (COMBINATION METER - MAIN BODY ECU)**

A ▶ **REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)**

4.	CHECK HARNESS AND CONNECTOR (COMBINATION METER - MAIN BODY ECU)

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(a) Disconnect the E46 meter connector.



(b) Disconnect the 2C connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
2C-8 (SPD) - E46-36 (+S)	Always	Below 1 Ω
2C-8 (SPD) or E46-36 (+S) - Body ground	Always	10 kΩ or higher

NG ▶ **CHECK HARNESS AND CONNECTOR (COMBINATION METER - NO. 4 JUNCTION BLOCK)**

OK ▼

5.	**INSPECT COMBINATION METER ASSEMBLY**

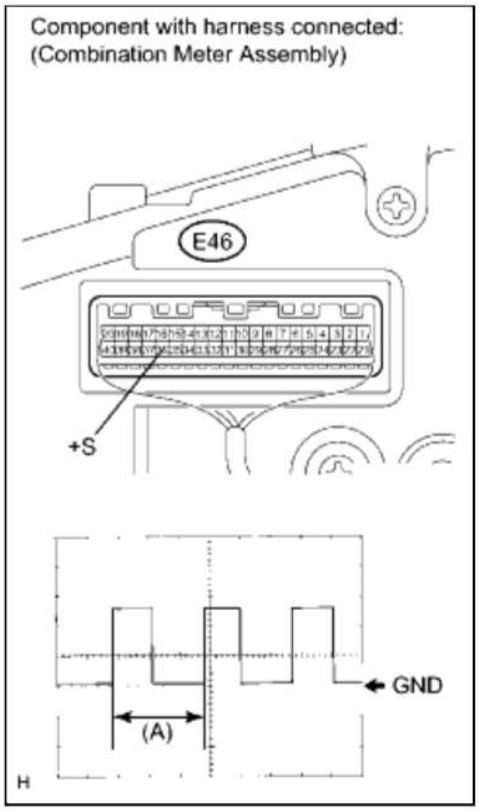
(a) Check the output waveform.

(1) Remove the combination meter with the connector(s) still connected INFO.

(2) Connect the oscilloscope to terminals E46-36 (+S) and body ground.

(3) Turn the engine switch on (IG).

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(4) Turn the wheel slowly.

(5) 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

OK:

The waveform is displayed as shown in the illustration.

HINT:

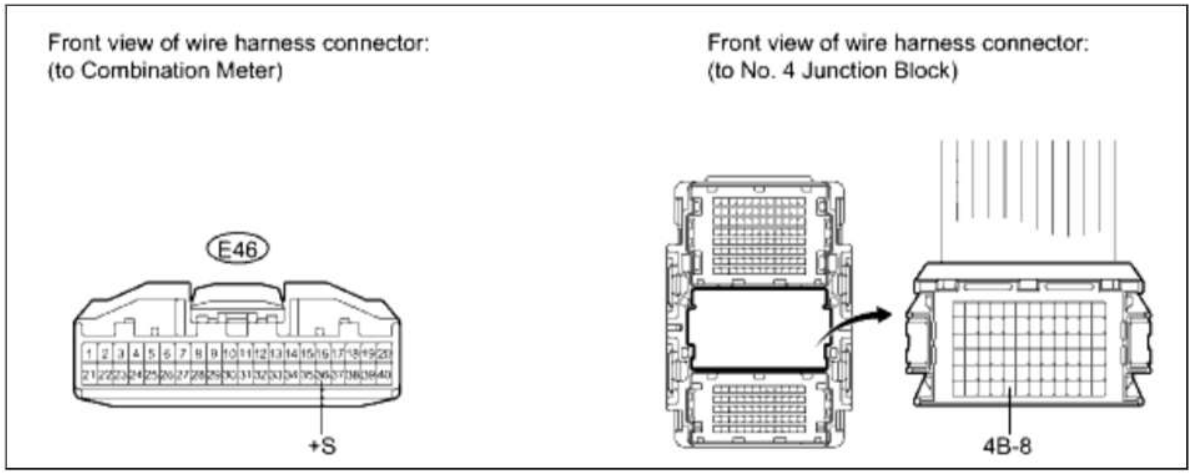
When the system is functioning normally, one wheel revolution generates 4 pulses. As the vehicle speed increases, the width indicated by (A) in the illustration narrows.

NG ▶ **GO TO METER / GAUGE SYSTEM**

OK ▶ **REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)**

6.	CHECK HARNESS AND CONNECTOR (COMBINATION METER - NO. 4 JUNCTION BLOCK)

(a) Disconnect the 4B connector.



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

Standard Resistance:

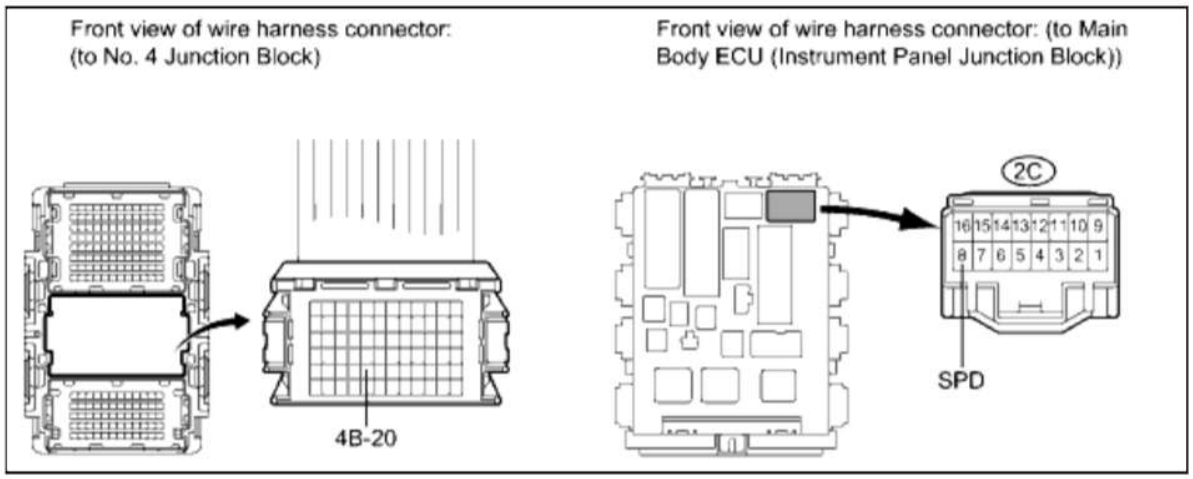
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E46-36 (+S) - 4B-8	Always	Below 1 Ω
E46-36 (+S) or 4B-8 - Body ground	Always	Below 1 Ω

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (COMBINATION METER - NO. 4 JUNCTION BLOCK)**

OK ▼

7.	**CHECK HARNESS AND CONNECTOR (INSTRUMENT PANEL JUNCTION BLOCK - NO. 4 JUNCTION BLOCK)**

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



Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
2C-8 (SPD) - 4B-20	Always	Below 1 Ω
2C-8 (SPD) or 4B-20 - Body ground	Always	10 kΩ or higher

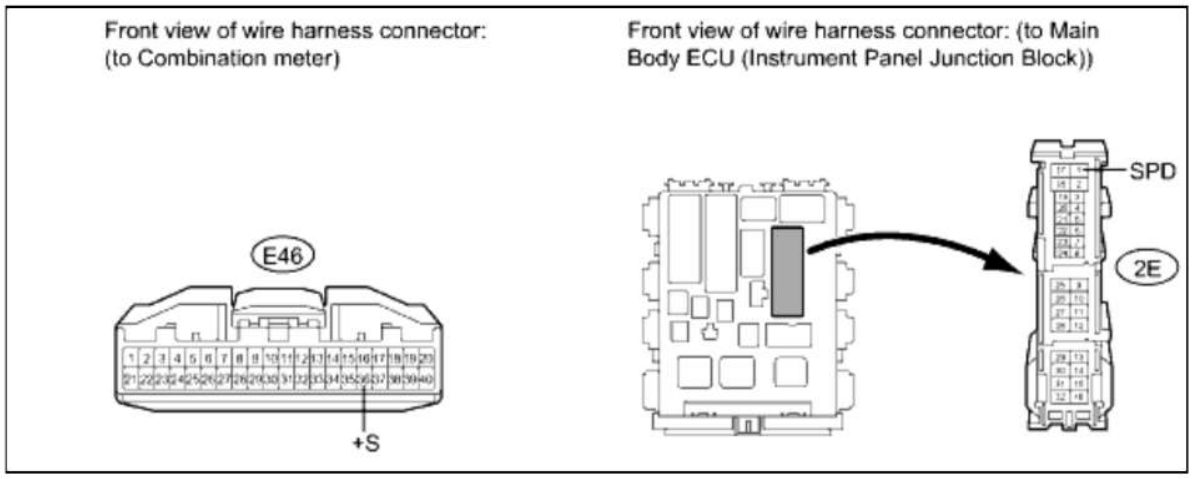
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (INSTRUMENT PANEL JUNCTION BLOCK - NO. 4 JUNCTION BLOCK)**

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OK ▶ **REPLACE JUNCTION CONNECTOR**

8.	**CHECK HARNESS AND CONNECTOR (COMBINATION METER - INSTRUMENT PANEL JUNCTION BLOCK)**

(a) Disconnect the E46 meter connector.



(b) Disconnect the 2E connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
2E-1 (SPD) - E46-36 (+S)	Always	Below 1 Ω
2E-1 (SPD) or E46-36 (+S) - Body ground	Always	10 kΩ or higher

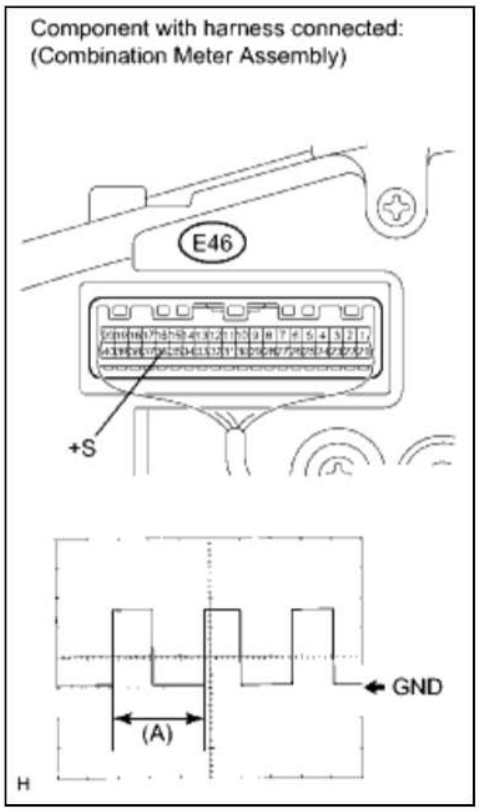
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (COMBINATION METER - INSTRUMENT PANEL JUNCTION BLOCK))**

OK ▼

9.	**INSPECT COMBINATION METER**

(a) Check the output waveform.

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(1) Remove the combination meter with the connector(s) still connected INFO .

(2) Connect the oscilloscope to terminals E46-36 (+S) and body ground.

(3) Turn the engine switch on (IG).

(4) Turn the wheel slowly.

(5) 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

OK:

The waveform is displayed as shown in the illustration.

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**

OK ▶ **REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001LV201TX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): B2281: "P" Signal Malfunction (2010 Corolla)		

DTC	**B2281**	**"P" Signal Malfunction**

DESCRIPTION

The ECM and the shift lock control ECU are connected by a cable and the CAN. If the cable information and CAN information are inconsistent, this DTC will be output.

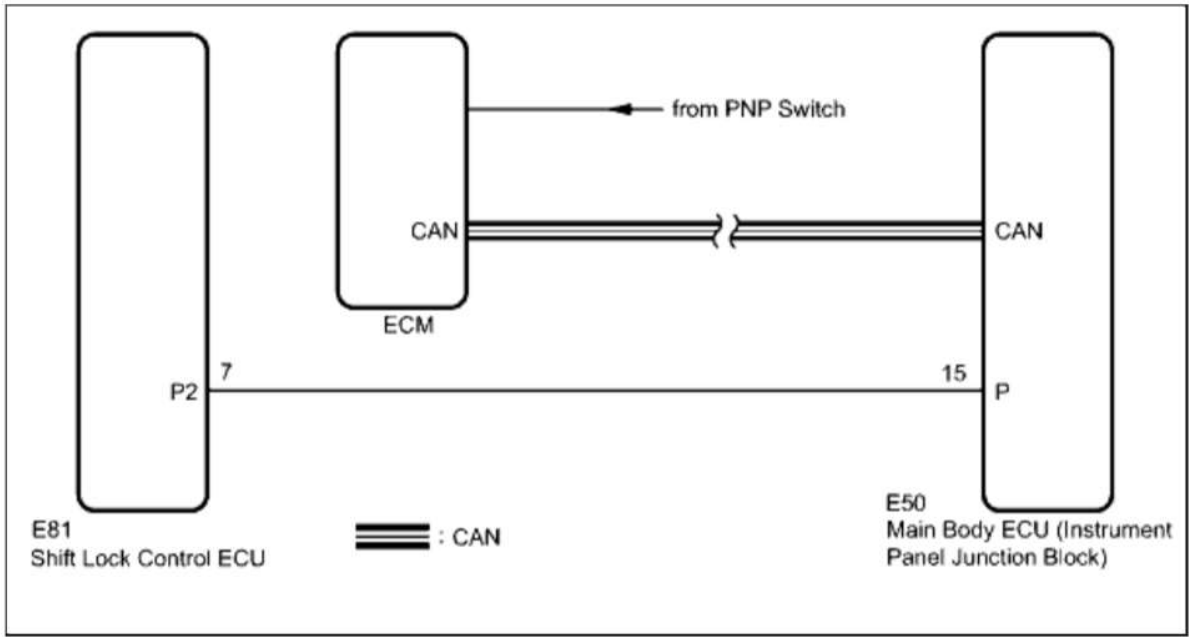
HINT:

If the main body ECU (instrument panel junction block) is replaced with a new one while the cable from the negative (-) battery terminal is connected, the power source mode will be in IG-ON mode. When the battery is removed and reinstalled, the power source mode that was selected when the battery was removed is restored. After the main body ECU (instrument panel junction block) is replaced, perform the registration procedure for the engine immobiliser system INFO .

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B2281	Cable information and CAN information between main body ECU (instrument panel junction block) and shift lock control ECU are inconsistent	• Main body ECU (instrument panel junction block) • Shift lock control ECU • Wire harness or connector

WIRING DIAGRAM

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INSPECTION PROCEDURE

PROCEDURE

1.	**CHECK CAN COMMUNICATION SYSTEM**

(a) Check for CAN communication system DTCs INFO.

HINT:

If the DTCs for the CAN communication system malfunction are output, inspect those DTCs first.

Result:

RESULT	PROCEED TO
CAN communication DTC is not output	A
CAN communication DTC is output	B

B ▶ **GO TO CAN COMMUNICATION SYSTEM**

A ▼

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2.	READ VALUE USING TECHSTREAM

(a) Connect the Techstream to the DLC3.

(b) Turn the engine switch on (IG) and turn the Techstream main switch on.

(c) Read the Data List according to the displays on the Techstream.

Main Body

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Shift P Signal	Shift P Signal / ON or OFF	ON: Shift P signal ON (Shift position is P) OFF: Shift P signal OFF (Shift position is not P)	-

OK:
"ON" (P signal is ON) and "OFF" (P signal is OFF) appear on the screen.

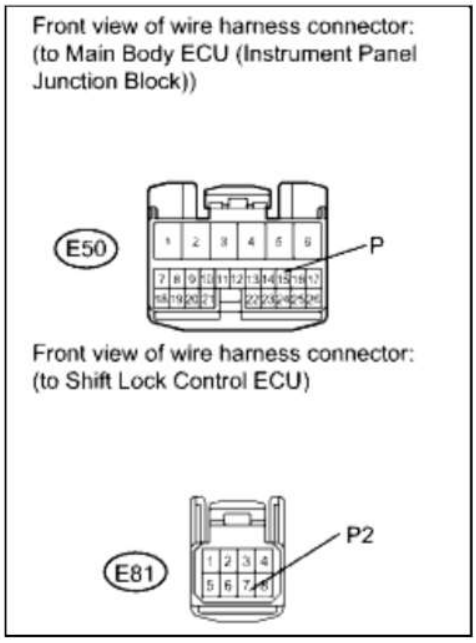
NG ▶ GO TO SHIFT CONTROL SYSTEM

OK ▼

3.	CHECK HARNESS AND CONNECTOR (MAIN BODY ECU - SHIFT LOCK CONTROL ECU)

(a) Disconnect the E50 and E81 ECU connectors.

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

Standard Resistance:

TERMINAL NO. (SYMBOL)	CONDITION	SPECIFIED CONDITION
E50-15 (P) - E81-7 (P2)	Always	Below 1 Ω
E50-15 (P) - Body ground	Always	10 kΩ or higher

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (MAIN BODY ECU - SHIFT LOCK CONTROL ECU)**

OK ▼

4.	CHECK MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK) OPERATION

(a) After replacing the main body ECU (instrument panel junction block) with a normally functioning ECU, check that the engine can start normally.

OK:

Engine can start normally.

NG ▶ **REPLACE SHIFT LOCK CONTROL ECU**

OK ▶ **END (MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK) DEFECTIVE)**

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Last Modified: 3-10-2010	6.4 J	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000YA105EX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): Engine does not Start (2010 Corolla)		

Engine does not Start

DESCRIPTION

1. ENGINE START SYSTEM FUNCTION

(a) If the engine switch is pressed with the shift lever is in P or N and the brake pedal depressed, the main body ECU (instrument panel junction block) determines that it is an engine start request.

(b) The certification ECU (smart key ECU assembly) and other ECUs perform key verification via the LIN communication line.

(c) The main body ECU (instrument panel junction block) activates the ACC relay.

(d) The main body ECU (instrument panel junction block) activates the IG1 and IG2 relays.

(e) The certification ECU (smart key ECU assembly) outputs a steering UNLOCK signal. The signal is sent to the main body ECU (instrument panel junction block) via the steering lock ECU.

(f) The main body ECU (instrument panel junction block) sends an engine start request signal to the ECM.

(g) The ECM sends an ACC cut request signal to the main body ECU (instrument panel junction block).

(h) The ECM and main body ECU (instrument panel junction block) activate the starter relay.

(i) The main body ECU (instrument panel junction block) deactivates the ACC relay until the main body ECU (instrument panel junction block) detects an engine start.

(j) When engine revolution speed reaches 1200 rpm, the ECM determines that the engine has been started.

The ECM stops sending an ACC cut request signal to the main body ECU.

The main body ECU (instrument panel junction block) reactivates the ACC relay and turns off the engine switch indicator light, when engine revolution speed reaches 800 rpm.

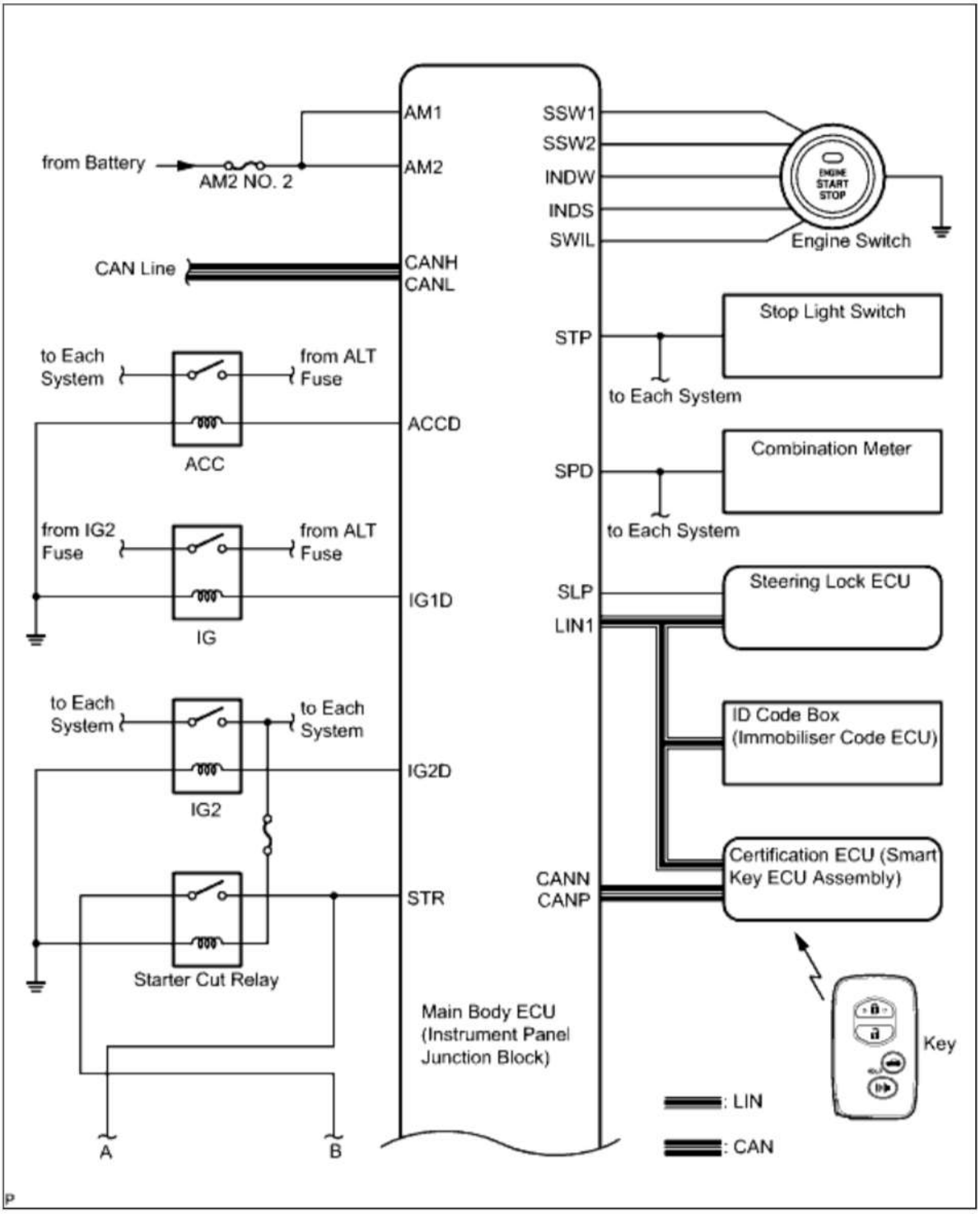
SYMBOL OF MAIN BODY ECU	SIGNAL	
STP	Stop light switch ON signal	Input
SSW1/SSW2	Engine switch ON signal	Input
ACCD	ACC relay operation signal	Output
SLP	Steering lock actuator position signal	Input
IG1D	IG1 relay operation signal	Output
IG2D	IG2 relay operation signal	Output
STR2	Starter relay operation signal (Sub)	Output

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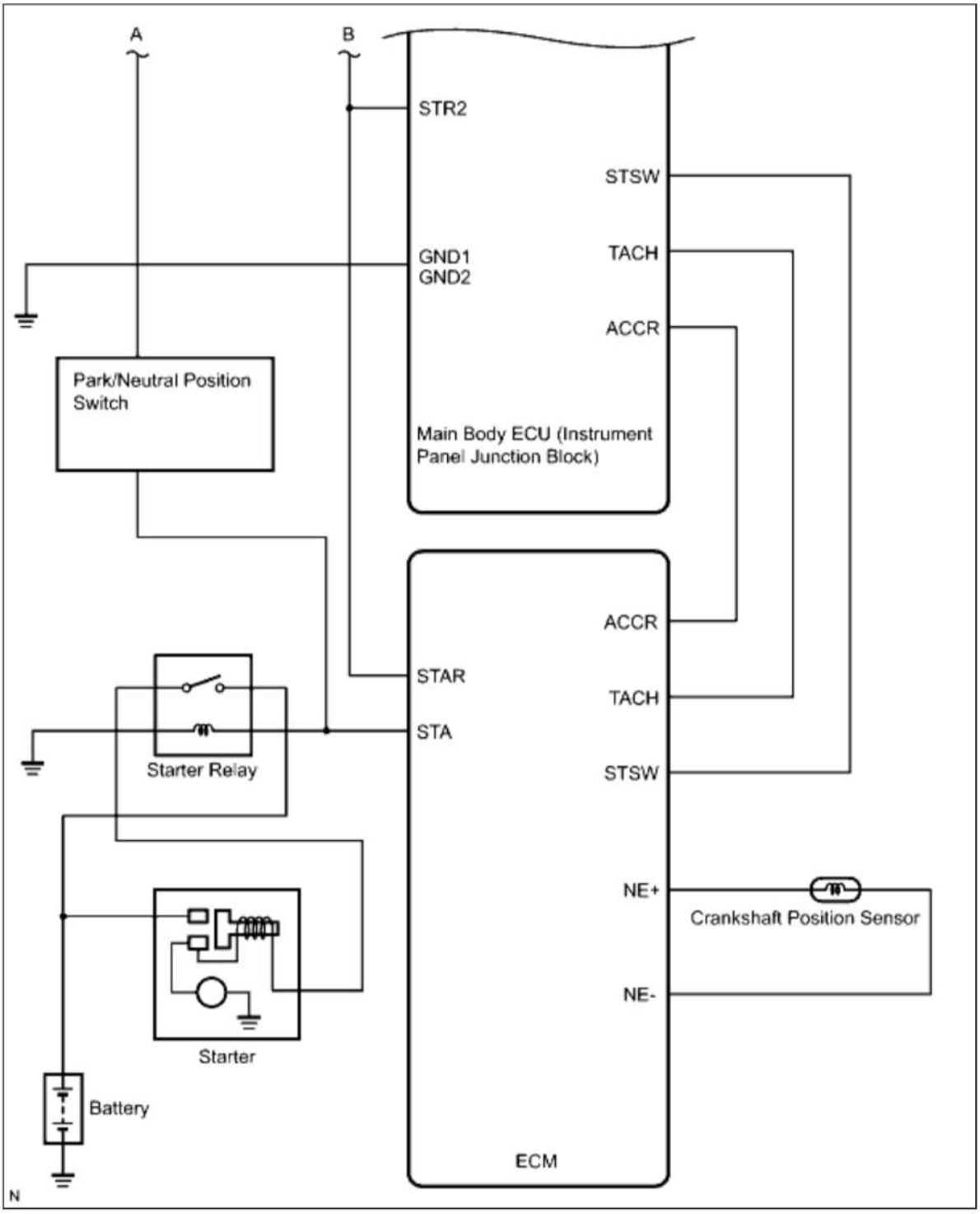
SYMBOL OF MAIN BODY ECU	SIGNAL	
STR	Park/Neutral position switch signal	Input
TACH	Engine start detection signal	Input
STSW	Starter activation request signal	Output
ACCR	ACC cut request signal	Input

SYMBOL OF ECM	SIGNAL	
ACCR	ACC cut request signal	Output
TACH	Engine revolution speed signal	Output
STSW	Starter activation request signal	Input
STAR	Starter relay operation signal (Main)	Output
STA	Starter activation signal	Input

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WIRING DIAGRAM

See CRANKING HOLDING FUNCTION CIRCUIT INFO .

INSPECTION PROCEDURE

1. EMERGENCY ENGINE 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 main body ECU (instrument panel junction block). This may result in the engine

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not starting even if the engine switch is pressed while the brake pedal is depressed and the shift lever is in P.

To activate the starter:

(1) Turn the engine switch from off to on (ACC).

(2) Hold pressing and hold the engine switch for 15 seconds.

HINT:

After the main body ECU (instrument panel junction block), certification ECU (smart key ECU assembly), steering lock ECU, ID code box (immobiliser code ECU) and/or ECM are/is replaced, perform the registration procedures for the engine immobiliser system INFO **.**

PROCEDURE

1.	**CHECK THE ENGINE SWITCH CONDITION**

(a) Check the power source mode changes.

(1) When the key is inside the vehicle and the shift lever is in P, check that the power source mode changes.

OK:

off → on (ACC) → on (IG) → off

NG ▶ **GO TO OTHER FLOW CHART**

OK ▼

2.	**CHECK FOR DTC**

(a) Clear the DTCs INFO .

(b) Check for DTCs again.

(c) Proceed to the next step based on the inspection result.

Result:

RESULT	PROCEED TO
No DTC is output	A
Smart key system (for start function) DTCs are output	B

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RESULT	PROCEED TO
Steering lock DTCs are output	C
Engine immobiliser system DTCs are output	D
Vehicle stability control system DTCs are output	E

E ▶ GO TO DIAGNOSTIC TROUBLE CODE CHART (VEHICLE STABILITY CONTROL SYSTEM)

D ▶ GO TO DIAGNOSTIC TROUBLE CODE CHART (ENGINE IMMOBILISER SYSTEM)

C ▶ GO TO DIAGNOSTIC TROUBLE CODE CHART (STEERING LOCK SYSTEM)

B ▶ GO TO DIAGNOSTIC TROUBLE CODE CHART (SMART KEY SYSTEM (STARTING))

A ▼

3.	CHECK CRANKING FUNCTION

(a) Check the engine cranking function.

(1) When there is fuel in the fuel tank, the key is inside the vehicle, and the shift lever is in P, check that depressing the brake pedal and pressing the engine switch crank the engine.

Result:

RESULT	PROCEED TO
Engine cranks	A
Engine does not crank	B

A ▶ GO TO SFI SYSTEM

B

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4.	READ VALUE USING TECHSTREAM (STARTER CONTROL)

(a) Connect the Techstream to the DLC3.

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

(c) Read the Data List according to the displays on the Techstream screen.

Engine and ECT

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Starter Control	Starter switch signal / ON or OFF	ON: Engine switch on (ST) OFF: Engine switch except on (ST)	-

Standard:

ENGINE SWITCH CONDITION	TESTER DISPLAY
When engine switch is on (ST)	ON
When engine switch is except on (ST)	OFF

NG ▶ **READ VALUE USING TECHSTREAM (PARK/NEUTRAL POSITION SWITCH)**

OK

5.	PERFORM ACTIVE TEST USING TECHSTREAM (STARTER RELAY)

(a) Connect the Techstream to the DLC3.

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

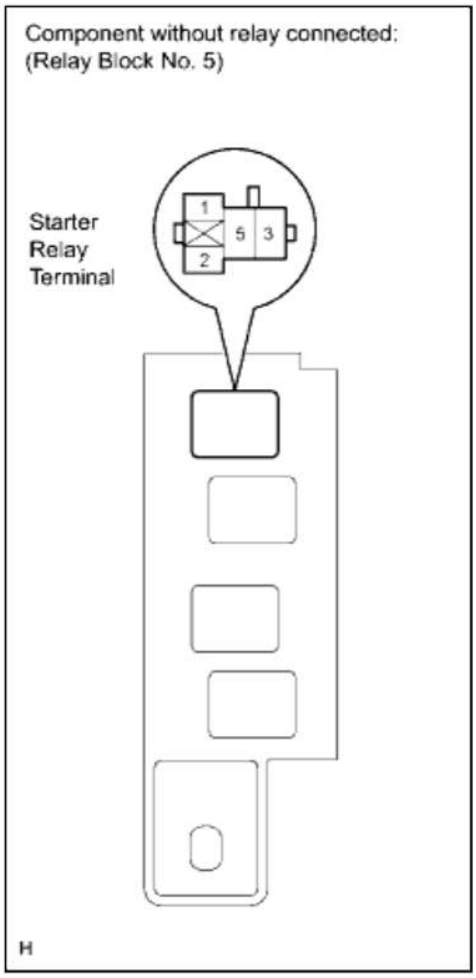
(c) Perform Active Test according to the prompts displayed on the Techstream.

Engine and ECT

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TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Activate the Starter Relay	Starter	ON or OFF	-

(d) for TMC Made:



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

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Relay block No. 5 starter relay terminal 2 - Relay block No. 5 starter relay terminal 1	When starter relay is ON by Active test using Techstream	8 to 14 V
Relay block No. 5 starter relay terminal 2 - Relay block No. 5 starter relay terminal 1	When starter relay is OFF by Active test using Techstream	Below 1 V

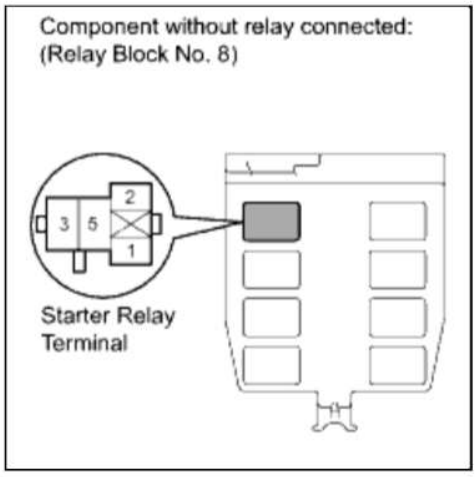
(e) for except TMC Made:

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

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Relay block No. 8 starter relay terminal 2 - Relay block No. 8 starter relay terminal 1	When starter relay is ON by Active test using Techstream	8 to 14 V

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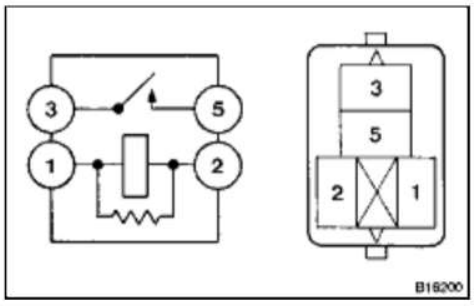


Relay block No. 8 starter relay terminal 2 - Relay block No. 8 starter relay terminal 1	When starter relay is OFF by Active test using Techstream	Below 1 V

NG ▶ **INSPECT STARTER CUT RELAY**

OK ▼

6.	**INSPECT STARTER RELAY**



(a) Remove the starter relay from the relay block No. 5*1.

(b) Remove the starter relay from the relay block No. 8*2.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
3 - 5	When battery voltage is not applied to terminals 1 and 2	10 kΩ or higher
3 - 5	When battery voltage is applied to terminals 1 and 2	Below 1 Ω

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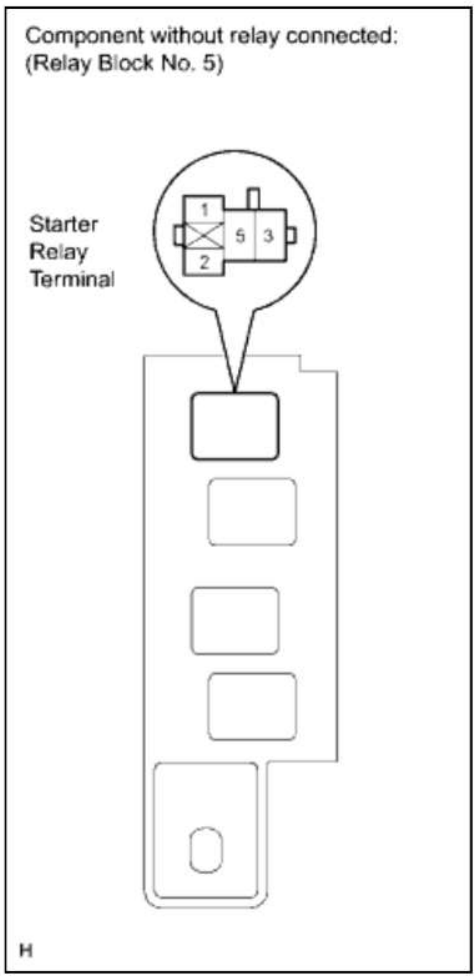
HINT:

- *1: for TMC Made
- *2: for except TMC Made

NG ▶ **REPLACE STARTER RELAY**

OK
▼

7.	**CHECK HARNESS AND CONNECTOR (STARTER RELAY TERMINAL VOLTAGE AND RESISTANCE)**



(a) for TMC Made:

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

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Relay block No. 5 starter relay terminal 5 - Body ground	Always	11 to 14 V

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

Standard Resistance:

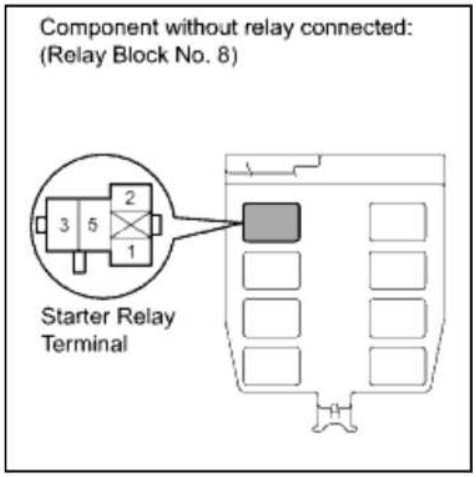
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Relay Block No. 5 starter relay terminal 1 - Body ground	Always	Below 1 Ω

(b) for except TMC Made:

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

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Standard Voltage:



TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Relay block No. 8 starter relay terminal 5 - Body ground	Always	11 to 14 V

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

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Relay block No. 8 starter relay terminals 1 - Body ground	Always	Below 1 Ω

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

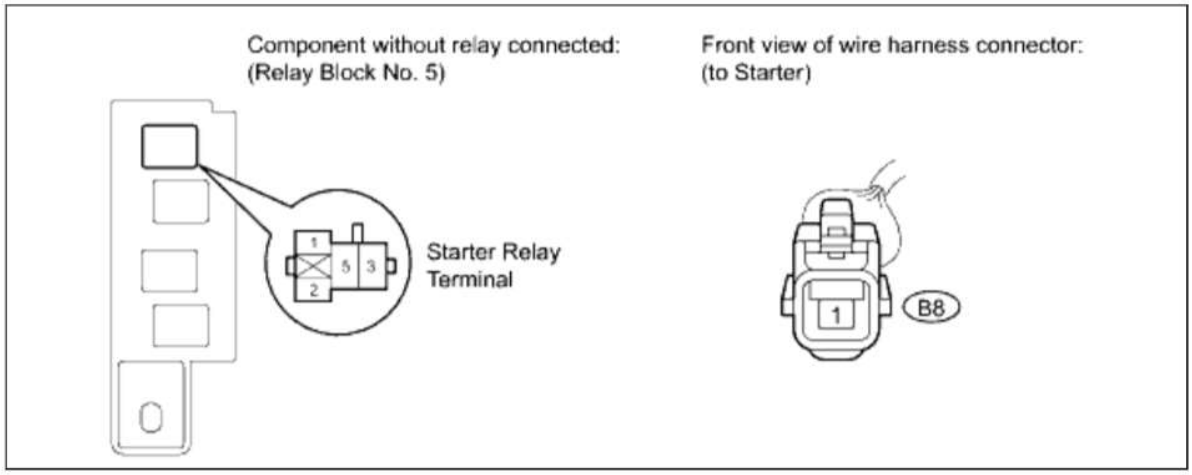
OK ▼

8.	CHECK HARNESS AND CONNECTOR (STARTER RELAY - STARTER)

(a) for TMC Made:

(1) Disconnect the B8 connector.

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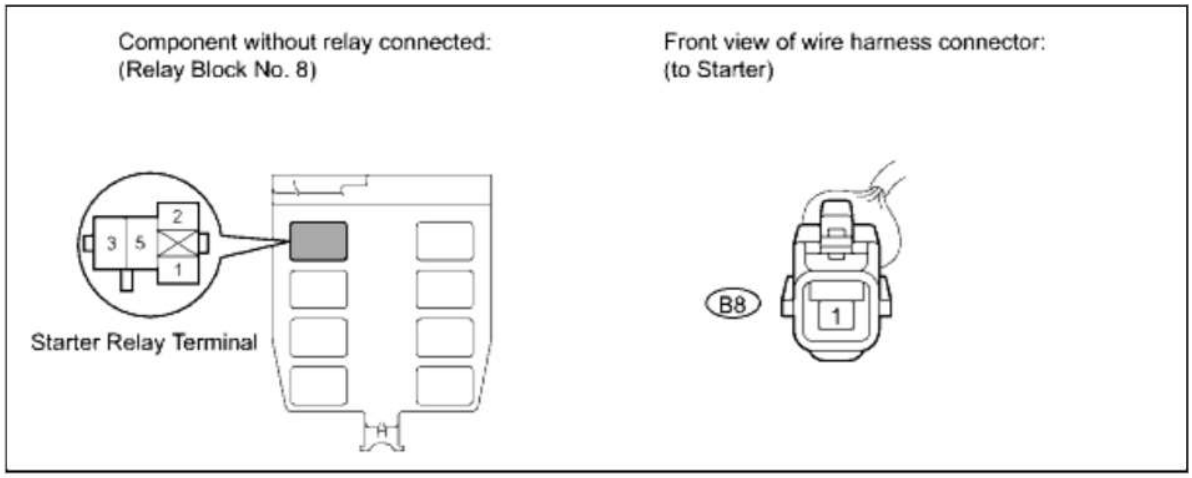
(2) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Relay block No. 5 starter relay terminal 3 - B8-1	Always	Below 1 Ω
Relay block No. 5 starter relay terminal 3 or B8-1 - Body ground	Always	10 kΩ or higher

(b) for except TMC Made:

(1) Disconnect the B8 connector.



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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION

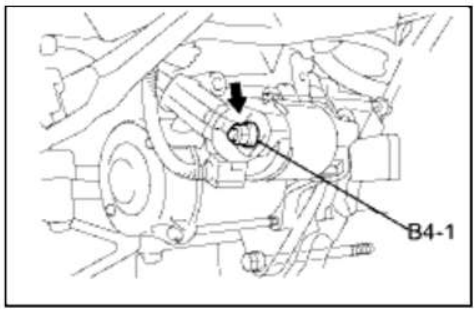
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TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Relay block No. 8 starter relay terminal 3 - B8-1	Always	Below 1 Ω
Relay block No. 8 starter relay terminal 3 or B8-1 - Body ground	Always	10 kΩ or higher

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (STARTER RELAY - STARTER)**

OK ▼

9.	**CHECK HARNESS AND CONNECTOR (BATTERY - STARTER)**



(a) Disconnect the B4 connector.

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

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B4-1 - Body ground	Always	11 to 14 V

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (BATTERY - STARTER)**

OK ▶ **REPLACE STARTER ASSEMBLY**

10.	**READ VALUE USING TECHSTREAM (PARK/NEUTRAL POSITION SWITCH)**

(a) Connect the Techstream to the DLC3.

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

(c) Read the Data List according to the displays on the Techstream screen.

Main Body

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
N SW / C SW	Park/Neutral position switch / ON or OFF	ON: Shift position is P or N OFF: Shift position is not P nor N	-

OK:
"ON" (Shift position is P or N) and "OFF" (Shift position is not P nor N) appear on the screen.

NG ▶ **CHECK HARNESS AND CONNECTOR (MAIN BODY ECU - BODY GROUND)**

OK ▼

11.	READ VALUE USING TECHSTREAM (S CODE)

(a) Connect the Techstream to the DLC3.

HINT:

When using the Techstream with the engine switch off, turn on and off any of the door courtesy light switches repeatedly at 1.5 second intervals or less until communication between the Techstream and vehicle starts.

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

(c) Read the Data List according to the displays on the Techstream.

Smart Key

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
S Code Chk	S code check / OK or NG	OK: Normal NG: Malfunction	-

OK:
"OK" is displayed on the screen.

NG ▶ **REGISTER RECOGNITION CODE (ECU CODE)**

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OK

12.	READ VALUE USING TECHSTREAM (L CODE)

(a) Connect the Techstream to the DLC3.

HINT:

When using the Techstream with the engine switch off, turn on and off any of the door courtesy light switches repeatedly at 1.5 second intervals or less until communication between the Techstream and vehicle starts.

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

(c) Read the Data List according to the displays on the Techstream.

Smart Key

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
L Code Chk	L code check / OK or NG	OK: Normal NG: Malfunction	-

OK:
"OK" is displayed on the screen.

NG ▶ **REGISTER RECOGNITION CODE (ECU CODE)**

OK

13.	READ VALUE USING TECHSTREAM (IMMOBILISER SYSTEM STATUS)

(a) Connect the Techstream to the DLC3.

HINT:

When using the Techstream with the engine switch off, turn on and off any of the door courtesy light switches repeatedly at 1.5 second intervals or less until communication between the Techstream and vehicle starts.

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

(c) Read the Data List according to the displays on the Techstream.

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Immobiliser

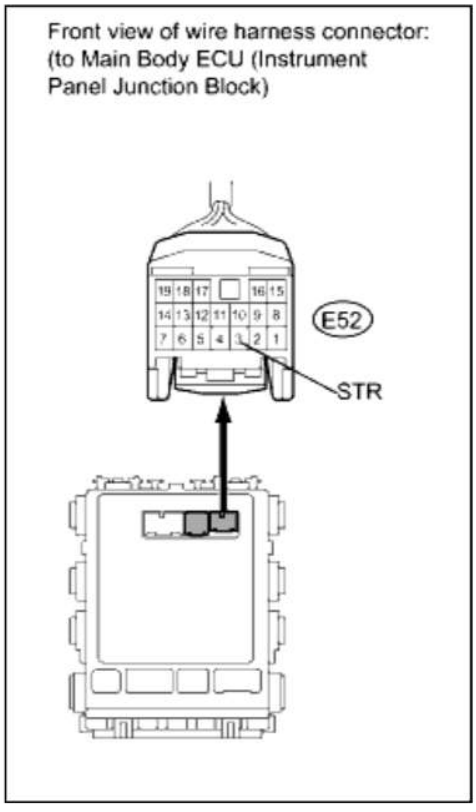
TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Immobiliser	Immobiliser system status / SET or UNSET	UNSET: Engine switch ON SET: Without key	-

OK:
UNSET (Engine switch ON) appears on the screen.

NG ▶ **READ VALUE USING TECHSTREAM (ENGINE START REQUEST)**

OK ▶ **REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)**

14.	CHECK HARNESS AND CONNECTOR (MAIN BODY ECU - BODY GROUND)



(a) Disconnect the E52 connector from the main body ECU (instrument panel junction block).

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

Standard Resistance:

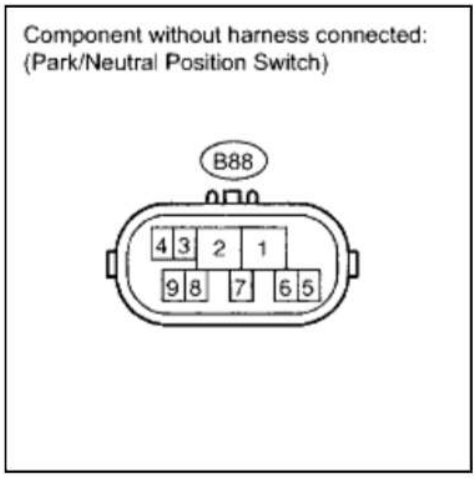
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TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E52-3 (STR) - Body ground	Shift position is P or N	105 to 115 Ω
E52-3 (STR) - Body ground	Shift position is not P nor N	10 kΩ or higher

NG ▶ **INSPECT PARK/NEUTRAL POSITION SWITCH**

OK ▶ **REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)**

15.	INSPECT PARK/NEUTRAL POSITION SWITCH



(a) Disconnect the B88 connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
4 - 5	P	Below 1 Ω
4 - 5	N	Below 1 Ω
4 - 5	Except P and N	10 kΩ or higher

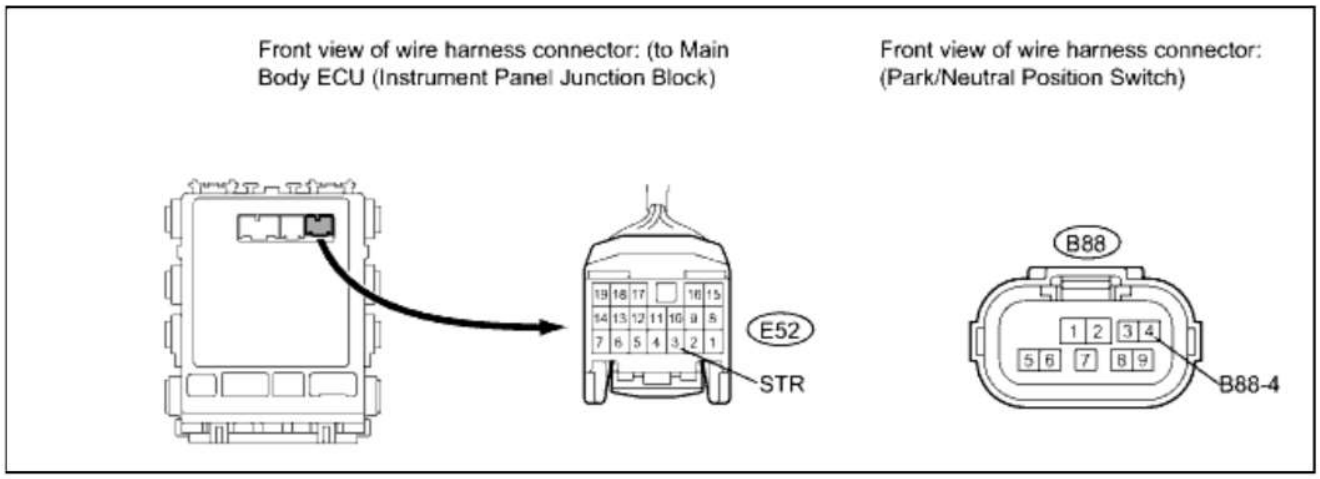
NG ▶ **REPLACE PARK/NEUTRAL POSITION SWITCH**

OK ▼

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16.	**CHECK HARNESS AND CONNECTOR (MAIN BODY ECU - PARK/NEUTRAL POSITION SWITCH)**

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



Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E52-3 (STR) - B88-4	Always	Below 1 Ω
E52-3 (STR) or B88-4 - Body ground	Always	10 kΩ or higher

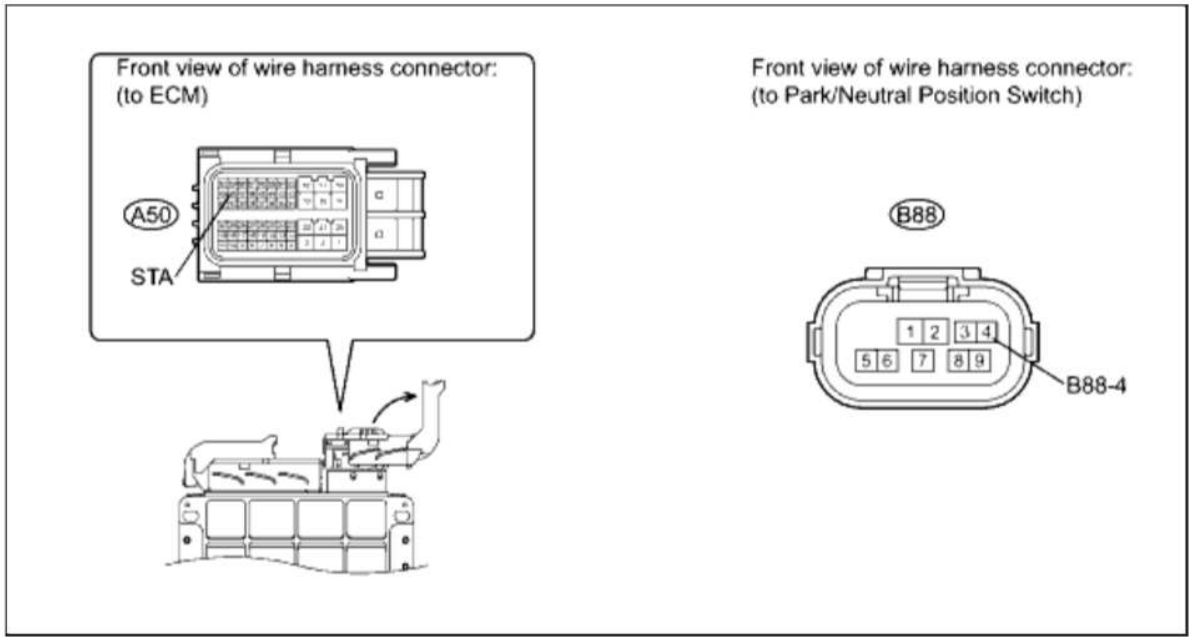
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (MAIN BODY ECU - PARK/NEUTRAL POSITION SWITCH)**

OK ▼

17.	**CHECK HARNESS AND CONNECTOR (PARK/NEUTRAL POSITION SWITCH - ECM)**

(a) Disconnect the E50 connector from the ECM.

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

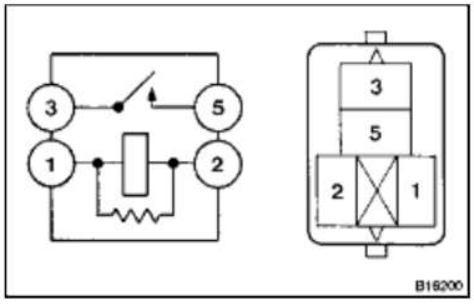
Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B88-4 - A50-48 (STA)	Always	Below 1 Ω
B88-4 or A50-48 (STA) - Body ground	Always	10 kΩ or higher

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (PARK/NEUTRAL POSITION SWITCH - ECM)**

OK ▼

18.	INSPECT STARTER RELAY



(a) Remove the starter relay from engine room relay block.

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

Standard Resistance:

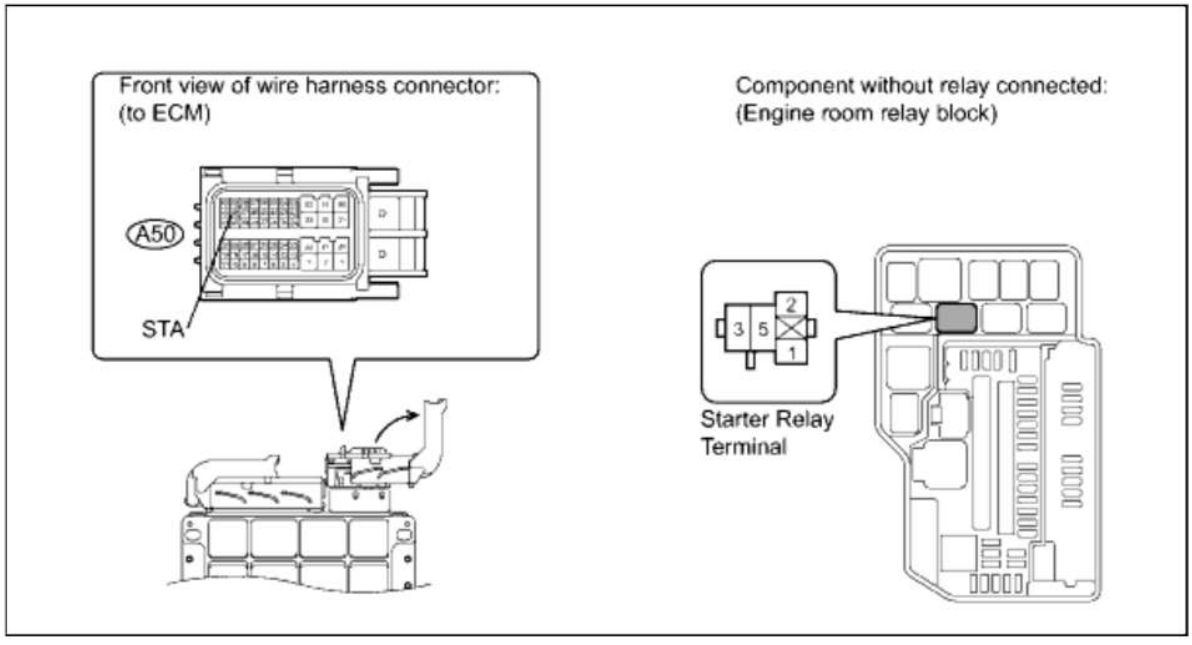
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
3 - 5	When battery voltage is not applied to terminals 1 and 2	10 kΩ or higher
3 - 5	When battery voltage is applied to terminals 1 and 2	Below 1 Ω

NG ▶ **REPLACE STARTER RELAY**

OK ▼

19.	CHECK HARNESS AND CONNECTOR (ECM - STARTER RELAY)

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



Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION

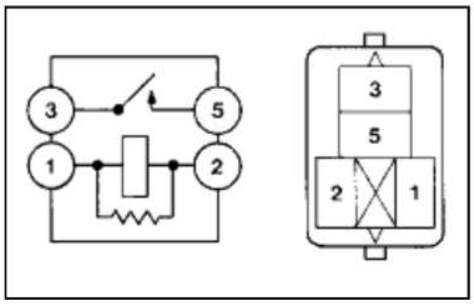
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TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Engine room relay block starter relay terminal 2 - A50-48 (STA)	Always	Below 1 Ω
Engine room relay block starter relay terminal 2 or A50-48 (STA) - Body ground	Always	10 kΩ or higher

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (ECM - STARTER RELAY)**

OK ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (STARTER RELAY - BODY GROUND)**

20.	INSPECT STARTER CUT RELAY



(a) Remove the starter cut relay from the engine room relay block.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
3 - 5	When battery voltage is applied to terminals 1 and 2	Below 1 Ω
3 - 5	When battery voltage is not applied to terminals 1 and 2	10 kΩ or higher

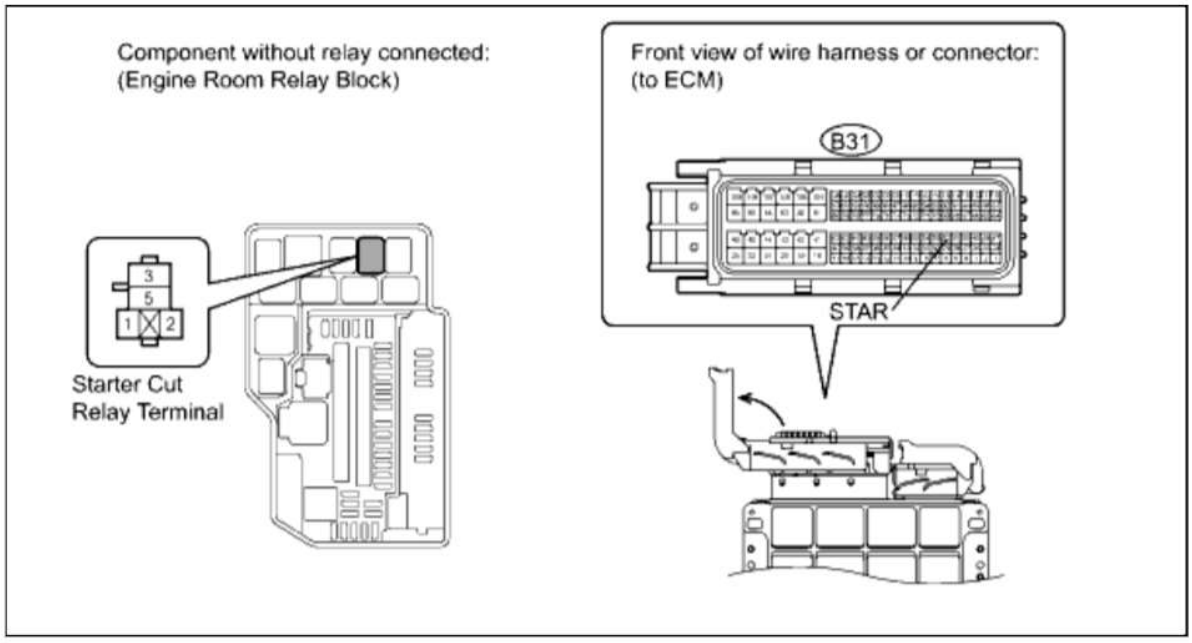
NG ▶ **REPLACE STARTER CUT RELAY**

OK ▼

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21.	CHECK HARNESS AND CONNECTOR (STARTER CUT RELAY - ECM)

(a) Disconnect the B31 connector from the ECM.



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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Engine room relay block starter cut relay terminal 5 - B31-52 (STAR)	Always	Below 1 Ω
Engine room relay block starter cut relay terminal 5 or B31-52 (STAR) - Body ground	Always	10 kΩ or higher

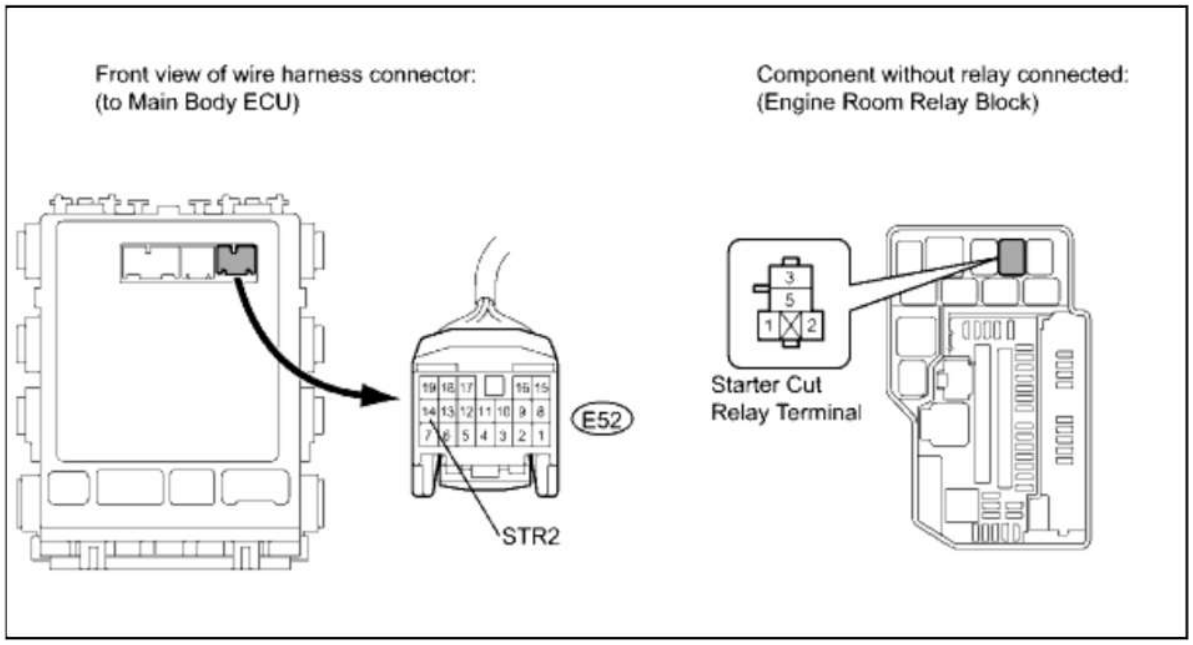
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (STARTER CUT RELAY - ECM)**

OK ▼

22.	CHECK HARNESS AND CONNECTOR (STARTER CUT RELAY - MAIN BODY ECU)

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(a) Disconnect the E52 connector from the main body ECU (instrument panel junction block).



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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Engine room relay block starter cut relay terminal 5 - E52-14 (STR2)	Always	Below 1 Ω
Engine room relay block starter cut relay terminal 5 or E52-14 (STR2) - Body ground	Always	10 kΩ or higher

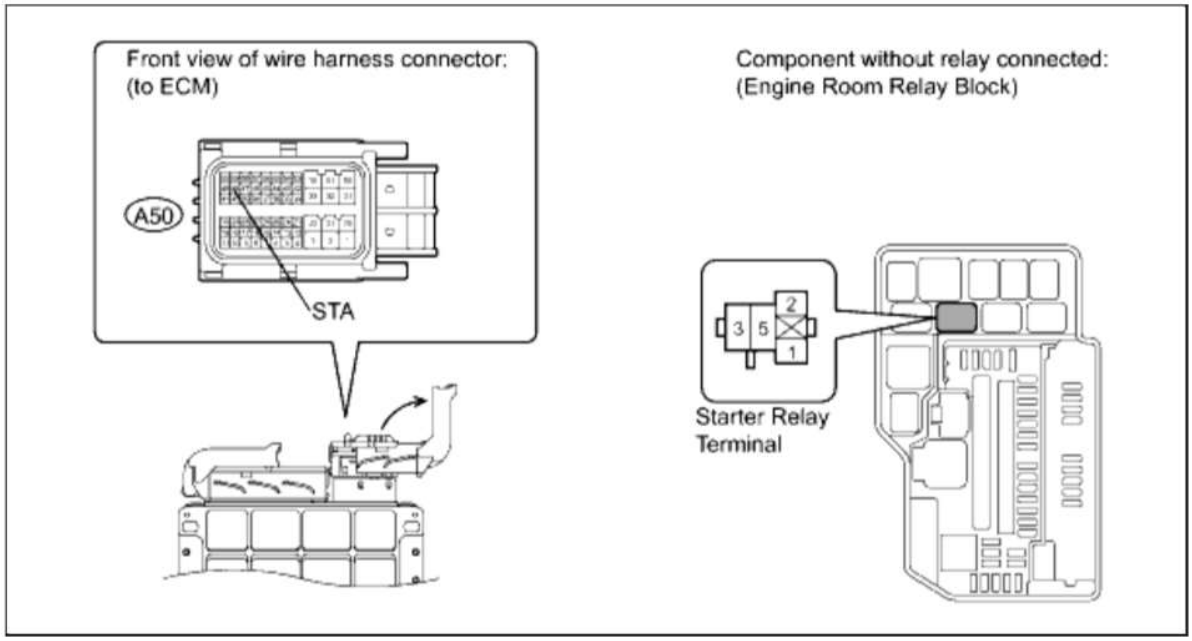
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (STARTER CUT RELAY - MAIN BODY ECU)**

OK ▼

23.	**CHECK HARNESS AND CONNECTOR (ECM - STARTER RELAY)**

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

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Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Engine room relay block starter relay terminal 2 - A50-48 (STA)	Always	Below 1 Ω
Engine room relay block starter relay terminal 2 or A50-48 (STA) - Body ground	Always	10 kΩ or higher

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (ECM - STARTER RELAY)**

OK ▶ **REPLACE ECM**

24.	REGISTER RECOGNITION CODE (ECU CODE)

(a) Register the recognition code (ECU code) INFO .

NEXT

25.	CHECK CRANKING FUNCTION

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(a) Check the engine cranking function.

(1) When there is fuel in the fuel tank, the key is inside the vehicle, and the shift lever is in P, check that depressing the brake pedal and pressing the engine switch crank the engine.

Result:

RESULT	PROCEED TO
Engine does not crank	A
Engine cranks	B

B ▶ **END**

A ▼

26.	REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

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

NEXT ▼

27.	KEY REGISTRATION

(a) Register the key INFO .

NEXT ▼

28.	CHECK CRANKING FUNCTION

(a) Check the engine cranking function.

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(1) When there is fuel in the fuel tank, the key is inside the vehicle, and the shift lever is in P, check that depressing the brake pedal and pressing the engine switch crank the engine.

Result:

RESULT	PROCEED TO
Engine does not crank	A
Engine cranks	B

B ▶ **END**

A ▶ **REPLACE ID CODE BOX (IMMOBILISER CODE ECU)**

29.	REGISTER RECOGNITION CODE (ECU CODE)

(a) Register the recognition code (ECU code) INFO.

NEXT

30.	CHECK CRANKING FUNCTION

(a) Check the engine cranking function.

(1) When there is fuel in the fuel tank, the key is inside the vehicle, and the shift lever is in P, check that depressing the brake pedal and pressing the engine switch crank the engine.

Result:

RESULT	PROCEED TO
Engine does not crank	A
Engine cranks	B

B ▶ **END**

A

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31.	REPLACE STEERING LOCK ECU

(a) Replace the steering lock ECU INFO .

NEXT

32.	REGISTER RECOGNITION CODE (ECU CODE)

(a) Register the recognition code (ECU code) INFO .

NEXT

33.	CHECK CRANKING FUNCTION

(a) Check the engine cranking function.

(1) When there is fuel in the fuel tank, the key is inside the vehicle, and the shift lever is in P, check that depressing the brake pedal and pressing the engine switch crank the engine.

Result:

RESULT	PROCEED TO
Engine does not crank	A
Engine cranks	B

B ▶ **END**

A ▶ **REPLACE ID CODE BOX (IMMOBILISER CODE ECU)**

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34.	READ VALUE USING TECHSTREAM (ENGINE START REQUEST)

(a) Connect Techstream to the DLC3.

HINT:

When using Techstream with the engine switch off, turn on and off any of the door courtesy light switches repeatedly at 1.5 second intervals or less until communication between the Techstream and vehicle starts.

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

(c) Read the Data List according to the displays on the Techstream.

Smart Key

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Start Rqst	Start request signal response / OK or NG	OK: Received NG: Not received	-

OK:
"OK" (received) and "NG" (not received) appear on the screen.

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

OK ▶ **REPLACE ID CODE BOX (IMMOBILISER CODE ECU)**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000XEW044X
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): B2284: Brake Signal Malfunction (2010 Corolla)		

DTC	**B2284**	**Brake Signal Malfunction**

DESCRIPTION

HINT:

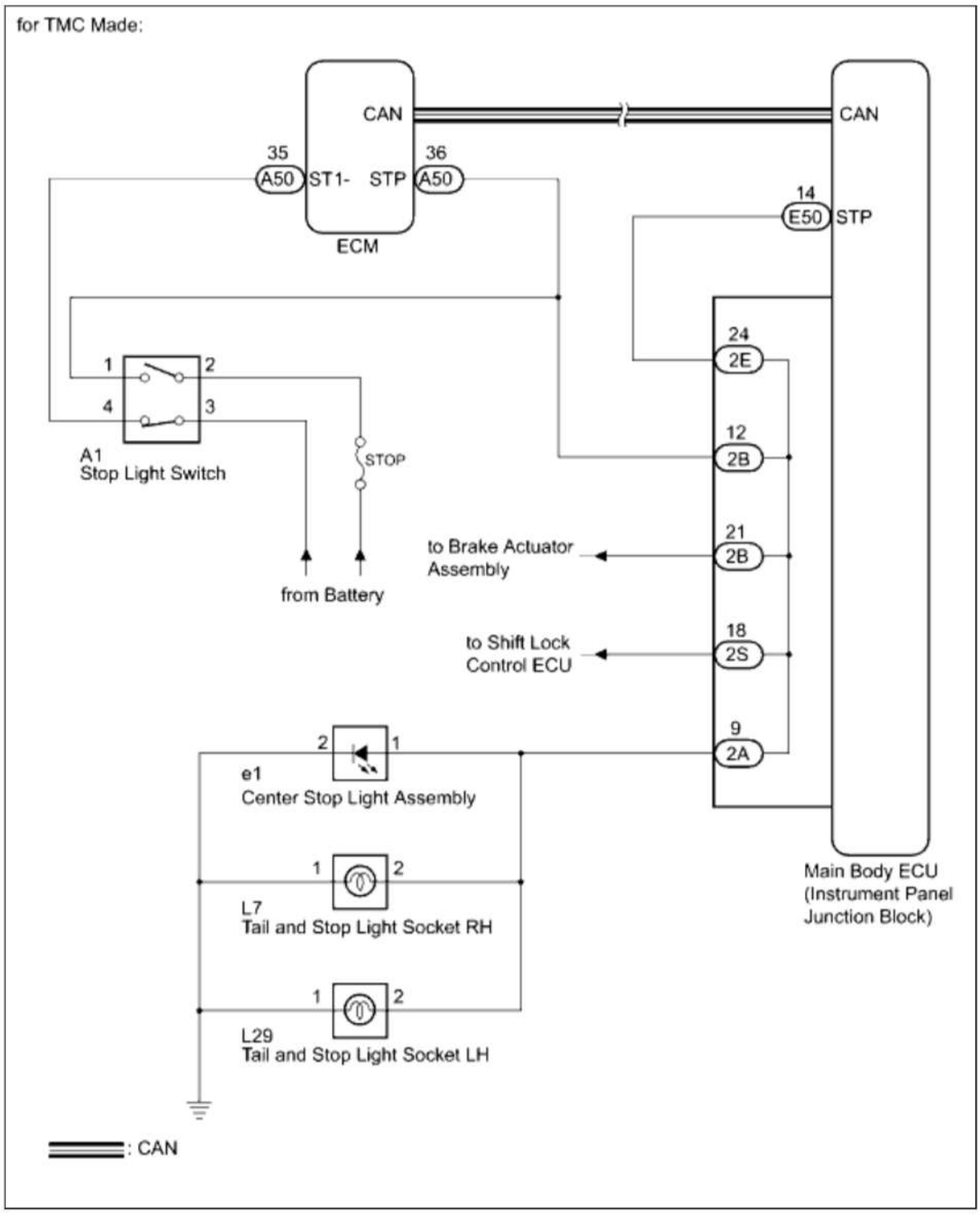
When the main body ECU is replaced with a new one and the cable from the negative (-) battery terminal is connected, the power source mode becomes the IG-ON mode. When the battery is removed and reinstalled, the power source mode that was selected when the battery was removed is restored.

After the main body ECU is replaced, perform the registration procedures for the engine immobiliser system INFO .

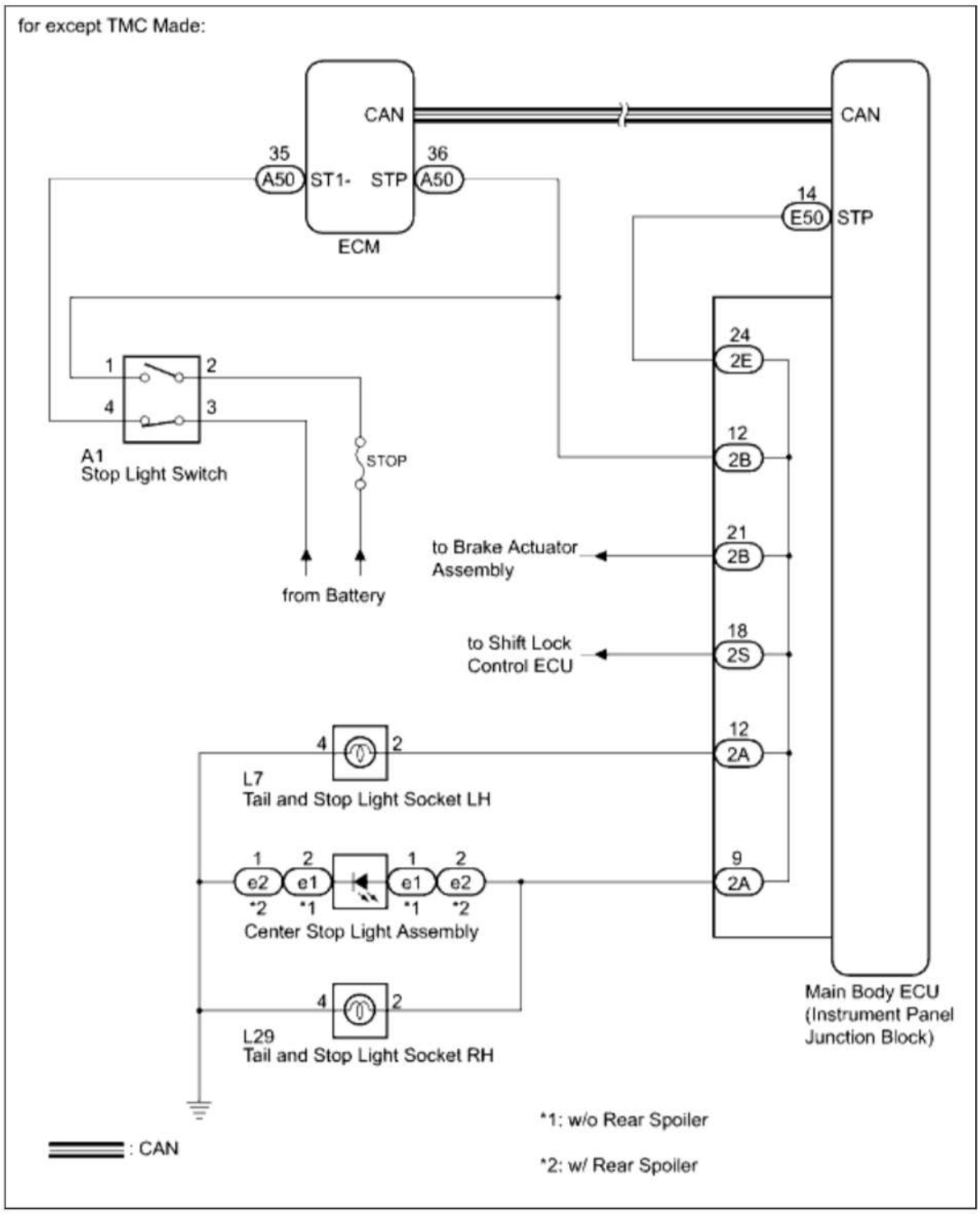
DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B2284	The brake signal circuit between the main body ECU and the stop light switch is malfunctioning and the CAN information is inconsistent	• Stop light switch • CAN communication system • ECM • Main body ECU (instrument panel junction block) • Wire harness or connector

WIRING DIAGRAM

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INSPECTION PROCEDURE

1. EMERGENCY ENGINE 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 main body ECU. This may result in the engine not starting even if the engine switch is pressed while the brake pedal is depressed and the shift lever is in P.

To activate the starter:

(1) Turn the engine switch from off to on (ACC).

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(2) Press and hold the engine switch for 15 seconds.

PROCEDURE

1.	CHECK FOR DTC (CAN COMMUNICATION SYSTEM)

(a) Clear the DTCs INFO.

(b) Check for CAN communication system DTCs INFO.

HINT:

If the DTCs for the CAN communication system malfunction are output, inspect those DTCs first.

OK:
No DTC is output.

NG ▶ GO TO CAN COMMUNICATION SYSTEM

OK ▼

2.	CHECK FOR DTC (ENGINE CONTROL SYSTEM)

(a) Clear the DTCs INFO.

(b) Check for DTC P0500 (Vehicle speed sensor A).

OK:
No DTC is output.

NG ▶ GO TO ENGINE CONTROL SYSTEM

OK ▼

3.	READ VALUE USING TECHSTREAM (STOP LIGHT SWITCH)

(a) Connect the Techstream to the DLC3.

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

(c) Check the Data List for proper functioning of the stop light switch.

Main Body

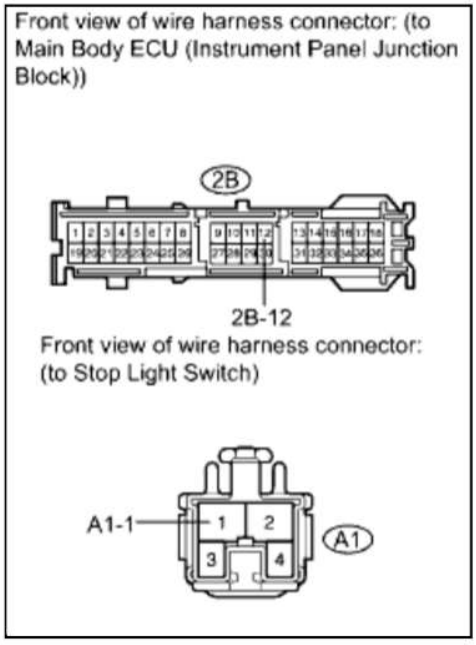
TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Stop Light SW	Stop light switch/ON or OFF	ON: Brake pedal depressed OFF: Brake pedal released	-

OK:
ON (brake pedal depressed) and OFF (brake pedal released) appear on the screen.

NG ▶ **CHECK HARNESS AND CONNECTOR (STOP LIGHT SWITCH - INSTRUMENT PANEL JUNCTION BLOCK)**

OK ▶ **REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)**

4.	**CHECK HARNESS AND CONNECTOR (STOP LIGHT SWITCH - INSTRUMENT PANEL JUNCTION BLOCK)**



(a) Disconnect the A1 switch connector.

(b) Disconnect the 2B junction block connector.

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

Standard Resistance:

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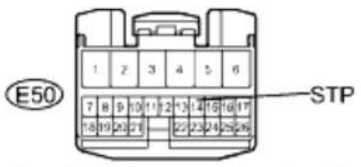
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A1-1 - 2B-12	Always	Below 1 Ω
A1-1 or 2B-12 - Body ground	Always	10 kΩ or higher

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (STOP LIGHT SWITCH - INSTRUMENT PANEL JUNCTION BLOCK)**

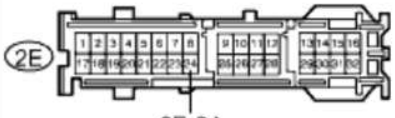
OK ▼

5.	**CHECK HARNESS AND CONNECTOR (INSTRUMENT PANEL JUNCTION BLOCK - MAIN BODY ECU)**

Front view of wire harness connector: (to Main Body ECU (Instrument Panel Junction Block))



Front view of wire harness connector: (to Main Body ECU (Instrument Panel Junction Block))



(a) Disconnect the 2E junction block connector.

(b) Disconnect the E50 ECU connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
2E-24 - E50-14 (STP)	Always	Below 1 Ω
2E-24 or E50-14 (STP) - Body ground	Always	10 kΩ or higher

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NG	REPAIR OR REPLACE HARNESS OR CONNECTOR (INSTRUMENT PANEL JUNCTION BLOCK - MAIN BODY ECU)
OK	REPLACE INSTRUMENT PANEL JUNCTION BLOCK



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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000YD304TX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): B2285: Steering Lock Position Signal Circuit Malfunction (2010 Corolla)		

DTC	**B2285**	**Steering Lock Position Signal Circuit Malfunction**

DESCRIPTION

This DTC is output when serial communication signals and LIN communication signals in the circuit between the main body ECU (instrument panel junction block) and steering lock actuator (steering lock ECU) are inconsistent.

HINT:

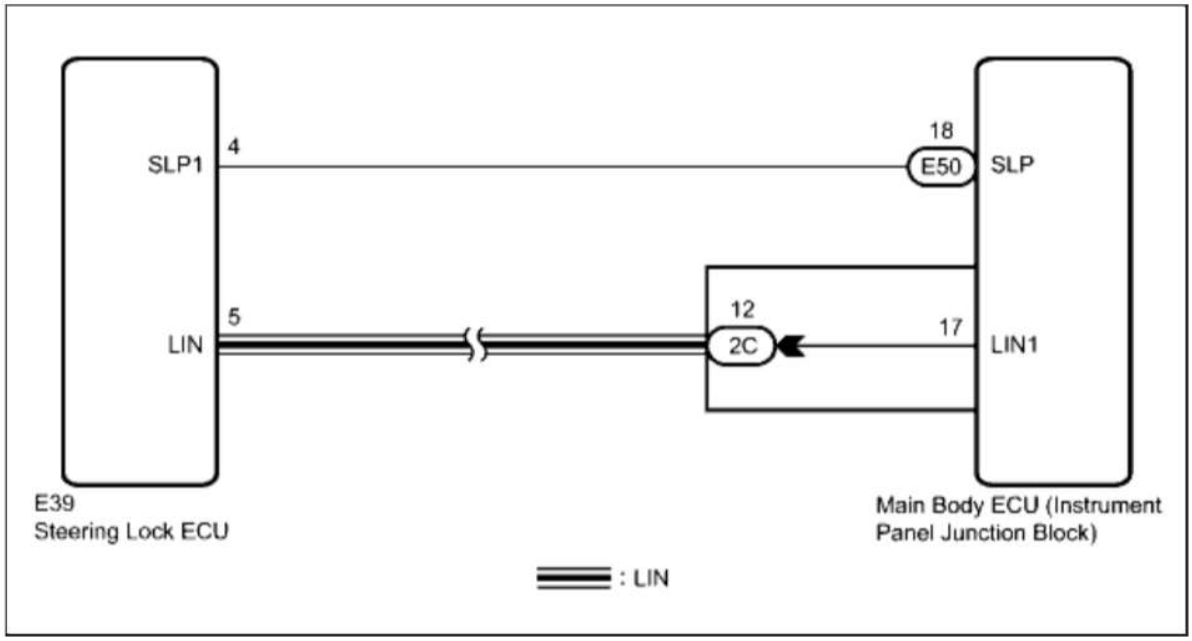
When the main body ECU (instrument panel junction block) is replaced with a new one and the cable from the negative (-) battery terminal is connected, the power source mode becomes the IG-ON mode. When the battery is removed and reinstalled, the power source mode that was selected when the battery was removed is restored.

After the main body ECU (instrument panel junction block) or steering lock ECU is replaced, perform the registration procedures for the engine immobiliser system INFO **.**

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B2285	Cable and LIN information between the main body ECU (instrument panel junction block) and the steering lock ECU are inconsistent	• Main body ECU (instrument panel junction block) • Steering lock ECU • Wire harness or connector

WIRING DIAGRAM

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INSPECTION PROCEDURE

PROCEDURE

1.	**READ VALUE USING TECHSTREAM**

(a) Connect the Techstream to the DLC3.

(b) Check the Data List for proper functioning of the steering lock function.

HINT:

When using the Techstream with the engine switch off, turn on and off any of the door courtesy light switches repeatedly at 1.5 second intervals or less until communication between the Techstream and vehicle starts.

Main Body

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Steering Unlock Switch	Steering lock condition / ON or OFF	ON: Steering is unlocked (Engine switch on (ACC)) OFF: Steering is locked (Engine switch off)	-

OK:

ON (steering is unlocked) and OFF (steering is locked) appear on the screen.

NG ▶ **CHECK HARNESS AND CONNECTOR (MAIN BODY ECU - STEERING LOCK ECU)**

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OK

2.	CHECK FOR DTC

(a) Clear the DTCs INFO.

(b) Check for DTC B2285 (Steering lock position signal circuit malfunction), DTC B2287 (LIN communication master malfunction) and DTC B2785 (Communication malfunction between ECUs connected by LIN).

Result:

DISPLAY (DTC OUTPUT)	PROCEED TO
"DTC B2285" only	A
"DTC B2287" and/or "DTC B2785"	B
No DTC	C

HINT:

- If DTC B2287 is output INFO.
- If DTC B2785 is output INFO.

C ▶ **CHECK INTERMITTENT PROBLEMS**

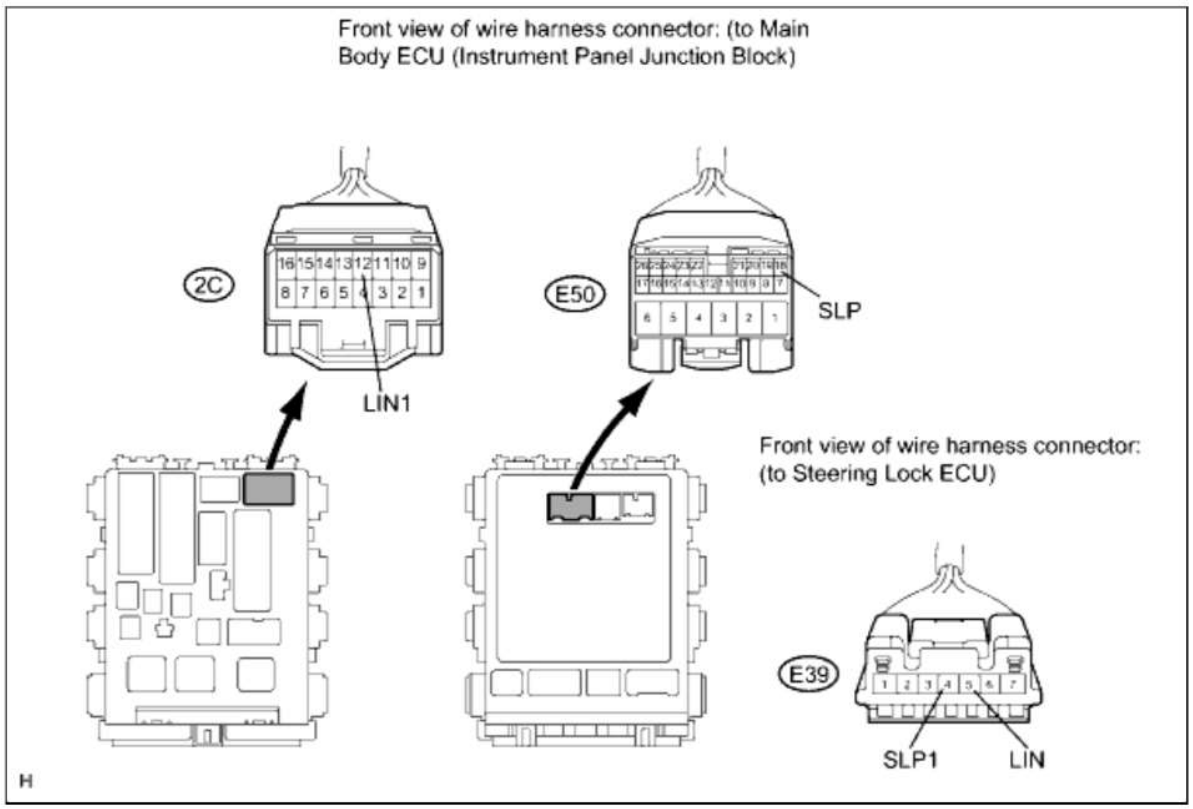
B ▶ **GO TO DTC CHART**

A ▶ **REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)**

3.	CHECK HARNESS AND CONNECTOR (MAIN BODY ECU - STEERING LOCK ECU)

(a) Disconnect the E50, 2C and E39 ECU connectors.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E50-18 (SLP) - E39-4 (SLP1)	Always	Below 1 Ω
2C-12 (LIN1) - E39-5 (LIN)	Always	Below 1 Ω
E50-18 (SLP) or E39-4 (SLP1) - Body ground	Always	10 kΩ or higher
2C-12 (LIN1) or E39-5 (LIN) - Body ground	Always	10 kΩ or higher

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

OK ▼

4.	**CHECK MAIN BODY ECU OPERATION**

(a) After replacing the main body ECU with a normally functioning ECU, check that the engine starts. Make sure the brake pedal is depressed and the shift position is P at this time.

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(b) Check that the engine switch mode can be changed by pushing the engine switch.

HINT:

Without depressing the brake pedal, push the engine switch repeatedly. Engine switch mode should turn from off to on (ACC) to on (IG) and back to off. With the brake pedal depressed, push the engine switch repeatedly. Engine switch mode should turn to ENGINE START from any status.

OK:
Engine starts normally.

NG ▶ **REPLACE STEERING LOCK ECU**

OK ▶ **END (MAIN BODY ECU DEFECTIVE)**

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Last Modified: 3-10-2010	6.4 J	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000002OS9034X
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): Power Source Mode does not Change (2010 Corolla)		

Power Source Mode does not Change

DESCRIPTION

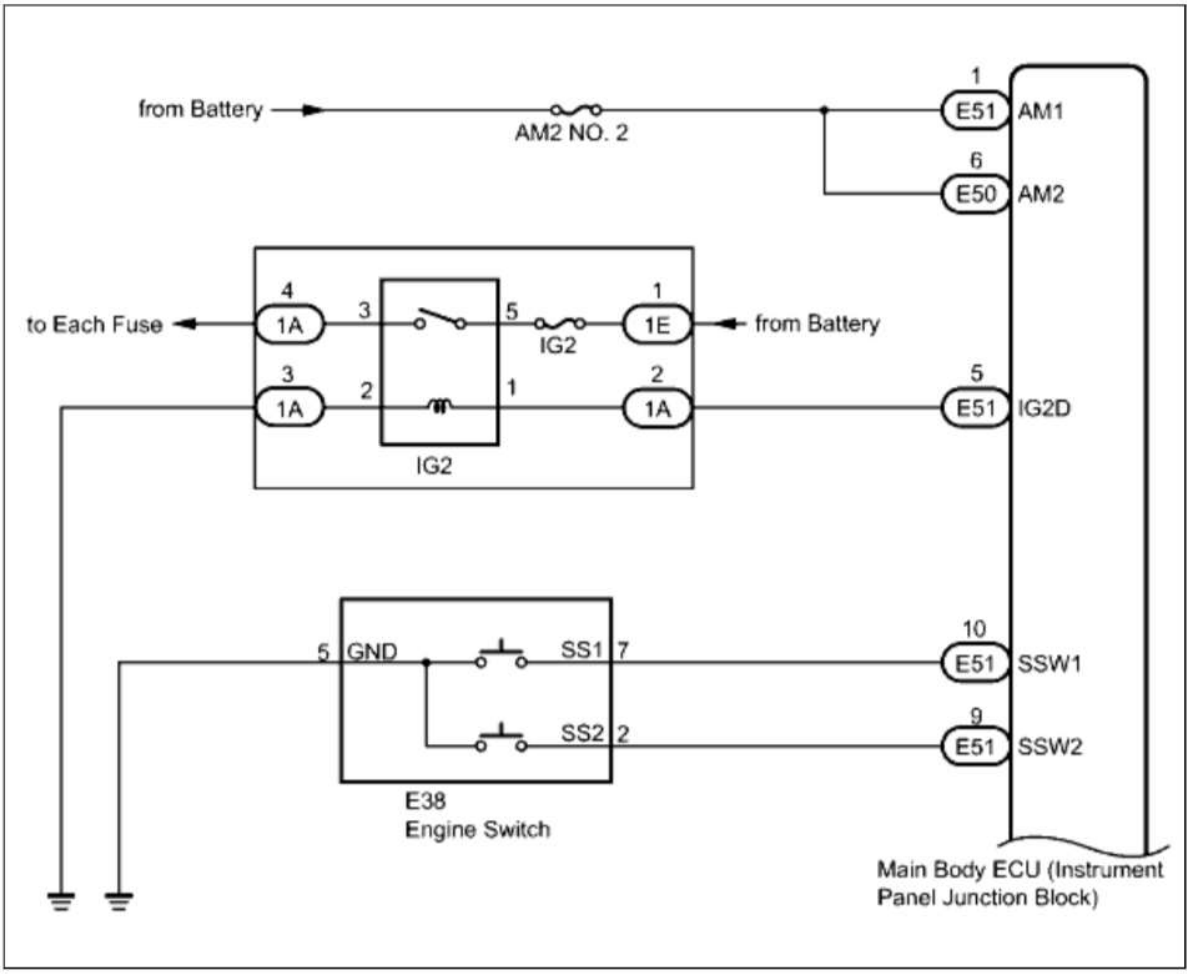
When the engine switch is pushed with the electrical key in the cabin, the main body ECU (instrument panel junction block) receives signals to switch the power source mode.

HINT:

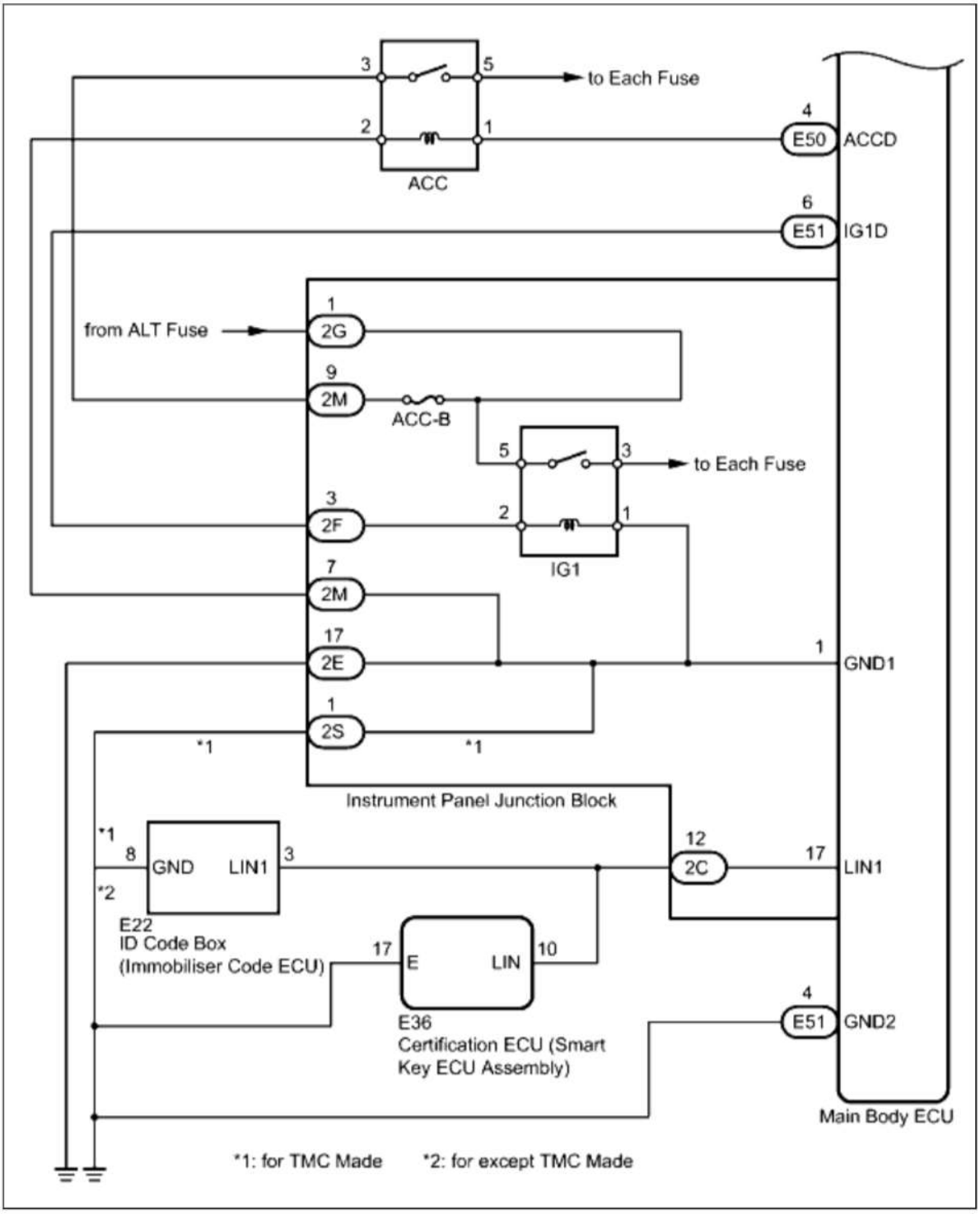
To allow use of the Techstream to inspect the push-button start function when the engine switch is off, repeat opening and closing any of the doors. Opening and closing a door establishes communication between the Techstream and the main body ECU (instrument panel junction block). (Opening and closing a door can also be simulated by operating a door courtesy light switch.)

WIRING DIAGRAM

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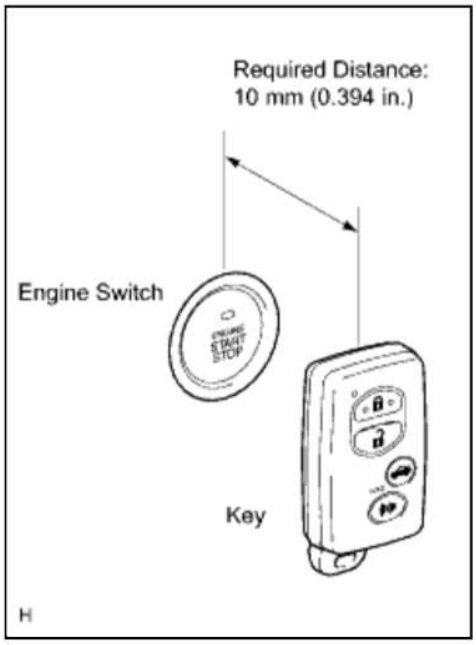


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INSPECTION PROCEDURE

PROCEDURE

1.	**CHECK SMART KEY SYSTEM**



(a) Remove the battery of the electrical key transmitter INFO .

(b) Touch the logo side mark of the key or card key to the engine witch.

(c) Check that the engine switch can be turned on (IG).

Result:

RESULT	PROCEED TO
Power source mode does not change to on (ACC)	A
Power source mode does not change to on (IG)	B
Power source mode does not change to on (IG and ACC)	C
Power source mode is turned on	D

D ▶ **GO TO SMART KEY SYSTEM (ENTRY FUNCTION)**

C ▶ **CHECK HARNESS AND CONNECTOR (BATTERY - INSTRUMENT PANEL JUNCTION BLOCK)**

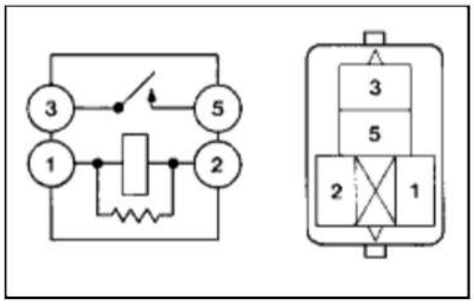
B ▶ **INSPECT IG1 RELAY**

A ▼

2. INSPECT ACC RELAY

(a) Remove the ACC relay from the relay block No. 5*1.

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(b) Remove the ACC relay from the relay block No. 8*2.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
3 - 5	When battery voltage is not applied to terminals 1 and 2	10 kΩ or higher
3 - 5	When battery voltage is applied to terminals 1 and 2	Below 1 Ω

HINT:

- *1: for TMC Made
- *2: for except TMC Made

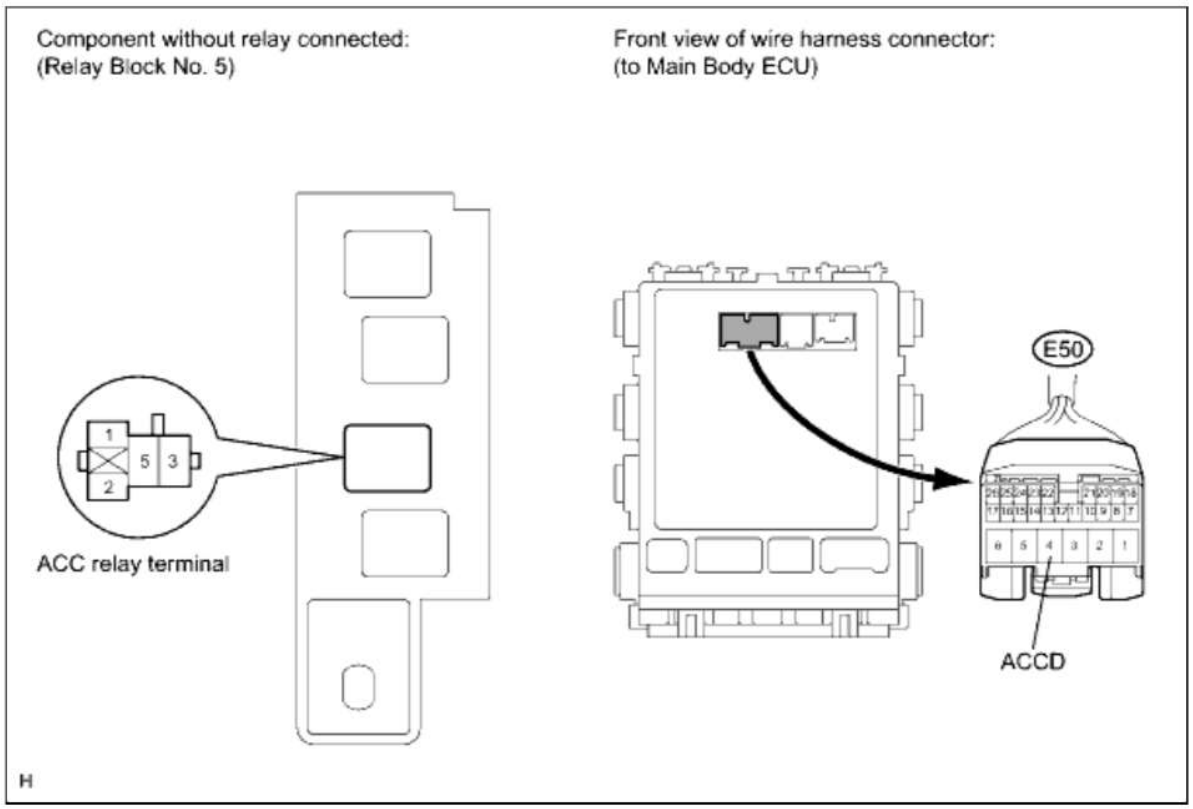
NG ▶ **REPLACE ACC RELAY**

OK ▼

3.	**CHECK HARNESS AND CONNECTOR (MAIN BODY ECU - ACC RELAY)**

(a) for TMC Made:

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(1) Disconnect the E50 connector from the main body ECU (instrument panel junction block).

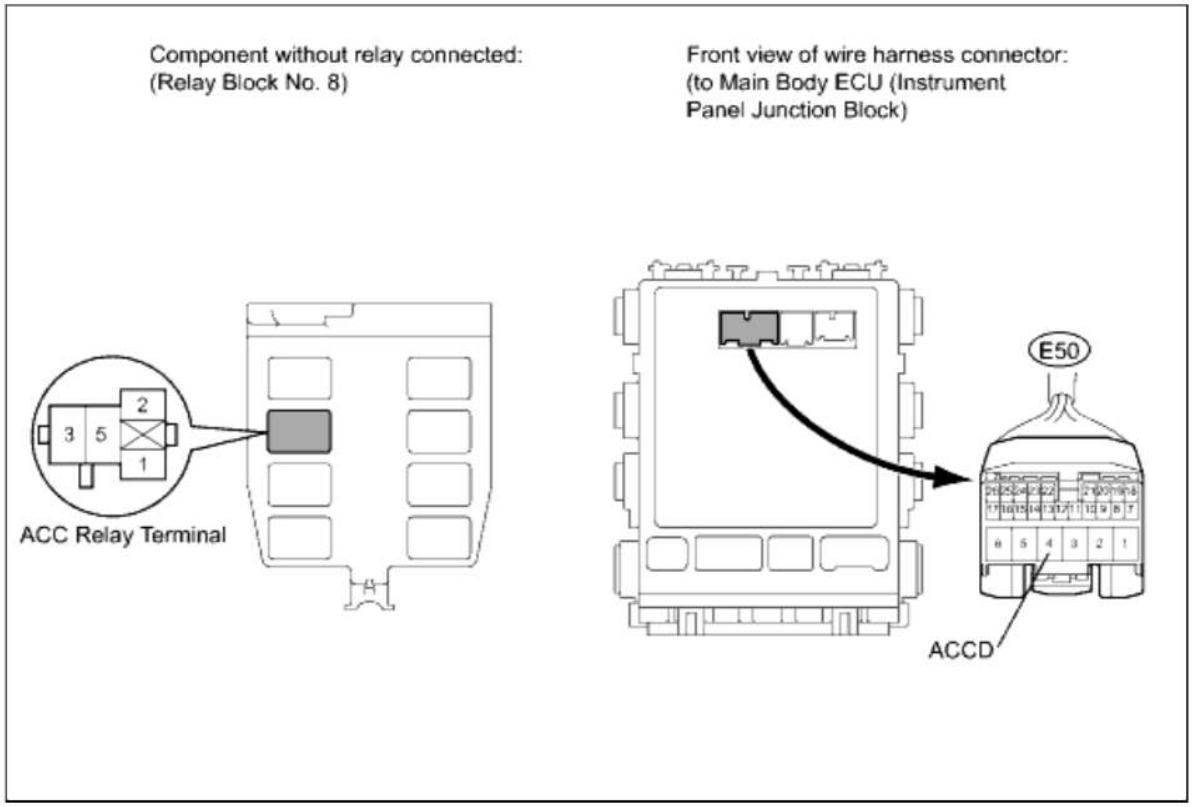
(2) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E50-4 (ACCD) - Relay block No. 5 ACC relay terminal 1	Always	Below 1 Ω
E50-4 (ACCD) or Relay block No. 5 ACC relay terminal 1 - Body ground	Always	10 kΩ or higher

(b) for except TMC Made:

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(1) Disconnect the E50 connector from the main body ECU (instrument panel junction block).

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E50-4 (ACCD) - Relay block No. 8 ACC relay terminal 1	Always	Below 1 Ω
E50-4 (ACCD) or Relay block No. 8 ACC relay terminal 1 - Body ground	Always	10 kΩ or higher

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (MAIN BODY ECU - ACC RELAY)**

OK ▼

4.	**INSPECT FUSE (ACC-B FUSE)**

(a) Remove the ACC-B fuse from the main body ECU (instrument panel junction block).

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

Standard Resistance:

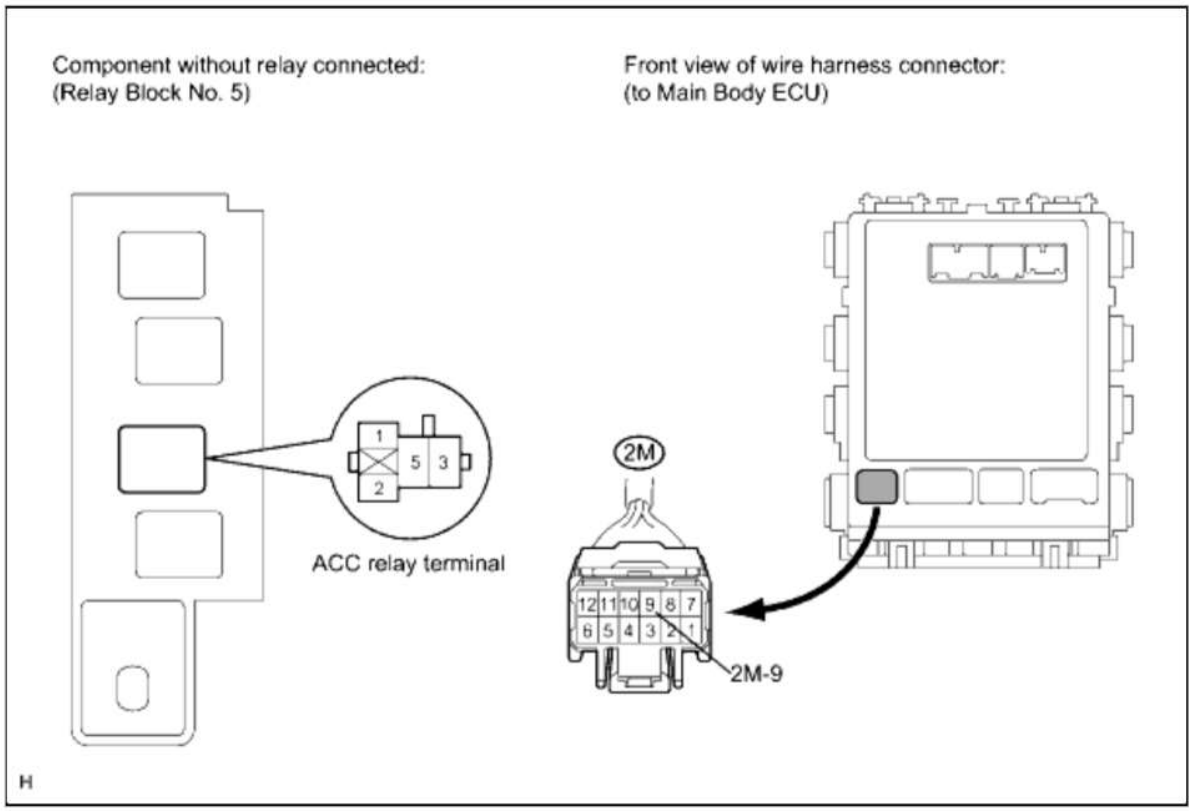
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
ACC-B fuse	Always	Below 1 Ω

NG ▶ **REPLACE FUSE (ACC-B FUSE)**

OK ▼

5.	**CHECK HARNESS AND CONNECTOR (INSTRUMENT PANEL JUNCTION BLOCK - ACC RELAY)**

(a) for TMC Made:



(1) Disconnect the 2M connector from the main body ECU (Instrument panel junction block).

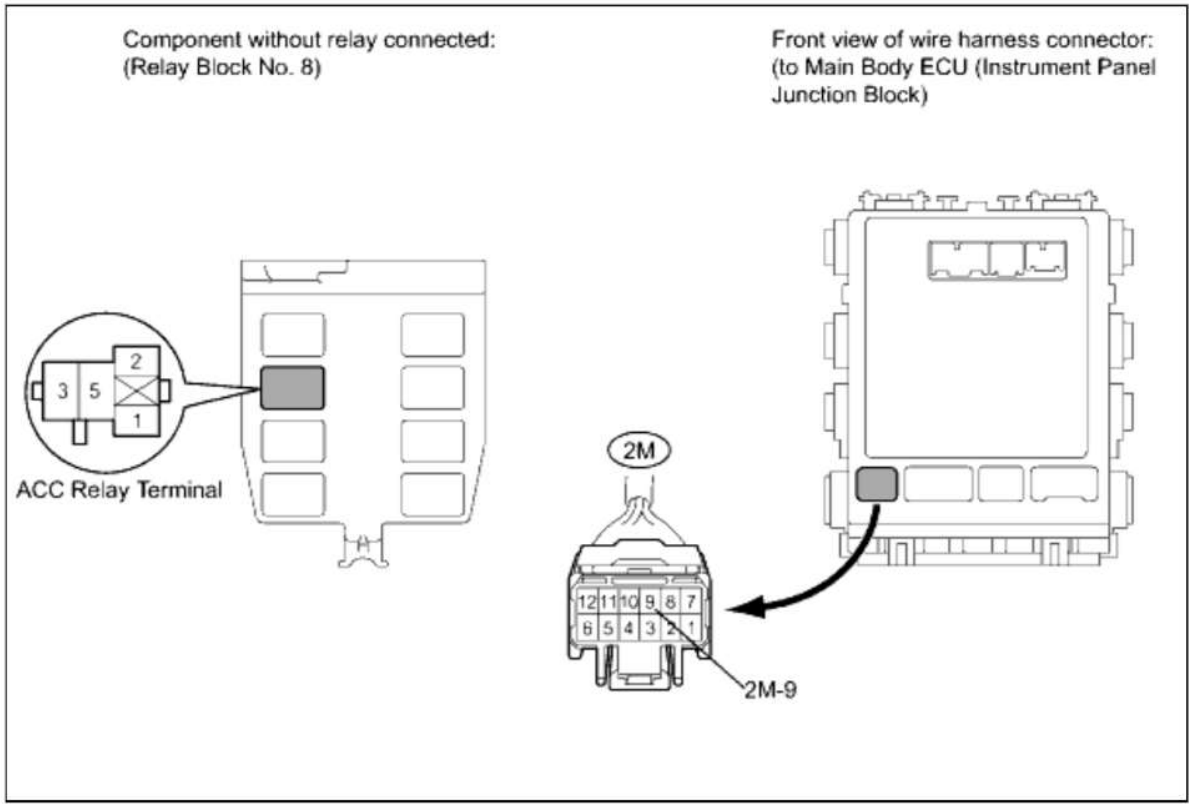
(2) Measure the resistance according to the value(s) in the table below.

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Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
2M-9 - Relay block No. 5 ACC relay terminal 3	Always	Below 1 Ω
2M-9 or Relay block No. 5 ACC relay terminal 3 - Body ground	Always	10 kΩ or higher

(b) for except TMC Made:



(1) Disconnect the 2M connector from the main body ECU (instrument panel junction block)

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
2M-9 - Relay block No. 8 ACC relay terminal 3	Always	Below 1 Ω
2M-9 or Relay block No. 8 ACC relay terminal 3 - Body ground	Always	10 k Ω or higher

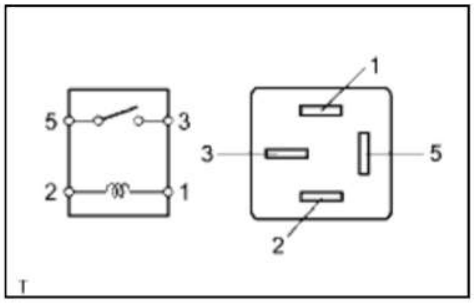
NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (INSTRUMENT PANEL JUNCTION BLOCK - ACC

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RELAY)

OK ▶ **REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK**

6.	**INSPECT IG1 RELAY**



(a) Remove the IG1 relay from the main body ECU (instrument panel junction block).

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
3 - 5	When battery voltage is not applied to terminals 1 and 2	10 kΩ or higher
3 - 5	When battery voltage is applied to terminals 1 and 2	Below 1 Ω

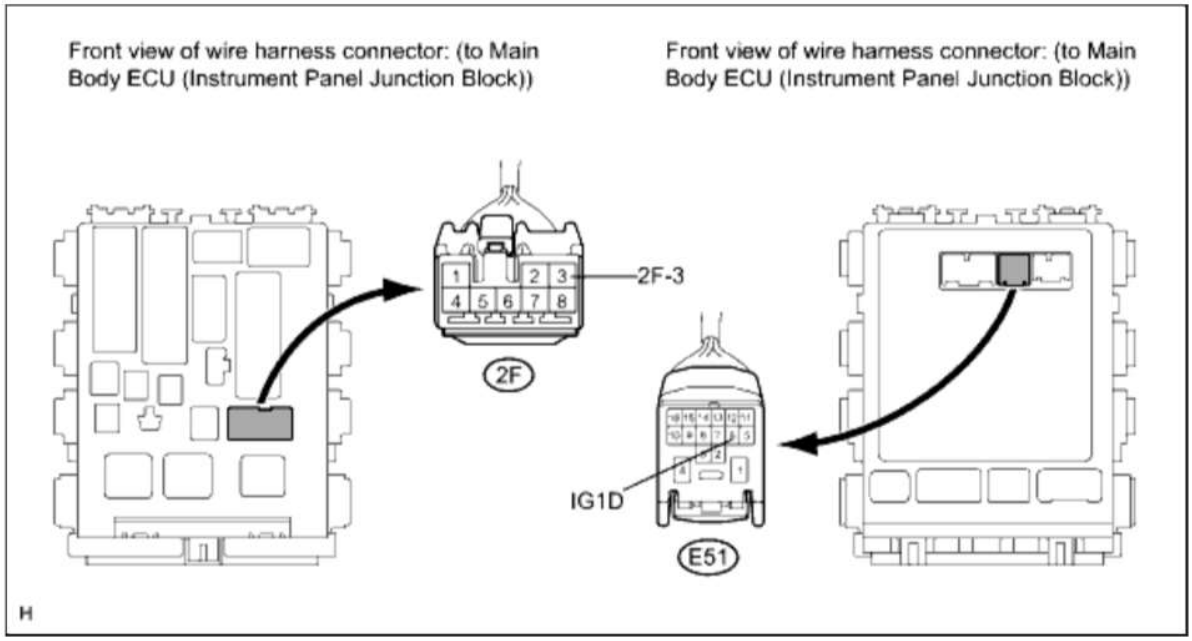
NG ▶ **REPLACE IG1 RELAY**

OK ▼

7.	**CHECK HARNESS AND CONNECTOR (MAIN BODY ECU - INSTRUMENT PANEL JUNCTION BLOCK)**

(a) Disconnect the E51 and 2F connectors from the main body ECU (Instrument panel junction block).

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E51-6 (IG1D) - 2F-3	Always	Below 1 Ω
E51-6 (IG1D) or 2F-3 - Body ground	Always	10 kΩ or higher

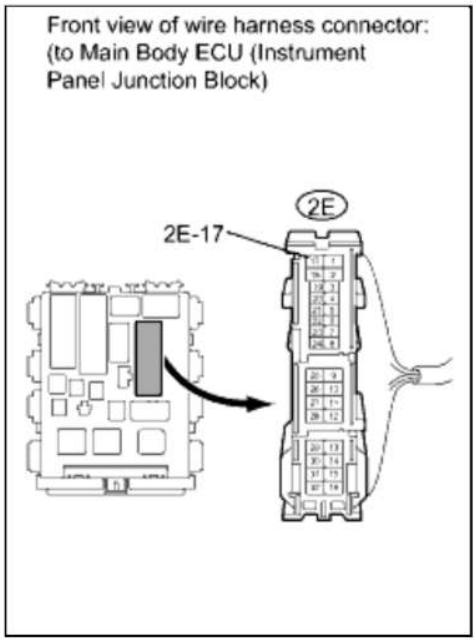
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (MAIN BODY ECU - INSTRUMENT PANEL JUNCTION BLOCK)**

OK ▼

8.	**CHECK HARNESS OR CONNECTOR (INSTRUMENT PANEL JUNCTION BLOCK - BODY GROUND)**

(a) Disconnect the 2E connector from main body ECU (Instrument panel junction block).

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

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
2E-17 - Body ground	Always	Below 1 Ω

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (INSTRUMENT PANEL JUNCTION BLOCK - BODY GROUND)**

OK ▼

9.	**INSPECT FUSE (IG2 FUSE)**

(a) Remove the IG2 fuse from engine room relay block.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
IG2 fuse	Always	Below 1 Ω

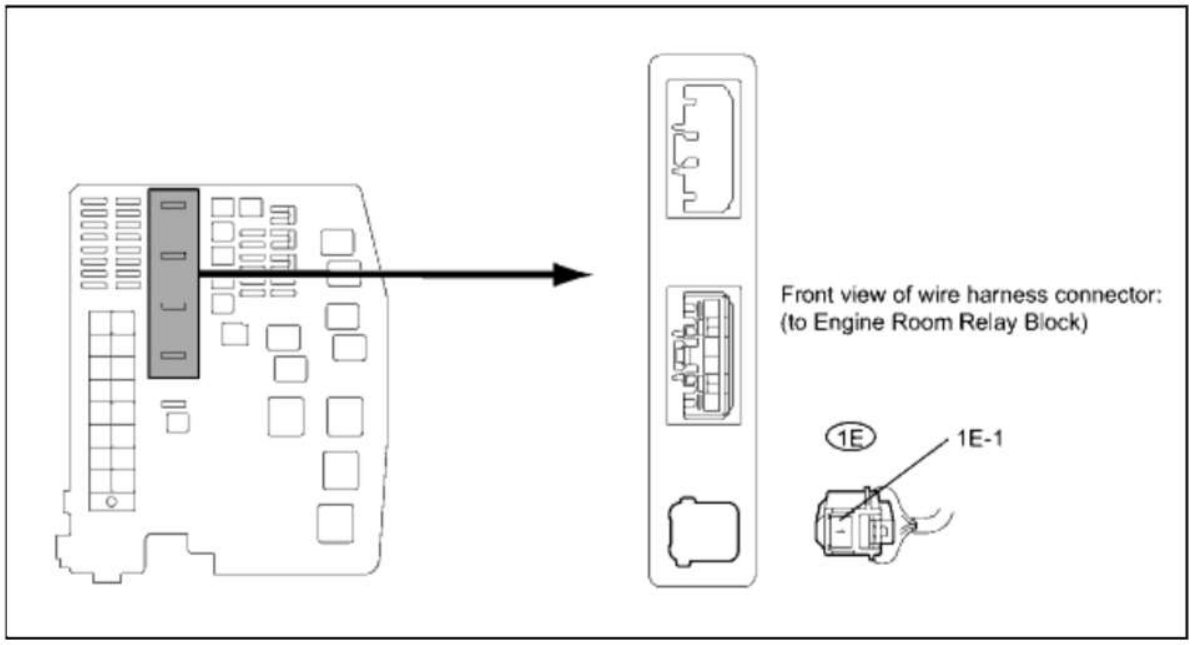
NG ▶ **REPLACE FUSE (IG2 FUSE)**

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OK

10.	**CHECK HARNESS AND CONNECTOR (BATTERY - ENGINE ROOM RELAY BLOCK)**

(a) Disconnect the 1E connector from engine room relay block.



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

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1E-1 - Body ground	Always	11 to 14 V

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (BATTERY - ENGINE ROOM RELAY BLOCK)**

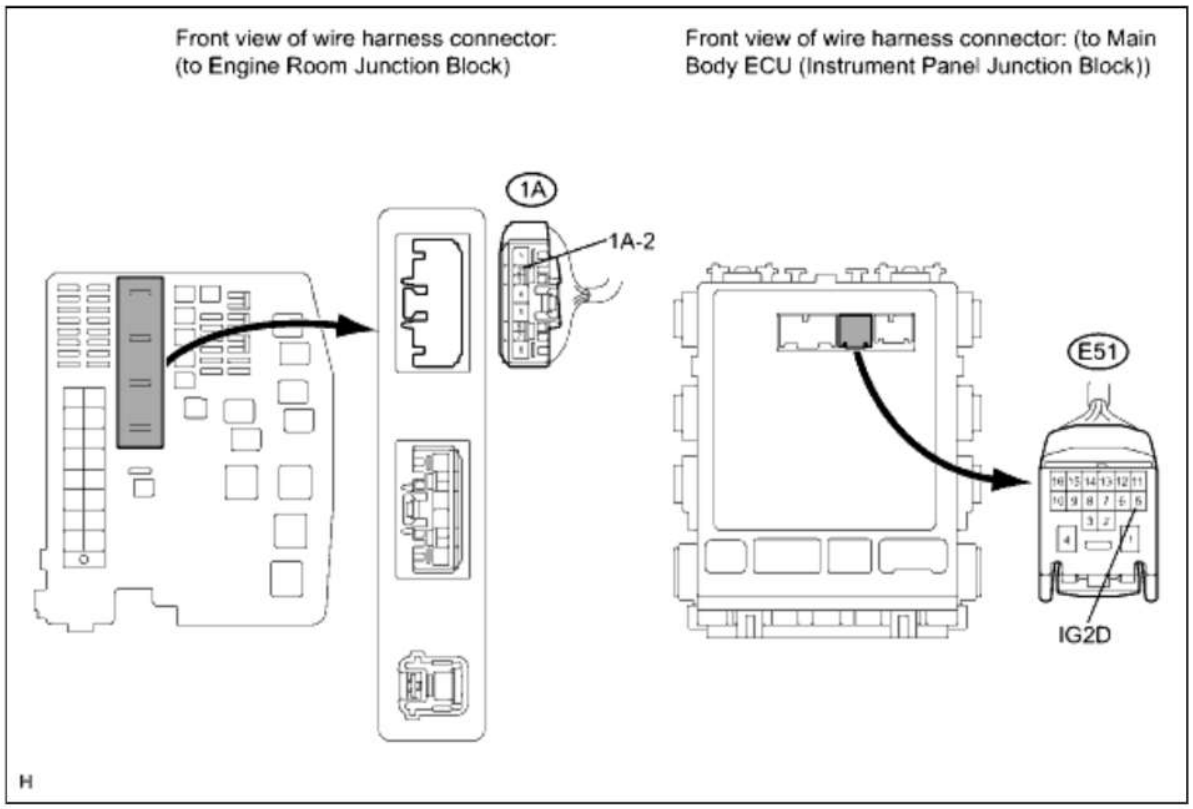
OK

11.	**CHECK HARNESS AND CONNECTOR (MAIN BODY ECU - ENGINE ROOM RELAY**

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	BLOCK)

(a) Disconnect the E51 connector from the main body ECU (instrument panel junction block).



(b) Disconnect the 1A connector from engine room relay block.

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

Standard Resistance:

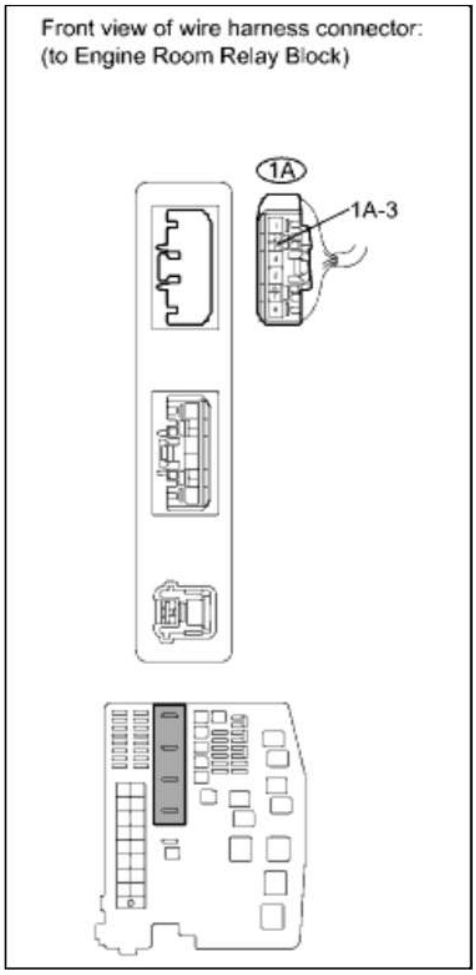
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E51-5 (IG2D) - 1A-2	Always	Below 1 Ω
E51-5 (IG2D) or 1A-2 - Body ground	Always	10 kΩ or higher

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (MAIN BODY ECU - ENGINE ROOM RELAY BLOCK)**

OK ▼

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12.	CHECK HARNESS AND CONNECTOR (ENGINE ROOM RELAY BLOCK - 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

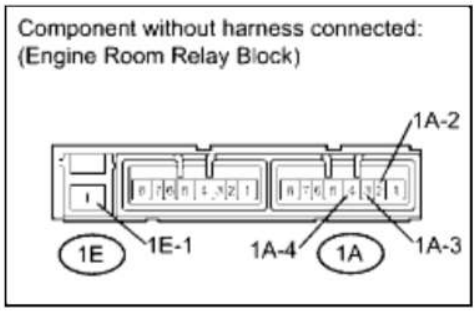
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (ENGINE ROOM RELAY BLOCK - BODY GROUND)**

OK ▼

13.	INSPECT ENGINE ROOM RELAY BLOCK (IG2 RELAY)

(a) Remove the engine room relay block.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1E-1 - 1A-4	When battery voltage is not applied to terminals 1A-2 and 1A-3	10 kΩ or higher
1E-1 - 1A-4	When battery voltage is applied to terminals 1A-2 and 1A-3	Below 1 Ω

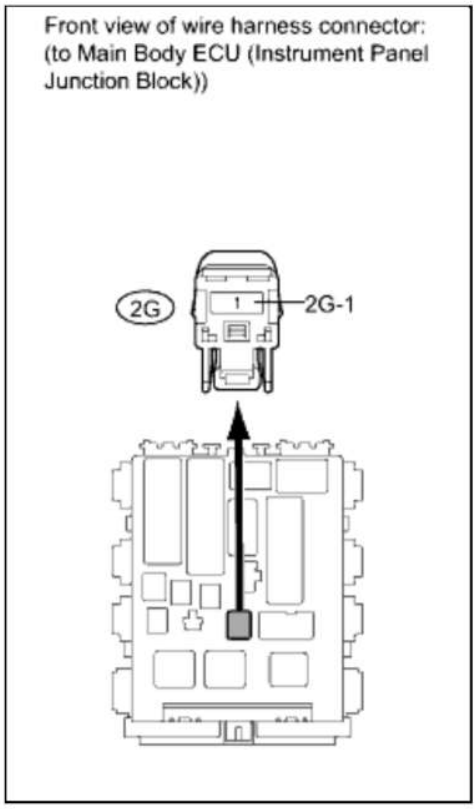
NG ▶ **REPLACE ENGINE ROOM RELAY BLOCK**

OK ▶ **REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)**

14.	**CHECK HARNESS AND CONNECTOR (BATTERY - INSTRUMENT PANEL JUNCTION BLOCK)**

(a) Disconnect the 2G connector from main body ECU (Instrument panel junction block).

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

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
2G-1 - Body ground	Always	11 to 14 V

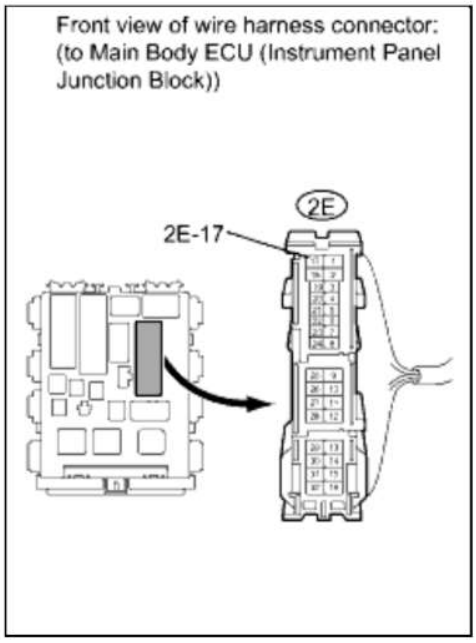
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (BATTERY - INSTRUMENT PANEL JUNCTION BLOCK)**

OK ▼

15.	**CHECK HARNESS OR CONNECTOR (INSTRUMENT PANEL JUNCTION BLOCK - BODY GROUND)**

(a) Disconnect the 2E connector from main body ECU (instrument panel junction block).

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
2E-17 - Body ground	Always	Below 1 Ω

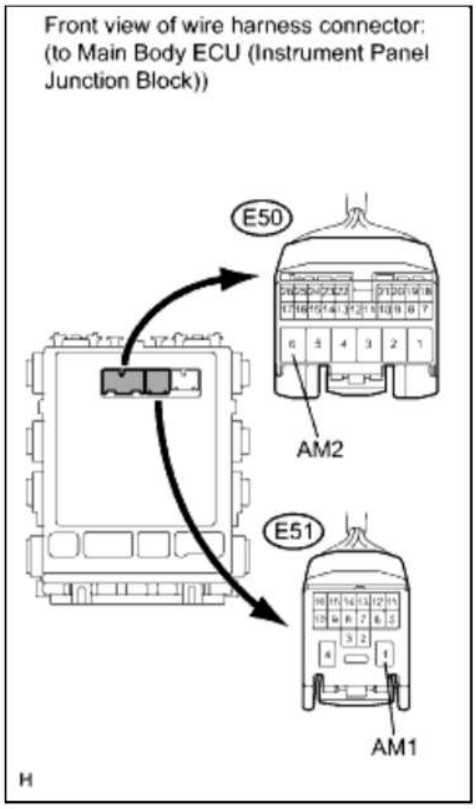
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (INSTRUMENT PANEL JUNCTION BLOCK - BODY GROUND)**

OK ▼

16.	**CHECK HARNESS AND CONNECTOR (BATTERY - MAIN BODY ECU)**

(a) Disconnect the E50 and E51 connectors from the main body ECU (Instrument panel junction block).

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

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E50-6 (AM2) - Body ground	Always	11 to 14 V
E51-1 (AM1) - Body ground	Always	11 to 14 V

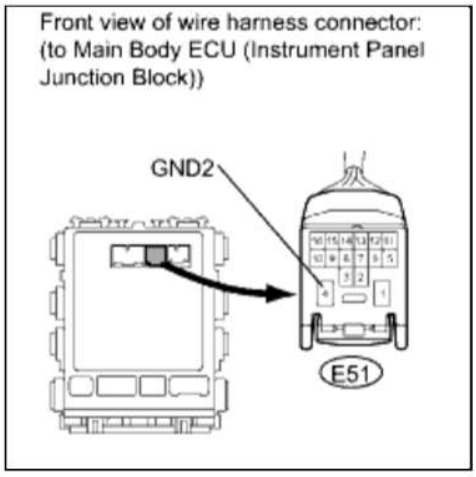
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (BATTERY - MAIN BODY ECU)**

OK ▼

17.	**CHECK HARNESS AND CONNECTOR (MAIN BODY ECU - BODY GROUND)**

(a) Disconnect the E51 connector from main body ECU (Instrument panel junction block).

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E51-4 (GND2) - Body ground	Always	Below 1 Ω

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (MAIN BODY ECU - BODY GROUND)**

OK ▶ **REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000YD4058X
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): B2286: Runnable Signal Malfunction (2010 Corolla)		

DTC	**B2286**	**Runnable Signal Malfunction**

DESCRIPTION

This DTC is output when serial communication signals and CAN communication signals in the circuit between the main body ECU (instrument panel junction block) and ECM are inconsistent.

HINT:

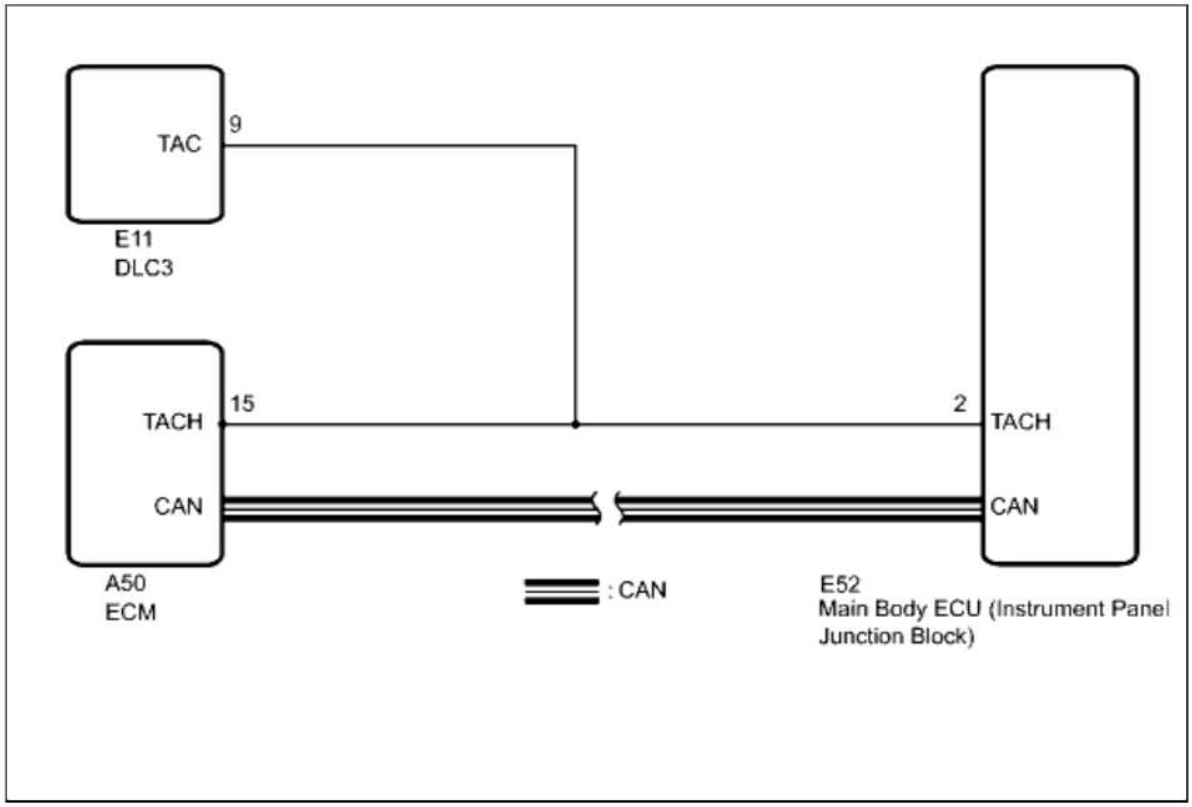
When the main body ECU (instrument panel junction block) is replaced with a new one and the cable from the negative (-) battery terminal is connected, the power source mode becomes the IG-ON mode. When the battery is removed and reinstalled, the power source mode that was selected when the battery was removed is restored.

After the main body ECU (instrument panel junction block) is replaced, perform the registration procedures for the engine immobiliser system INFO **.**

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B2286	Serial communication signals and CAN communication signals in the circuit between the main body ECU (instrument panel junction block) and ECM are inconsistent.	• CAN communication system • ECM • Main body ECU (instrument panel junction block) • Wire harness or connector

WIRING DIAGRAM

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INSPECTION PROCEDURE

PROCEDURE

1.	**CHECK FOR DTC (CAN COMMUNICATION SYSTEM)**

(a) Clear the DTCs INFO .

(b) Check for CAN communication system INFO .

HINT:

If the DTCs for the CAN communication system malfunction are output, inspect those DTCs first.

OK:
DTC is not output.

NG ▶ **GO TO CAN COMMUNICATION SYSTEM**

OK
▼

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2.	**READ VALUE USING TECHSTREAM**

(a) Connect the Techstream to the DLC3.

(b) Check the Data List for proper functioning of the engine.

HINT:

When using the Techstream with the engine switch off, turn on and off any of the door courtesy light switches repeatedly at 1.5 second intervals or less until communication between the Techstream and vehicle starts.

Main Body

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Engine Condition	Engine condition/STOP or RUN	Stop: Engine is stopped RUN: Engine is running	-

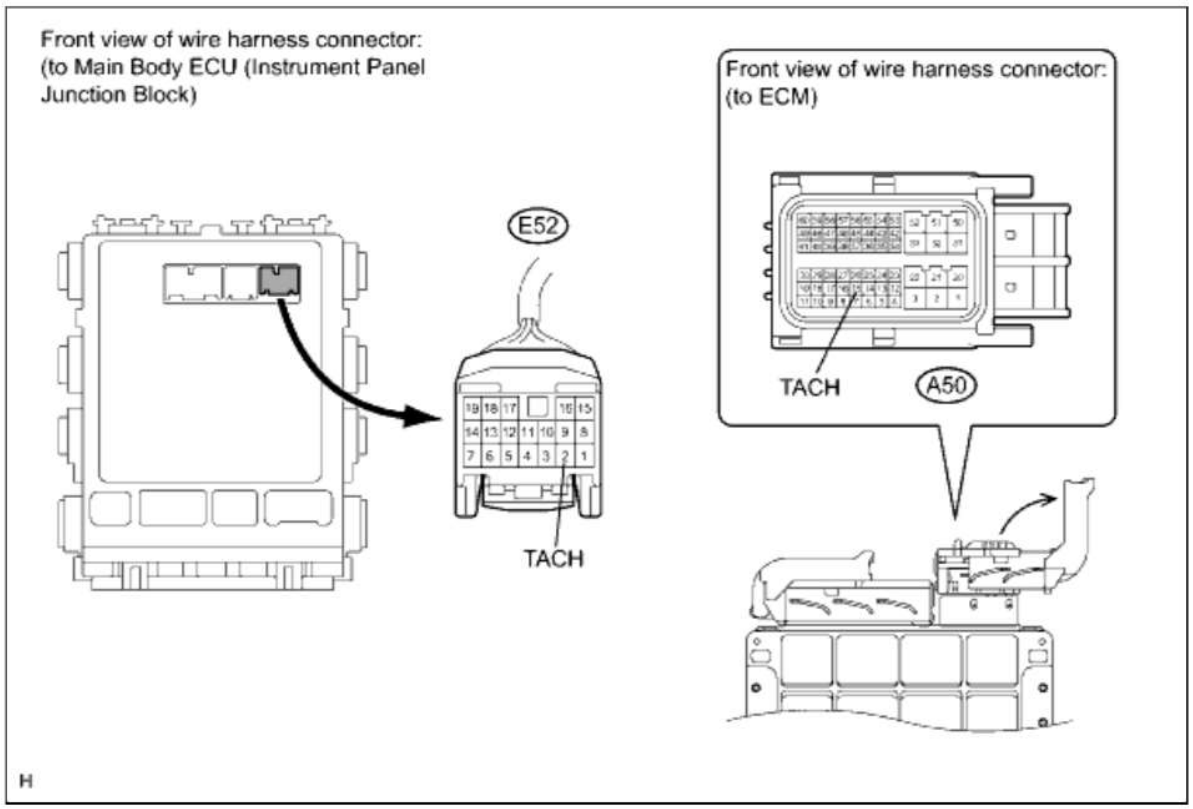
NG ▶ **CHECK HARNESS AND CONNECTOR (MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK) - ECM)**

OK ▶ **REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)**

3.	**CHECK HARNESS AND CONNECTOR (MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK) - ECM)**

(a) Disconnect the A50 ECM connector.

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(b) Disconnect the E52 ECU connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E52-2 (TACH) - A50-15 (TACH)	Always	Below 1 Ω
E52-2 (TACH) or A50-15 (TACH) - Body ground	Always	10 kΩ or higher

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK) - ECM)**

OK ▶ **REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000XEY04AX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): B2287: LIN Communication Master Malfunction (2010 Corolla)		

DTC	**B2287**	**LIN Communication Master Malfunction**

DESCRIPTION

Refer to DTC B2287 INFO .

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B2287	Communication or communication line is abnormal between the main body ECU (instrument panel junction block) and the certification ECU (smart key ECU assembly)	• Main body ECU (instrument panel junction block) • Certification ECU (smart key ECU assembly) • Wire harness or connector

WIRING DIAGRAM

Refer to DTC B2287 INFO .

INSPECTION PROCEDURE

Refer to DTC B2287 INFO .

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000020S7037X
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): B2288: Steering Lock Signal Circuit Malfunction (2010 Corolla)		

DTC	**B2288**	**Steering Lock Signal Circuit Malfunction**

DESCRIPTION

This DTC is output when the main body ECU (instrument panel junction block) cannot detect the unlock condition of the steering lock within a specified time.

HINT:

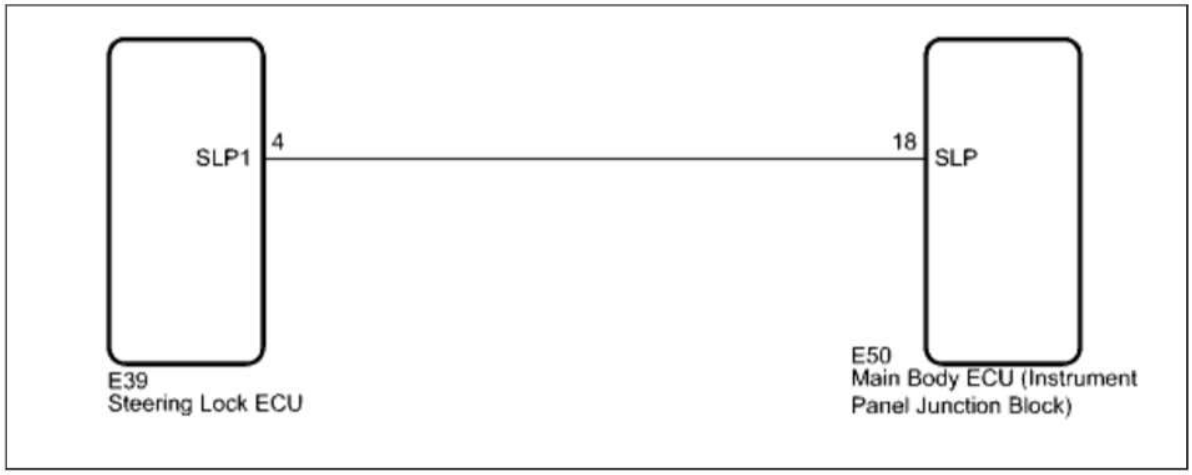
When the main body ECU (instrument panel junction block) is replaced with a new one and the cable from the negative (-) battery terminal is connected, the power source mode becomes the IG-ON mode. When the battery is removed and reinstalled, the power source mode that was selected when the battery was removed is restored.

After the main body ECU (instrument panel junction block) is replaced, perform the registration procedures for the engine immobiliser system INFO **.**

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B2288	After turning engine switch from off to on (IG), the steering wheel does not unlock for a certain period of time (ECU unlocks steering wheel only when it receives an unlock signal from LIN communication and cable)	• Main body ECU (instrument panel junction block) • Steering lock ECU • Wire harness or connector

WIRING DIAGRAM

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INSPECTION PROCEDURE

PROCEDURE

1.	CHECK FOR DTC

(a) Clear the DTCs INFO .

(b) After all DTCs are cleared, check if the trouble occurs again 18 to 22 seconds after the engine switch is turned on (IG).

(c) Check for DTCs again.

Result:

RESULT	PROCEED TO
DTC B2285 (Steering lock Position Signal Circuit Malfunction) is output	A
Steering lock DTCs B2781, B2782 and / or B2788 are output	B
DTC is not output	C

B ▶ GO TO DIAGNOSTIC TROUBLE CODE CHART (DTC B2781, B2782, B2788)

A ▶ GO TO OTHER FLOW CHART (DTC B2285)

C ▼

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2.	CHECK STEERING LOCK

(a) Check if the steering lock is released when turning the engine switch on (ACC).

OK:
The steering lock is released.

NG ▶ GO TO STEERING LOCK SYSTEM

OK ▼

3.	READ VALUE USING TECHSTREAM

(a) Connect the Techstream to the DLC3.

(b) Check the Data List for proper functioning of the steering lock function.

HINT:

When using the Techstream with the engine switch off, turn on and off any of the door courtesy light switches repeatedly at 1.5 second intervals or less until communication between the Techstream and vehicle starts.

Main Body

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Steering Unlock Switch	Steering lock condition / ON or OFF	ON: Steering is unlocked (Engine switch on (ACC)) OFF: Steering is locked (Engine switch off)	-

NG ▶ REPLACE STEERING LOCK ECU

OK ▶ REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000020S8037X
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): B2289: Key Collation Waiting Time Over (2010 Corolla)		

DTC	**B2289**	**Key Collation Waiting Time Over**

DESCRIPTION

This DTC is output when there is a LIN communication problem between the main body ECU (instrument panel junction block) and certification ECU (smart key ECU assembly) or when there is a problem in the entry function.

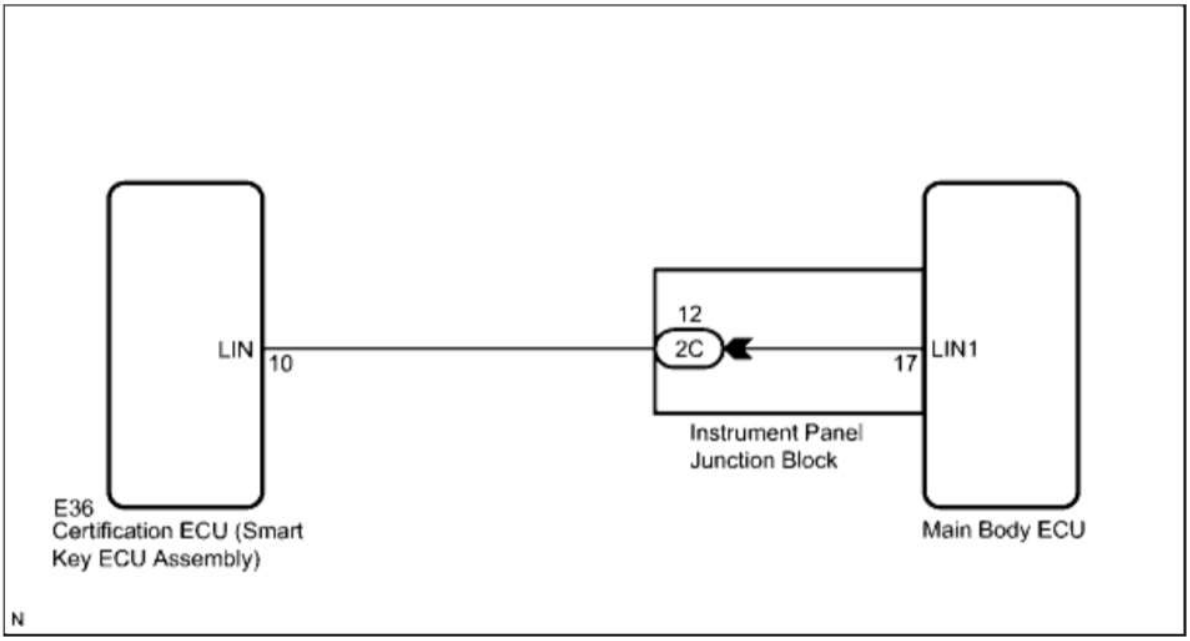
HINT:

After the main body ECU (instrument panel junction block) is replaced, perform the registration procedures for the engine immobiliser system INFO **.**

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B2289	Either condition below is met: • LIN communication is abnormal between the main body ECU (instrument panel junction block) and the certification ECU (smart key ECU assembly) • The engine immobiliser system is malfunctioning	• Main body ECU (instrument panel junction block) • Smart key system (entry function) • Wire harness or connector • Certification ECU (smart key ECU assembly)

WIRING DIAGRAM

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INSPECTION PROCEDURE

PROCEDURE

1.	**CHECK FOR DTC**

(a) Clear the DTCs INFO.

(b) Check for DTC B2289 (Key collection waiting time over) and B2785 (Communication malfunction between ECUs connected by LIN).

Result:

DISPLAY (DTC OUTPUT)	PROCEED TO
"DTC B2289" only	A
"DTC B2785" only	B
No DTC	C

HINT:

- If DTC B2785 is output, perform troubleshooting for DTC B2785 first.

C ▶ **USE SIMULATION METHOD TO CHECK**

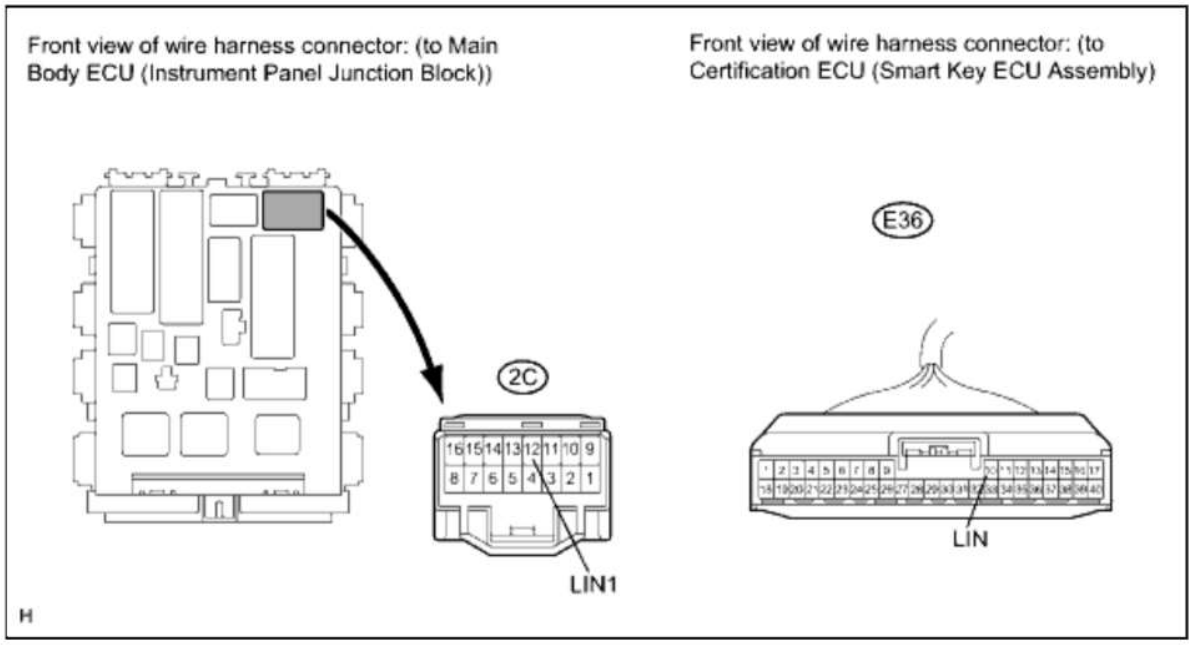
B ▶ **GO TO DTC B2785**

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A

2.	CHECK HARNESS AND CONNECTOR (MAIN BODY ECU - CERTIFICATION ECU)

(a) Disconnect the E36 ECU and 2C junction block connectors.



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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
2C-12 (LIN1) - E36-10 (LIN)	Always	Below 1 Ω
2C-12 (LIN1) or E36-10 (LIN) - Body ground	Always	10 kΩ or higher

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (MAIN BODY ECU - CERTIFICATION ECU)**

OK

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3.	CHECK MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK) OPERATION

(a) After replacing the main body ECU (instrument panel junction block) with a normally functioning ECU, check that the engine starts.

OK:

Engine starts normally.

HINT:

If the engine does not start, refer to Problem Symptoms Table of the smart key system (entry function) (Room Oscillator does not Recognized Key).

NG ▶ **GO TO SMART KEY SYSTEM (ENTRY FUNCTION)**

OK ▶ **END (MAIN BODY ECU DEFECTIVE)**

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Last Modified: 3-10-2010	6.4 J	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000YA204NX
Title: THEFT DETERRENT / KEYLESS ENTRY: SMART KEY SYSTEM (for Start Function): Engine Switch Indicator Circuit (2010 Corolla)		

Engine Switch Indicator Circuit

DESCRIPTION

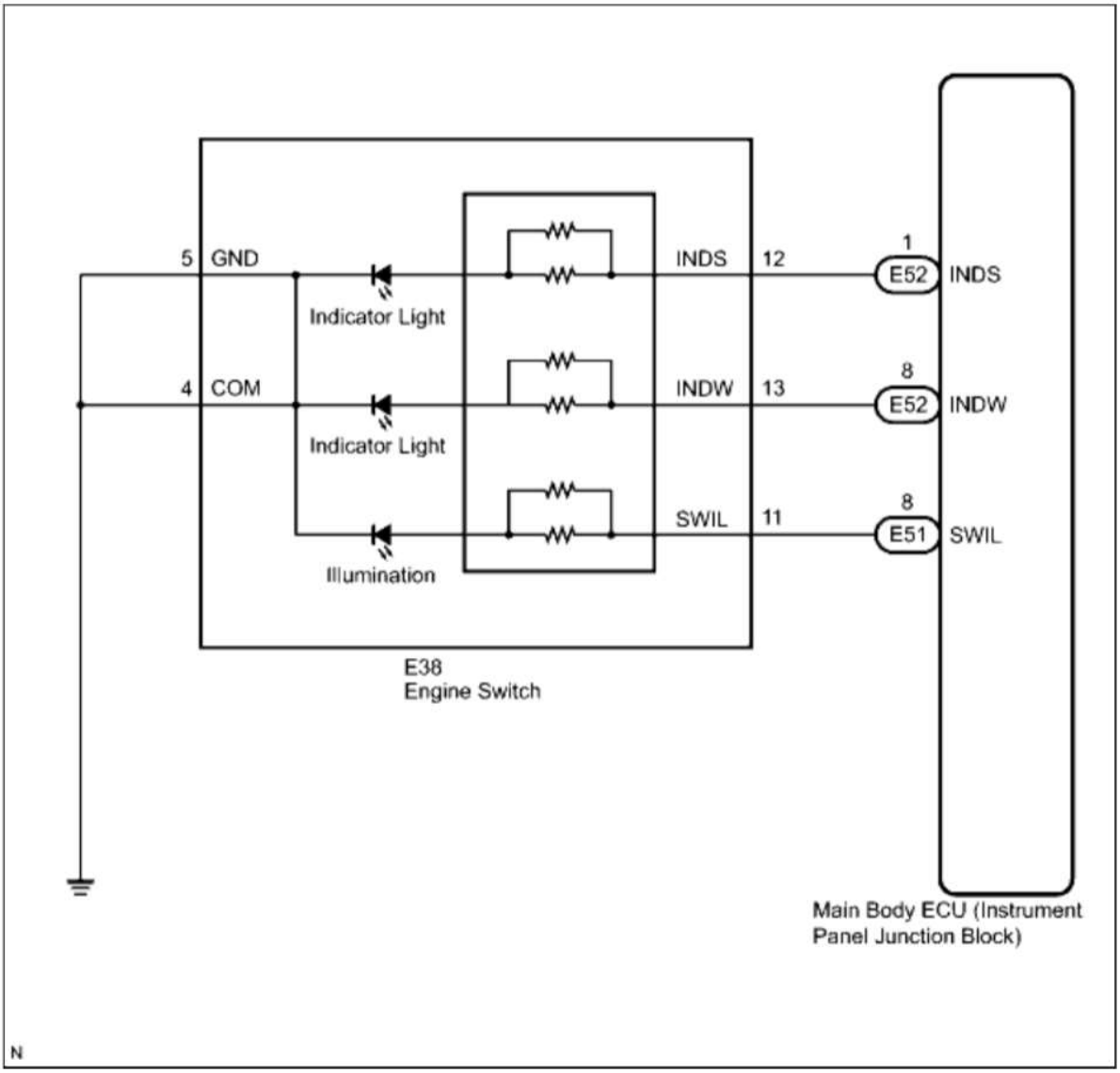
Engine start conditions or system malfunctions can be checked by the status of the engine switch indicator light.

Engine Switch Indicator Light Condition

POWER SOURCE MODE/CONDITION	INDICATOR LIGHT CONDITION	
	BRAKE PEDAL RELEASED	BRAKE PEDAL DEPRESSED, SHIFT LEVER IN P
off	OFF	ON (Green) (When key and vehicle IDs match)
on (ACC, IG)	ON (Amber)	ON (Green)
Engine running	OFF	OFF
Steering lock not unlocked	Flashes (Green) for 15 sec.	Flashes (Green) for 15 sec.
System malfunction	Flashes (Amber) for 15 sec.	Flashes (Amber) for 15 sec.

WIRING DIAGRAM

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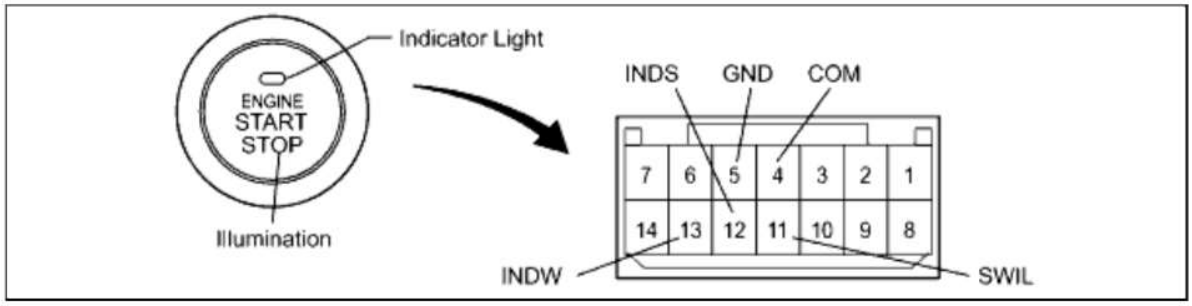
INSPECTION PROCEDURE

PROCEDURE

1.	**INSPECT ENGINE SWITCH**

(a) Remove the engine switch INFO .

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(b) Apply battery voltage between the terminals of the switch, and check the illumination condition of the switch.

NOTICE:

- If the positive (+) lead and the negative (-) lead are incorrectly connected, the engine switch indicator will not illuminate.
- If the voltage is too low, the indicator will not illuminate.

OK:

MEASUREMENT CONDITION	SPECIFIED CONDITION
Battery positive (+) → Terminal 11 (SWIL) Battery negative (-) → Terminal 4 (COM) or 5 (GND)	Illuminates
Battery positive (+) → Terminal 12 (INDS) Battery negative (-) → Terminal 4 (COM) or 5 (GND)	Illuminates
Battery positive (+) → Terminal 13 (INDW) Battery negative (-) → Terminal 4 (COM) or 5 (GND)	Illuminates

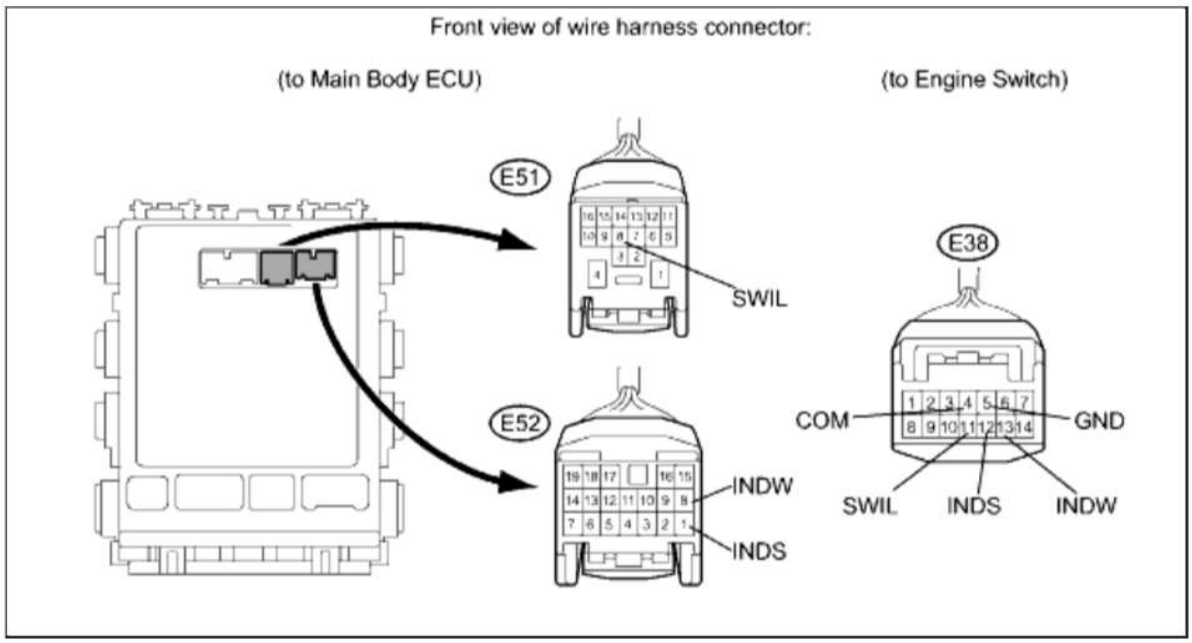
NG ▶ **REPLACE ENGINE SWITCH**

OK ▼

2.	**CHECK HARNESS AND CONNECTOR (ENGINE SWITCH - MAIN BODY ECU AND BODY GROUND)**

(a) Disconnect the E38 switch connector.

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(b) Disconnect the E51 and E52 ECU connectors.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E38-11 (SWIL) - E51-8 (SWIL)	Always	Below 1 Ω
E38-12 (INDS) - E52-1 (INDS)		
E38-13 (INDW) - E52-8 (INDW)		
E38-5 (GND) - Body ground		
E38-4 (COM) - Body ground		
E38-11 (SWIL) or E51-8 (SWIL) - Body ground		10 kΩ or higher
E38-12 (INDS) or E52-1 (INDS) - Body ground		
E38-13 (INDW) or E52-8 (INDW) - Body ground		

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

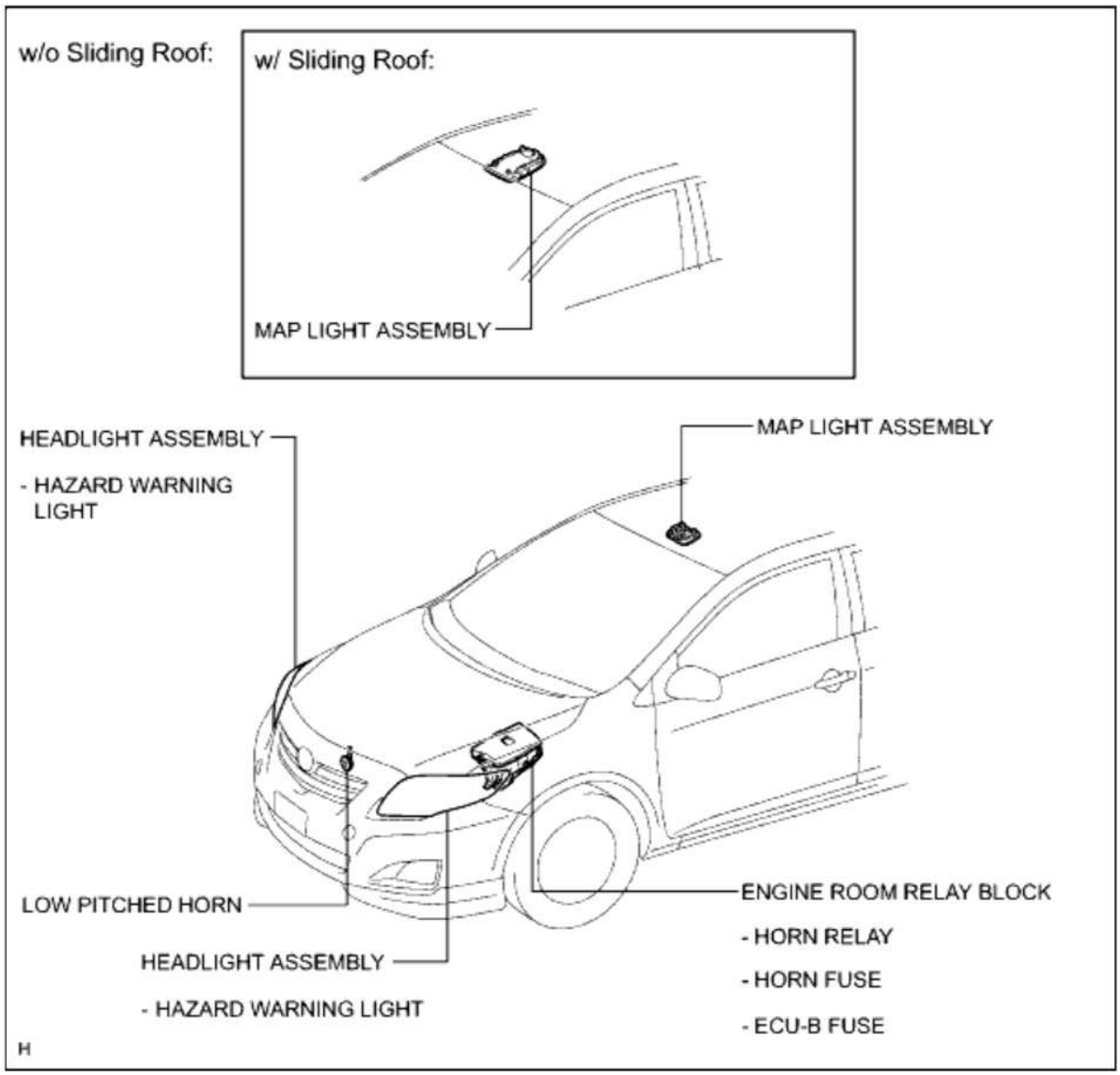
OK ▶ **REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)**

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Last Modified: 3-10-2010	6.4 R	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000035 7I00AX
Title: THEFT DETERRENT / KEYLESS ENTRY: THEFT DETERRENT SYSTEM: PARTS LOCATION (2010 Corolla)		

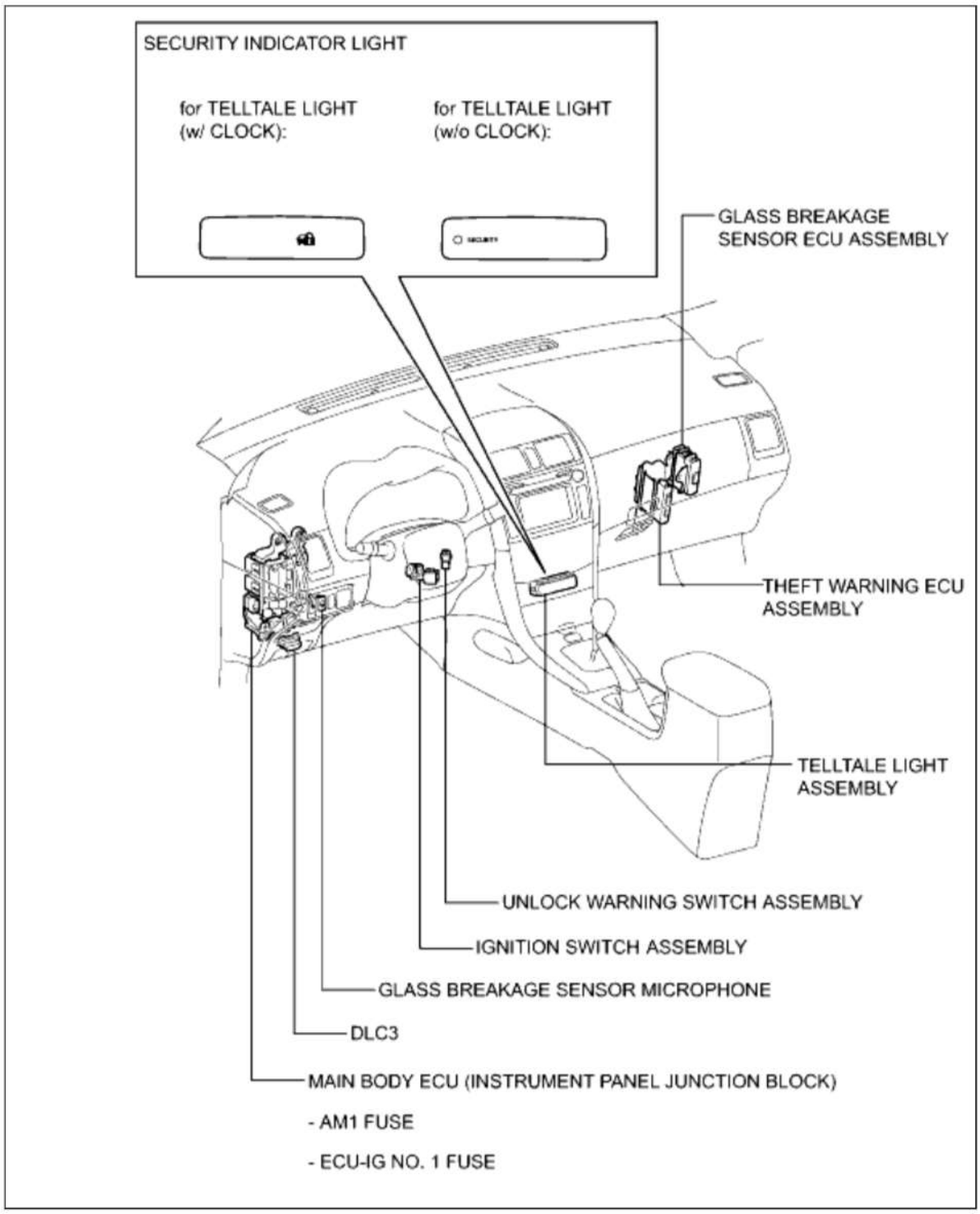
PARTS LOCATION

ILLUSTRATION



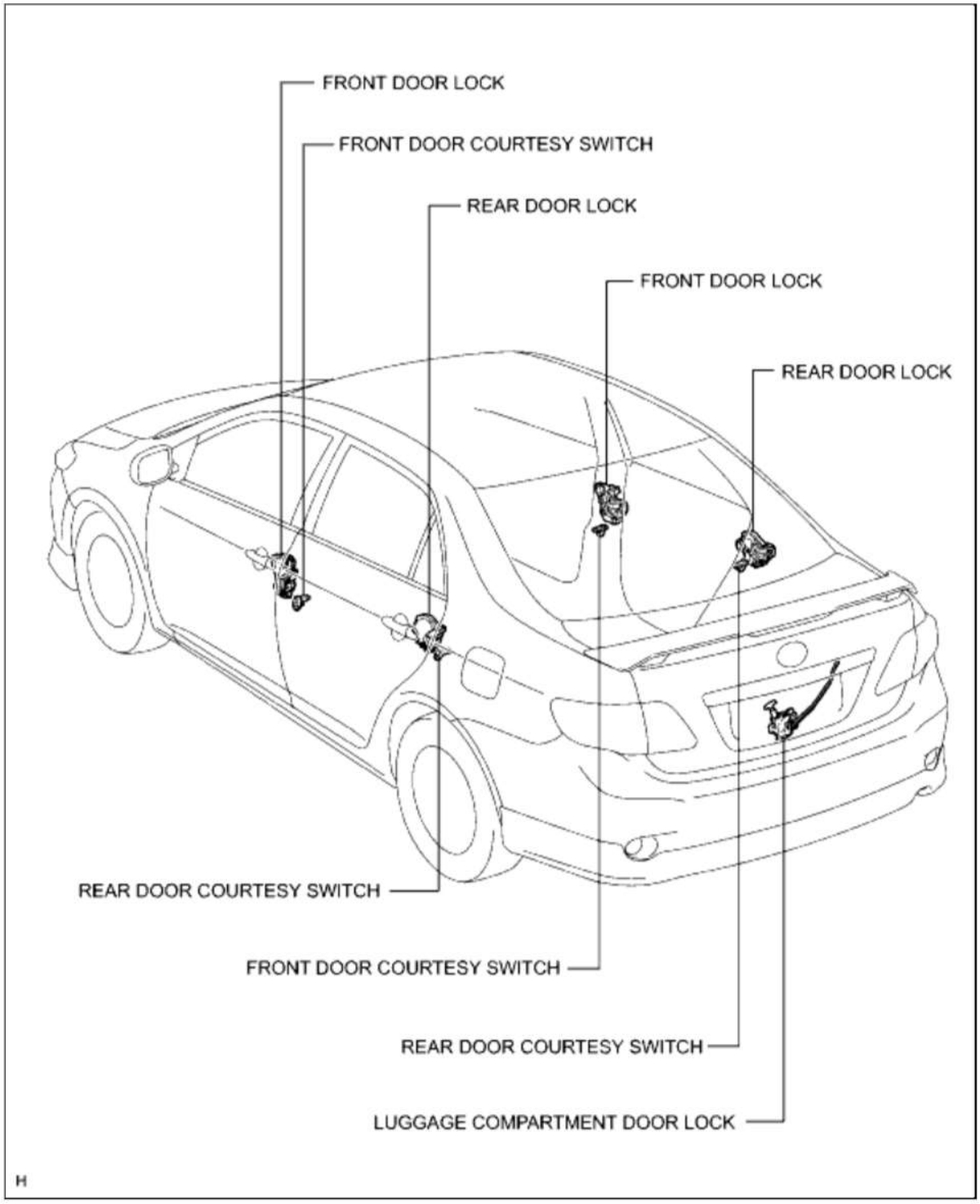
ILLUSTRATION

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ILLUSTRATION

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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000026P0021X
Title: THEFT DETERRENT / KEYLESS ENTRY: THEFT DETERRENT SYSTEM: SYSTEM DESCRIPTION (2010 Corolla)		

SYSTEM DESCRIPTION

1. OUTLINE OF THEFT DETERRENT SYSTEM

- The theft deterrent system can be set by locking the doors using the transmitter or key, or by opening and closing the doors (see Active Arming Mode or Passive Arming Mode for details).
- The alarm function will be activated when someone attempts to forcibly unlock the any of the doors, open any of the doors or the luggage compartment door while the system is in the armed state.
- In the alarm sounding state, the system illuminates the interior light and blinks the hazard warning lights, the headlights and taillights. At the same time, the system sounds the vehicle horn to deter break-in and theft as well as to warn people around the vehicle.
- The alarm can be cancelled by unlocking the doors using the transmitter or key.
- There are two arming modes for this system: active arming mode and passive arming mode. When the active arming mode has been set, the theft deterrent system will be set after the user locks the doors via the transmitter or key. When the passive arming mode has been set, the theft deterrent system will be set after the key is removed and the driver door is closed.

(a) Disarmed state:

- The alarm function is not operating.
- The theft deterrent system is not operating.

(b) Arming preparation state:

- The time until the system goes into the armed state.
- The theft deterrent system is not operating.

(c) Armed state:

- The theft deterrent system is operating.

(d) Alarm sounding state:

- The alarm function is operating.

Alarm time:
Approx. 57 sec.

Refer to the table below for alarm methods and time

Alarm Method	Headlights	Blinking
	Taillights	Blinking
	Hazard Warning Lights	Blinking
	Interior Light	Illuminating
	Vehicle Horn	Sounding (approx. 0.4-second cycles)

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Alarm Time	Approx. 57 sec.

HINT:

If any of the doors are unlocked when the key is not in the key cylinder during the armed state, a forced door lock signal will be output (see Forced Door Lock Control).

2. FUNCTION OF MAIN COMPONENTS

COMPONENT	FUNCTION
Security indicator light	Informs driver of theft deterrent system status.
Headlights	Blink when attempted break-in or theft is detected.
Taillights	• Blink when attempted break-in or theft is detected. • Come on when theft deterrent system has entered into alarm sounding state.
Hazard warning lights	Blink when attempted break-in or theft is detected.
Interior light	Comes on when attempted break-in or theft is detected.
Vehicle horn	Sounds when attempted break-in or theft is detected.
Door courtesy light switch	Detects door status (open or closed).
Door unlock detection switch	Detects door status (locked or unlocked).
Luggage courtesy switch	Detects luggage compartment door status (open or closed).
Glass breakage sensor	When detecting that any door glass is tapped or broken, the glass breakage sensor microphone sends an analog signal to the glass breakage sensor ECU assembly. After receiving the analog signal, the glass breakage sensor ECU assembly sends a signal to the theft warning ECU assembly to sound the alarm.

3. ACTIVE ARMING MODE

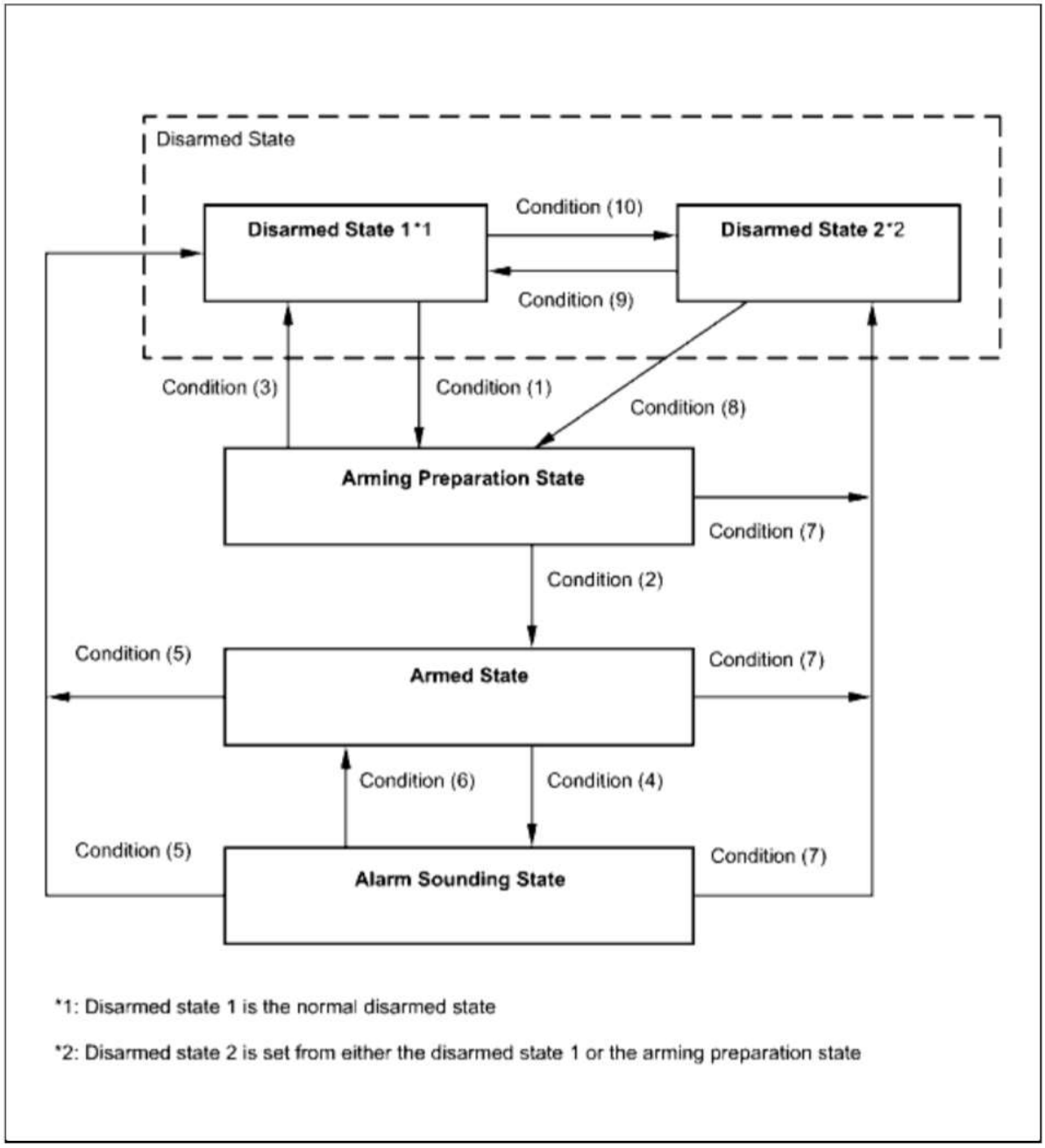
HINT:

Active arming mode starts the alarm control immediately after the doors are locked.

(a) Active arming mode:

This system operates as described in the diagram below when one of the items for each condition is met.

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CONDITION	ITEM
Condition (1)	In the disarmed state, the system state is switched if one of the following conditions is met when the key is not in the ignition key cylinder: • With all doors and luggage compartment door closed, all doors are locked by key operation. • With all doors and luggage compartment door closed, all doors are locked by wireless operation. • With all door lock position switches locked and luggage compartment door closed, all doors are closed.
Condition (2)	Approx. 30 seconds elapse after condition (1) is met.

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CONDITION	ITEM
Condition (3)	• A wireless unlock signal is received. • All doors are unlocked by key operation. • Any door is unlocked. • Any door is opened. • The luggage compartment is opened. • The key is inserted into the ignition key cylinder. • The ignition switch is turned to ON or ACC. • The battery is reconnected.
Condition (4)	• The battery is reconnected. • The luggage compartment is opened. • Any door is opened. • Any door is unlocked when all doors are locked without using the key. • Any door is unlocked when all doors are locked without using the wireless operation. • Glass breakage sensor impacts to or breakage of the glass.
Condition (5)	• A wireless unlock signal is received. • All door are unlocked by key operation. • The ignition switch is turned to ON and the engine is run for more than 2 seconds.
Condition (6)	Approx. 57 seconds elapse. (The alarm stops and the system returns to the armed state.)
Condition (7)	• Luggage compartment door is opened by wireless trunk opener operation. • Luggage compartment door is opened by key operation.
Condition (8)	• Luggage compartment door is closed.
Condition (9)	• Any door is unlocked when all doors are locked. • Any door is opened. • The key is inserted into the ignition key cylinder. • The ignition switch is turned to ON or ACC. • The battery is reconnected. • All doors are unlocked by wireless operation. • All doors are unlocked by key operation.
Condition (10)	In the disarmed state, the system state is switched if one of the following conditions is met when the key is not in the ignition key cylinder: • With all doors closed and luggage compartment door opened, all doors are locked by key operation. • With all doors closed and luggage compartment door opened, all doors are locked by wireless operation. • With all doors lock position locked and luggage compartment door opened, all doors are closed.

4. PASSIVE ARMING MODE

HINT:

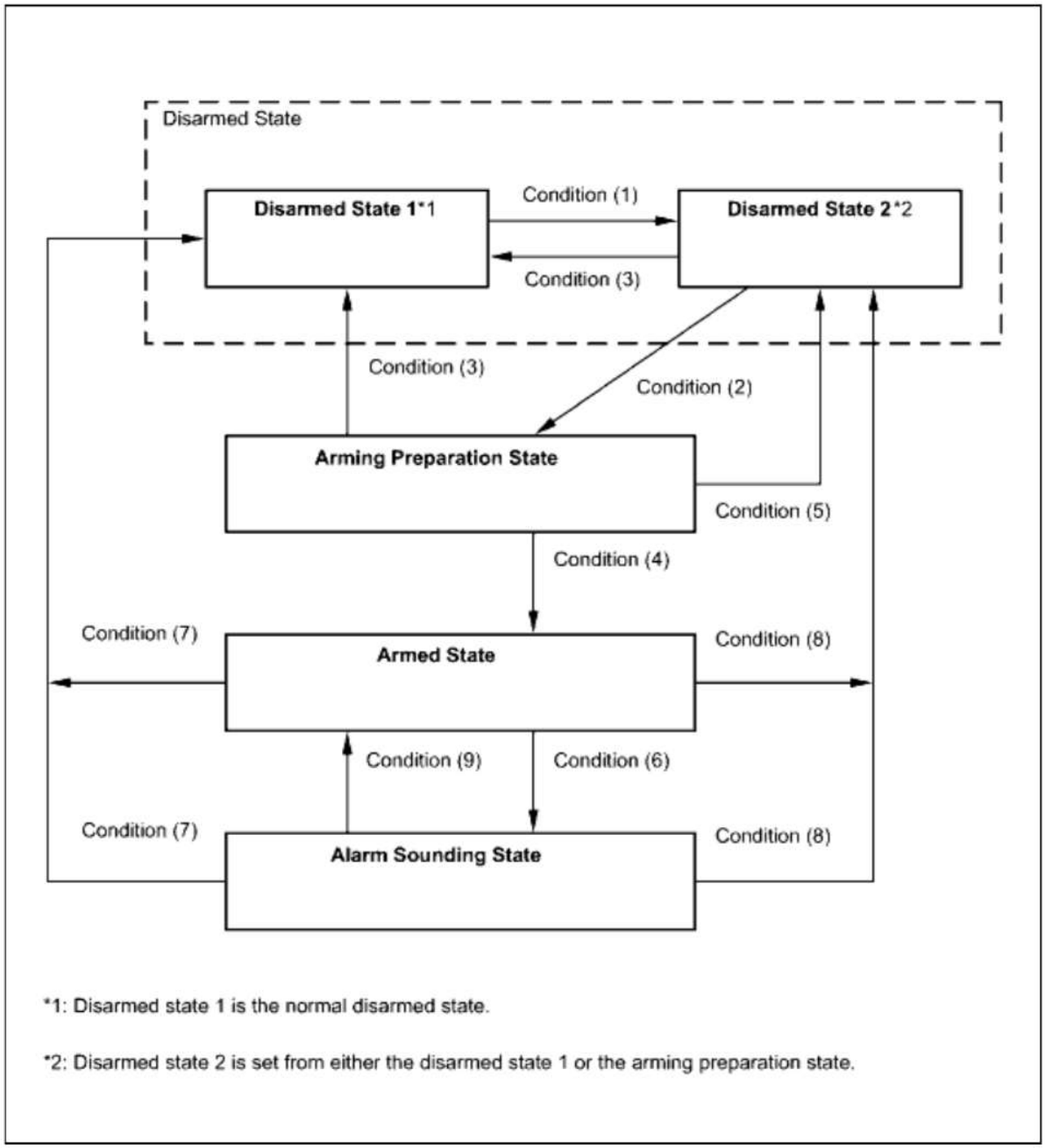
- Passive arming mode starts the alarm control after the key is removed from the key cylinder and the doors are closed.
- Passive arming mode can be switched ON/OFF using the Techstream.
- The alarm is initially set (when shipped from the factory) to active arming mode (not passive arming mode).

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- During passive arming mode, the theft deterrent system goes into the armed state even if the doors are not locked.
- Detecting that the doors are unlocked does not set off the alarm during passive arming mode.
- A forced door lock signal is not output during passive arming mode (see Forced Door Lock Control).
- Although the theft deterrent system detects that the doors are opened during passive arming mode, the alarm will not go off immediately because an entry delay time is set.
- If condition (1) of active arming mode is met during passive arming mode, the theft deterrent system will switch to active arming mode.

(a) Passive arming mode:

This system operates as described in the diagram below when one of the items for each condition is met.



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CONDITION	ITEM
Condition (1)	• With the ignition switch off, any door is opened and then the key is removed from the ignition key cylinder. • With the ignition switch off, the key is removed from the ignition key cylinder and then any door is opened.
Condition (2)	• With luggage compartment door closed, all doors are closed. • With all doors closed, luggage compartment door is closed.
Condition (3)	• A wireless unlock signal is received. • All doors are unlocked by key operation. • The battery is reconnected. • The key is inserted into the ignition key cylinder. • The ignition switch is turned to ON or ACC.
Condition (4)	Approx. 30 seconds elapse after condition (1) is met.
Condition (5)	• Any door is opened. • Luggage compartment door is opened by key operation. • Luggage compartment door is opened by wireless trunk opener operation.
Condition (6)	• Any door is opened and the entry delay time* elapse. • Luggage compartment door is opened. • The battery is reconnected. • The ignition switch is turned to ON without using the key. • The ignition switch is turned to ON within 5 seconds after it is turned off.
Condition (7)	• A wireless unlock signal is received. • All doors are unlocked by key operation. • The ignition switch is turned to ON and the engine is run for more than 2 seconds. • Insert the key into the ignition key cylinder and turn the ignition switch to ON.
Condition (8)	• Luggage compartment door is opened by key operation. • Luggage compartment door is opened by wireless trunk opener operation.
Condition (9)	Approx. 57 seconds elapse. (The alarm stops and the system returns to the armed state.)

- *: When any door is opened while all the doors are closed during passive arming mode, the entry delay time starts. If the switch condition (armed state → disarmed state (1) or (2)) is met during the entry delay time, the theft deterrent system will return to disarmed state (1) or (2). However, if the switch condition for disarmed state (1) or (2) is not met, the theft deterrent system will recognize it as a theft and set off the alarm. Entry delay time of 0, 14 or 30 sec. can be selected by the customizing function.

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5. FORCED DOOR LOCK CONTROL

(a) The forced door lock control prevents the vehicle from being tampered with. Immediately after a door is unlocked (alarm starts), all doors are forced to lock by a forced door lock signal.

(1) Conditions that force the doors to lock:

The key is not in the key cylinder and both of the following conditions are met:

- The theft deterrent system is in the alarm sounding state of active arming mode.
- Any door is unlocked.

6. ALARM MEMORY FUNCTION

(a) If the alarm is set off (tampering is detected) while the theft deterrent system is armed, it will be recorded by the alarm memory function. Whenever the theft deterrent system is cancelled, the alarm memory function causes the taillights to light up for 2 seconds in order to inform you that the alarm has been set off.

(1) Conditions of the alarm memory function that cause the taillights to light up for 2 seconds:

- When the theft deterrent system has entered into the alarm sounding state (tempering has been detected) even once.
- When switched to disarmed state 1 from the armed state during passive arming mode.

HINT:

Active arming mode: See Active Arming Mode.

Passive arming mode: See Passive Arming Mode.

7. PANIC ALARM CONTROL

(a) The panic alarm control makes it possible to voluntarily set off the panic alarm by pressing the panic switch on the wireless transmitter.

(1) When the PANIC switch on the wireless transmitter is pressed, the panic alarm control sets off the panic alarm if any of the following conditions is met:

- The ignition switch is off.
- The theft deterrent system is not in the alarm sounding state. (This condition is common both to active arming mode and to passive arming mode.)

(2) Conditions that cause the panic alarm control to shut off the alarm:

The panic alarm control shuts off the panic alarm when any of the following conditions is met during panic alarm operation:

- The ignition switch is turned to ON.
- The panic alarm switch is turned on again.
- Either of the switches on the wireless transmitter (LOCK/UNLOCK/TRUNK OPENER) is pressed.
- The panic alarm ends (approx. 57 sec. have elapsed).
- The theft deterrent system switches to the alarm sounding state. Under this condition, the theft deterrent system is controlling the alarm rather than the panic alarm control. In order to cancel this alarm, refer to the theft deterrent system alarm sounding state cancellation procedure. (This condition is common both to active arming mode and to passive arming mode.)

HINT:

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- Active arming mode: See Active Arming Mode.
- Passive arming mode: See Passive Arming Mode.

8. SECURITY INDICATOR OUTPUT

(a) The main body ECU outputs a signal to come on the security indicator light assembly, according to the state of the theft deterrent system. However, some of the actual lighting conditions of the security indicator light assembly are different from the output signals of the main body ECU.

Output

STATE OF THEFT DETERRENT SYSTEM	SECURITY INDICATOR	
	OUTPUT SIGNAL FROM MAIN BODY ECU	ACTUAL LIGHTING CONDITION
Disarmed state (1), (2)	OFF	OFF (Immobiliser system unset) BLINKING (Immobiliser system set)
Arming preparation state	ON	ON
Armed state	OFF	BLINKING
Alarm sounding state	ON	ON

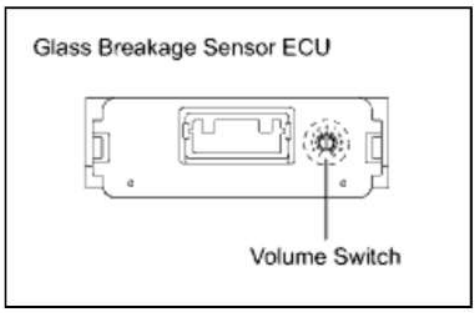
Blinking Cycle

TIME	SECURITY INDICATOR
0.25 sec.	ON
1.8 sec.	OFF

HINT:

When the immobiliser system is set, the security indicator light assembly blinks during both the disarmed state and the armed state, due to output signals from the immobiliser system.

9. GLASS BREAKAGE SENSOR



(a) The glass breakage sensor detects impacts or breakage of the glass. If the sensor detects any impacts or breakage while the theft deterrent system is functioning, it will sound an alarm for 57 seconds.

(b) The sensitivity of the glass breakage sensor can be adjusted by the volume switch in the glass breakage sensor ECU.

HINT:

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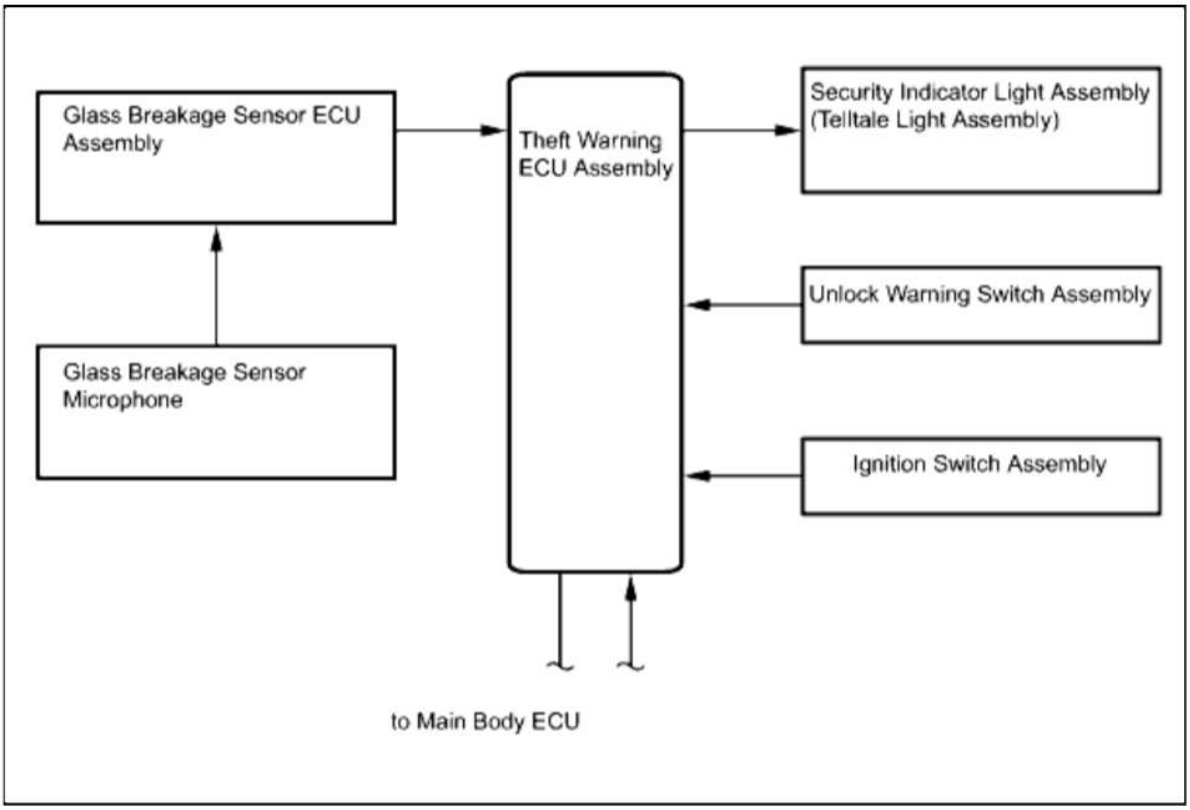
The glass breakage sensor may issue a false alarm if the sensor sensitivity is set too high.



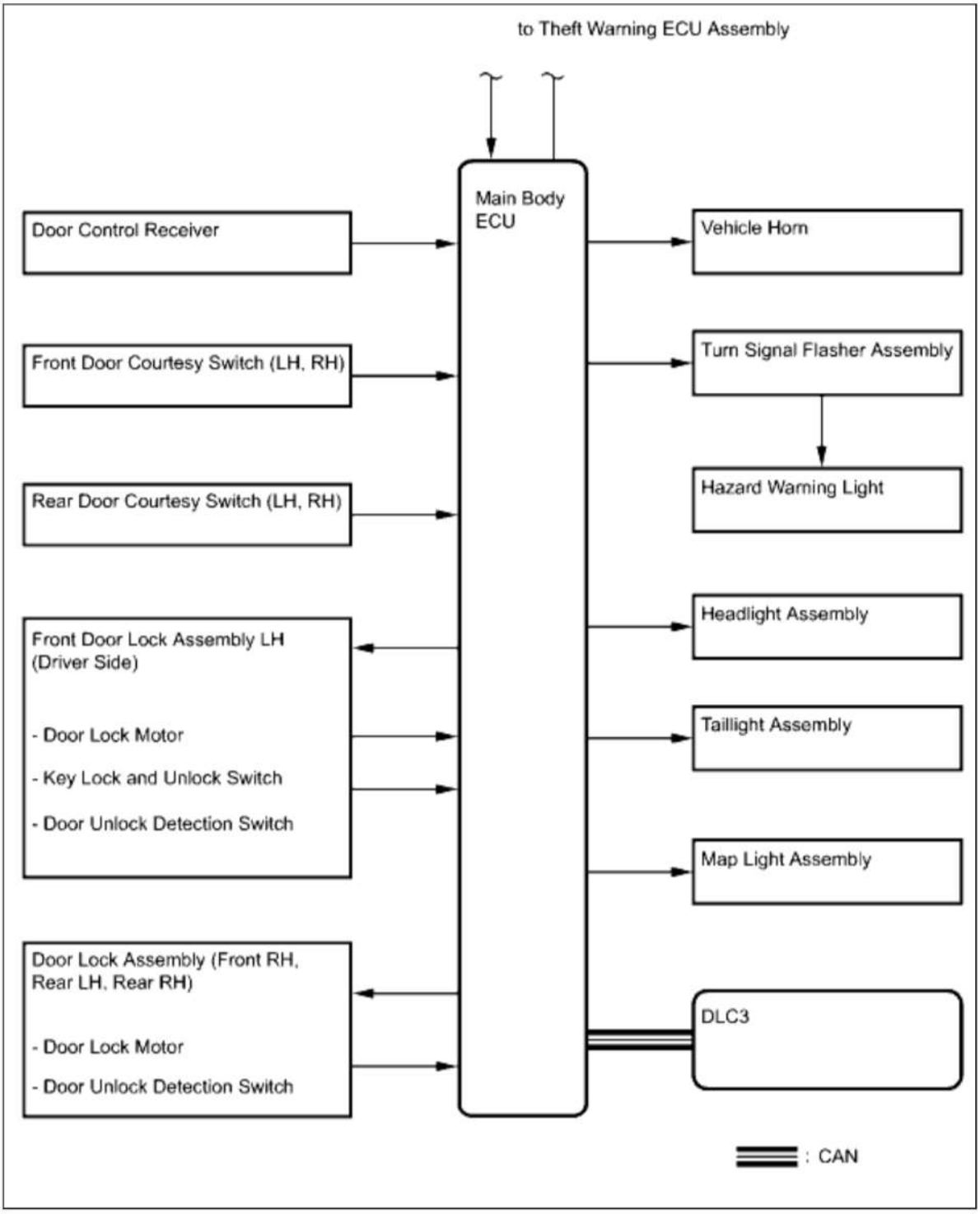
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Last Modified: 3-10-2010	6.4 U	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000002Y8H00JX
Title: THEFT DETERRENT / KEYLESS ENTRY: THEFT DETERRENT SYSTEM: SYSTEM DIAGRAM (2010 Corolla)		

SYSTEM DIAGRAM



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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000010J306NX
Title: THEFT DETERRENT / KEYLESS ENTRY: THEFT DETERRENT SYSTEM: HOW TO PROCEED WITH TROUBLESHOOTING (2010 Corolla)		

HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

- Use this procedure to troubleshoot the theft deterrent system.
- *: Using the Techstream.

1.	**VEHICLE BROUGHT TO WORKSHOP**

NEXT

2.	**CUSTOMER PROBLEM ANALYSIS**

(a) Interview the customer to confirm the trouble INFO.

NEXT

3.	**INSPECT FOR DTC***

(a) Use the Techstream to check for DTC B1269 INFO.

Result:

RESULT	PROCEED TO
DTC is not output	A
DTC is output	B

B INFO **GO TO DIAGNOSTIC TROUBLE CODE CHART**

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A

4.	INSPECT COMMUNICATION FUNCTION OF CAN COMMUNICATION SYSTEM*

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

Result:

RESULT	PROCEED TO
CAN DTC is not output	A
CAN DTC is output	B

B INFO GO TO CAN COMMUNICATION SYSTEM

A

5.	SYMPTOM SIMULATION

NEXT

6.	PROBLEM SYMPTOMS TABLE

Result:

RESULT	PROCEED TO
Fault is not listed in Problem Symptoms Table	A
Fault is listed in Problem Symptoms Table	B

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B ▶ Go to step 8

A ▼

7.	PERFORM TROUBLESHOOTING ACCORDING TO MALFUNCTION SYMPTOM*

(a) System description INFO

(b) Terminals of ECU INFO

(c) Data List/Active Test INFO

8.	ADJUST, REPAIR OR REPLACE

NEXT ▼

9.	CONFIRMATION TEST

NEXT ▶ END

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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000010JG02AX
Title: THEFT DETERRENT / KEYLESS ENTRY: THEFT DETERRENT SYSTEM: CUSTOMIZE PARAMETERS (2010 Corolla)		

CUSTOMIZE PARAMETERS

HINT:

The following items can be customized.

NOTICE:

- After confirming whether the items requested by the customer are applicable or not for customization, perform customizing operations.
- Be sure to record the current settings before customization.
- When troubleshooting, make sure that the item in question is not set to "OFF" as a result of customization (Example: For the system, "the wireless function does not operate", first check that the wireless function is not set to "OFF", then perform troubleshooting).

1. CUSTOMIZE

(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Turn the Techstream on.

(d) Enter the following menus: Customize Setting.

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

Security

DISPLAY (ITEM)	DEFAULT	CONTENTS	SETTING
Passive Mode	OFF	• Passive Mode is a function that switches the theft deterrent system from the arming preparation state to the armed state 30 seconds after the key is removed from the key cylinder and all doors and luggage compartment door are closed, even if the doors are not locked by wireless or door key lock operation. • In Passive Mode, if the following operations are not performed within 14 seconds after a door is opened during the armed state, the theft deterrent system will judge that condition as a theft and switch to the alarm sounding state. • Unlock any door by key or wireless operation • Turn the ignition switch to ON • Open the luggage compartment door by key or wireless operation	ON/OFF
Warning by Glass Sen	ON	Function that turns the glass breakage sensor on/off this function is only effective for vehicles with glass breakage sensor.	ON/OFF

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DISPLAY (ITEM)	DEFAULT	CONTENTS	SETTING
Entry Delay Time	14 s	Function that changes entry delay time (time before warning starts) for Passive Mode	0 s/14 s/30 s

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Last Modified: 3-10-2010	6.4 T	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000026P1011X
Title: THEFT DETERRENT / KEYLESS ENTRY: THEFT DETERRENT SYSTEM: PROBLEM SYMPTOMS TABLE (2010 Corolla)		

PROBLEM SYMPTOMS TABLE

- 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.

Theft Deterrent System

SYMPTOM	SUSPECTED AREA	SEE PAGE
Theft deterrent system cannot be set	Security indicator light circuit	INFO
	Theft Warning ECU power source circuit	INFO
	Unlock warning switch circuit	INFO
	Door courtesy switch circuit	INFO
	Front door lock assembly	INFO
	Rear door lock assembly	INFO
	Luggage compartment door lock assembly	INFO
	Theft warning ECU assembly	INFO
	If the symptom(s) still occur after the above areas are inspected and proved to be normal, replace the main body ECU (instrument panel junction block)	-
Security indicator does not blink when theft deterrent system is set	Security indicator light circuit	INFO
	Theft warning ECU assembly	INFO
	If the symptom(s) still occur after the above areas are inspected and proved to be normal, replace the main body ECU (instrument panel junction block)	-
Alarm sounding state to cannot be canceled when ignition switch is turned to ON	Ignition switch circuit	INFO
	Unlock warning switch circuit	INFO
	Theft warning ECU assembly	INFO
	If the symptom(s) still occur after the above areas are inspected and proved to be normal, replace the main body ECU (instrument panel junction block)	-
	Door courtesy switch circuit	INFO

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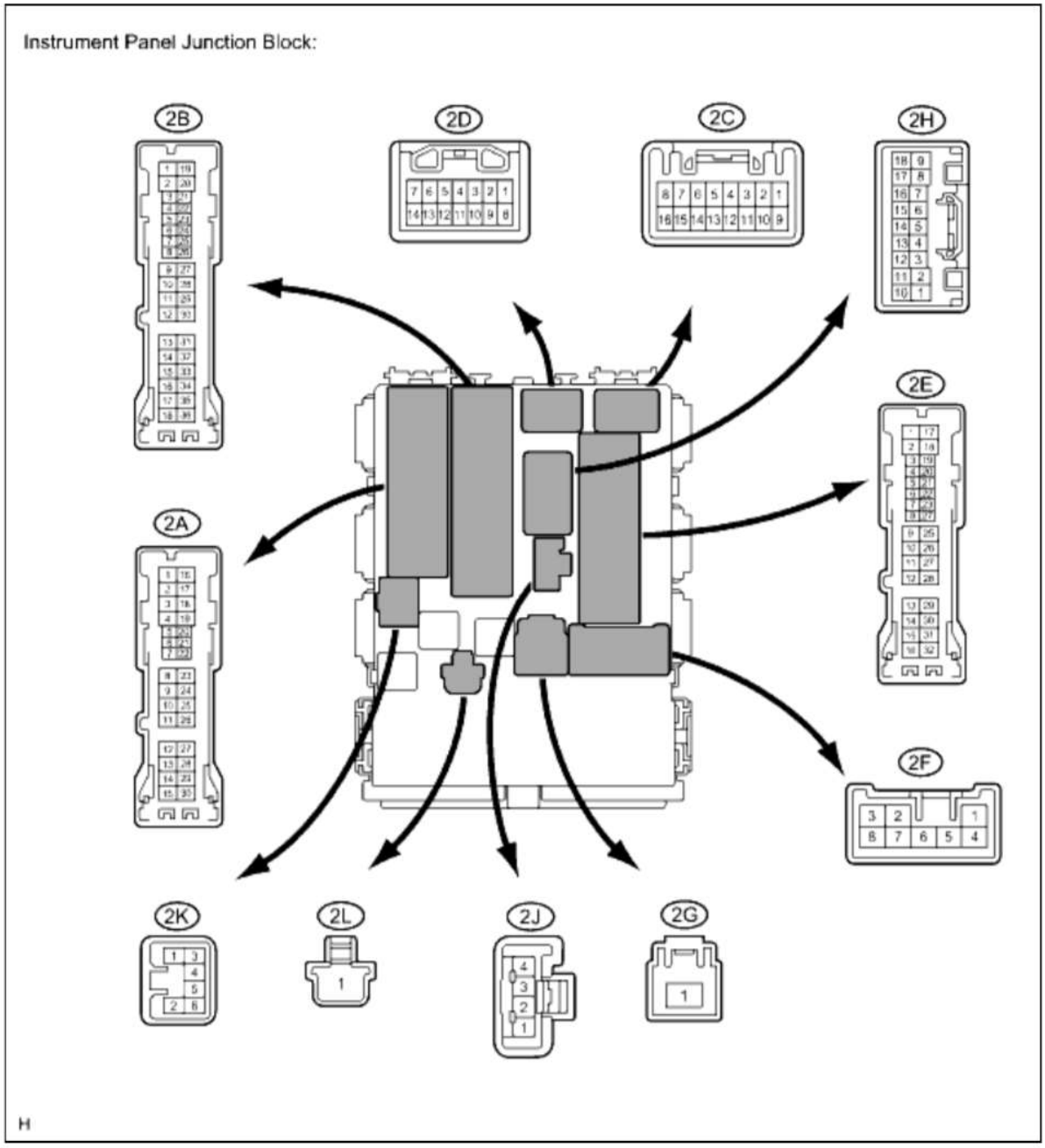
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Last Modified: 3-10-2010	6.4 U	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001PQV01RX
Title: THEFT DETERRENT / KEYLESS ENTRY: THEFT DETERRENT SYSTEM: TERMINALS OF ECU (2010 Corolla)		

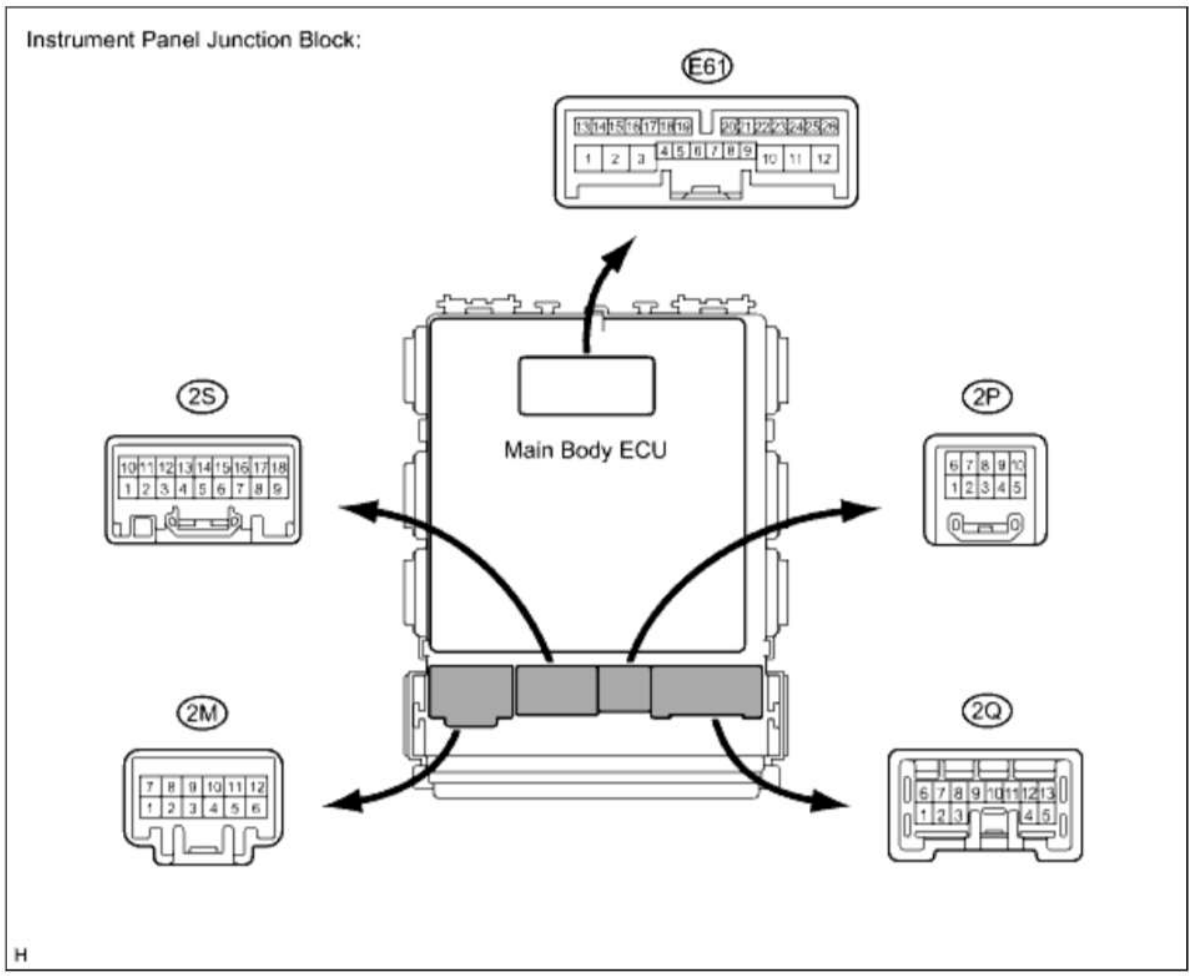
TERMINALS OF ECU

1. CHECK MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)

(a) Disconnect the 2A, 2B, 2E, 2F, 2G and E61 junction block connectors and main body ECU connector.



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(b) Measure the resistance and voltage between each terminal of the wire harness side connectors and body ground.

TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
2H-7 (LGCY) - Body ground	LG - Body ground	Luggage compartment door courtesy light switch input	Luggage compartment door CLOSED (OFF) → OPEN (ON)	10 kΩ or higher → Below 1 Ω
2A-21 (DCTY) - Body ground	V - Body ground	Driver side door courtesy light switch input	Driver side door CLOSED (OFF) → OPEN (ON)	10 kΩ or higher → Below 1 Ω
2B-30 (BECU) - Body ground	W - Body ground	+B power supply	Always	11 to 14 V
2E-19 (RCTY) - Body ground	Y - Body ground	Rear courtesy light switch RH input	Rear door RH CLOSED (OFF) → OPEN (ON)	10 kΩ or higher → Below 1 Ω
2E-20 (PCTY) - Body ground	BR - Body ground	Passenger side courtesy light switch input	Passenger side door CLOSED (OFF) → OPEN (ON)	10 kΩ or higher → Below 1 Ω

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TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
2F-5 (ACC) - Body ground	L - Body ground	Ignition power supply (ACC signal)	Ignition switch ACC → off	11 to 14 V → Below 1 V
2G-1 (IG) - Body ground	W - Body ground	Ignition power supply (IG signal)	Ignition switch ON → off	11 to 14 V → Below 1 V
2E-17 (GND1) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
E61-13 (LCTY) -Body ground	B - Body ground	Rear courtesy light switch LH input	Rear door LH CLOSED (OFF) → OPEN (ON)	10 kΩ or higher → Below 1 Ω

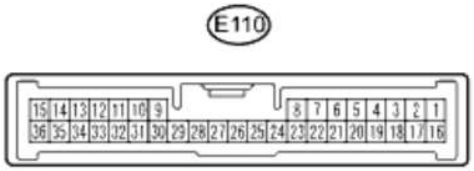
HINT:

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

2. CHECK THEFT WARNING ECU ASSEMBLY

(a) Disconnect the E110 theft warning ECU assembly connector.

Theft Warning ECU Assembly:



(b) Measure the voltage and resistance between each terminal of the wire harness side connectors and body ground.

TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
E110-7 (KSW) - E110-16 (E)	L - W-B	Unlock warning switch input	No key in ignition key cylinder (OFF) → Key inserted (ON)	10 kΩ or higher → Below 1 Ω
E110-9 (IG) - E110-16 (E)	L -W-B	Ignition power supply (IG signal)	Ignition switch ON → off	11 to 14 V → Below 1 V
E110-11 (+B1) - E110-16 (E)	R - W-B	+B power supply	Always	11 to 14 V
E110-16 (E) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω

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

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(c) Reconnect the E110 theft warning ECU assembly connector.

(d) Measure the voltage between each terminal of the connector.

TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
E110-24 (BRK+) - E110-16 (E)	LG - W-B	Alarm BERKES communication	Theft deterrent system is in alarm sounding state	Pulse generation (1.5 V ← → Below 1.2 V)
E110-25 (BRK-) - E110-16 (E)	W - W-B	Alarm BERKES communication	All doors are locked using key (Theft deterrent system is in arming preparation state.)	Pulse generation (1.5 V ← → Below 1.2 V)
E110-29 (IND) - E110-16 (E)	Y - W-B	Security indicator output	Security indicator light assembly in on (It comes on only in arming preparation state or alarm sounding state. It flashes when immobiliser is operating.)	3 to 6 V
E110-3 (GBS) - E110-16 (E)	BE - W-B	Glass breakage sensor ECU communication	Armed state → Alarm sounds (on glass breakage detection)	Below 1 V → Pulse generation

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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001PQX05CX
Title: THEFT DETERRENT / KEYLESS ENTRY: THEFT DETERRENT SYSTEM: DIAGNOSIS SYSTEM (2010 Corolla)		

DIAGNOSIS SYSTEM

1. DESCRIPTION

The ECU stores trouble codes when trouble occurs on the vehicle.

The diagnostic system allows for reading of the trouble codes from the DLC3.

Use the Techstream to check and solve the problem.

2. CHECK DLC3

(a) Check the DLC3 INFO .

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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001NN601NX
Title: THEFT DETERRENT / KEYLESS ENTRY: THEFT DETERRENT SYSTEM: DTC CHECK / CLEAR (2010 Corolla)		

DTC CHECK / CLEAR

1. DTC CHECK/CLEAR (USING TECHSTREAM)

(a) DTC check

(1) Connect the Techstream to the DLC3.

(2) Turn the ignition switch to ON .

(3) Read DTCs on the Techstream screen.

(b) DTC clear

(1) Connect the Techstream to the DLC3.

(2) Turn the ignition switch to ON.

(3) Clear the DTCs following the prompts on the Techstream screen.

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Last Modified: 3-10-2010	6.4 U	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001PQY01OX
Title: THEFT DETERRENT / KEYLESS ENTRY: THEFT DETERRENT SYSTEM: DATA LIST / ACTIVE TEST (2010 Corolla)		

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.

(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Turn the Techstream on.

(d) Enter the following menus: Body Electrical / Main Body or Security / Data List.

(e) According to the display on the Techstream, read the Data List.

Main Body

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
D Door Courtesy SW	D door courtesy switch / ON or OFF	ON: Driver door is OPEN OFF: Driver door is CLOSED	-
P Door Courtesy SW	P door courtesy switch / ON or OFF	ON: Front passenger side door is OPEN OFF: Front passenger side door is CLOSED	-
RR Door Courtesy SW	Rear right door courtesy switch / ON or OFF	ON: Rear right door is OPEN OFF: Rear right door is CLOSED	-
RL Door Courtesy SW	Rear left door courtesy switch / ON or OFF	ON: Rear left door is OPEN OFF: Rear left door is CLOSED	-
D-Door Lock Pos SW	Driver's door lock position switch / ON or OFF	ON: Driver door is UNLOCKED OFF: Driver door is LOCKED	-
P-Door Lock Pos SW	Passenger door lock position switch / ON or OFF	ON: Front passenger door is UNLOCKED OFF: Front passenger door is LOCKED	-

Security

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TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Glass Sensor Detection	Glass breakage sensor detection / ON or OFF	ON: Glass breakage sensor operates OFF: Glass breakage sensor does not operate	-
Key Unlock Warning SW	Unlock warning switch signal / ON or OFF	ON: Key is inserted in the ignition key cylinder OFF: Key is removed from the ignition key cylinder	-
IG SW	Ignition switch signal / ON or OFF	ON: Ignition switch is ON OFF: Ignition switch is off	-
Alarm Trigger	Alarm trigger	GLS BRK: Alarms are caused by glass breakage sensor D CRTSY: Alarms are caused by door courtesy switch IG SW: Alarms are caused by ignition switch OPEN: Alarms are caused by open circuit KEY UNLK: Alarms are caused by unlock warning switch	-
Passive Mode	Passive mode/ON or OFF	ON: Passive mode ON OFF: Passive mode OFF	-
Warning by Glass Sensor	Warning by glass breakage sensor / ON or OFF	ON: Warns when glass breakage is detected OFF: Does not warn when glass breakage is detected	-
Entry Delay Time	Entry delay time during passive mode	0s: Entry delay time is 0 sec. 14s: Entry delay time is 14 sec. 30s: Entry delay time is 30 sec.	-

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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 trouble shooting 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 ignition switch to ON.

(c) Turn the Techstream on.

(d) Enter the following menus: Body Electrical / Main Body or Security / Active Test.

(e) According to the display on the Techstream, perform the Active Test.

Main Body

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Hazard	Hazard warning lights	ON / OFF	-
Vehicle Horn	Vehicle horn	ON / OFF	-

Security

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Security Indicator	Security indicator	ON / OFF	-



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Last Modified: 3-10-2010	6.4 S	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000002Y8R00DX
Title: THEFT DETERRENT / KEYLESS ENTRY: THEFT DETERRENT SYSTEM: DIAGNOSTIC TROUBLE CODE CHART (2010 Corolla)		

DIAGNOSTIC TROUBLE CODE CHART

Theft Deterrent System

DTC CODE	DETECTION ITEM	TROUBLE AREA	SEE PAGE
B1269	Theft Deterrent ECU Communication Stop	1. Wire harness and connector 2. Theft warning ECU assembly 3. Main body ECU (instrument panel junction block)	INFO

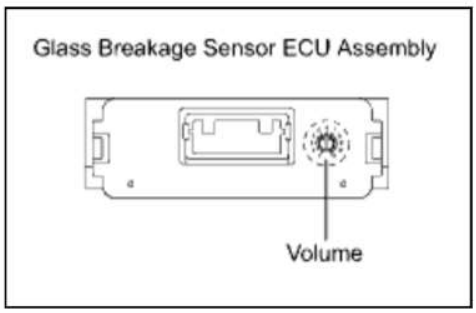
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Last Modified: 3-10-2010	6.4 N	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000002JWF006X
Title: THEFT DETERRENT / KEYLESS ENTRY: THEFT DETERRENT SYSTEM: ADJUSTMENT (2010 Corolla)		

ADJUSTMENT

1. ADJUST SENSITIVITY

(a) Adjust the sensitivity volume.



(1) Turn the knob on the glass breakage sensor ECU assembly to adjust the volume.

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001K7I011X
Title: THEFT DETERRENT / KEYLESS ENTRY: THEFT DETERRENT SYSTEM: B1269: Theft Deterrent ECU Communication Stop (2010 Corolla)		

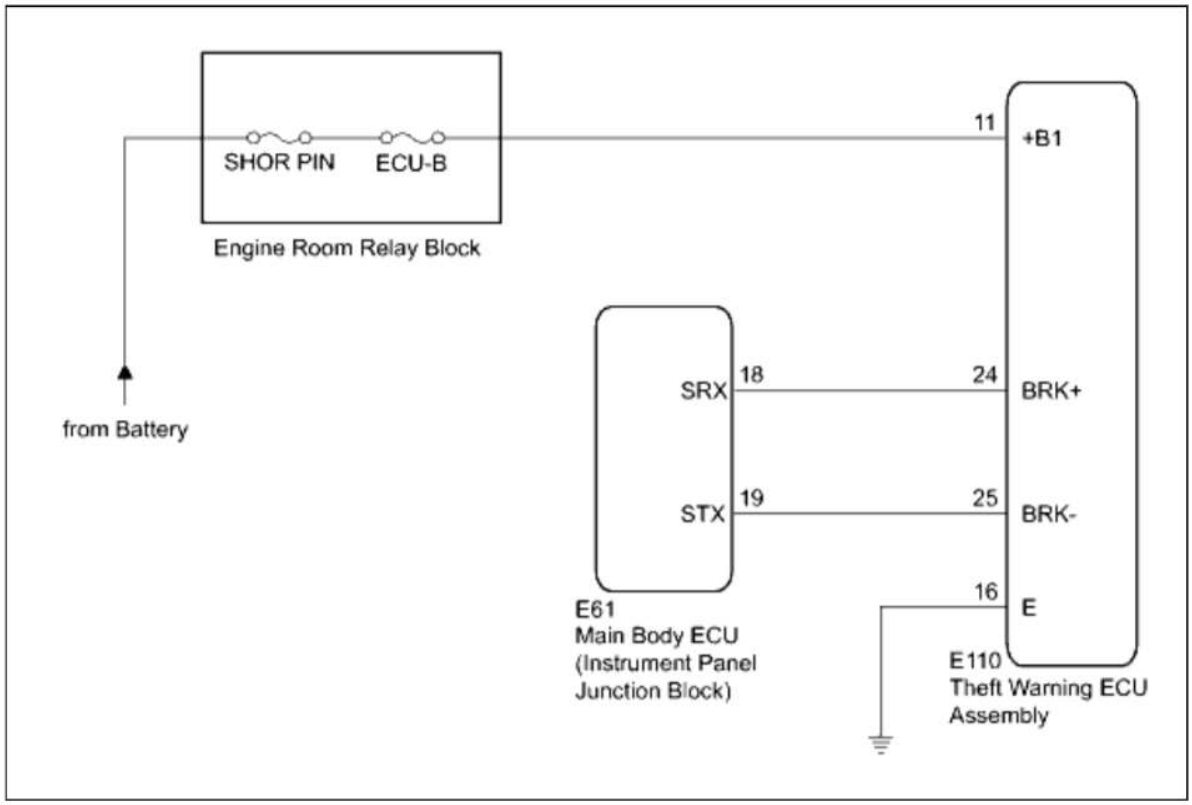
DTC	**B1269**	**Theft Deterrent ECU Communication Stop**

DESCRIPTION

DTC B1269 is stored when the communication between the theft warning ECU assembly and the main body ECU stops for more than 10 seconds.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B1269	No communication from theft warning ECU assembly for more than 10 seconds.	• Wire harness and connector • Theft warning ECU assembly • Main body ECU (instrument panel junction block)

WIRING DIAGRAM



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INSPECTION PROCEDURE

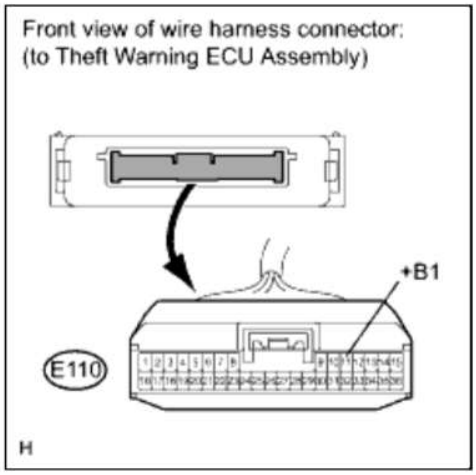
NOTICE:

Inspect the fuses for circuits related to this system before performing the following inspection procedure.

PROCEDURE

1.	**CHECK HARNESS AND CONNECTOR (BATTERY VOLTAGE)**

(a) Disconnect the E110 theft warning ECU assembly connector.



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

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E110-11 (+B1) - Body ground	Always	11 to 14 V

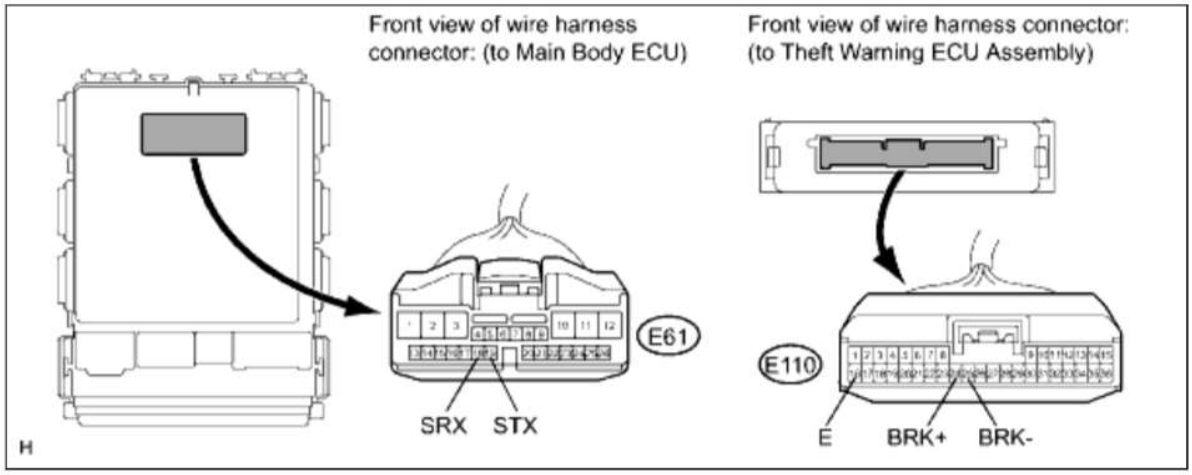
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

2.	**CHECK HARNESS AND CONNECTOR (THEFT WARNING ECU ASSEMBLY - MAIN BODY ECU)**

(a) Disconnect the E61 main body ECU connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E110-24 (BRK+) - E61-18 (SRX)	Always	Below 1 Ω
E110-25 (BRK-) - E61-19 (STX)	Always	Below 1 Ω
E110-24 (BRK+) - Body ground	Always	10 kΩ or higher
E110-25 (BRK-) - Body ground	Always	10 kΩ or higher
E110-16 (E) - Body ground	Always	Below 1 Ω

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

OK ▼

3.	**CONFIRM DTC**

(a) Clear the DTC INFO.

(b) Check if the same DTC is detected.

HINT:

Reinstall the sensors, connectors, etc. and restore the previous vehicle conditions before rechecking for DTCs.

Result:

RESULT	PROCEED TO

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RESULT	PROCEED TO
DTC is output	A
DTC is not output	B

B ▶ **USE SIMULATION METHOD TO CHECK**

A

▼

4.	**REPLACE THEFT WARNING ECU ASSEMBLY**

(a) Replace the theft warning ECU assembly INFO

NEXT

▼

5.	**CONFIRM DTC**

(a) Clear the DTC INFO .

(b) Check if the same DTC is detected.

HINT:

Reinstall the sensors, connectors, etc. and restore the previous vehicle conditions before rechecking for DTCs.

Result:

RESULT	PROCEED TO
DTC is not output	A
DTC is output	B

B ▶ **REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY)**

A ▶ **END**

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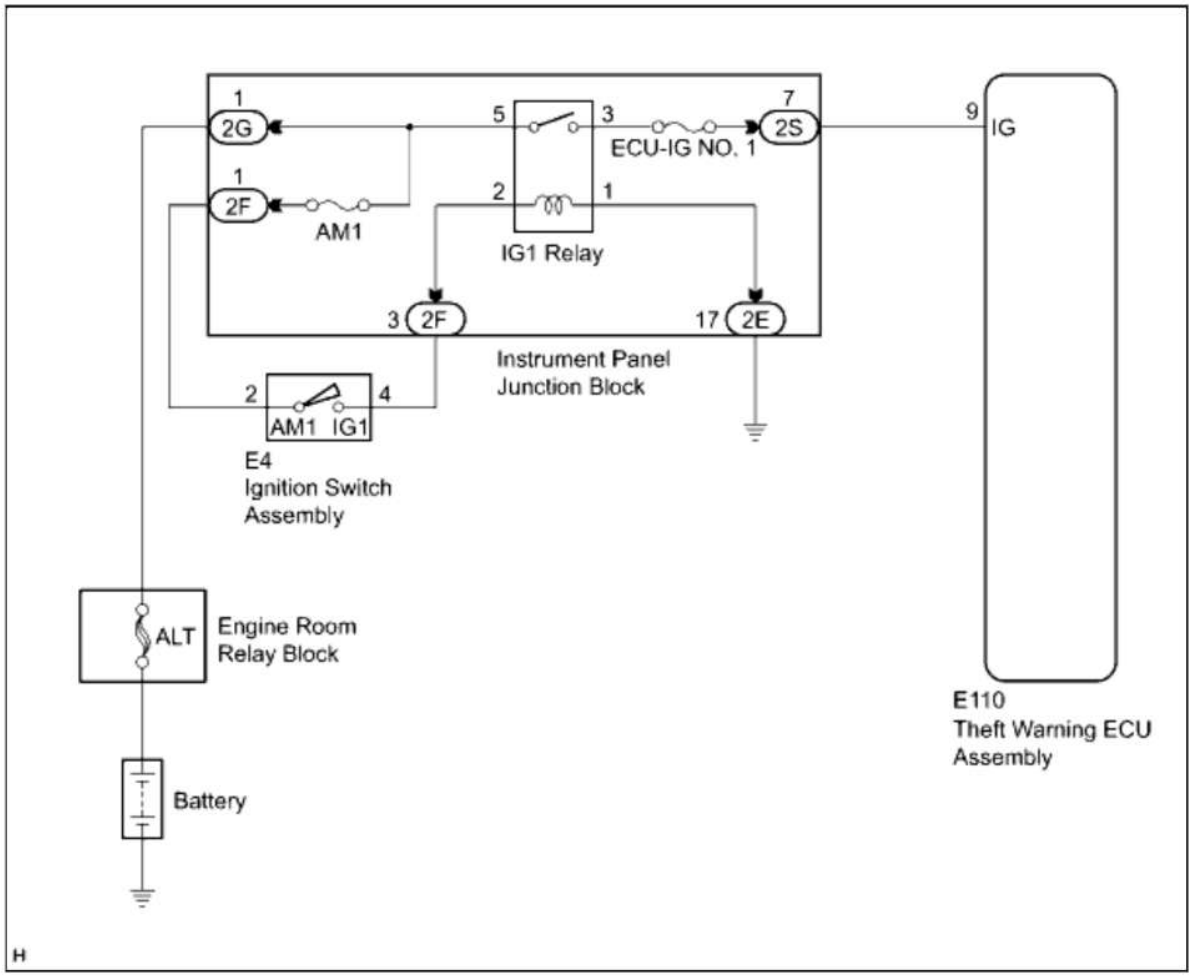
Last Modified: 3-10-2010	6.4 J	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000028IX00XX
Title: THEFT DETERRENT / KEYLESS ENTRY: THEFT DETERRENT SYSTEM: Ignition Switch Circuit (2010 Corolla)		

Ignition Switch Circuit

DESCRIPTION

The theft warning ECU assembly determines the ignition switch assembly (off, ON) based on signals from the IG circuit.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

Inspect the fuses for circuits related to this system before performing the following inspection procedure.

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PROCEDURE

1.	**READ VALUE USING TECHSTREAM**

(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Turn the Techstream on.

(d) Select the items below in the Data List and read the display on the Techstream.

Security

ITEM	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
IG SW	Ignition switch ON signal ON/OFF	ON: Ignition switch is ON OFF: Ignition switch is off	-

OK:
When the ignition switch assembly is operated, the display changes as shown in the table.

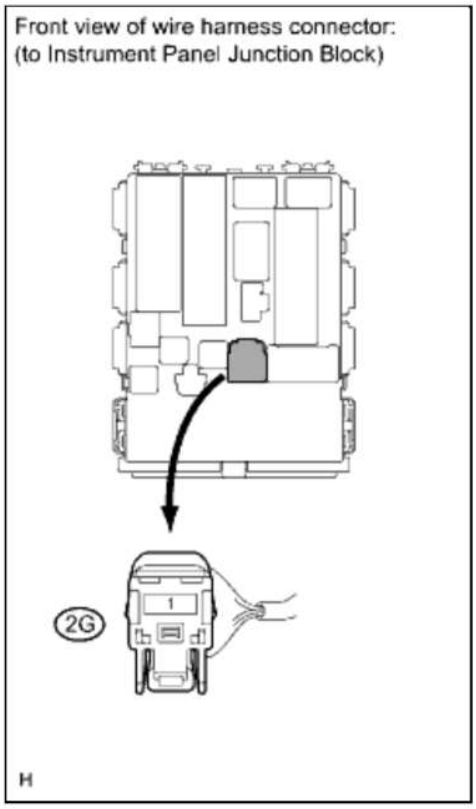
NG ▶ **CHECK HARNESS AND CONNECTOR (BATTERY - INSTRUMENT PANEL JUNCTION BLOCK)**

OK ▶ **PROCEED TO NEXT SUSPECTED AREA SHOWN IN PROBLEM SYMPTOMS TABLE**

2.	**CHECK HARNESS AND CONNECTOR (BATTERY - INSTRUMENT PANEL JUNCTION BLOCK)**

(a) Disconnect the 2G instrument panel junction block connector.

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

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
2G-1 - Body ground	Always	11 to 14 V

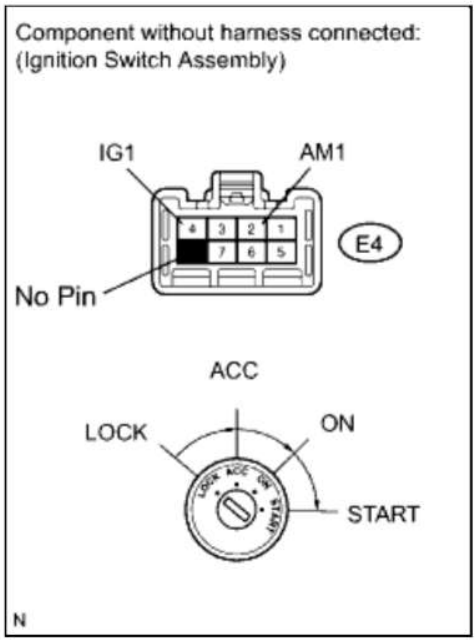
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR OR ALT FUSE**

OK ▼

3.	**INSPECT IGNITION SWITCH ASSEMBLY**

(a) Disconnect the E4 ignition switch assembly connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E4-2 (AM1) - E4-4 (IG1)	Ignition switch ON	Below 1 Ω
E4-2 (AM1) - E4-4 (IG1)	Ignition switch off	10 kΩ or higher

Result:

RESULT	PROCEED TO
OK	A
NG (2AZ-FE)	B
NG (2ZR-FE)	C

C ▶ **REPLACE IGNITION SWITCH ASSEMBLY (2ZR-FE)**

B ▶ **REPLACE IGNITION SWITCH ASSEMBLY (2AZ-FE)**

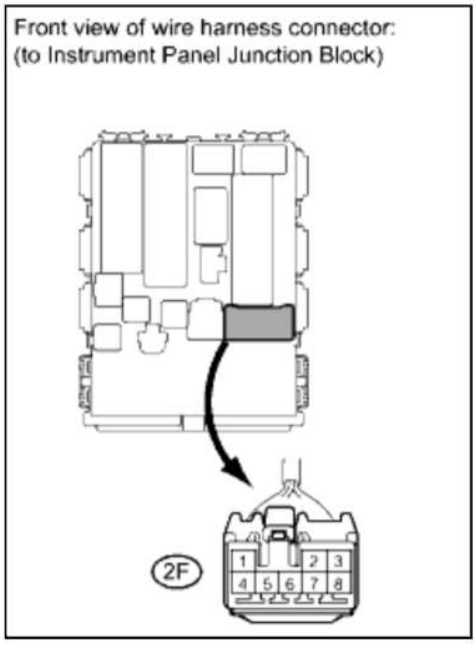
A ▼

4.	**CHECK HARNESS AND CONNECTOR (INSTRUMENT PANEL J/B - INSTRUMENT PANEL**

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	J/B)

(a) Reconnect the E4 ignition switch assembly connector.



(b) Disconnect the 2F instrument panel junction block connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
2F-1 - 2F-3	Ignition switch ON	Below 1 Ω
2F-1 - 2F-3	Ignition switch off	10 kΩ or higher

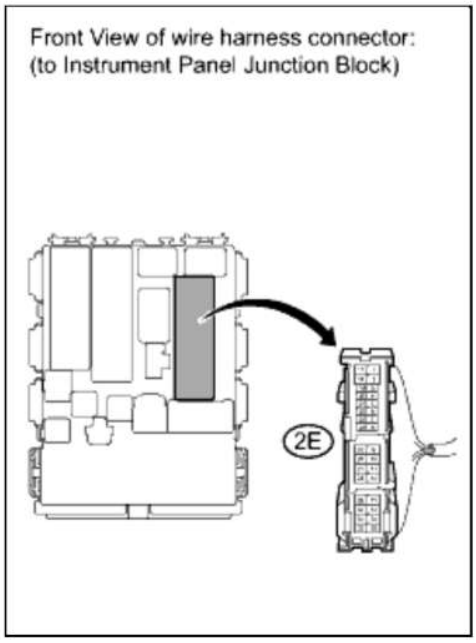
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

5.	**CHECK HARNESS AND CONNECTOR (INSTRUMENT PANEL JUNCTION BLOCK - BODY GROUND)**

(a) Disconnect the 2E instrument panel junction block connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
2E-17 - Body ground	Always	Below 1 Ω

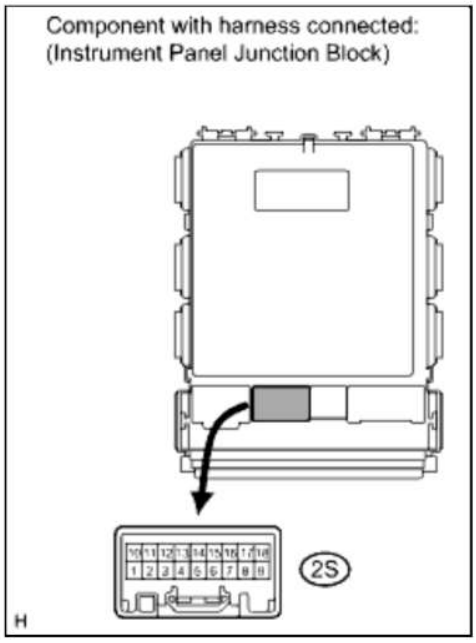
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

6.	**INSPECT MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK (IG SIGNAL))**

(a) Reconnect the 2G, 2F and 2E instrument panel junction block connectors.

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

Standard Voltage:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
2S-7 - Body ground	Ignition switch ON	11 to 14 V

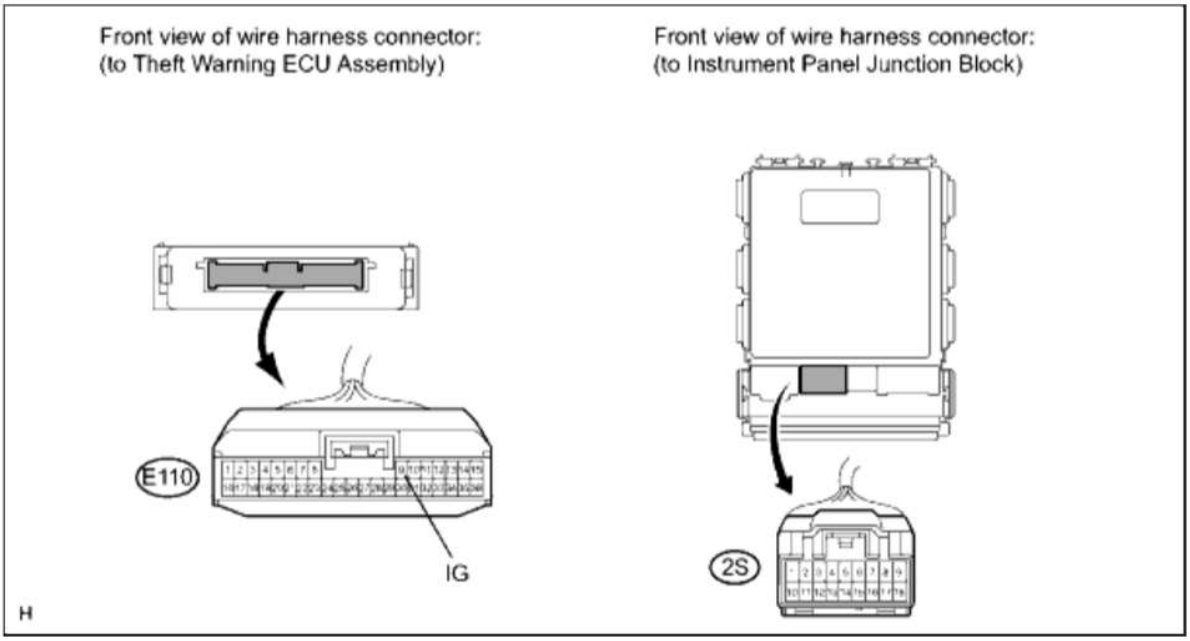
NG ▶ **REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)**

OK ▼

7.	**CHECK HARNESS AND CONNECTOR (THEFT WARNING ECU ASSEMBLY - INSTRUMENT PANEL JUNCTION BLOCK)**

(a) Disconnect the E110 theft warning ECU assembly and 2S instrument panel junction block connectors.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E110-9 (IG) - 2S-7	Always	Below 1 Ω
E110-9 (IG) - Body ground	Always	10 kΩ or higher

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

OK ▶ **REPLACE THEFT WARNING ECU ASSEMBLY**

TOYOTA

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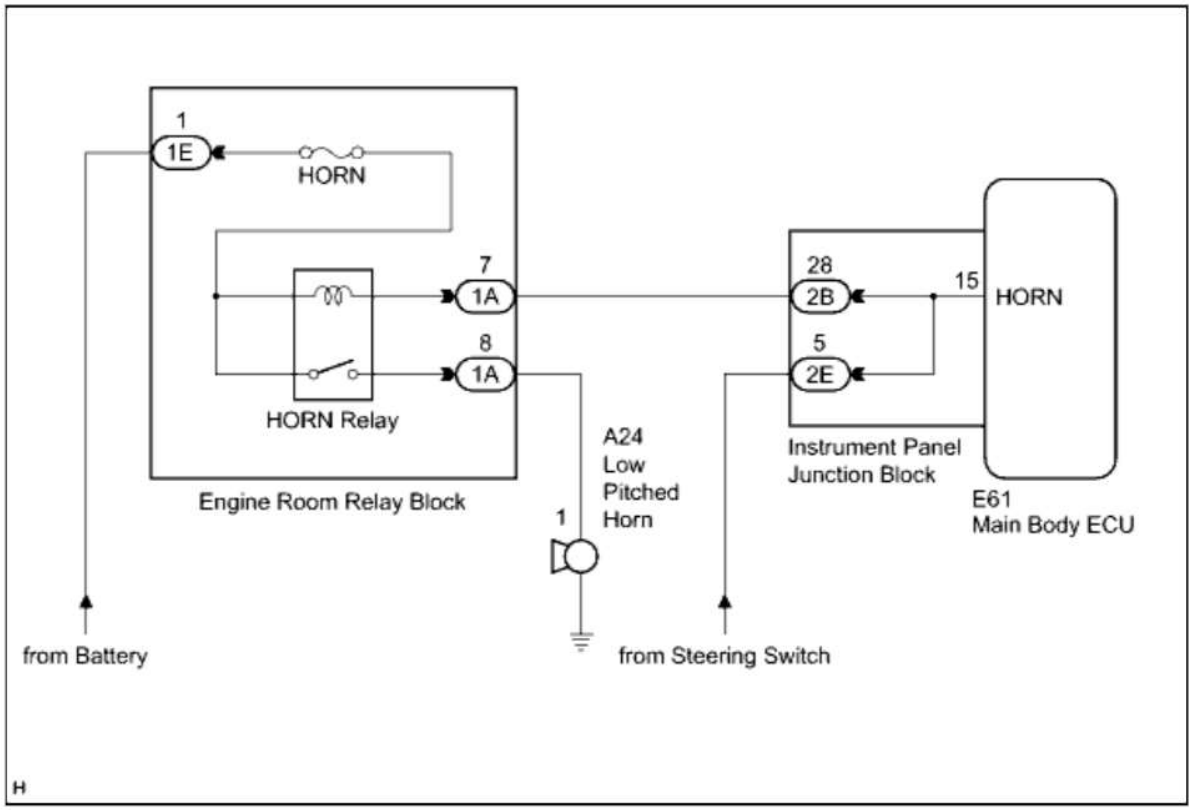
Last Modified: 3-10-2010	6.4 J	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001PR402HX
Title: THEFT DETERRENT / KEYLESS ENTRY: THEFT DETERRENT SYSTEM: Horn Circuit (2010 Corolla)		

Horn Circuit

DESCRIPTION

When the theft deterrent system is switched from the armed state to the alarm sounding state, the main body ECU transmits a signal to cause the horn to sound at intervals of 0.4 seconds.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

Inspect the fuses for circuits related to this system before performing the following inspection procedure.

PROCEDURE

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1.	INSPECT HORN

(a) Press the horn switch and check if the horn sound.

Result:

RESULT	PROCEED TO
Horn sounds	A
Horn does not sound	B

B ▶ GO TO HORN SYSTEM

A ▼

2.	PERFORM ACTIVE TEST USING TECHSTREAM

(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Turn the Techstream on.

(d) Select the item below in the Active Test and then check that the horn operate.

Main Body

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Vehicle Horn	Vehicle horn	ON / OFF	-

OK:

The vehicle horn sounds or stops correctly when operating them through the Techstream.

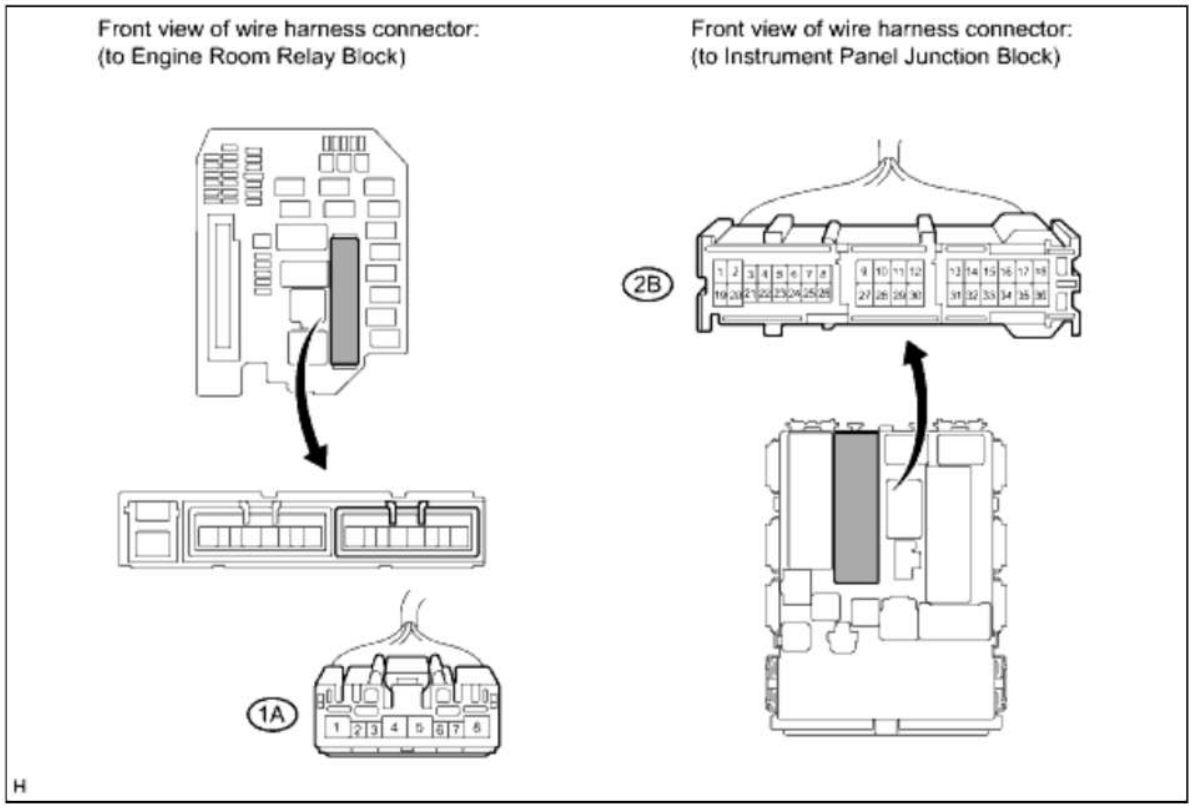
NG ▶ CHECK HARNESS AND CONNECTOR (INSTRUMENT PANEL JUNCTION BLOCK - ENGINE ROOM RELAY BLOCK)

OK ▶ REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)

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3.	**CHECK HARNESS AND CONNECTOR (INSTRUMENT PANEL JUNCTION BLOCK - ENGINE ROOM RELAY BLOCK)**

(a) Disconnect the 2B instrument panel junction block and 1A engine room relay block connectors.



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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
2B-28 - 1A-7	Always	Below 1 Ω
2B-28 - Body ground	Always	10 kΩ or higher

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

OK ▶ **REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)**

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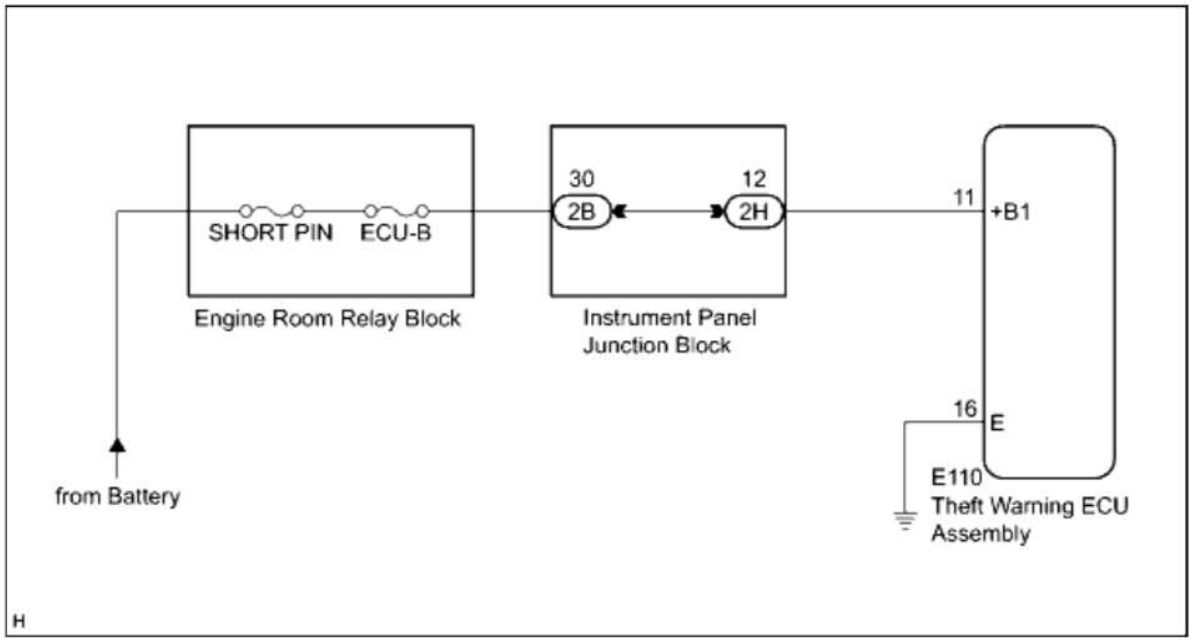
Last Modified: 3-10-2010	6.4 J	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000010J6023X
Title: THEFT DETERRENT / KEYLESS ENTRY: THEFT DETERRENT SYSTEM: Theft Warning ECU Power Source Circuit (2010 Corolla)		

Theft Warning ECU Power Source Circuit

DESCRIPTION

This circuit provides power for theft warning ECU assembly operation.

WIRING DIAGRAM



INSPECTION PROCEDURE

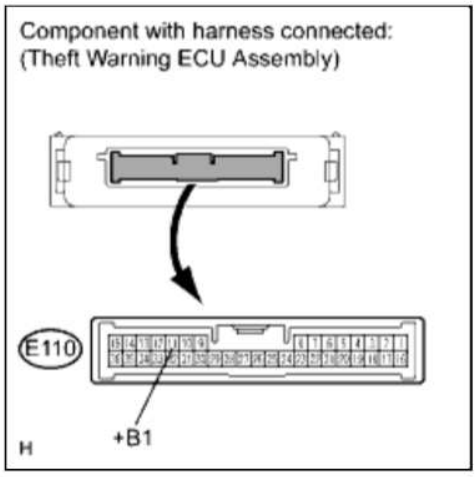
PROCEDURE

1.	**CHECK THEFT WARNING ECU ASSEMBLY**

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

Standard Voltage:

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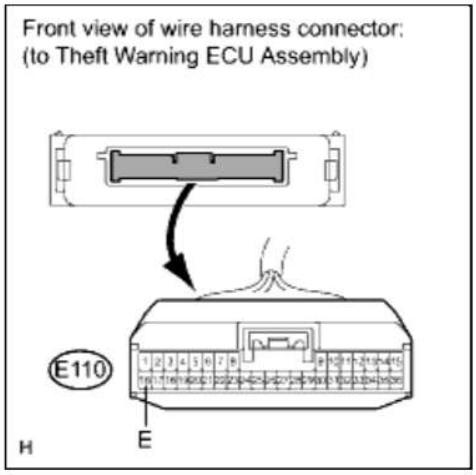


TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E110-11 (+B1) - Body ground	Always	11 to 14 V

NG ▶ **CHECK HARNESS AND CONNECTOR (THEFT WARNING ECU ASSEMBLY - BODY GROUND)**

OK ▶ **PROCEED TO NEXT SUSPECTED AREA SHOWN IN PROBLEM SYMPTOMS TABLE**

2.	**CHECK HARNESS AND CONNECTOR (THEFT WARNING ECU ASSEMBLY - BODY GROUND)**



(a) Disconnect the E110 theft warning ECU assembly connector.

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

Standard Resistance:

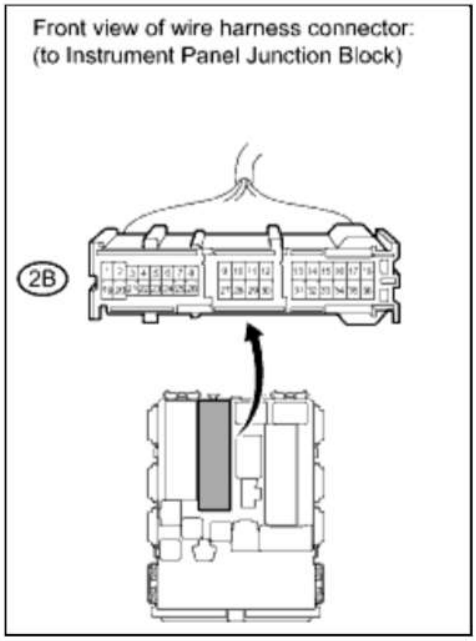
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E110-16 (E) - Body ground	Always	Below 1 Ω

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

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OK

3.	**CHECK HARNESS AND CONNECTOR (BATTERY - INSTRUMENT PANEL JUNCTION BLOCK)**



(a) Disconnect the 2B instrument panel junction block connector.

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

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
2B-30 - Body ground	Always	11 to 14 V

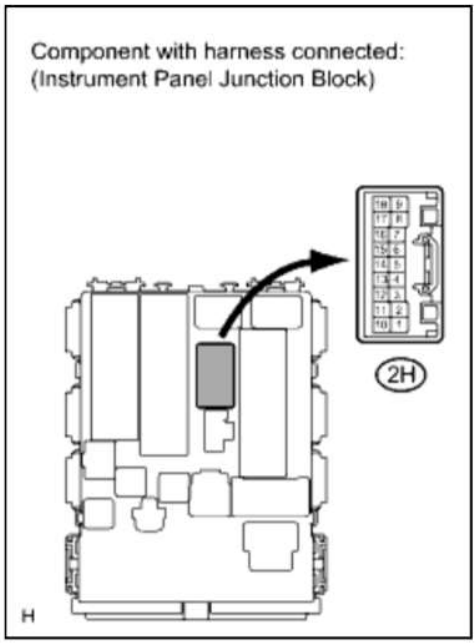
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR OR SHORT PIN OR ECU-B**

OK

4.	**CHECK INSTRUMENT PANEL JUNCTION BLOCK (POWER SOURCE)**

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(a) Reconnect the 2B instrument panel junction block connector.



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

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
2H-12 - Body ground	Always	11 to 14 V

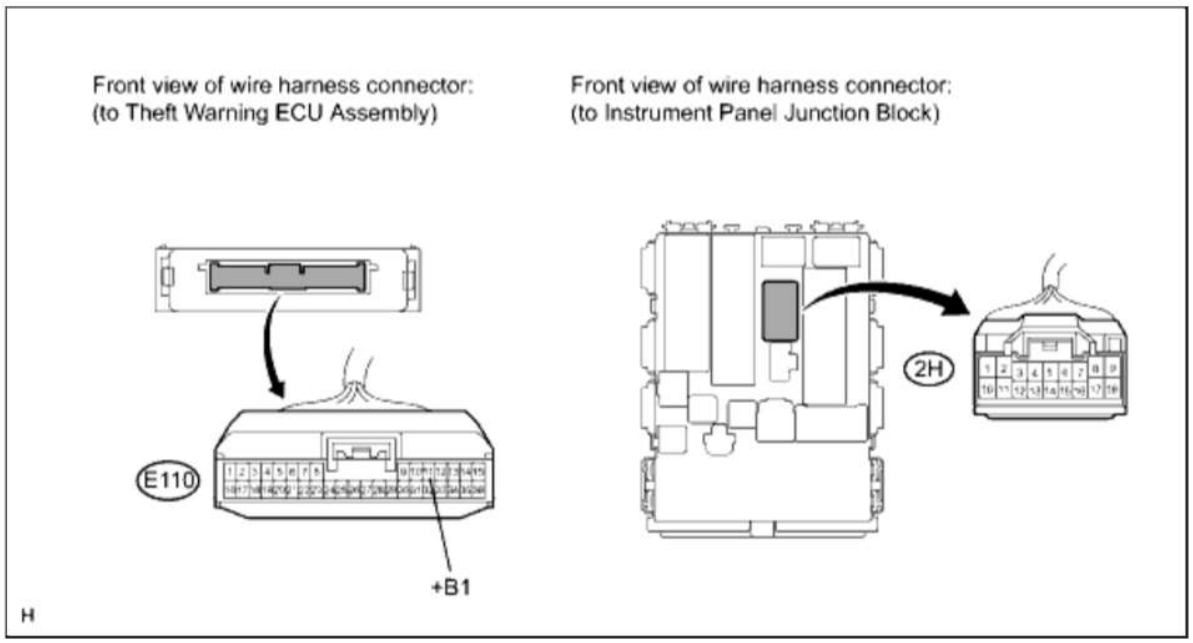
NG ▶ **REPLACE MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)**

OK ▼

5.	**CHECK HARNESS AND CONNECTOR (INSTRUMENT PANEL JUNCTION BLOCK - THEFT WARNING ECU ASSEMBLY)**

(a) Disconnect the 2H instrument panel junction block and E110 theft warning ECU assembly connectors.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
2H-12 - E110-11 (+B1)	Always	Below 1 Ω
2H-12 - Body ground	Always	10 kΩ or higher

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

OK ▶ **REPLACE THEFT WARNING ECU ASSEMBLY**

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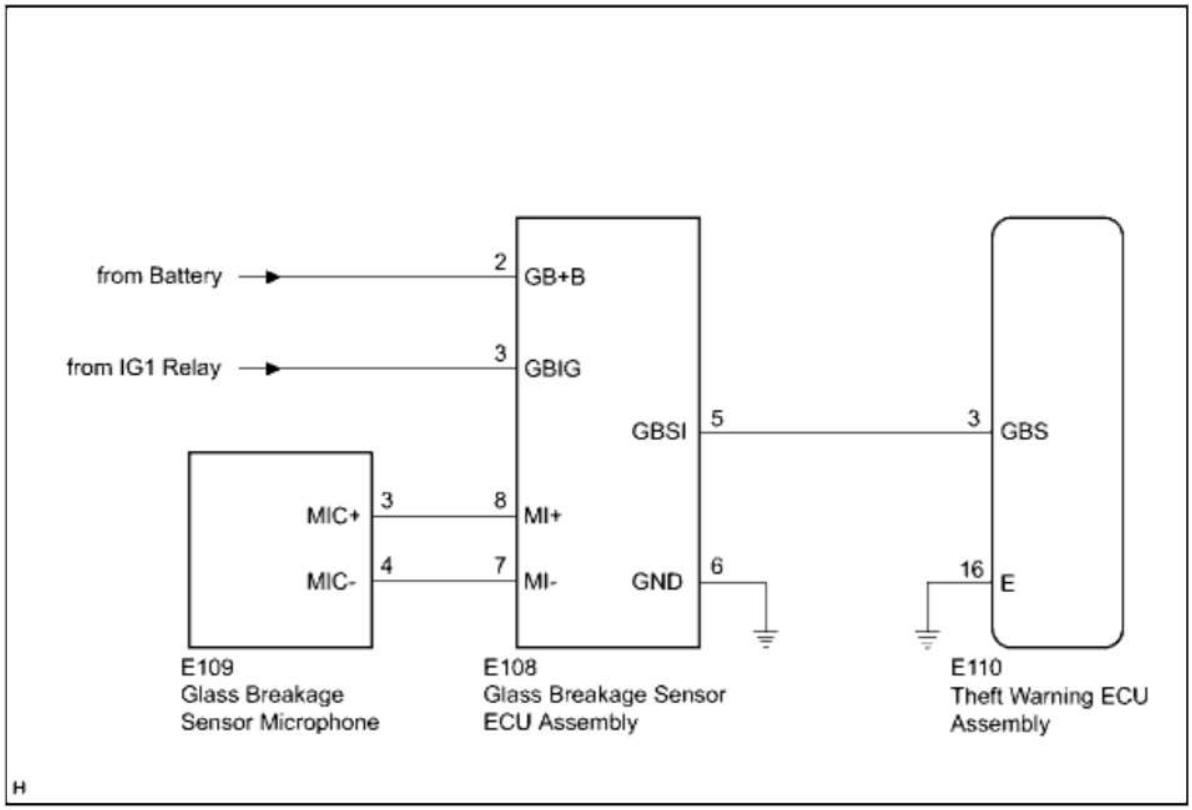
Last Modified: 3-10-2010	6.4 J	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM00000215L00DX
Title: THEFT DETERRENT / KEYLESS ENTRY: THEFT DETERRENT SYSTEM: Glass Breakage Sensor Circuit (2010 Corolla)		

Glass Breakage Sensor Circuit

DESCRIPTION

When the glass breakage sensor detects that any door glass is tapped or broken, the sensor will set off an alarm for 57 seconds.

WIRING DIAGRAM



INSPECTION PROCEDURE

PROCEDURE

1.	**READ VALUE USING TECHSTREAM**

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(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Turn the Techstream on.

(d) Select the item below in the Data List and then check that the indicator operates.

Security

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Glass break sensor detection	Glass breakage sensor detection / ON or OFF	ON: Glass breakage sensor operates OFF: Glass breakage sensor does not operate	-

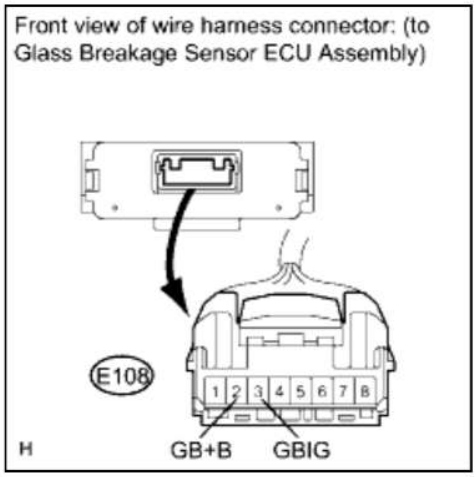
OK:

When tapping on the glass breakage sensor microphone with your finger, "ON" is displayed on the Techstream screen.

NG ▶ **CHECK HARNESS AND CONNECTOR (GLASS BREAKAGE SENSOR ECU ASSEMBLY - POWER SOURCE)**

OK ▶ **PROCEED TO NEXT SUSPECTED AREA SHOWN IN PROBLEM SYMPTOMS TABLE**

2.	**CHECK HARNESS AND CONNECTOR (GLASS BREAKAGE SENSOR ECU ASSEMBLY - POWER SOURCE)**



(a) Disconnect the E108 glass breakage sensor ECU assembly connector.

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

Standard Voltage:

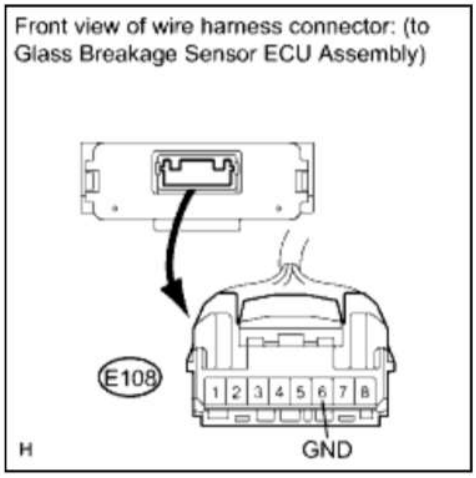
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TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E108-2 (GB+B) - Body ground	Always	11 to 14 V
E108-3 (GBIG) - Body ground	Ignition switch ON	11 to 14 V
E108-3 (GBIG) - Body ground	Ignition switch off	Below 1 V

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

OK ▼

3.	**CHECK HARNESS AND CONNECTOR (GLASS BREAKAGE SENSOR ECU ASSEMBLY - BODY GROUND)**



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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E108-6 (GND) - Body ground	Always	Below 1 Ω

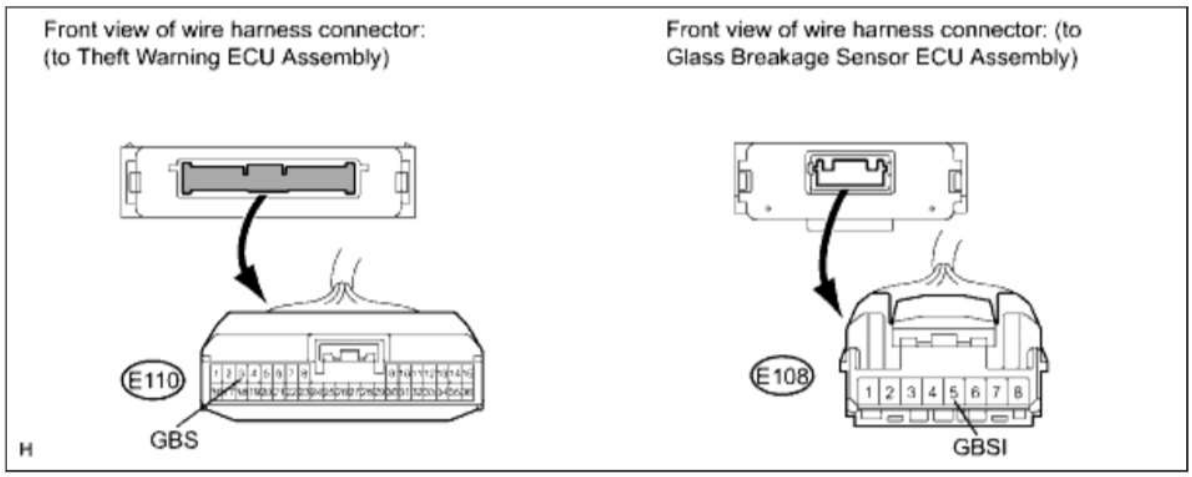
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

4.	**CHECK HARNESS AND CONNECTOR (THEFT WARNING ECU ASSEMBLY - GLASS BREAKAGE SENSOR ECU)**

(a) Disconnect the E110 theft warning ECU assembly connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E110-3 (GBS) - E108-5 (GBSI)	Always	Below 1 Ω
E110-3 (GBS) - Body ground	Always	10 kΩ or higher

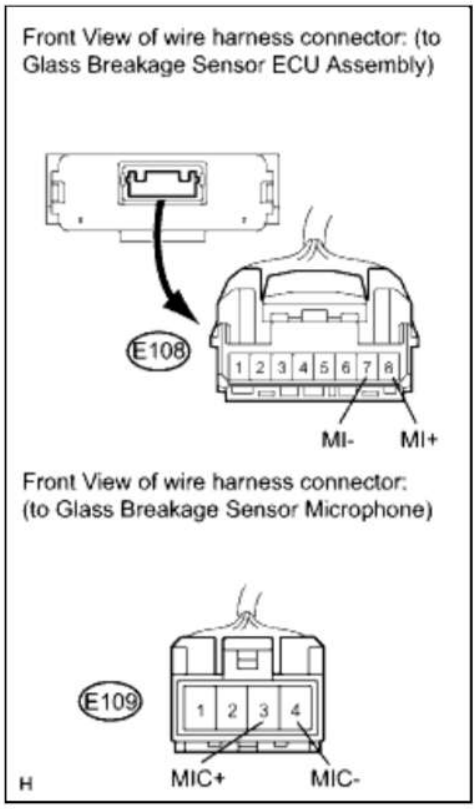
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

5.	**CHECK HARNESS AND CONNECTOR (GLASS BREAKAGE SENSOR ECU - GLASS BREAKAGE SENSOR MICROPHONE)**

(a) Disconnect the E109 glass breakage sensor microphone connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E108-7 (MI-) - E109-4 (MIC-)	Always	Below 1 Ω
E108-8 (MI+) - E109-3 (MIC+)	Always	Below 1 Ω
E108-7 (MI+) - Body ground	Always	10 kΩ or higher
E108-8 (MI-) - Body ground	Always	10 kΩ or higher

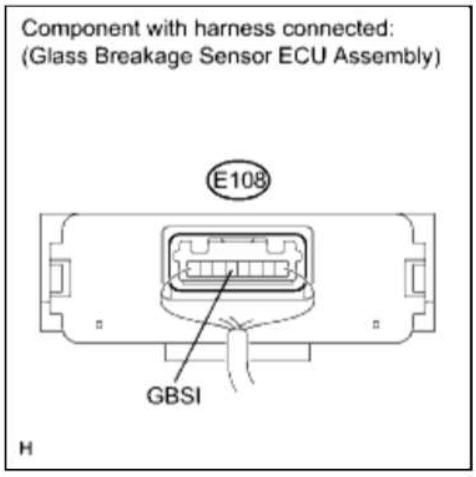
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

6.	**INSPECT GLASS BREAKAGE SENSOR ECU ASSEMBLY (MICROPHONE OUTPUT)**

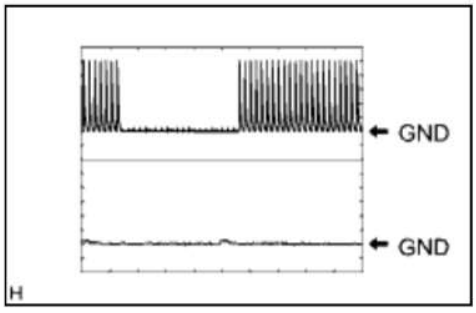
(a) Reconnect the E108 glass breakage sensor ECU assembly, E109 glass breakage sensor microphone and E110 theft warning ECU assembly connectors.

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(b) Connect an oscilloscope to terminal 5 (GBSI) of the glass breakage sensor ECU assembly and body ground.

(c) Turn the ignition switch to ON.



(d) Check the signal waveform according to the condition(s) in the table below.

ITEM	CONDITION
Tool setting	1 V/DIV, 50 ms/DIV
Vehicle condition	Tap the glass breakage sensor microphone with a hard object such as your fingernail.

OK:
Waveform is as shown in the illustration.

NG ▶ **REPLACE GLASS BREAKAGE SENSOR MICROPHONE**

OK ▶ **REPLACE GLASS BREAKAGE SENSOR ECU ASSEMBLY**

7.	REPLACE GLASS BREAKAGE SENSOR MICROPHONE

(a) Replace glass breakage sensor microphone INFO.

NEXT

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8.	CHECK GLASS BREAKAGE SENSOR

(a) Check the glass breakage sensor operation INFO .

(b) Connect the Techstream to the DLC3.

(c) Turn the ignition switch to ON.

(d) Turn the Techstream on.

(e) Select the item below in the Data List and then check that the indicator operates.

Security

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Glass break sensor detection	Glass breakage sensor detection / ON or OFF	ON: Glass breakage sensor operates OFF: Glass breakage sensor does not operates	-

OK:
When tapping on the glass breakage sensor microphone with your finger, "ON" is displayed on the Techstream screen.
Result:

RESULT	PROCEED TO
Glass breakage sensor operates	OK
Glass breakage sensor does not operate	NG

NG ▶ **REPLACE GLASS BREAKAGE SENSOR ECU ASSEMBLY**

OK ▶ **END**

9.	REPLACE GLASS BREAKAGE SENSOR ECU ASSEMBLY

(a) Replace glass breakage sensor ECU assembly INFO .

NEXT

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10.	CHECK GLASS BREAKAGE SENSOR

(a) Check the glass breakage sensor operation INFO .

(b) Connect the Techstream to the DLC3.

(c) Turn the ignition switch to ON.

(d) Turn the Techstream on.

(e) Select the item below in the Data List and then check that the indicator operates.

Security

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Glass break sensor detection	Glass breakage sensor detection / ON or OFF	ON: Glass breakage sensor operates OFF: Glass breakage sensor does not operates	-

OK:
When tapping on the glass breakage sensor microphone with your finger, "ON" is displayed on the Techstream screen.
Result:

RESULT	PROCEED TO
Glass breakage sensor operates	OK
Glass breakage sensor does not operate	NG

NG ▶ **REPLACE THEFT WARNING ECU ASSEMBLY**

OK ▶ **END**

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Last Modified: 3-10-2010	6.4 J	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001PR501XX
Title: THEFT DETERRENT / KEYLESS ENTRY: THEFT DETERRENT SYSTEM: Security Indicator Light Circuit (2010 Corolla)		

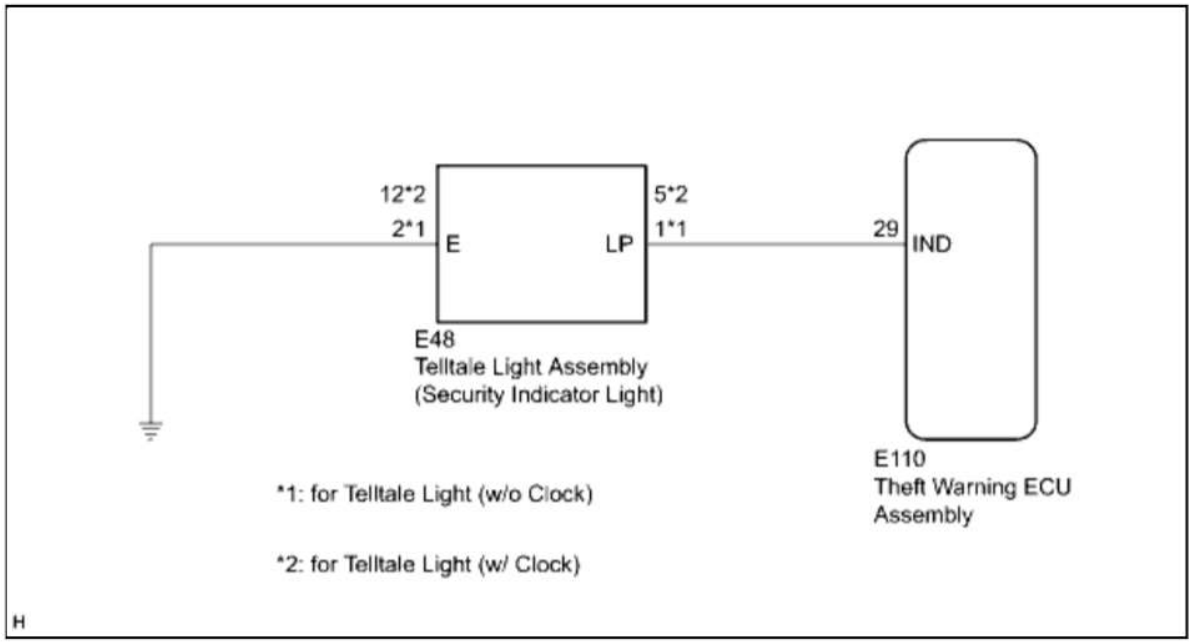
Security Indicator Light Circuit

DESCRIPTION

Even when the theft deterrent system is in the disarmed state, the telltale light assembly (security indicator light) blinks due to a signal output from the immobiliser system. The telltale light assembly (security indicator light) blinks continuously due to a continuous signal received from the immobiliser system while in the armed state.

The theft warning ECU assembly causes the telltale light assembly (security indicator light) to come on only during the arming preparation and alarm sounding states.

WIRING DIAGRAM



INSPECTION PROCEDURE

PROCEDURE

1.	**PERFORM ACTIVE TEST USING TECHSTREAM**

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(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Turn the Techstream on.

(d) Select the item below in the Active Test and then check that the indicator operates.

Security

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Security Indicator	Security indicator	ON / OFF	-

OK:

The security indicator light flashes or goes off correctly when operating it through the Techstream.

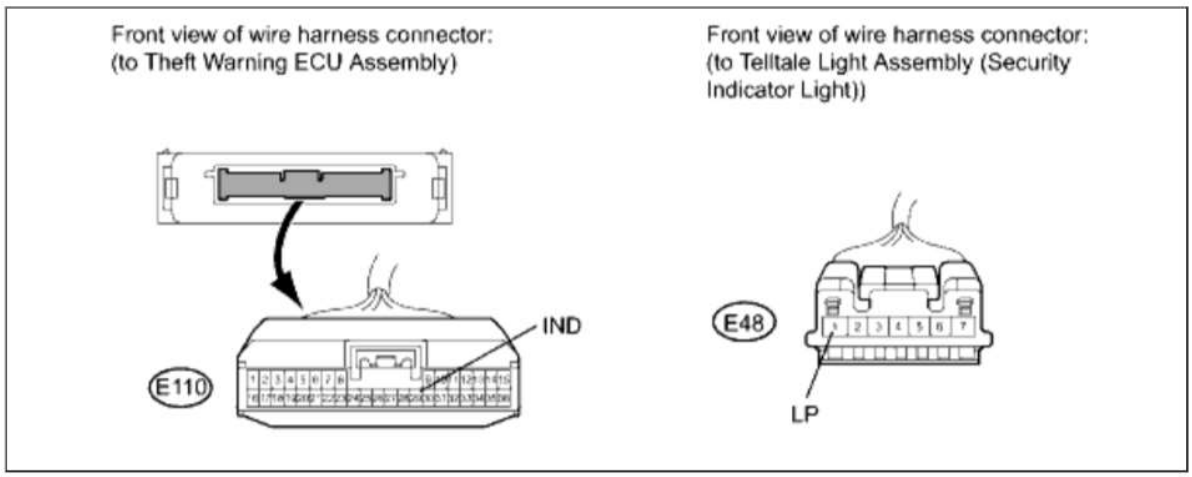
NG ▶ **CHECK HARNESS AND CONNECTOR (THEFT DETERRENT ECU ASSEMBLY - TELLTALE LIGHT ASSEMBLY)**

OK ▶ **PROCEED TO NEXT SUSPECTED AREA SHOWN IN PROBLEM SYMPTOMS TABLE**

2.	**CHECK HARNESS AND CONNECTOR (THEFT DETERRENT ECU ASSEMBLY - TELLTALE LIGHT ASSEMBLY)**

(a) Disconnect the E110 theft warning ECU assembly and E48 telltale light assembly (security indicator light) connectors.

(b) for Telltale Light (w/o Clock):



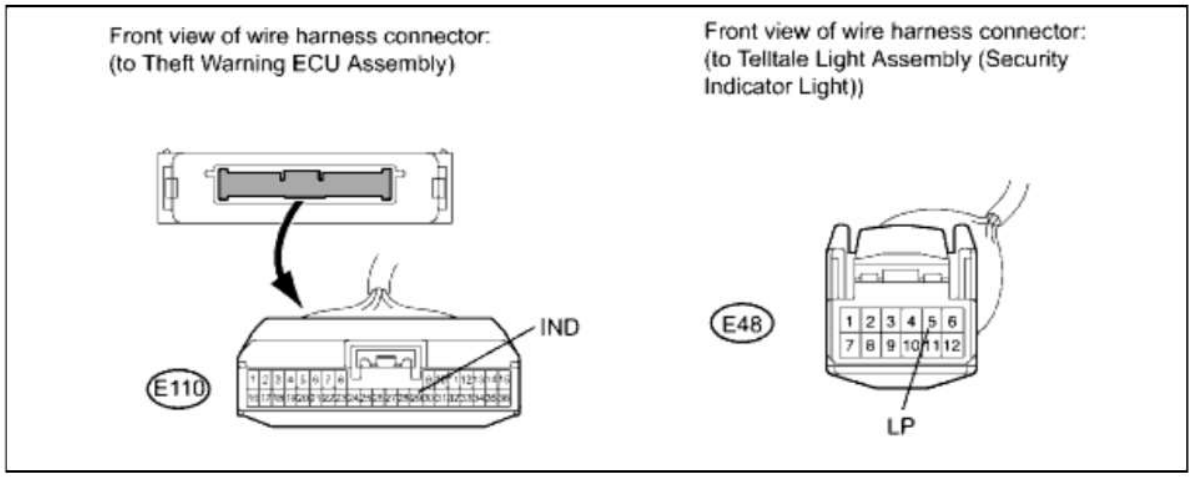
(1) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

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TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E110-29 (IND) - E48-1 (LP)	Always	Below 1 Ω
E110-29 (IND) - Body ground	Always	10 kΩ or higher

(c) for Telltale Light (w/ Clock):



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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E110-29 (IND) - E48-5 (LP)	Always	Below 1 Ω
E110-29 (IND) - Body ground	Always	10 kΩ or higher

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

OK ▼

3.	CHECK HARNESS AND CONNECTOR (TELLTALE LIGHT ASSEMBLY - BODY GROUND)

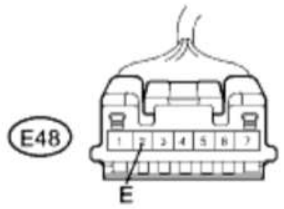
(a) for Telltale Light (w/o Clock):

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

Standard Resistance:

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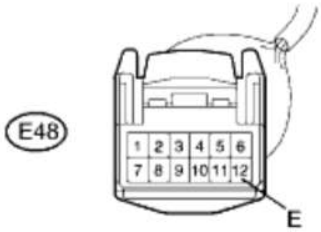
Front view of wire harness connector:
(to Telltale Light Assembly (Security Indicator Light))



TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E48-2 (E) - Body ground	Always	Below 1 Ω

(b) for Telltale Light (w/ Clock):

Front view of wire harness connector:
(to Telltale Light Assembly (Security Indicator Light))



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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E48-12 (E) - Body ground	Always	Below 1 Ω

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

OK ▶ **REPLACE TELLTALE LIGHT ASSEMBLY (SECURITY INDICATOR LIGHT)**

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Last Modified: 3-10-2010	6.4 J	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001575016X
Title: THEFT DETERRENT / KEYLESS ENTRY: THEFT DETERRENT SYSTEM: Unlock Warning Switch Circuit (2010 Corolla)		

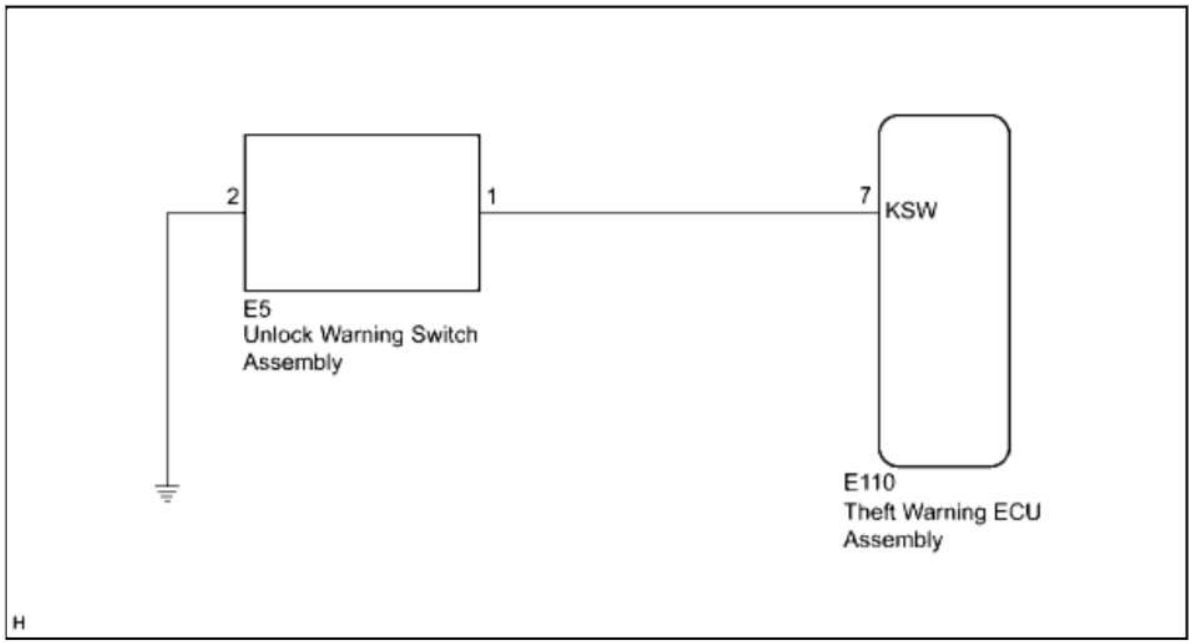
Unlock Warning Switch Circuit

DESCRIPTION

The key unlock warning switch assembly turns on when the ignition key is inserted into the ignition key cylinder and turns off when the ignition key is removed.

The theft warning ECU assembly operates the key confinement prevention function while the key unlock warning switch assembly is on.

WIRING DIAGRAM



INSPECTION PROCEDURE

PROCEDURE

1.	**READ VALUE USING TECHSTREAM (UNLOCK WARNING SWITCH ASSEMBLY)**

(a) Connect the Techstream to the DLC3.

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(b) Turn the ignition switch to ON.

(c) Turn the Techstream on.

(d) Select the item below in the Data List and then read the display on the Techstream.

Security

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Key unlock warning switch	Unlock warning switch signal / ON or OFF	ON: Key is inserted into ignition key cylinder OFF: Key is removed from ignition key cylinder	-

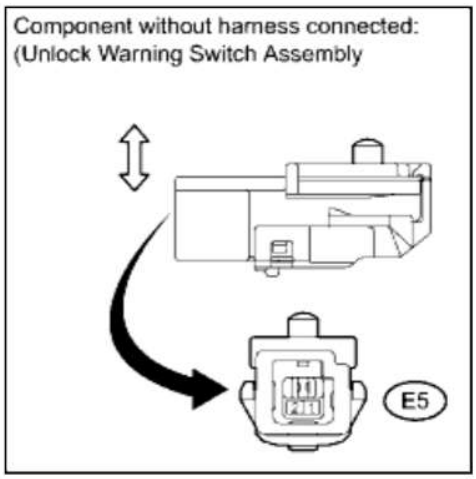
OK:

When the key is in the ignition key cylinder, "ON" appears on the screen.

NG ▶ **INSPECT UNLOCK WARNING SWITCH ASSEMBLY**

OK ▶ **PROCEED TO NEXT SUSPECTED AREA SHOWN IN PROBLEM SYMPTOMS TABLE**

2.	**INSPECT UNLOCK WARNING SWITCH ASSEMBLY**



(a) Remove the unlock warning switch assembly INFO.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E5-1 - E5-2	Free (Key removed)	10 kΩ or higher

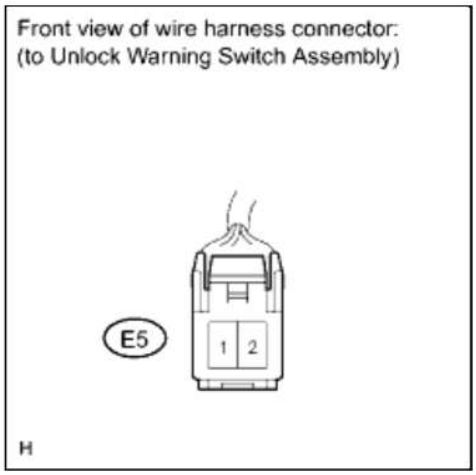
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TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E5-1 - E5-2	Pushed (Key set)	Below 1 Ω

NG ▶ **REPLACE UNLOCK WARNING SWITCH ASSEMBLY**

OK ▼

3.	**CHECK HARNESS AND CONNECTOR (UNLOCK WARNING SWITCH ASSEMBLY - BODY GROUND)**



(a) Disconnect the E5 unlock warning switch assembly connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E5-2 - Body ground	Always	Below 1 Ω

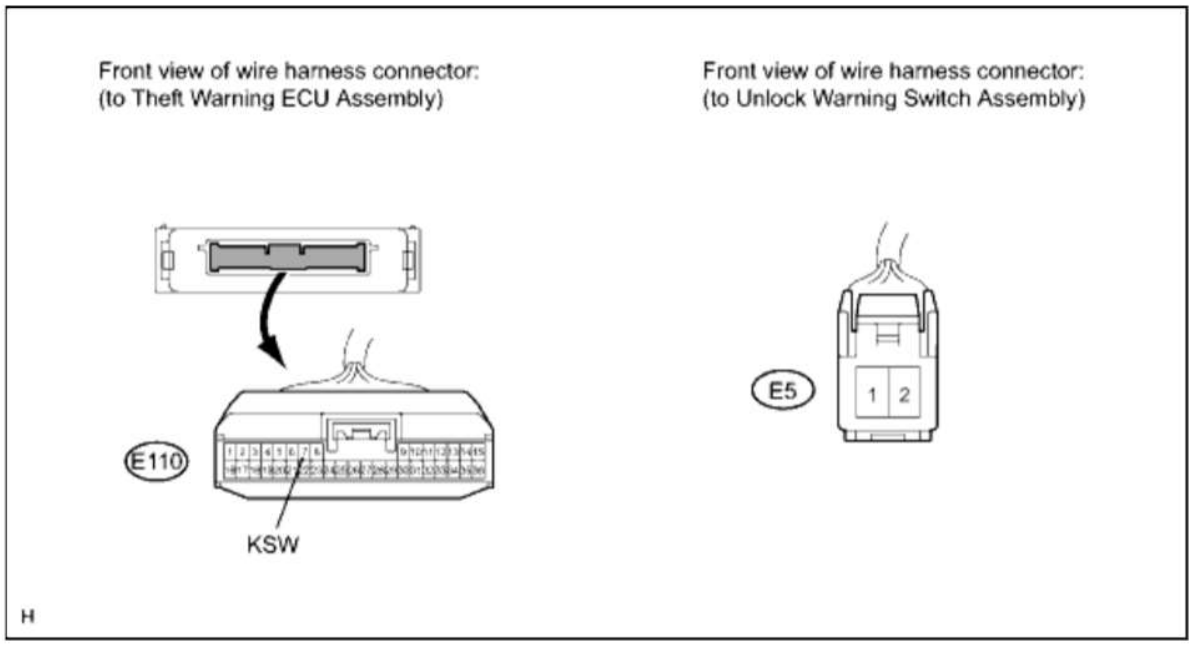
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

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4.	**CHECK HARNESS AND CONNECTOR (UNLOCK WARNING SWITCH ASSEMBLY - THEFT WARNING ECU ASSEMBLY)**

(a) Disconnect the E110 theft warning ECU assembly connector.



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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E5-1 - E110-7 (KSW)	Always	Below 1 Ω

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

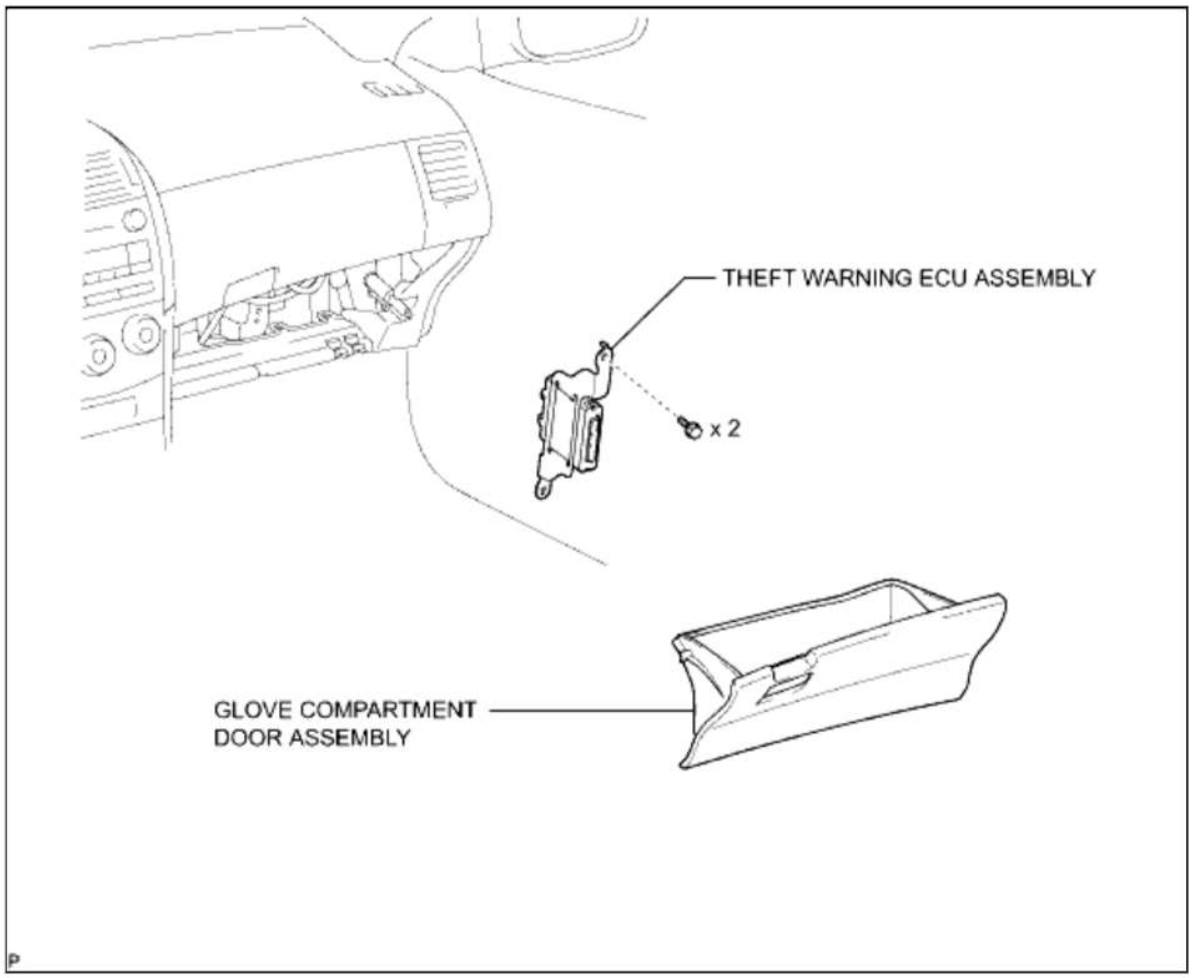
OK ▶ **REPLACE THEFT WARNING ECU ASSEMBLY**

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Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000342J005X
Title: THEFT DETERRENT / KEYLESS ENTRY: THEFT WARNING ECU: COMPONENTS (2010 Corolla)		

COMPONENTS

ILLUSTRATION



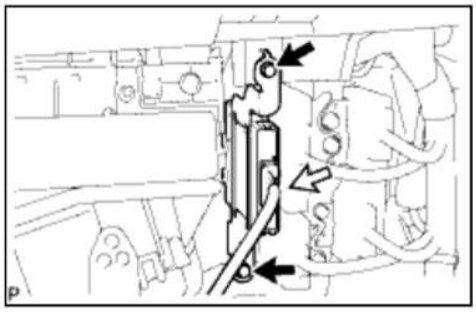
cardiagn.com

Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM00000342K007X
Title: THEFT DETERRENT / KEYLESS ENTRY: THEFT WARNING ECU: REMOVAL (2010 Corolla)		

REMOVAL

1. REMOVE GLOVE COMPARTMENT DOOR ASSEMBLY INFO

2. REMOVE THEFT WARNING ECU ASSEMBLY



(a) Disconnect the connector.

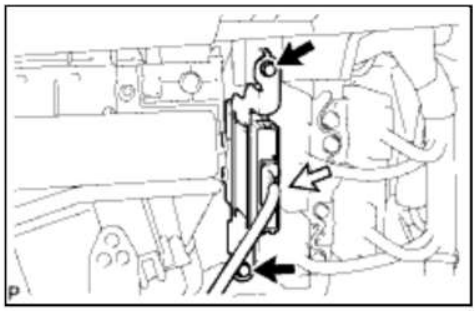
(b) Remove the 2 bolts and theft warning ECU assembly.

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000342I007X
Title: THEFT DETERRENT / KEYLESS ENTRY: THEFT WARNING ECU: INSTALLATION (2010 Corolla)		

INSTALLATION

1. INSTALL THEFT WARNING ECU ASSEMBLY



(a) Install the theft warning ECU assembly with the 2 bolts.

(b) Connect the connector.

2. INSTALL GLOVE COMPARTMENT DOOR ASSEMBLY INFO

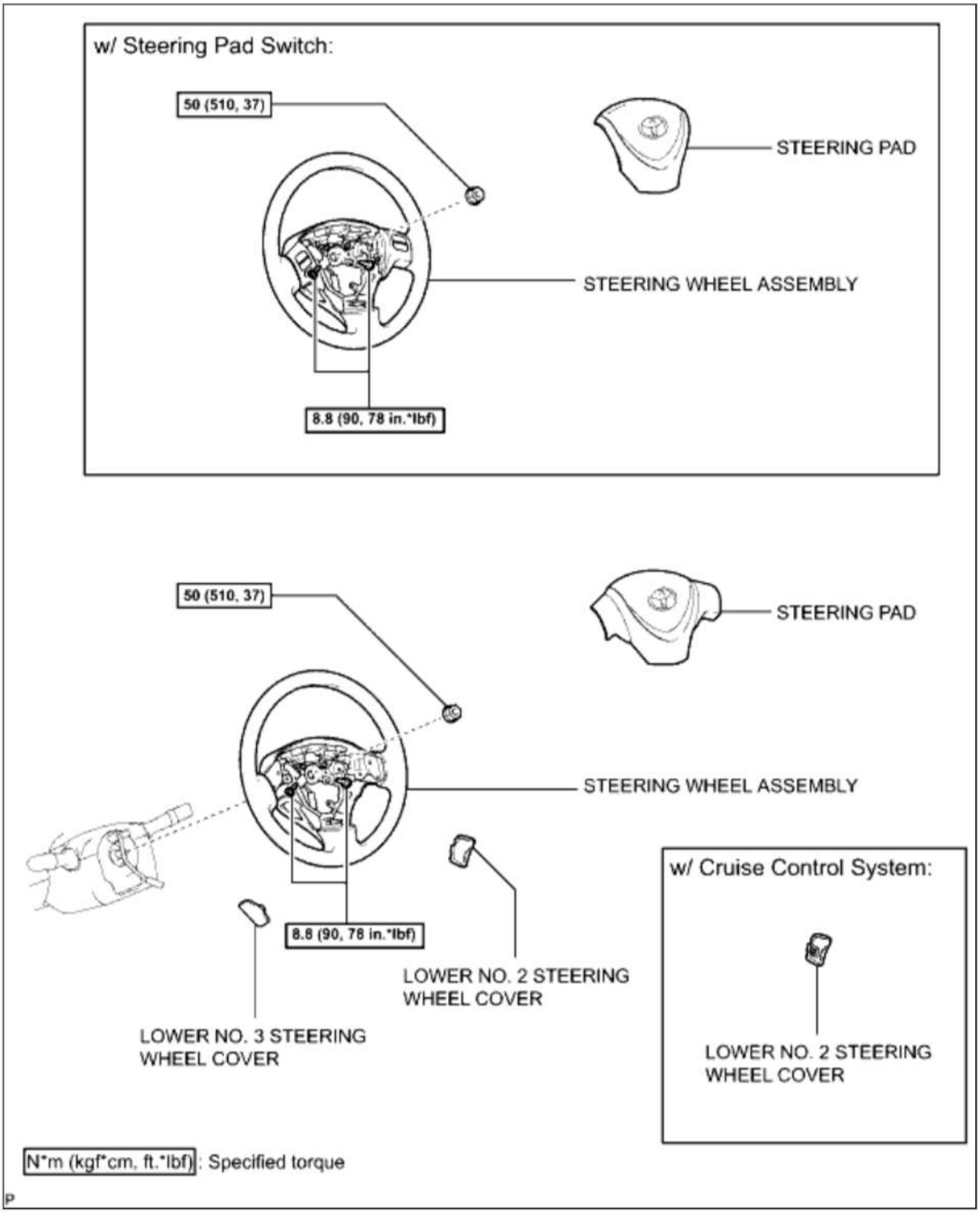
cardiagn.com

Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000003G0K001X
Title: THEFT DETERRENT / KEYLESS ENTRY: TRANSPONDER KEY AMPLIFIER: COMPONENTS (2010 Corolla)		

COMPONENTS

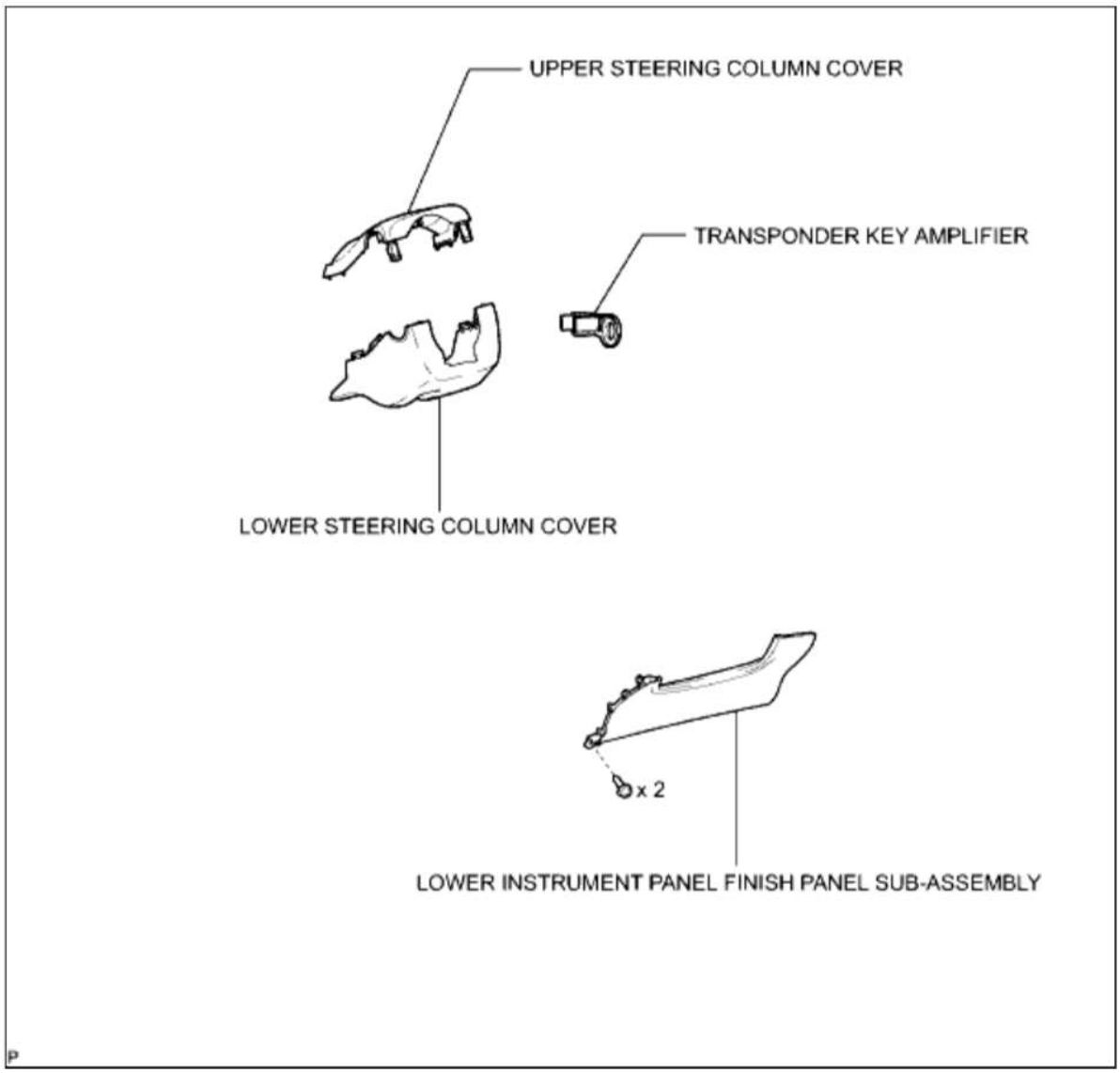
ILLUSTRATION

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ILLUSTRATION

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000003G0L001X
Title: THEFT DETERRENT / KEYLESS ENTRY: TRANSPONDER KEY AMPLIFIER: REMOVAL (2010 Corolla)		

REMOVAL

1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

CAUTION:

Wait at least 90 seconds after disconnecting the cable from the negative (-) battery terminal to disable the SRS system.

2. REMOVE LOWER NO. 2 STEERING WHEEL COVER INFO

3. REMOVE LOWER NO. 3 STEERING WHEEL COVER INFO

4. REMOVE STEERING PAD INFO

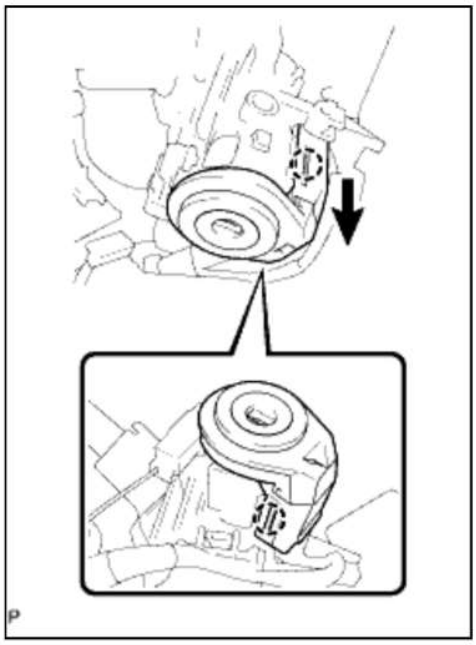
5. REMOVE STEERING WHEEL ASSEMBLY INFO

6. REMOVE LOWER INSTRUMENT PANEL FINISH PANEL SUB-ASSEMBLY INFO

7. REMOVE LOWER STEERING COLUMN COVER INFO

8. REMOVE UPPER STEERING COLUMN COVER INFO

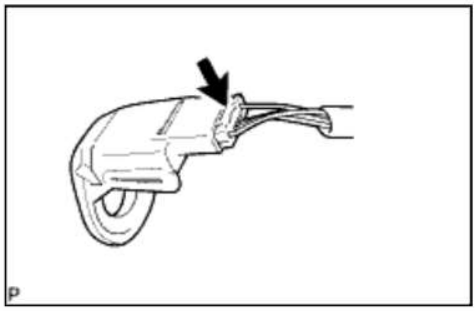
9. REMOVE TRANSPONDER KEY AMPLIFIER



(a) Disengage the 2 claws as shown in the illustration.

(b) Disconnect the connector and remove the transponder key

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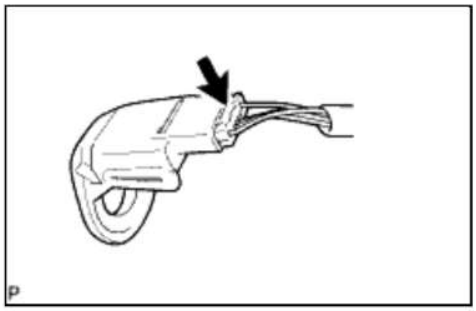
amplifier.

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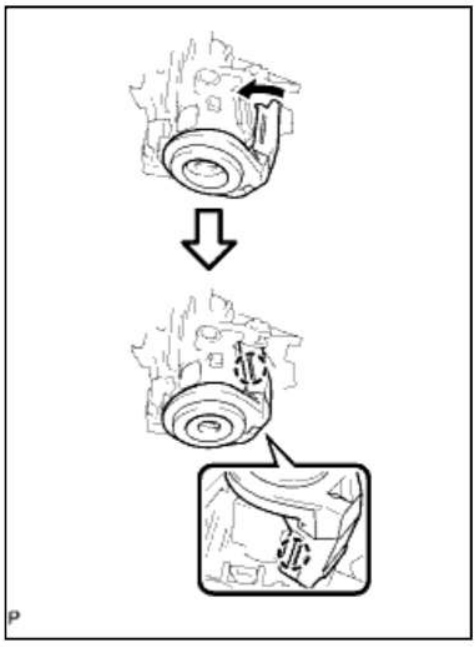
Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000003G0J001X
Title: THEFT DETERRENT / KEYLESS ENTRY: TRANSPONDER KEY AMPLIFIER: INSTALLATION (2010 Corolla)		

INSTALLATION

1. INSTALL TRANSPONDER KEY AMPLIFIER



(a) Connect the connector to the transponder key amplifier.



(b) Align the transponder key amplifier with the steering column upper bracket. Tilt the amplifier slightly and slide it into position.

(c) Push the transponder key amplifier, and engage the 2 claws to install the transponder key amplifier to the steering column upper bracket.

2. INSTALL UPPER STEERING COLUMN COVER INFO

3. INSTALL LOWER STEERING COLUMN COVER INFO

4. ADJUST SPIRAL CABLE INFO

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5. INSTALL STEERING WHEEL ASSEMBLY INFO

6. INSTALL STEERING PAD INFO

7. INSTALL LOWER NO. 3 STEERING WHEEL COVER INFO

8. INSTALL LOWER NO. 2 STEERING WHEEL COVER INFO

9. INSPECT STEERING WHEEL CENTER POINT

10. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL

11. INSPECT STEERING PAD INFO

12. INSPECT SRS WARNING LIGHT

INFO

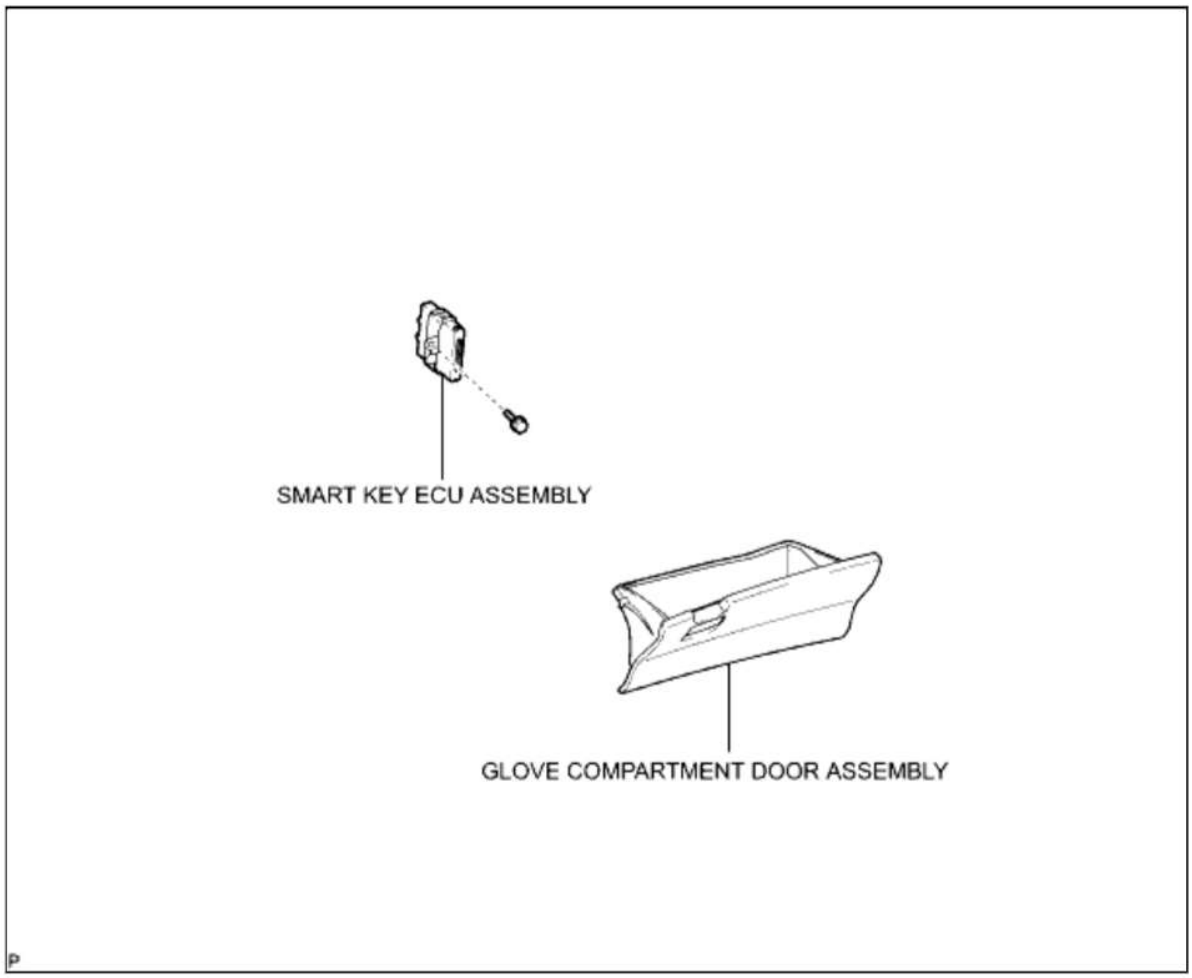


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Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000003G0N001X
Title: THEFT DETERRENT / KEYLESS ENTRY: CERTIFICATION ECU: COMPONENTS (2010 Corolla)		

COMPONENTS

ILLUSTRATION



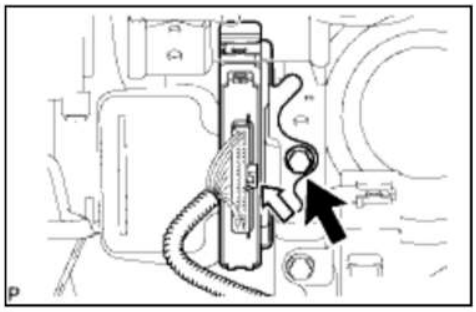
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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000003G0O001X
Title: THEFT DETERRENT / KEYLESS ENTRY: CERTIFICATION ECU: REMOVAL (2010 Corolla)		

REMOVAL

1. REMOVE GLOVE COMPARTMENT DOOR ASSEMBLY INFO

2. REMOVE SMART KEY ECU ASSEMBLY



(a) Disconnect the connector.

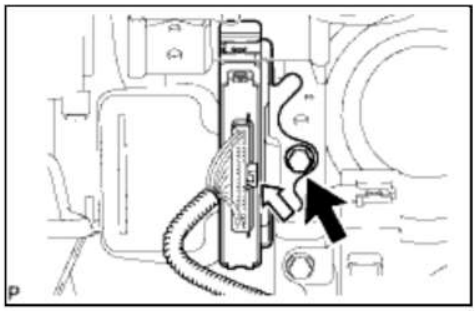
(b) Remove the bolt and smart key ECU assembly.

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000003G0M001X
Title: THEFT DETERRENT / KEYLESS ENTRY: CERTIFICATION ECU: INSTALLATION (2010 Corolla)		

INSTALLATION

1. INSTALL SMART KEY ECU ASSEMBLY



(a) Install the smart key ECU assembly with the bolt.

(b) Connect the connector.

2. INSTALL GLOVE COMPARTMENT DOOR ASSEMBLY INFO

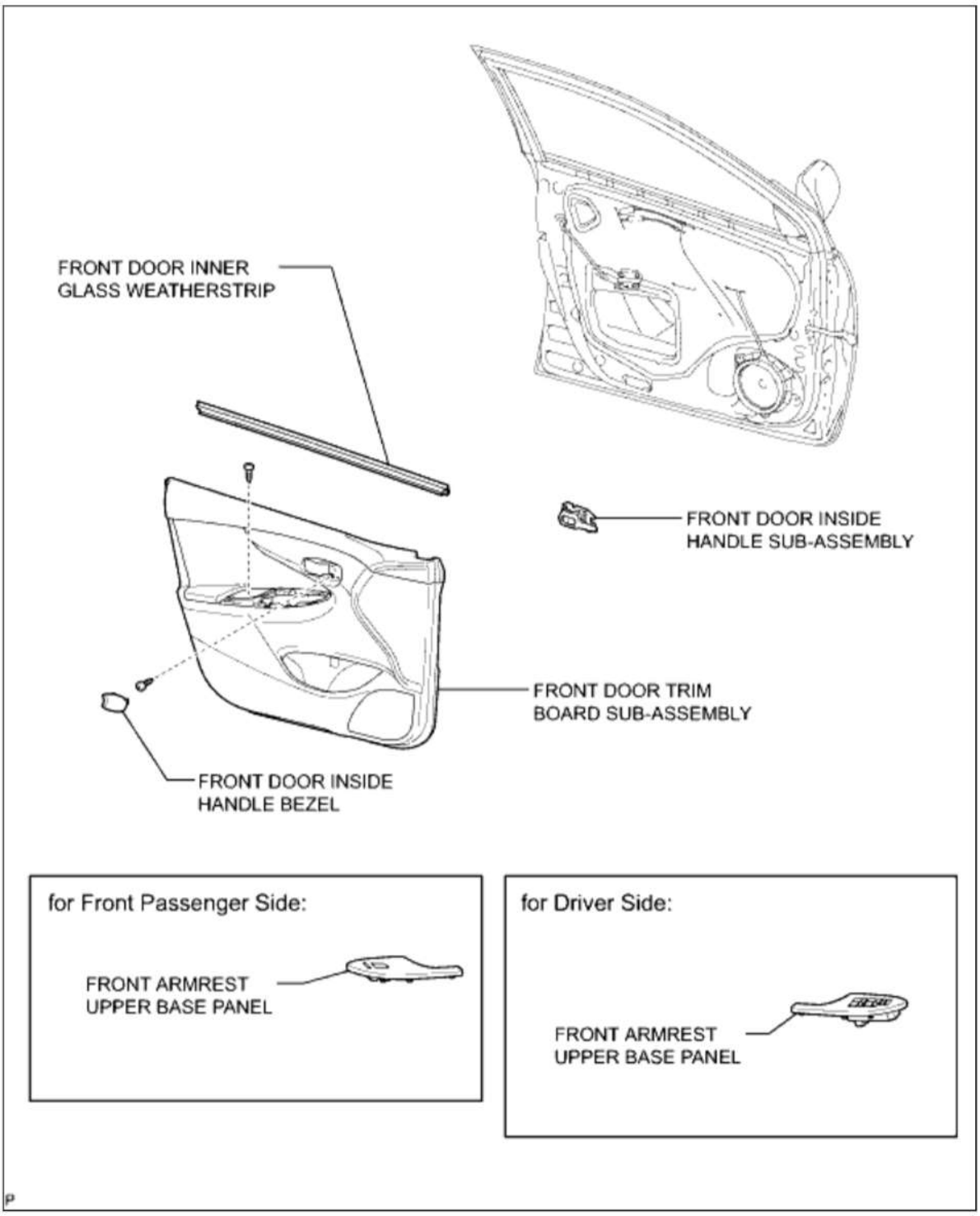
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Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000002Y4I00GX
Title: THEFT DETERRENT / KEYLESS ENTRY: ELECTRICAL KEY OSCILLATOR (for Front Door): COMPONENTS (2010 Corolla)		

COMPONENTS

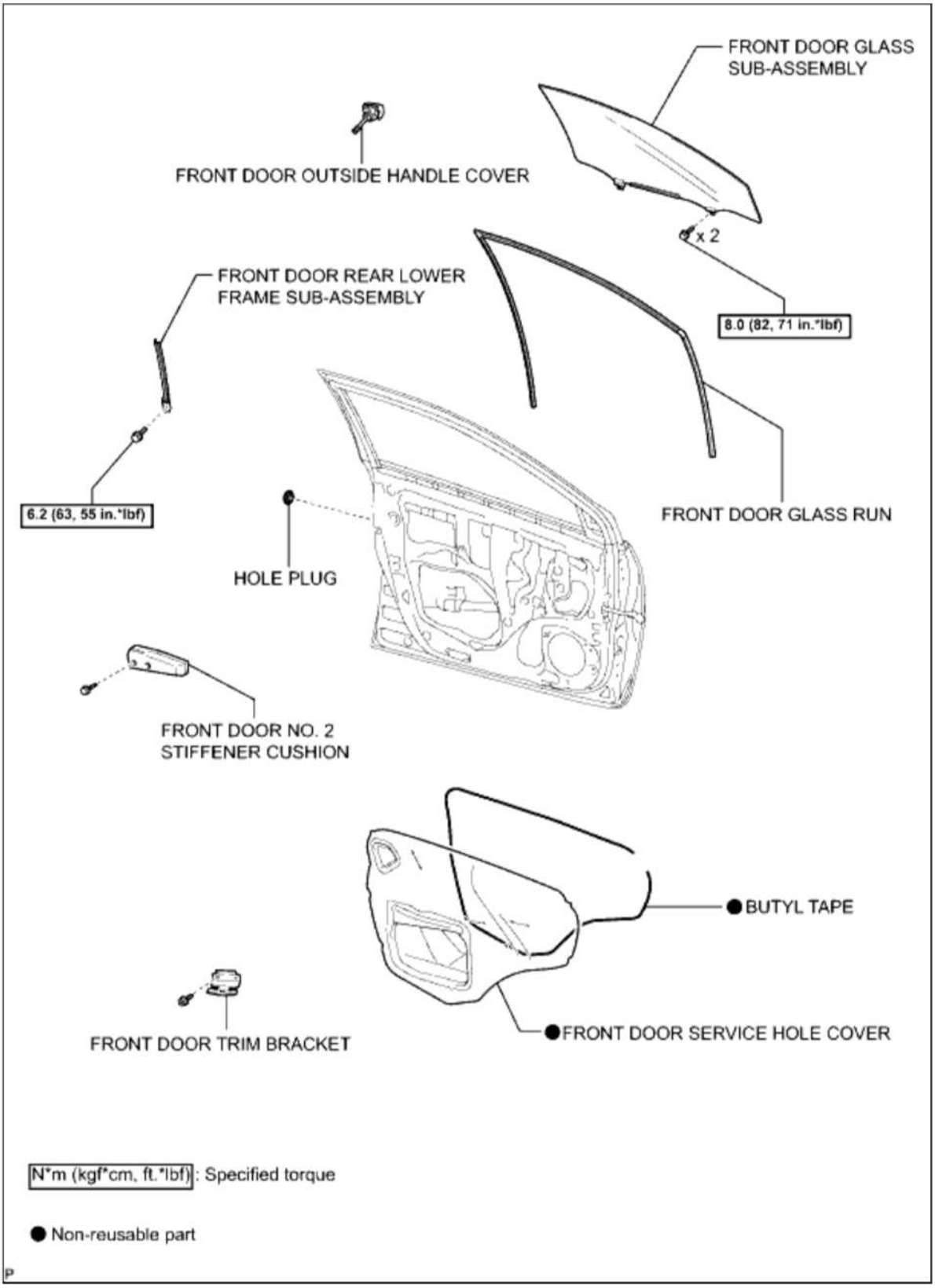
ILLUSTRATION

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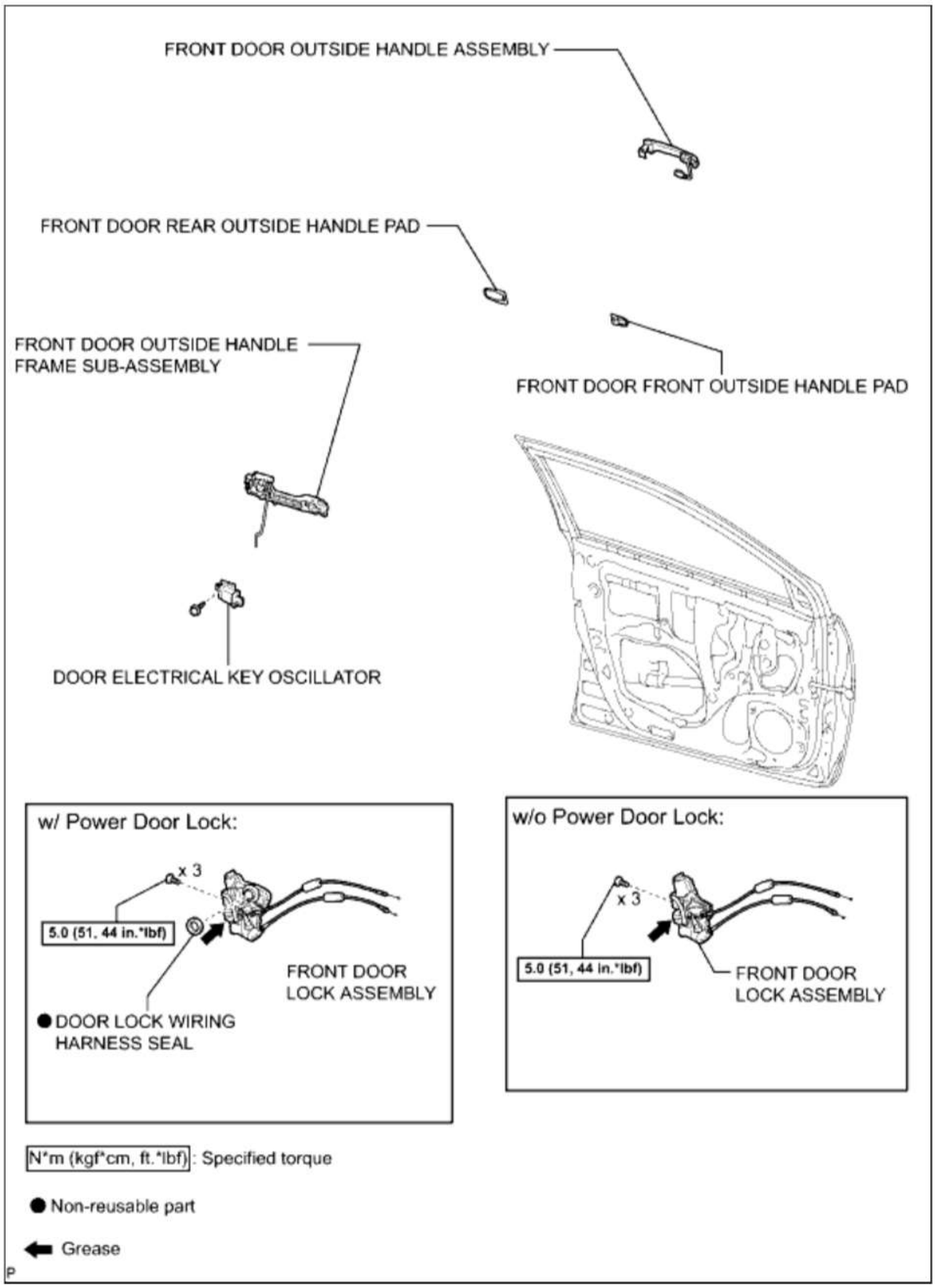
ILLUSTRATION

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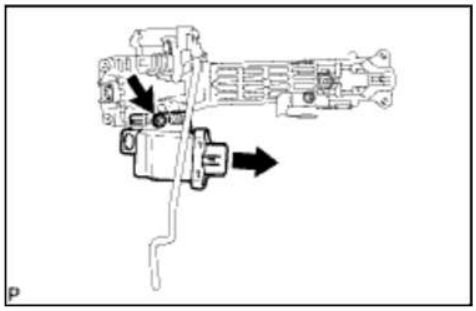
Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000011QF02VX
Title: THEFT DETERRENT / KEYLESS ENTRY: ELECTRICAL KEY OSCILLATOR (for Front Door): REMOVAL (2010 Corolla)		

REMOVAL

1. REMOVE FRONT DOOR INSIDE HANDLE BEZEL INFO
2. REMOVE FRONT ARMREST UPPER BASE PANEL INFO
3. REMOVE FRONT DOOR TRIM BOARD SUB-ASSEMBLY INFO
4. REMOVE FRONT DOOR INSIDE HANDLE SUB-ASSEMBLY INFO
5. REMOVE FRONT DOOR INNER GLASS WEATHERSTRIP INFO
6. REMOVE FRONT DOOR TRIM BRACKET INFO
7. REMOVE FRONT DOOR SERVICE HOLE COVER INFO
8. REMOVE FRONT DOOR GLASS SUB-ASSEMBLY INFO
9. REMOVE FRONT DOOR NO. 2 STIFFENER CUSHION INFO
10. REMOVE FRONT DOOR GLASS RUN INFO
11. REMOVE FRONT DOOR REAR LOWER FRAME SUB-ASSEMBLY INFO
12. REMOVE FRONT DOOR OUTSIDE HANDLE COVER INFO
13. REMOVE FRONT DOOR OUTSIDE HANDLE ASSEMBLY INFO
14. REMOVE FRONT DOOR FRONT OUTSIDE HANDLE PAD INFO
15. REMOVE FRONT DOOR REAR OUTSIDE HANDLE PAD INFO
16. REMOVE FRONT DOOR LOCK ASSEMBLY (w/o Power Door Lock) INFO
17. REMOVE FRONT DOOR LOCK ASSEMBLY (w/ Power Door Lock) INFO
18. REMOVE FRONT DOOR OUTSIDE HANDLE FRAME SUB-ASSEMBLY INFO
19. REMOVE DOOR ELECTRICAL KEY OSCILLATOR

(a) Remove the screw and the door electrical key oscillator.

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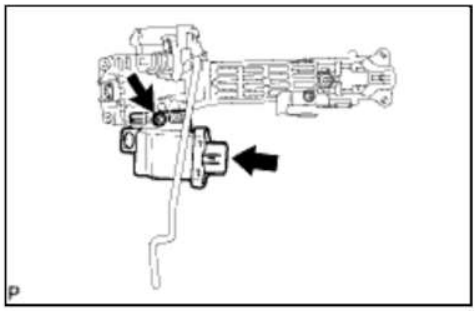


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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000011QG02VX
Title: THEFT DETERRENT / KEYLESS ENTRY: ELECTRICAL KEY OSCILLATOR (for Front Door): INSTALLATION (2010 Corolla)		

INSTALLATION

1. INSTALL DOOR ELECTRICAL KEY OSCILLATOR



(a) Install the door electrical key oscillator with the screw.

2. INSTALL FRONT DOOR OUTSIDE HANDLE FRAME SUB-ASSEMBLY INFO

3. INSTALL FRONT DOOR LOCK ASSEMBLY (w/o Power Door Lock) INFO

4. INSTALL FRONT DOOR LOCK ASSEMBLY (w/ Power Door Lock) INFO

5. INSTALL FRONT DOOR REAR OUTSIDE HANDLE PAD INFO

6. INSTALL FRONT DOOR FRONT OUTSIDE HANDLE PAD INFO

7. INSTALL FRONT DOOR OUTSIDE HANDLE ASSEMBLY INFO

8. INSTALL FRONT DOOR OUTSIDE HANDLE COVER INFO

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

10. INSTALL FRONT DOOR GLASS RUN INFO

11. INSTALL FRONT DOOR NO. 2 STIFFENER CUSHION INFO

12. INSTALL FRONT DOOR GLASS SUB-ASSEMBLY INFO

13. INSTALL FRONT DOOR SERVICE HOLE COVER INFO

14. INSTALL FRONT DOOR TRIM BRACKET INFO

15. INSTALL FRONT DOOR INNER GLASS WEATHERSTRIP INFO

16. INSTALL FRONT DOOR INSIDE HANDLE SUB-ASSEMBLY INFO

17. INSTALL FRONT DOOR TRIM BOARD SUB-ASSEMBLY INFO

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18. INSTALL FRONT ARMREST UPPER BASE PANEL INFO

19. INSTALL FRONT DOOR INSIDE HANDLE BEZEL INFO



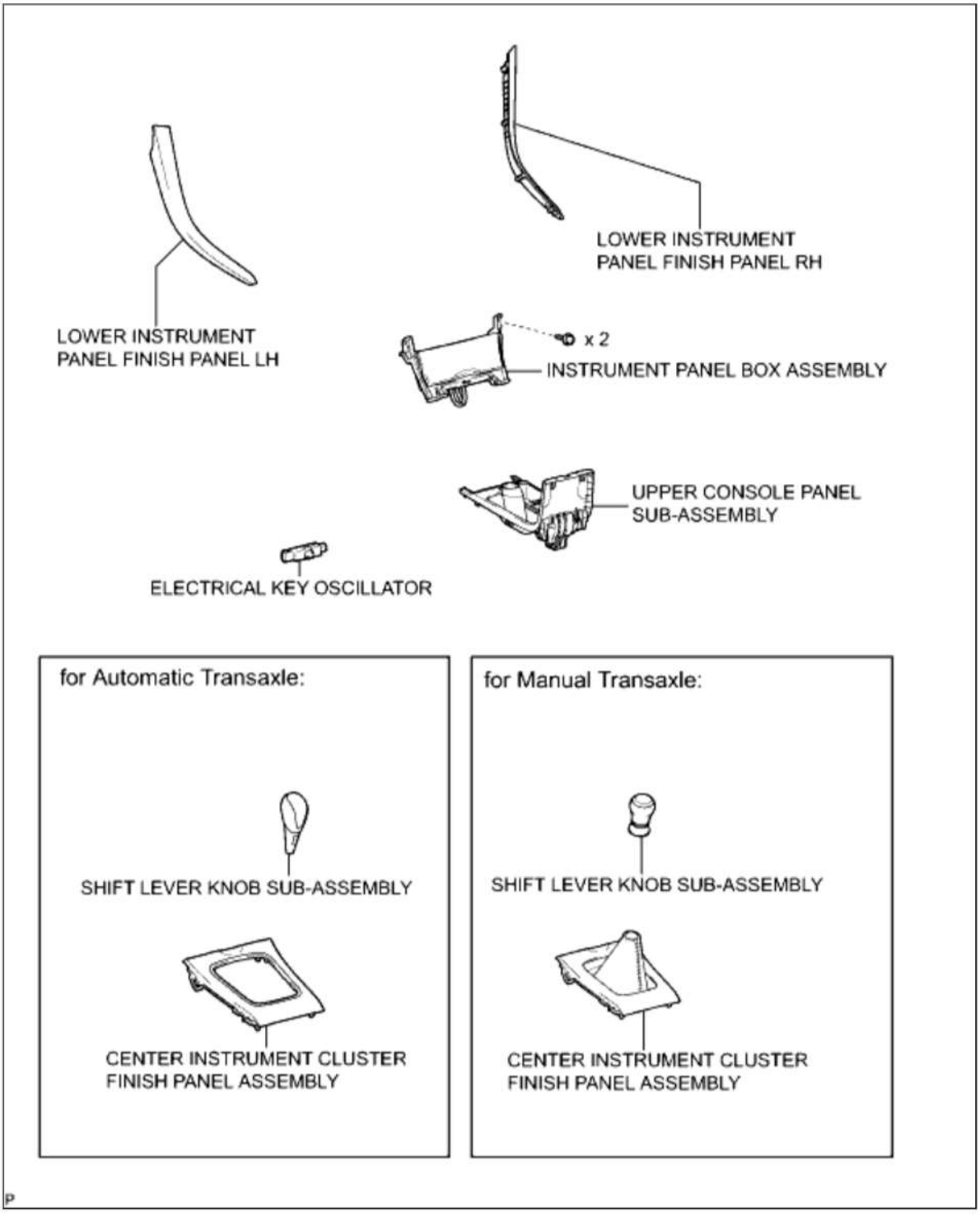
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Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000002XQ600GX
Title: THEFT DETERRENT / KEYLESS ENTRY: ELECTRICAL KEY OSCILLATOR (for Front Side): COMPONENTS (2010 Corolla)		

COMPONENTS

ILLUSTRATION

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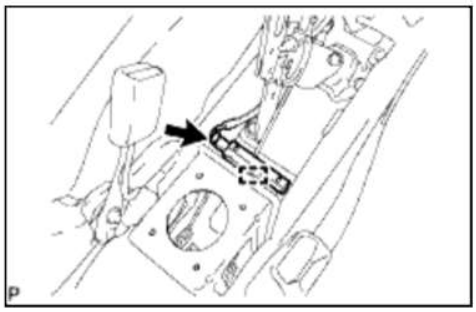


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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000002XWJ00OX
Title: THEFT DETERRENT / KEYLESS ENTRY: ELECTRICAL KEY OSCILLATOR (for Front Side): REMOVAL (2010 Corolla)		

REMOVAL

1. **REMOVE LOWER INSTRUMENT PANEL FINISH PANEL LH** INFO
2. **REMOVE LOWER INSTRUMENT PANEL FINISH PANEL RH** INFO
3. **REMOVE SHIFT LEVER KNOB SUB-ASSEMBLY (for Manual Transaxle)** INFO
4. **REMOVE SHIFT LEVER KNOB SUB-ASSEMBLY (for Automatic Transaxle)** INFO
5. **REMOVE CENTER INSTRUMENT CLUSTER FINISH PANEL ASSEMBLY (for Manual Transaxle)** INFO
6. **REMOVE CENTER INSTRUMENT CLUSTER FINISH PANEL ASSEMBLY (for Automatic Transaxle)** INFO
7. **REMOVE INSTRUMENT PANEL BOX ASSEMBLY** INFO
8. **REMOVE UPPER CONSOLE PANEL SUB-ASSEMBLY** INFO
9. **REMOVE ELECTRICAL KEY OSCILLATOR**



(a) Disconnect the connector.

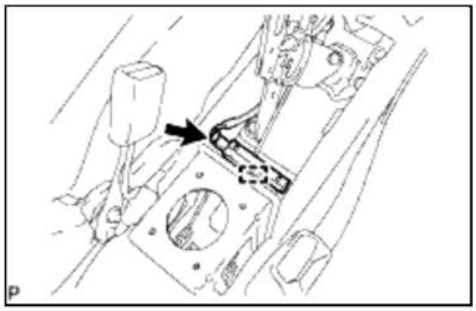
(b) Disengage the clamp and remove the electrical key oscillator.

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000030OB00JX
Title: THEFT DETERRENT / KEYLESS ENTRY: ELECTRICAL KEY OSCILLATOR (for Front Side): INSTALLATION (2010 Corolla)		

INSTALLATION

1. INSTALL ELECTRICAL KEY OSCILLATOR



(a) Disconnect the connector.

(b) Remove the bolt and the indoor electrical key oscillator.

2. INSTALL UPPER CONSOLE PANEL SUB-ASSEMBLY INFO

3. INSTALL INSTRUMENT PANEL BOX ASSEMBLY INFO

4. INSTALL CENTER INSTRUMENT CLUSTER FINISH PANEL ASSEMBLY (for Automatic Transaxle) INFO

5. INSTALL CENTER INSTRUMENT CLUSTER FINISH PANEL ASSEMBLY (for Manual Transaxle) INFO

6. INSTALL SHIFT LEVER KNOB SUB-ASSEMBLY (for Automatic Transaxle) INFO

7. INSTALL SHIFT LEVER KNOB SUB-ASSEMBLY (for Manual Transaxle) INFO

8. INSTALL LOWER INSTRUMENT PANEL FINISH PANEL LH INFO

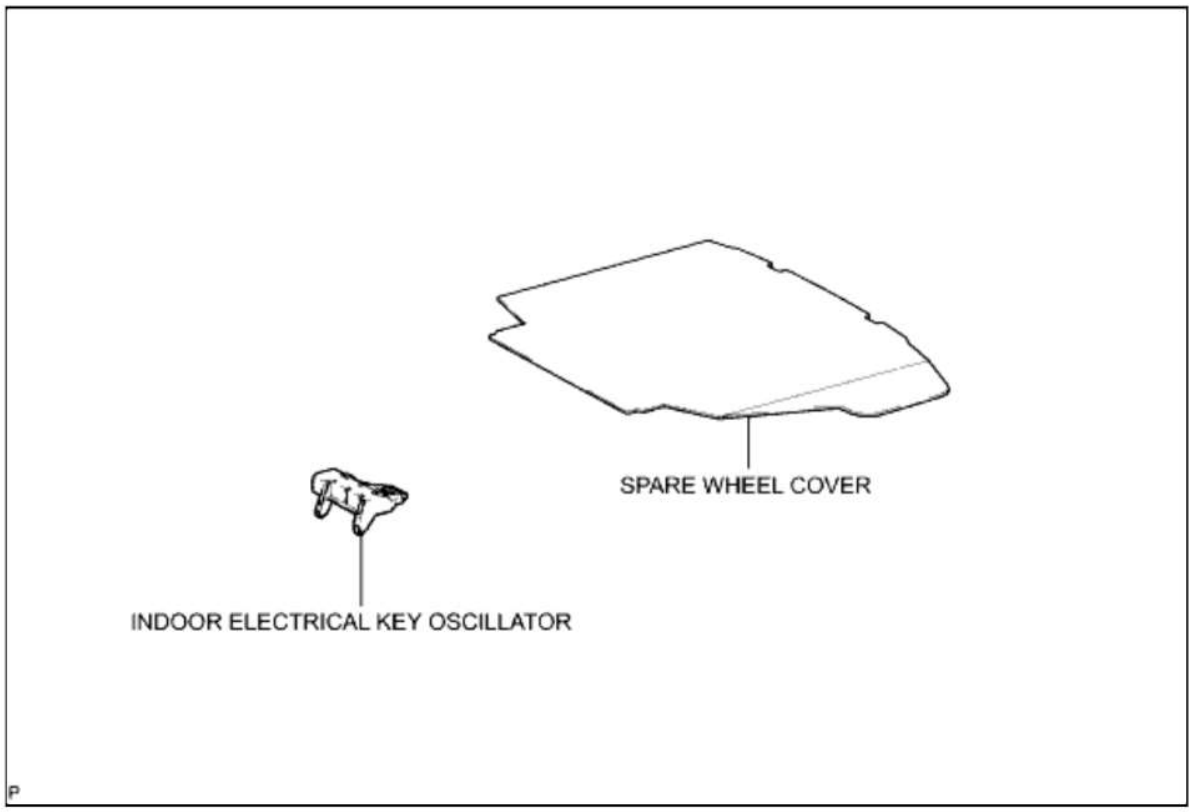
9. INSTALL LOWER INSTRUMENT PANEL FINISH PANEL RH INFO

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Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000030OD00CX
Title: THEFT DETERRENT / KEYLESS ENTRY: ELECTRICAL KEY OSCILLATOR (for Luggage Compartment): COMPONENTS (2010 Corolla)		

COMPONENTS

ILLUSTRATION



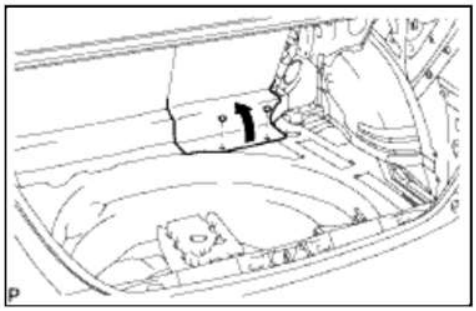
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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000030OE00CX
Title: THEFT DETERRENT / KEYLESS ENTRY: ELECTRICAL KEY OSCILLATOR (for Luggage Compartment): REMOVAL (2010 Corolla)		

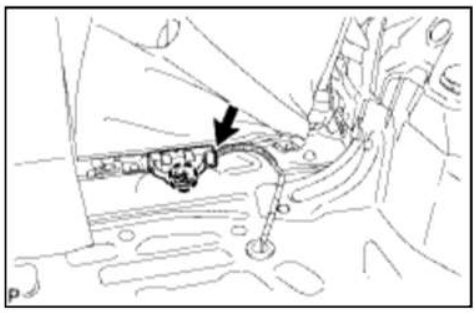
REMOVAL

1. REMOVE SPARE WHEEL COVER INFO

2. REMOVE INDOOR ELECTRICAL KEY OSCILLATOR



(a) Disengage the 2 clips and pull the rear seat back cover off.



(b) Disengage the claw and remove the indoor electrical key oscillator.

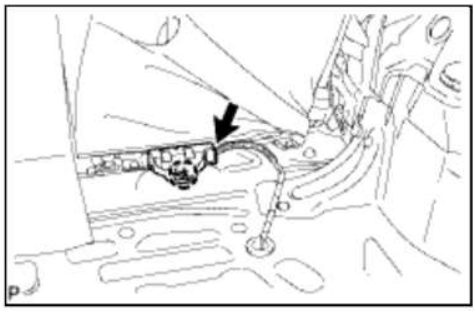
(c) Disconnect the connector and remove the indoor electrical key oscillator.

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000030OC00CX
Title: THEFT DETERRENT / KEYLESS ENTRY: ELECTRICAL KEY OSCILLATOR (for Luggage Compartment): INSTALLATION (2010 Corolla)		

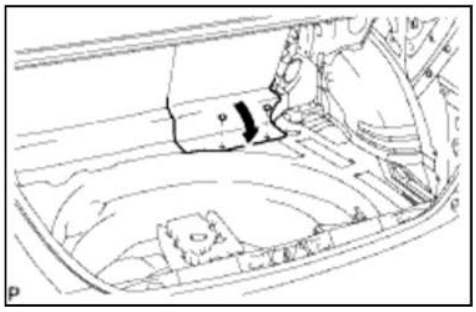
INSTALLATION

1. INSTALL INDOOR ELECTRICAL KEY OSCILLATOR



(a) Connect the connector.

(b) Engage the claw and install the indoor electrical key oscillator.



(c) Install the seat back cover with the 2 clips.

2. INSTALL SPARE WHEEL COVER INFO

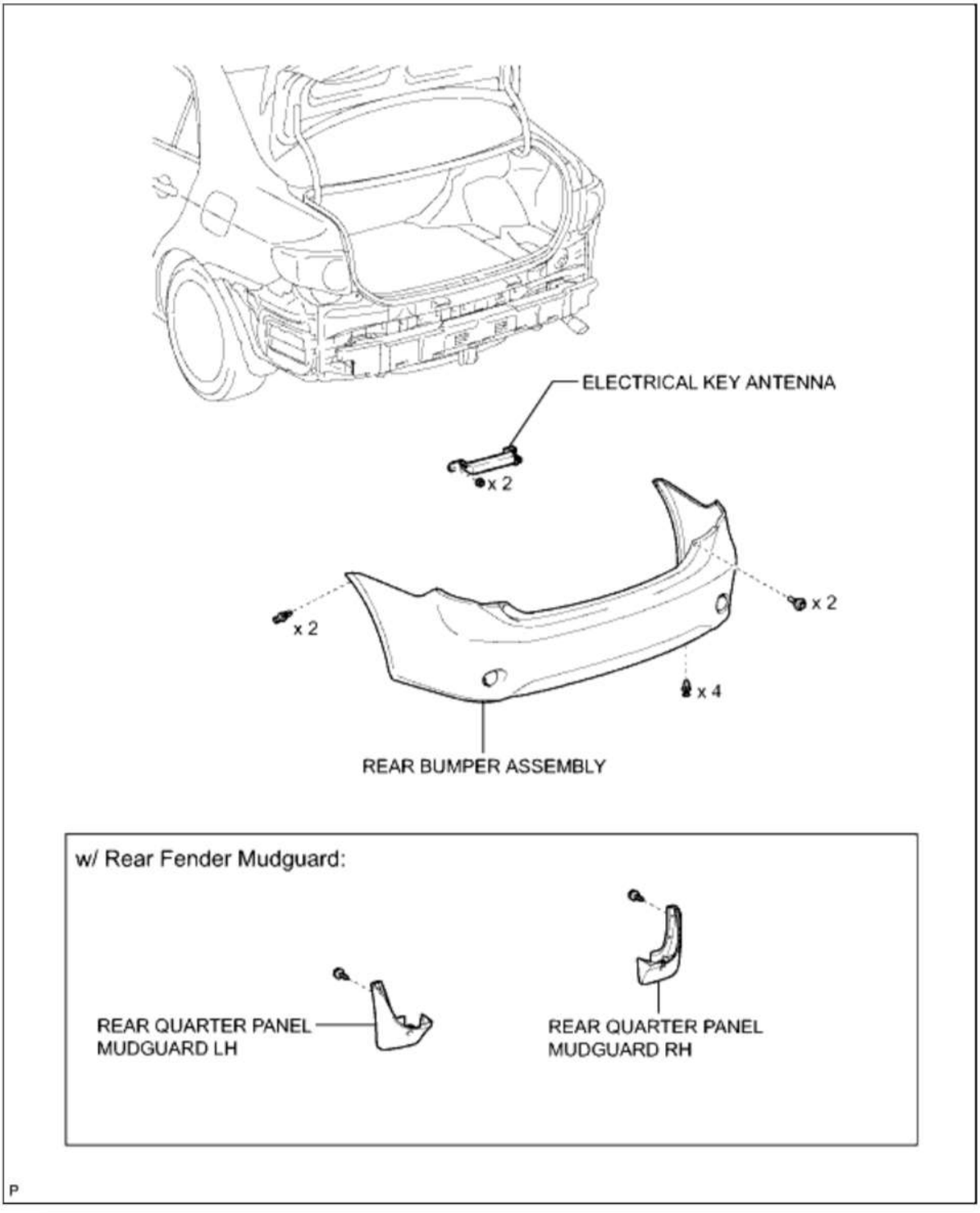
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Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000002XQC00GX
Title: THEFT DETERRENT / KEYLESS ENTRY: ELECTRICAL KEY OSCILLATOR (for Outside Luggage Compartment): COMPONENTS (2010 Corolla)		

COMPONENTS

ILLUSTRATION

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000002XQD00HX
Title: THEFT DETERRENT / KEYLESS ENTRY: ELECTRICAL KEY OSCILLATOR (for Outside Luggage Compartment): REMOVAL (2010 Corolla)		

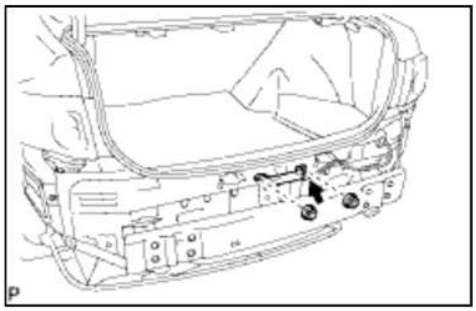
REMOVAL

1. REMOVE REAR QUARTER PANEL MUDGUARD LH (w/ Rear Fender Mudguard) INFO

2. REMOVE REAR QUARTER PANEL MUDGUARD RH (w/ Rear Fender Mudguard) INFO

3. REMOVE REAR BUMPER ASSEMBLY INFO

4. REMOVE ELECTRICAL KEY ANTENNA



(a) Disconnect the connector.

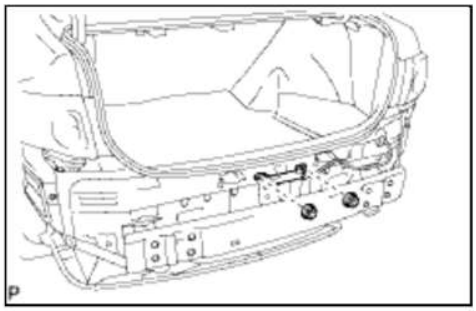
(b) Remove the 2 nuts and the electrical key antenna.

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000002XQB00GX
Title: THEFT DETERRENT / KEYLESS ENTRY: ELECTRICAL KEY OSCILLATOR (for Outside Luggage Compartment): INSTALLATION (2010 Corolla)		

INSTALLATION

1. INSTALL ELECTRICAL KEY ANTENNA



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

(b) Connect the connector.

2. INSTALL REAR BUMPER ASSEMBLY INFO

3. INSTALL REAR QUARTER PANEL MUDGUARD LH (w/ Rear Fender Mudguard) INFO

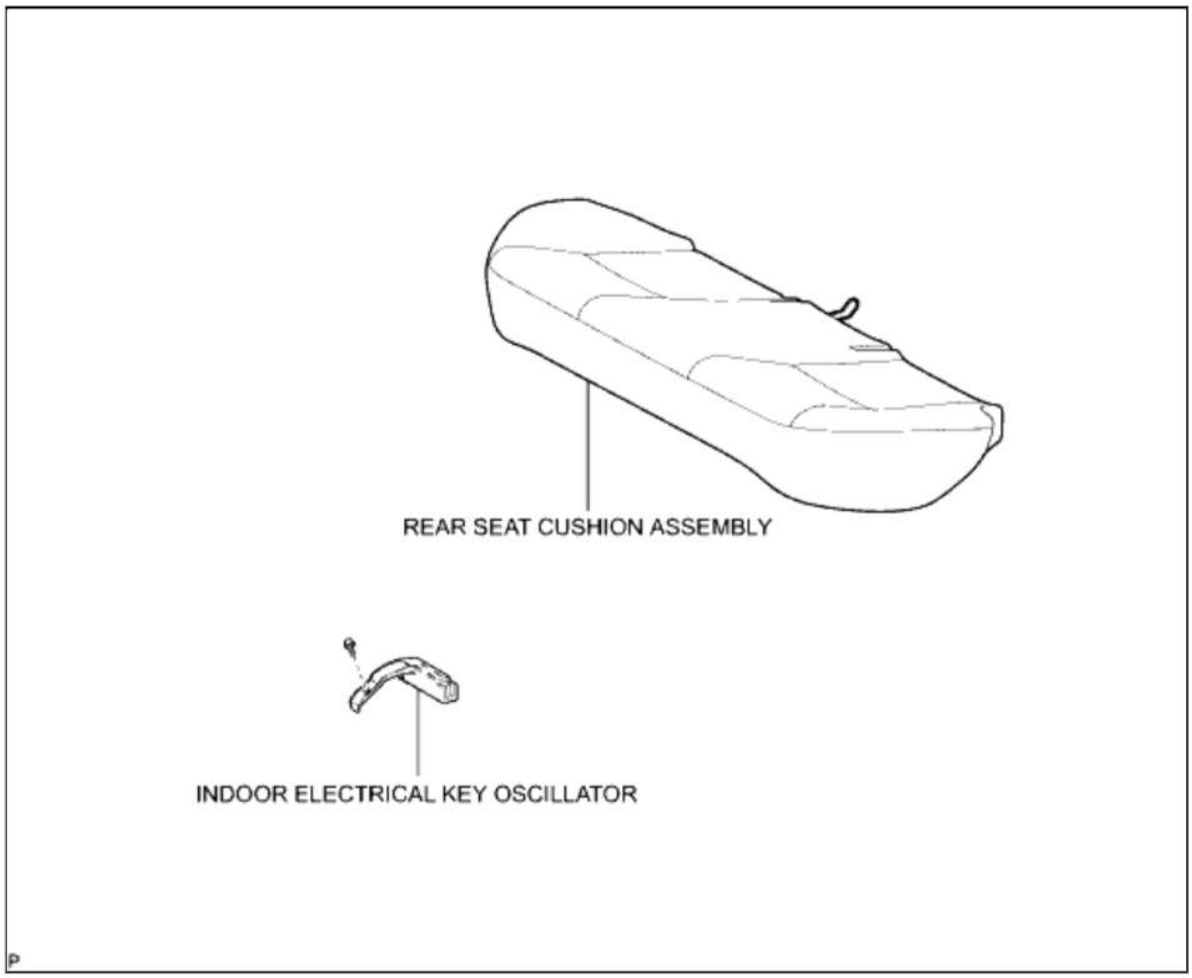
4. INSTALL REAR QUARTER PANEL MUDGUARD RH (w/ Rear Fender Mudguard) INFO

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Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000002XQ900HX
Title: THEFT DETERRENT / KEYLESS ENTRY: ELECTRICAL KEY OSCILLATOR (for Rear Side): COMPONENTS (2010 Corolla)		

COMPONENTS

ILLUSTRATION



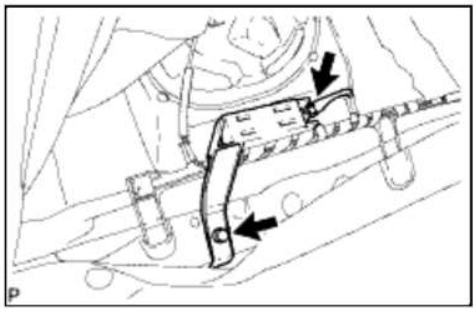
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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000002XQA00HX
Title: THEFT DETERRENT / KEYLESS ENTRY: ELECTRICAL KEY OSCILLATOR (for Rear Side): REMOVAL (2010 Corolla)		

REMOVAL

1. REMOVE REAR SEAT CUSHION ASSEMBLY INFO

2. REMOVE INDOOR ELECTRICAL KEY OSCILLATOR



(a) Disconnect the connector.

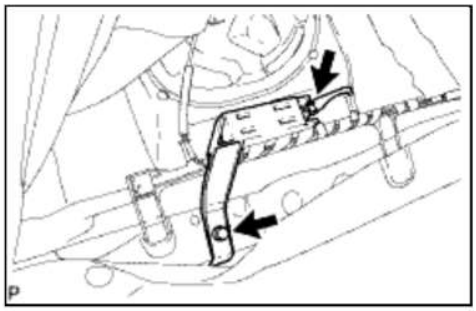
(b) Remove the bolt and the indoor electrical key oscillator.

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000002XQ800HX
Title: THEFT DETERRENT / KEYLESS ENTRY: ELECTRICAL KEY OSCILLATOR (for Rear Side): INSTALLATION (2010 Corolla)		

INSTALLATION

1. INSTALL INDOOR ELECTRICAL KEY OSCILLATOR



(a) Install the indoor electrical key oscillator with the bolt.

(b) Connect the connector.

2. INSTALL REAR SEAT CUSHION ASSEMBLY INFO

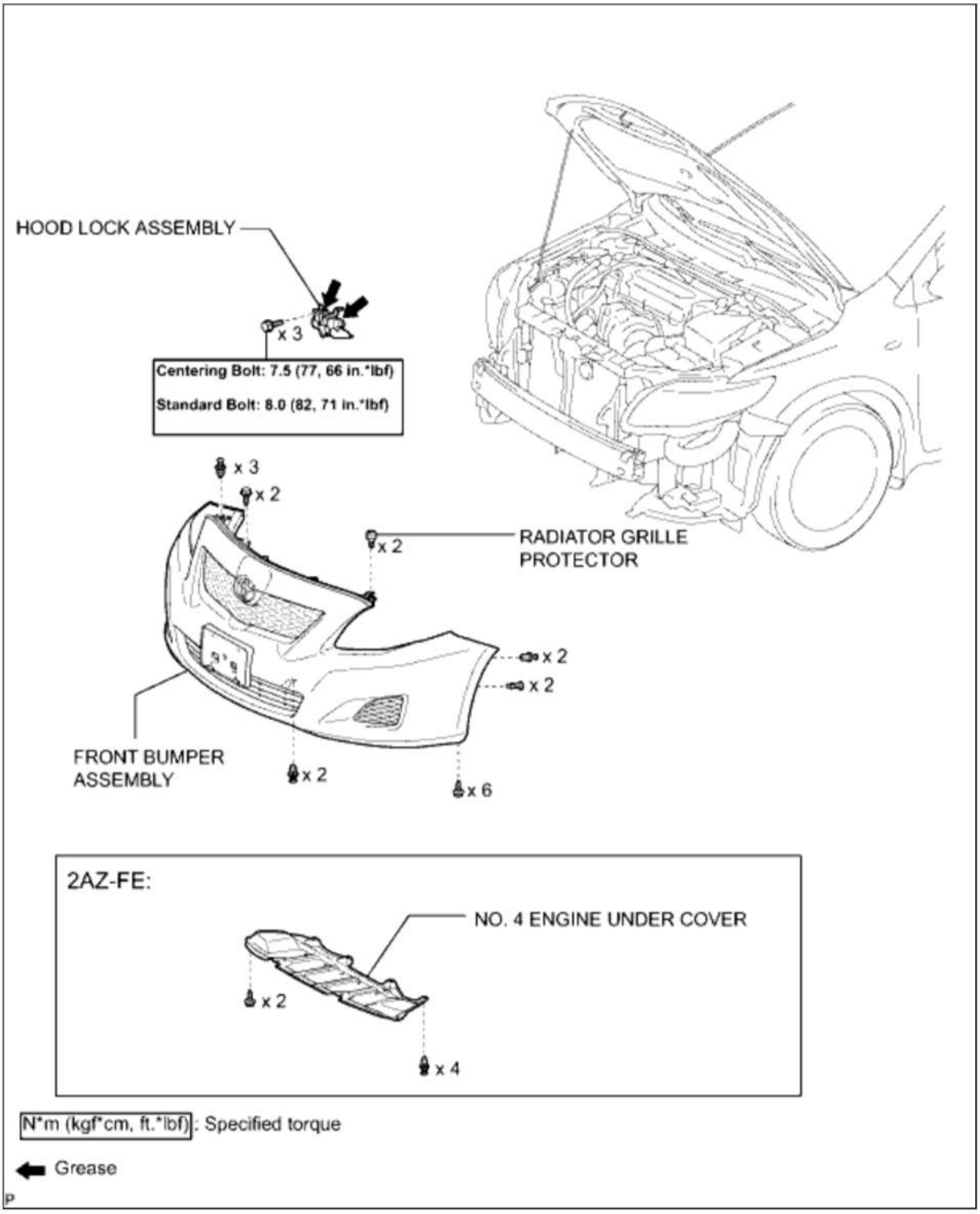
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Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000Y5402CX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE HOOD COURTESY SWITCH: COMPONENTS (2010 Corolla)		

COMPONENTS

ILLUSTRATION

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000Y5502WX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE HOOD COURTESY SWITCH: REMOVAL (2010 Corolla)		

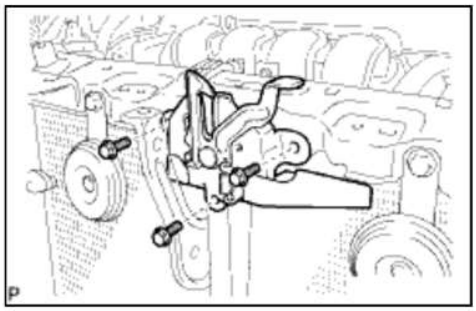
REMOVAL

1. REMOVE RADIATOR GRILLE PROTECTOR INFO

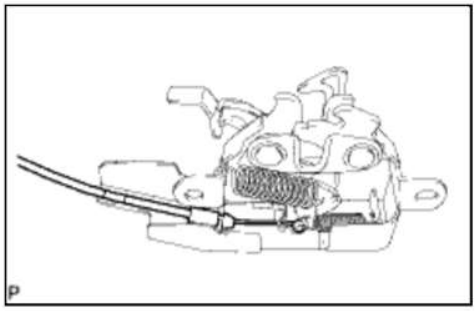
2. REMOVE NO. 4 ENGINE UNDER COVER (for 2AZ-FE) INFO

3. REMOVE FRONT BUMPER ASSEMBLY INFO

4. REMOVE HOOD LOCK ASSEMBLY



(a) Remove the 3 bolts from the hood lock assembly.



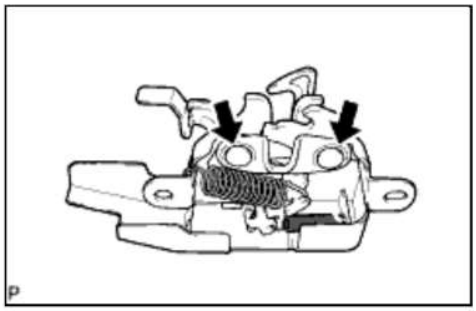
(b) Disconnect the hood lock control cable and remove the hood lock assembly.

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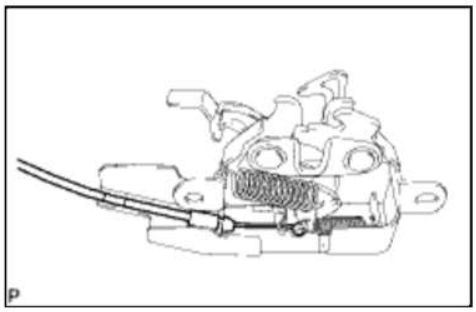
Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000Y53031X
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE HOOD COURTESY SWITCH: INSTALLATION (2010 Corolla)		

INSTALLATION

1. INSTALL HOOD LOCK ASSEMBLY



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

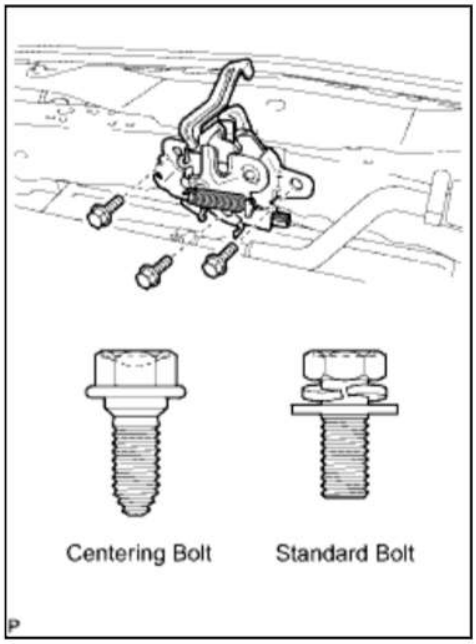


(b) Connect the hood lock control cable.

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

Centering Bolt - Torque: 7.5 N·m (77 kgf·cm, 66in·lbf)
Standard Bolt - Torque: 8.0 N·m (82 kgf·cm, 71in·lbf)

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2. INSPECT HOOD SUB-ASSEMBLY INFO

3. ADJUST HOOD SUB-ASSEMBLY INFO

4. INSTALL FRONT BUMPER ASSEMBLY INFO

5. INSTALL NO. 4 ENGINE UNDER COVER (for 2AZ-FE) INFO

6. INSTALL RADIATOR GRILLE PROTECTOR INFO

7. VEHICLE PREPARATION FOR FOG LIGHT AIMING (w/ Fog Light) INFO

8. PREPARATION FOR FOG LIGHT AIMING (w/ Fog Light) INFO

9. INSPECT FOG LIGHT AIMING (w/ Fog Light) INFO

10. ADJUST FOG LIGHT AIMING (w/ Fog Light) INFO

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Last Modified: 3-10-2010	6.4 L	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000PVN02XX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): PRECAUTION (2010 Corolla)		

PRECAUTION

1. PRECAUTIONS WHEN USING TECHSTREAM

(a) When using the Techstream to troubleshoot the smart key system: Connect the Techstream to the DLC3 while the engine 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.

2. 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 or strike the key.

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

(3) Do not use an ultrasonic washing machine to clean the key.

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

(5) Do not attach any stickers to the key.

(b) Precautions for the engine start function:

(1) Before starting the engine, firmly depress the brake pedal until the indicator of the engine switch illuminates in green.

(2) Be sure to turn the engine switch off before disconnecting the cable from the negative (-) battery terminal. When the battery terminal is disconnected, the power source mode (off, on (ACC), on (IG)) will remain in memory. When the vehicle battery becomes discharged, be sure to remember the power source mode.

(3) After the battery is removed and reinstalled, be sure to wait 10 seconds or more before starting the engine. The engine may not start immediately after the battery is reinstalled.

(c) Precautions for the battery built into the key and the vehicle battery:

(1) When the doors are locked (locked state), signals are emitted by the vehicle at predetermined intervals. If the vehicle remains parked for a long time, the battery may become discharged. To prevent this, periodically charge the vehicle battery, or disable the smart key system.

(2) When the doors are locked (locked state), and the key remains in the door oscillator detection area, the system will maintain periodic communication with the key. If the vehicle remains parked in this state for a long time, the vehicle and key batteries may become discharged. If the vehicle is not being used, keep the key at least 2 m (6.56 ft.) away from the vehicle.

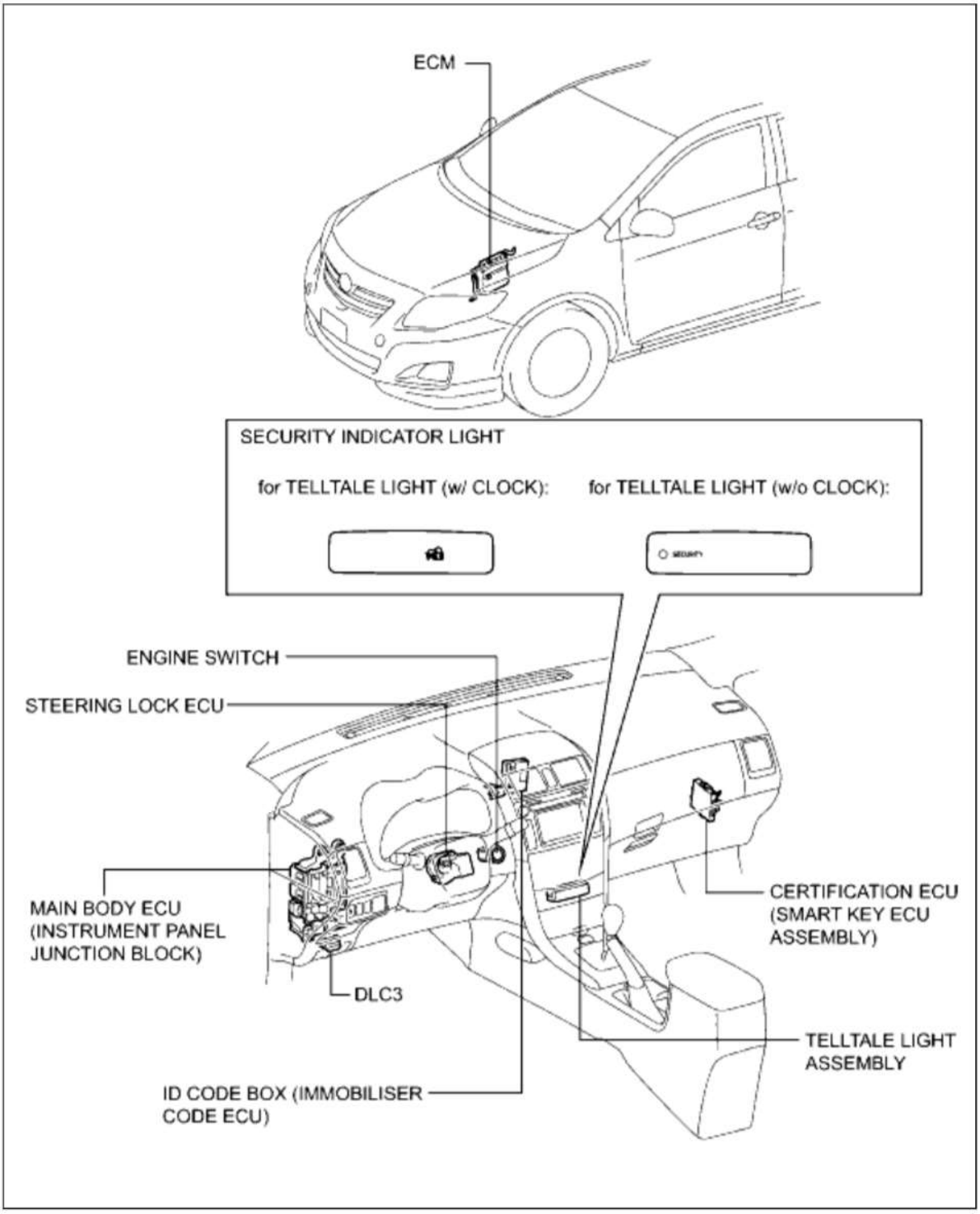
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Last Modified: 3-10-2010	6.4 R	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001W2100XX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): PARTS LOCATION (2010 Corolla)		

PARTS LOCATION

ILLUSTRATION

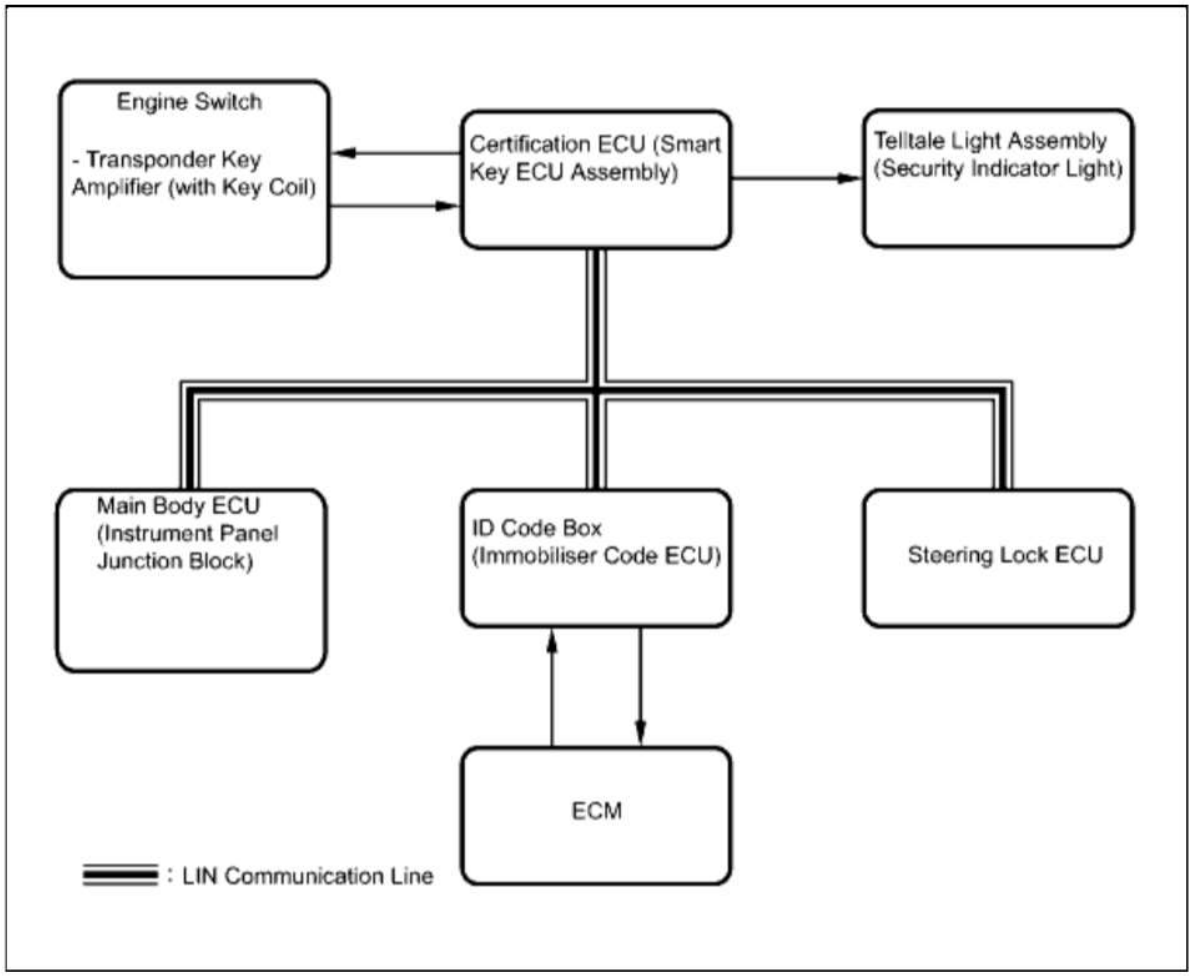
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Last Modified: 3-10-2010	6.4 U	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000QYD02UX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): SYSTEM DIAGRAM (2010 Corolla)		

SYSTEM DIAGRAM



Communication Table

TRANSMITTING ECU (TRANSMITTER)	RECEIVING ECU (RECEIVER)	SIGNAL	COMMUNICATION METHOD
Steering lock ECU	• Certification ECU (Smart Key ECU Assembly) • ID code box (Immobiliser Code ECU)	Steering lock request signal	LIN
		Steering unlock signal	
		Steering lock confirmation signal	

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TRANSMITTING ECU (TRANSMITTER)	RECEIVING ECU (RECEIVER)	SIGNAL	COMMUNICATION METHOD
		Steering unlock confirmation signal	
		Diagnosis response signal	
		Steering unlock drive relay signal	
		Steering lock drive relay signal	
		Steering lock motor operation signal	
ID code box (Immobiliser Code ECU)	Certification ECU (Smart Key ECU Assembly)	Matching request random number signal	LIN
		EEPROM access malfunction signal	
		Model code matching signal	
		Model code mismatching signal	
		ECM code receiving status signal	
		Engine start permission request signal	
		Engine start permission response signal	
		S code matching result signal	
		S code registration status signal	
		S code registration mode signal	
		L code matching result signal	
		ECM communication signal	
		Registered key number response	

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TRANSMITTING ECU (TRANSMITTER)	RECEIVING ECU (RECEIVER)	SIGNAL	COMMUNICATION METHOD
		signal	
		Diagnosis mode switching signal	
		DTC (B2791) signal	
		Registered key number signal	
ID code box (Immobiliser Code ECU)	Steering lock ECU	Steering lock release signal	LIN
		Matching request random number signal	
Certification ECU (Smart Key ECU Assembly)	ID code box (Immobiliser Code ECU)	3 bit code request signal	LIN
		ID code matching result signal	
		Registered key number signal	
		Vehicle type handle signal	
Certification ECU (Smart Key ECU Assembly)	• ID code box (Immobiliser Code ECU) • Steering lock ECU	L code registration mode signal	LIN
		Diagnosis mode request signal	
		DTC clear request signal	
		L code registration status signal	
Main body ECU (Instrument panel junction block)	Certification ECU (Smart Key ECU Assembly)	Key code recognition signal	LIN

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Last Modified: 3-10-2010	6.4 M	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000QYF01NX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): REGISTRATION (2010 Corolla)		

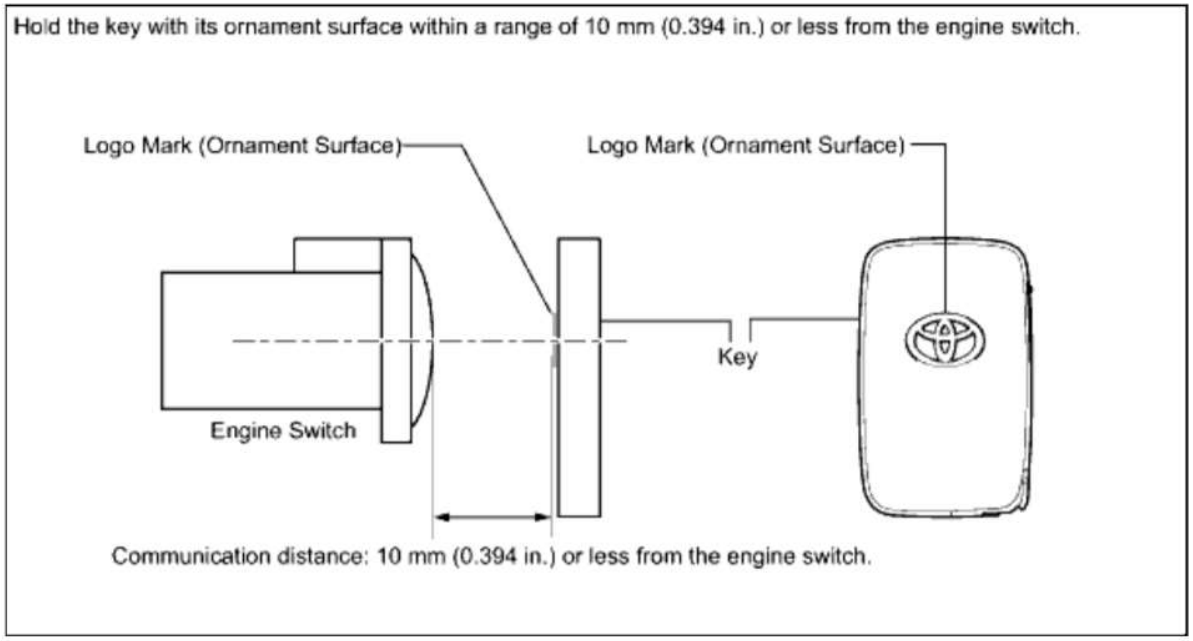
REGISTRATION

1. DESCRIPTION OF CODE REGISTRATION

HINT:

- The ID codes are the same as recognition codes for the wireless transmitter and the 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), steering lock ECU, or key is replaced with a new one.

(a) Vehicles with the smart key system do not have a key slot. Therefore, hold the key close to the engine switch to register the key, as shown in the illustration.



2. PART REPLACEMENT AND KEY REGISTRATION

(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

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All key ID erasure

ECU code registration

- If the customer has not brought all the registered keys, replacement of the ID code box (immobiliser code ECU) is also required.
- A maximum of 4 keys can be registered.

PART TO BE REPLACED	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 registration) **HINT:** **If key codes cannot be erased or additional keys cannot be registered due to a malfunction in the certification ECU (smart key ECU assembly), replace the ID code box (immobiliser code ECU) and certification ECU (smart key ECU assembly). 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"

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PART TO BE REPLACED	CONDITION	PROCEDURE	REFERENCE
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 key codes cannot be erased or additional keys cannot be registered due to a malfunction in the certification ECU (smart key ECU assembly), replace the ID code box (immobiliser code ECU) and certification ECU (smart key ECU assembly). 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"
Steering lock ECU	Customer has brought at least 1 key	1. Replace steering lock ECU	-
		2. Register recognition codes in ECUs (ECU code registration)	PROCEDURE "F"

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PART TO BE REPLACED	CONDITION	PROCEDURE	REFERENCE
	All keys are lost	1. Replace steering lock ECU	-
		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"
		5. Register ECU communication ID	PROCEDURE "G"
Main body ECU (Instrument panel junction block)	No condition required	Replace main body ECU (instrument panel junction block)	-
ECM	No condition required	1. Replace ECM	-
		2. Register ECU communication ID	PROCEDURE "H"
Key (for replacement)	Customer has brought at least 1 key	1. Using remaining key, erase lost key code (Key ID erasure)	PROCEDURE "D"
		2. Register additional keys as necessary (Additional key ID registration)	PROCEDURE "C"
	All keys are lost	1. Erase all key codes (All key ID erasure)	PROCEDURE "E"
		2. Register all keys (New key ID registration) **HINT:** **If the customer brings lost keys at a later date, they can be registered using the additional key ID registration function.**	PROCEDURE "A"
Key (for addition)	Customer has brought at least 1 key **HINT:** **When adding keys (Additional**	1. Register additional keys as necessary (Additional key ID registration)	PROCEDURE "C"

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PART TO BE REPLACED	CONDITION	PROCEDURE	REFERENCE
	registration)		

3. KEY REGISTRATION

(a) PROCEDURE "A"

New key ID registration (when replacing the certification ECU (smart key ECU assembly) and ID code box (immobiliser code ECU), or when replacing the certification ECU (smart key ECU assembly), ID code box (immobiliser code ECU) and steering lock ECU)

PROCESS	PROCEDURE
1. Start of registration	1. Connect the Techstream to DLC3 2. Turn the engine switch on (IG) 3. Enter the following menus: Body Electrical / Smart Key / Utility / Smart Code Registration **HINT:** **The engine switch cannot be turned on (IG) more than 10 times. After connecting the Techstream, turn the Techstream on while turning the driver's side 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. Verification of unregistered key*1	1. Hold the unregistered key close to the engine 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's 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"

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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 engine switch on (IG) 3. Enter the following menus: Body Electrical / Smart Key / Utility / Smart Code Registration **HINT:** **The engine switch cannot be turned on (IG) more than 10 times. After connecting the Techstream, turn the Techstream on while turning the driver's side 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 engine 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 engine switch (For details, refer to "Description of Code Registration") 2. Confirm that wireless door lock buzzer sounds once (short beep) 3. Place the unregistered key on the driver's seat 4. Confirm that the wireless door lock buzzer sounds once (short beep)
5. Registration of ID code •	Perform operation according to prompts on the Techstream screen
6. End of registration •	Finish new key ID code registration

- *1: Repeat this process for each key 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 is not finished within the specified time, perform the registration procedures again from 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.

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(c) PROCEDURE "C"

Additional key ID registration

PROCESS	PROCEDURE
1. Start of registration	1. Connect the Techstream to DLC3 2. Turn the engine 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 engine 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 engine 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's seat 4. Confirm that the wireless door lock buzzer sounds once (short beep)
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 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 is not finished within the specified time, perform the registration procedures again from 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:

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Erase all registered key codes except one.

PROCESS	PROCEDURE
1. Start of erasure	1. Connect the Techstream to DLC3 2. Turn the engine 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 engine 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 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.

(e) PROCEDURE "E"

All key ID erasure

HINT:

All the key codes registered in the vehicle are erased.

PROCESS	PROCEDURE
1. Start of erasure	1. Connect the Techstream to DLC3 2. Turn the engine switch on (IG) 3. Turn the Techstream on while turning driver side 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 Erasure
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
4. End of erasure •	Finish key ID code erasure

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(f) PROCEDURE "F"

ECU code registration

PROCESS	PROCEDURE
1. Start of registration	1. Connect the Techstream to DLC3 2. Turn the engine switch on (IG) 3. Enter the following menus: Body Electrical / Smart Key / Utility / ECU Communication ID Registration
2. Confirmation of registered key*1	1. Hold the registered key close to engine 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 registered for the vehicle. Finish the procedure within 30 seconds. If the procedure has not been finished within the specified time, perform the erasure procedures again from process 1.

(g) PROCEDURE "G"

ECU communication ID registration

NOTICE:

- The ECU communication ID should be registered when the ID code box (immobiliser code ECU) is replaced in order to match these ECU communication IDs.
- The engine cannot be started unless the ECU communication IDs match.
- After the registration, pressing the engine switch may not start the engine on the first try. If so, press the engine switch again.
- Clear DTC B2799 (code for ECM's immobiliser communication error) by either of the following:

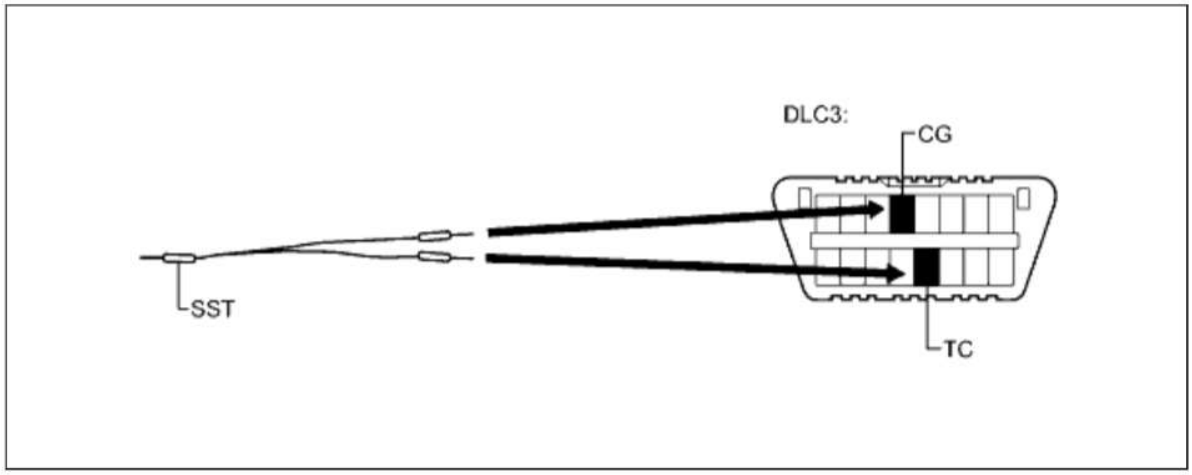
  - Use the Techstream.

  - Disconnect the battery for 30 seconds.

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

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

HINT:

Do not start the engine.

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

(4) Check that the engine starts and stays running for more than 3 seconds.

(h) PROCEDURE "H"

ECU communication ID registration

NOTICE:

The ECU communication ID should be registered when the ECM is replaced in order to match the ECU communication IDs.

PROCEDURE	SECURITY INDICATOR LIGHT CONDITION
1. Start	OFF
2. Hold an already registered key close to the engine switch and turn the engine switch on (IG) with the brake pedal depressed	
3. Check that the engine starts and stays running for more than 3 seconds	
4. Next	
5. End	

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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000QYA02UX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): SYSTEM DESCRIPTION (2010 Corolla)		

SYSTEM DESCRIPTION

1. ENGINE IMMOBILISER SYSTEM DESCRIPTION

(a) The immobiliser system is a theft deterrent system that determines whether to disable starting of the SFI system based on a comparison of the key ID codes and the vehicle pre-registered code. The immobiliser system compares the vehicle certification ECU (smart key ECU assembly) pre-registered 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 SFI system cannot be started. The certification ECU (smart key ECU assembly) manages communication with the ECM, main body ECU (instrument panel junction block), steering lock ECU and ID code box (immobiliser code ECU). When the ID codes of the transponder chip and certification ECU (smart key ECU assembly) match, the certification ECU (smart key ECU assembly) authorizes the SFI system to start.

2. FUNCTION OF MAIN COMPONENTS

COMPONENT	OUTLINE
Transponder key coil/amplifier (built into the engine switch)	Receives a key ID code, amplifies and outputs the code to the certification ECU (smart key ECU assembly).
Indoor electrical key oscillator	Transmits key detection signals within the detection area in the vehicle interior 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 vehicle interior and the engine switch is pushed.
Door control receiver	Receives an ID code from the key in the actuation area and transmits it to the certification ECU (smart key ECU assembly).
Security indicator	Illuminates or starts flashing. Illumination is controlled by the certification ECU (smart key ECU assembly).

3. SYSTEM FUNCTION

(a) Using the entry function

(1) When the driver (or passenger) is sitting in the vehicle while carrying the key, and the engine switch is pressed while the brake pedal is depressed, the main body ECU (instrument panel junction block) recognizes that the engine start operation has occurred and sends a certification request signal to the certification ECU (smart key ECU assembly). Upon receipt of the certification request signal, the certification ECU (smart key ECU assembly) sends a request signal to the indoor electrical key oscillator. Upon receipt of the request signal, the indoor electrical key oscillator sends a request signal to detect if the key is inside the vehicle. When the key receives this request signal, it answers by sending an ID code containing a

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response code through the glass antenna to the door control receiver. Upon receipt of the ID code, the certification ECU (smart key ECU assembly) analyzes the code. If the interior certification passes, then the main body ECU (instrument panel junction block) sends a certification pass response signal. When the main body ECU (instrument panel junction block) receives this signal, the ACC relay is switched on and the IG1 and IG2 relays are switched on in sequence. At this time, the engine switch indicator illuminates in green. Then the certification ECU (smart key ECU assembly) checks that the power source mode has been changed and sends a steering lock command signal to the main body ECU (instrument panel junction block). After receiving this signal, the main body ECU (instrument panel junction block) supplies power to the steering lock actuator. Then the steering lock ECU confirms that the certification ECU (smart key ECU assembly) is certified (via the ID code box (immobiliser code ECU)) and drives the steering actuator motor until the steering is unlocked. After unlocking the steering, an unlock completed signal is sent to the certification ECU (smart key ECU assembly). Upon receipt of this signal, the certification ECU (smart key ECU assembly) sends an unset command signal to the ID code box (immobiliser code ECU). Once this signal is received, the ID code box (immobiliser code ECU) confirms that the certification ECU (smart key ECU assembly) is certified, sends an immobiliser unset command signal to the ECM, and sends a security indicator light off signal to the certification ECU (smart key ECU assembly).

(b) Not using the entry function (when the key battery is depleted)

(1) When the driver is sitting in the vehicle while carrying the key and depressing the brake pedal, the main body ECU (instrument panel junction block) recognizes that the stop light switch is on and sends a key confirmation request signal to the certification ECU (smart key ECU assembly). Upon receipt of this signal, the certification ECU (smart key ECU assembly) drives the immobiliser amplifier built in the engine switch. At this time, the engine switch sends an RF wave communication signal to the immobiliser. If the driver holds the key up to the engine switch at this time, the engine switch receives the immobiliser RF wave signal and responds by sending a radio wave signal. When the engine switch receives the radio wave signal from the key, it duplicates the signal and sends an ID code to the certification ECU (smart key ECU assembly). Upon receipt of the ID code, the code is analyzed. If the certification passes, the certification ECU sends a key certification pass response signal to the main body ECU (instrument panel junction block) and a sound buzzer request signal to the meter ECU. When the main body ECU (instrument panel junction block) receives this signal, the ACC relay is switched on and the IG1 and IG2 relays are switched on in sequence. At this time, the engine switch indicator illuminates in green. Then the certification ECU (smart key ECU assembly) checks that the power source mode has been changed and sends a steering lock command signal to the main body ECU (instrument panel junction block). After receiving this signal, the main body ECU (instrument panel junction block) supplies power to the steering lock actuator. Then the steering lock ECU confirms that the certification ECU (smart key ECU assembly) is certified (via the ID code box (immobiliser code ECU)) and drives the steering actuator motor until the steering is unlocked. After unlocking the steering, an unlock completed signal is sent to the certification ECU (smart key ECU assembly). Upon receipt of this signal, the certification ECU (smart key ECU assembly) sends an unset command signal to the ID code box (immobiliser code ECU). Once this signal is received, the ID code box (immobiliser code ECU) confirms that the certification ECU (smart key ECU assembly) is certified, sends an immobiliser unset command signal to the ECM, and sends a security indicator light off signal to the certification ECU (smart key ECU assembly).



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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000QY4038X
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): HOW TO PROCEED WITH TROUBLESHOOTING (2010 Corolla)		

HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

- Use the following procedures to troubleshoot the engine immobiliser system.
- *: Using 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?	Driving conditions, weather conditions
How did it happen?	Problem symptoms

NEXT

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3.	INSPECT BATTERY VOLTAGE

(a) Measure the battery voltage.

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.	CRANK ENGINE FOR MORE THAN 10 SECONDS

NEXT

5.	CHECK FOR DTC*

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

(b) Clear the DTCs.

(c) Recheck for DTCs. Based on the DTCs output above, try to duplicate the SFI system DTC, engine immobiliser system DTC, steering lock system DTC or smart key system (for start function) DTC by simulating the symptoms indicated by the DTCs.

Result:

RESULT	PROCEED TO
SFI system DTC output recurs	A
Engine immobiliser system DTC output recurs	B
Steering lock system DTC output recurs	C

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RESULT	PROCEED TO
Smart key system (for start function) DTC output recurs	D
DTC output does not recur	E

A ▶ INFO **Go to DIAGNOSTIC TROUBLE CODE CHART**

B ▶ INFO **Go to DIAGNOSTIC TROUBLE CODE CHART**

C ▶ INFO **Go to DIAGNOSTIC TROUBLE CODE CHART**

D ▶ INFO **Go to DIAGNOSTIC TROUBLE CODE CHART**

E ▼

6.	PROBLEM SYMPTOMS TABLE

(a) Refer to Problem Symptoms Table INFO .

Result:

RESULT	PROCEED TO
Fault is listed in problem symptoms table	A
Fault is not listed in problem symptoms table	B

A ▶ **GO TO STEP 8**

B ▼

7.	OVERALL ANALYSIS AND TROUBLESHOOTING*

(a) Data List / Active Test INFO

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(b) Terminals of ECU INFO

NEXT

8.	REPAIR OR REPLACE

NEXT

9.	CONFIRMATION TEST

NEXT END

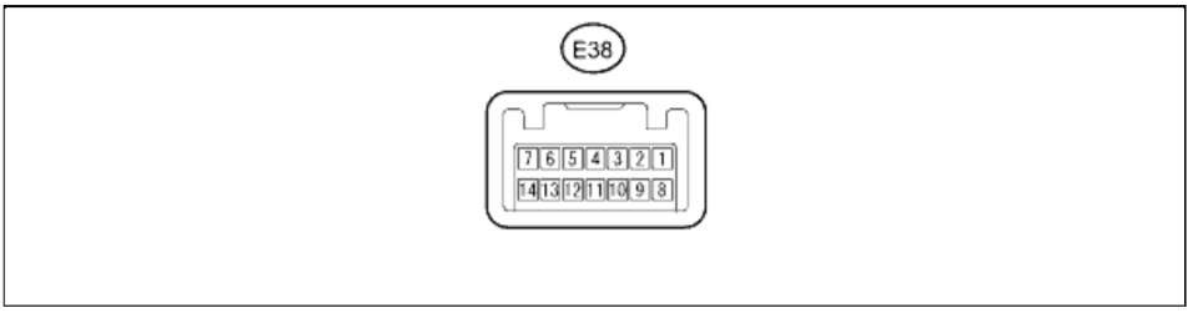
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Last Modified: 3-10-2010	6.4 U	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000QY702ZX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): TERMINALS OF ECU (2010 Corolla)		

TERMINALS OF ECU

1. CHECK ENGINE SWITCH

(a) Disconnect the E38 engine switch connector.



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

TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
E38-8 (AGND) - Body ground	BR - Body ground*1 GR - Body ground*2	Ground	Always	Below 1 Ω

- *1: for TMC Made
- *2: Except for TMC Made

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

(c) Reconnect the E38 engine switch 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
E38-8 (AGND) - Body ground	BR - Body ground*1 GR - Body ground*2	Ground	Always	Below 1 Ω
E38-14 (VC5) - E38-8 (AGND)	SB - BR*1 BE - GR*2	Power supply	Key is not in cabin	Below 1 V

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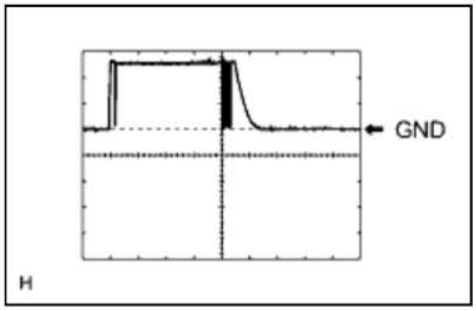
TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
E38-14 (VC5) - E38-8 (AGND)	SB - BR*1 BE - GR*2	Power supply	Key is in cabin*	4.6 to 5.4 V
E38-10 (CODE) - E38-8 (AGND)	P - BR*1 G - GR*2	Demodulated signal of key code data	Key is not in cabin	Below 1 V
E38-10 (CODE) - E38-8 (AGND)	P - BR*1 G - GR*2	Demodulated signal of key code data	Press engine switch and hold key close to engine switch*	Pulse generation (See waveform 1)
E38-9 (TXCT) - E38-8 (AGND)	L - BR*1 SB - GR*2	Key code output signal	Key is not in cabin	Below 1 V
E38-9 (TXCT) - E38-8 (AGND)	L - BR*1 SB - GR*2	Key code output signal	Press engine switch and hold key close to engine switch*	Pulse generation (See waveform 2)

- *1: for TMC Made
- *2: Except for TMC Made

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

(e) Inspect using an oscilloscope.

(1) Waveform 1 (Reference)



ITEM	CONTENT
Tester Connection	E38-10 (CODE) - E38-8 (AGND)
Tool Setting	2 V/DIV., 50 ms./DIV.
Condition	Press engine switch and hold key close to engine switch*

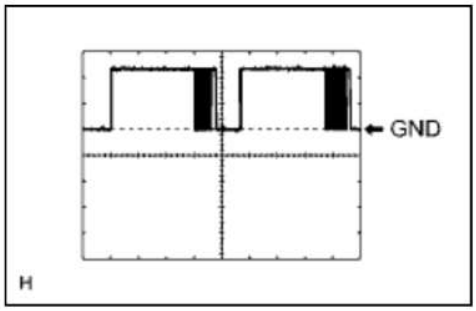
HINT:

***: Remove the key battery before performing this inspection.**

(2) Waveform 2 (Reference)

ITEM	CONTENT
Tester Connection	E38-9 (TXCT) - E38-8 (AGND)

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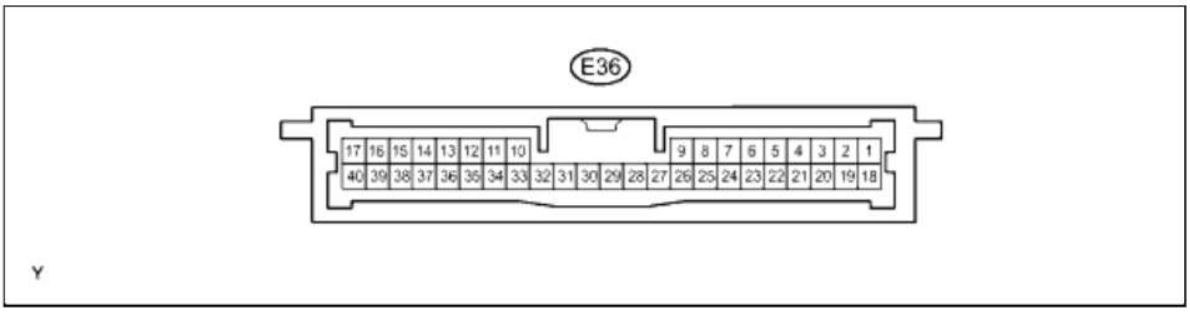
Tool Setting	2 V/DIV., 50 ms./DIV.
Condition	Press engine switch and hold key close to engine switch*

HINT:

***: Remove the key battery before performing this inspection.**

2. CHECK CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

(a) Disconnect the E36 certification ECU (smart key ECU assembly) 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
E36-17 (E) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
E36-1 (+B) - E36-17 (E)	W - W-B*1 BR - W-B*2	+B power supply	Always	11 to 14 V
E36-18 (IG) - E36-17 (E)	L - W-B*1 B - W-B*2	Ignition power supply	Engine switch off	Below 1 V

- *1: for TMC Made
- *2: Except for TMC Made

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

(c) Reconnect the E36 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
E36-40 (AGND) - Body ground	BR - Body ground*1 GR - Body	Engine switch ground	Always	Below 1 Ω

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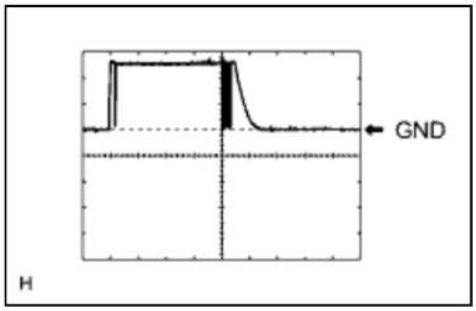
TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
	ground*2			
E36-30 (VC5) - E36-40 (AGND)	SB - BR*1 BE - GR*2	Engine switch power supply	Key is not in cabin	Below 1 V
E36-30 (VC5) - E36-40 (AGND)	SB - BR*1 BE - GR*2	Engine switch power supply	Key is in cabin*	4.6 to 5.4 V
E36-9 (CODE) - E36-40 (AGND)	P - BR*1 G - GR*2	Engine switch CODE input	Key is not in cabin	Below 1 V
E36-9 (CODE) - E36-40 (AGND)	P - BR*1 G - GR*2	Engine switch CODE input	Press engine switch and hold key close to engine switch*	Pulse generation (See waveform 1)
E36-8 (TXCT) - E36-40 (AGND)	L - BR*1 SB - GR*2	Engine switch TXCT output	Key is not in cabin	Below 1 V
E36-8 (TXCT) - E36-40 (AGND)	L - BR*1 SB - GR*2	Engine switch TXCT output	Press engine switch and hold key close to engine switch*	Pulse generation (See waveform 2)

- *1: for TMC Made
- *2: Except for TMC Made

- 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	E36-9 (CODE) - E36-40 (AGND)
Tool Setting	2 V/DIV., 50 ms./DIV.
Condition	Press engine switch and hold key close to engine switch*

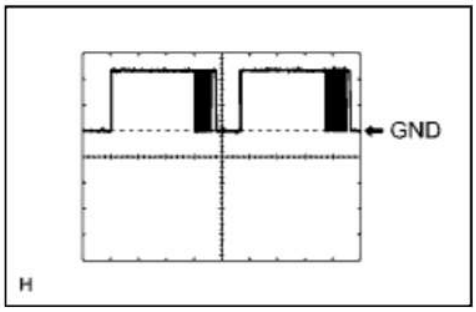
HINT:

***: Remove the key battery before performing this inspection.**

(2) Waveform 2 (Reference)

ITEM	CONTENT

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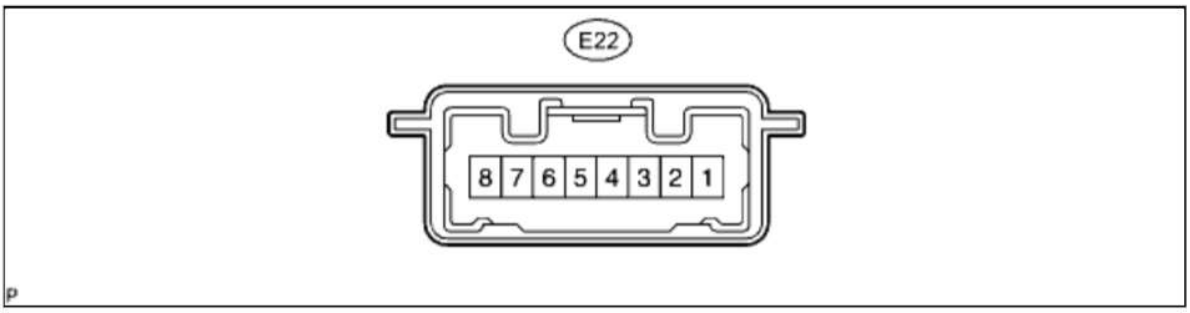
Tester Connection	E36-8 (TXCT) - E36-40 (AGND)
Tool Setting	2 V/DIV., 50 ms./DIV.
Condition	Press engine switch and hold key close to engine switch*

HINT:

***: Remove the key battery before performing this inspection.**

3. CHECK ID CODE BOX (IMMOBILISER CODE ECU)

(a) Disconnect the E22 ID code box (immobiliser code ECU) 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
E22-8 (GND) - Body ground	BR - Body ground	Ground	Always	Below 1 Ω
E22-1 (+B) - E22-8 (GND)	W - BR*1 BR - BR*2	+B power supply	Always	11 to 14 V

- *1: for TMC Made
- *2: Except for TMC Made

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

(c) Reconnect the E22 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
E22-5 (EFII) - E22-8 (GND)	LG - BR	ECM input signal	Engine switch off	10 to 14 V

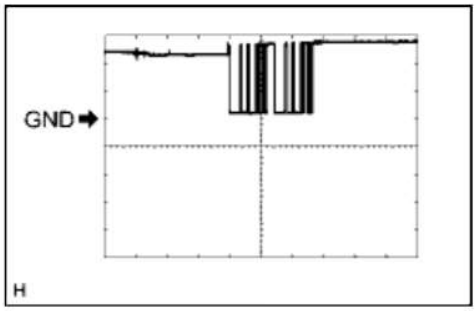
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TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
E22-5 (EFII) - E22-8 (GND)	LG - BR	ECM input signal	Within 3 seconds after starter operates and initial combustion occurs, or within 3seconds after engine switch first turned on (IG) after battery disconnected and connected.	Pulse generation (see waveform 1)
E22-6 (EFIO) - E22-8 (GND)	P - BR	ECM output signal	Engine switch off	Below 1 V
E22-6 (EFIO) - E22-8 (GND)	P - BR	ECM output signal	Engine switch on (IG)	Pulse generation (see waveform 2)

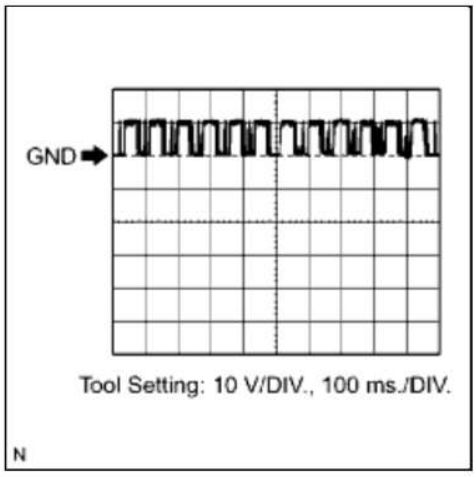
- If the result is not as specified, the ID code box (immobiliser code ECU) may have a malfunction.

(e) Inspect using an oscilloscope.

(1) Waveform 1 (Reference)



ITEM	CONTENT
Tester Connection	E22-5 (EFII) - E22-8 (GND)
Tool Setting	5 V/DIV., 500 ms./DIV.
Condition	Within 3 seconds after starter operates and initial combustion occurs, or within 3seconds after engine switch first turned on (IG) after battery disconnected and connected.



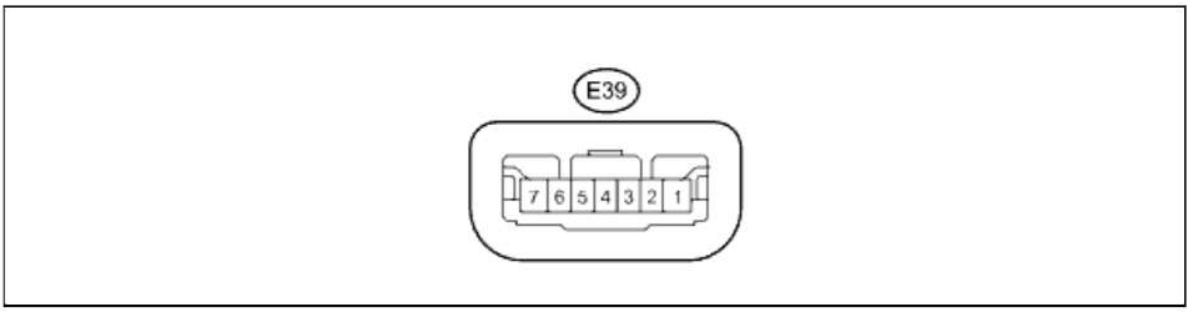
(2) Waveform 2 (Reference)

ITEM	CONTENT
Tester Connection	E22-6 (EFIO) - E22-8 (GND)
Tool Setting	10 V/DIV., 100 ms./DIV.
Condition	Engine switch on (IG)

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4. CHECK STEERING LOCK ECU

(a) Disconnect the E39 steering lock ECU connector.



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

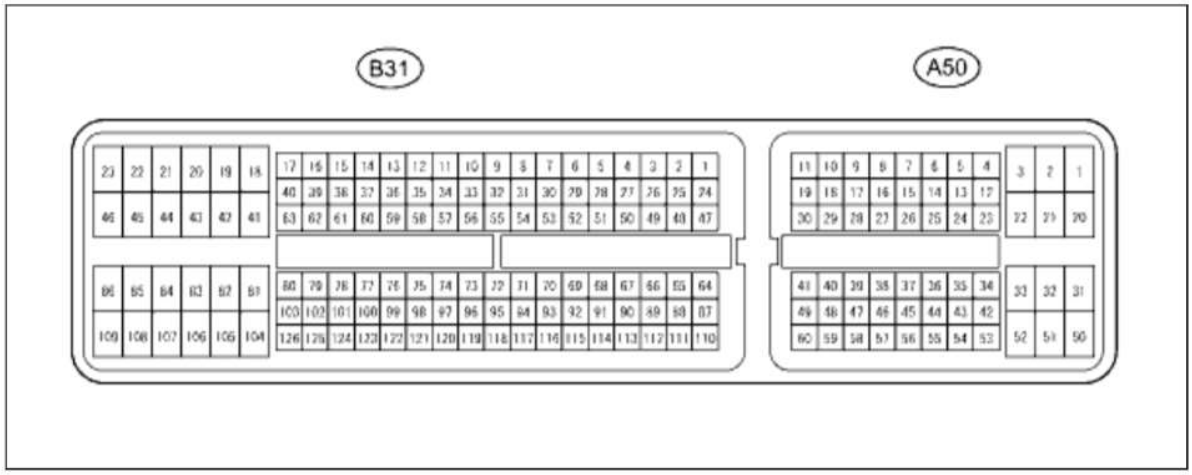
TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
E39-2 (SGND) - Body ground	BR - Body ground*1 W-B - Body ground*2	Ground	Always	Below 1 Ω
E39-1 (GND) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
E39-7 (B) - Body ground	L - Body ground	+B power supply	Always	11 to 14 V
E39-6 (IG2) - Body ground	B - Body ground	Ignition power supply	Engine switch off	0 V
			Engine switch on (IG)	11 to 14 V

- *1: for TMC Made
- *2: Except for TMC Made

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

5. CHECK ECM

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

TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
A50-11 (IMI) - B31-104 (E1)	P - BR	ID code box (immobiliser code ECU) input signal	Engine switch off	Below 1 V
A50-11 (IMI) - B31-104 (E1)	P - BR	ID code box (immobiliser code ECU) input signal	Engine switch on (IG)	Pulse generation (See waveform 1)
A50-10 (IMO) - B31-104 (E1)	LG-B - BR	ID code box (immobiliser code ECU) output signal	Engine switch off	10 to 14 V
A50-10 (IMO) - B31-104 (E1)	LG-B - BR	ID code box (immobiliser code ECU) output signal	Within 3 seconds after starter operates and initial combustion occurs, or within 3seconds after engine switch first turned on (IG) after battery disconnected and connected.	Pulse generation (See waveform 2)

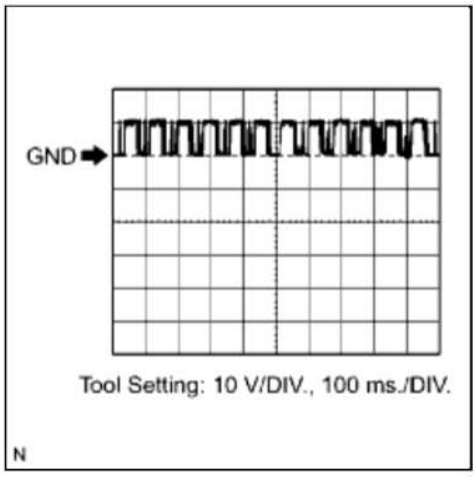
If the result is not as specified, the ECM may have a malfunction.

(b) Inspect using an oscilloscope.

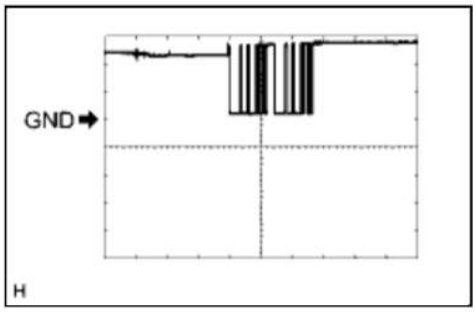
(1) Waveform 1 (Reference)

ITEM	CONTENT
Tester Connection	A50-11 (IMI) - B31-104 (E1)
Tool Setting	10 V/DIV., 100 ms./DIV.
Condition	Engine switch on (IG)

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(2) Waveform 2 (Reference)



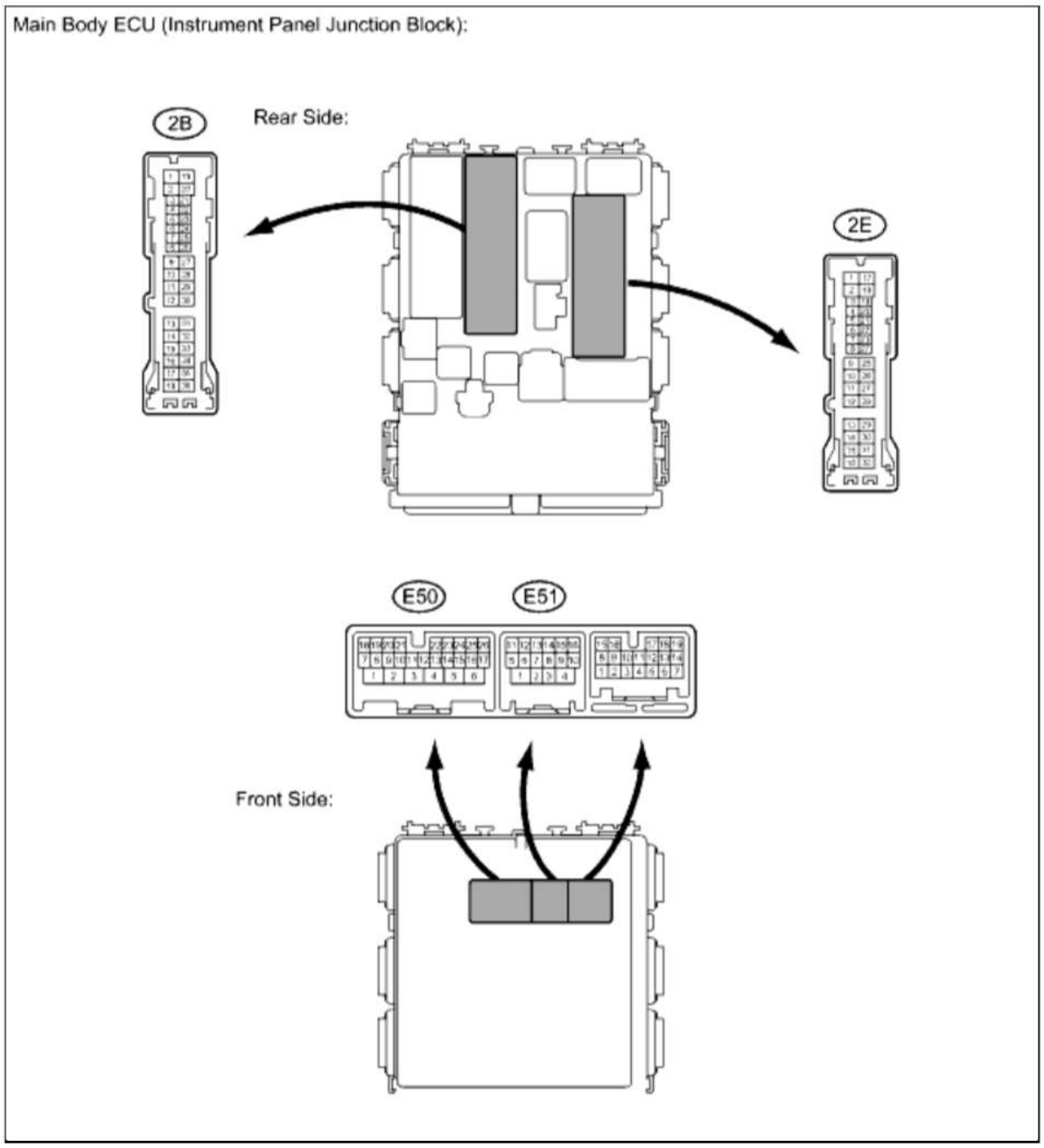
ITEM	CONTENT
Tester Connection	A50-10 (IMO) - B31-104 (E1)
Tool Setting	5 V/DIV., 500 ms./DIV.
Condition	Within 3 seconds after starter operates and initial combustion occurs, or within 3seconds after engine switch first turned on (IG) after battery disconnected and connected.

6. CHECK MAIN BODY ECU (INSTRUMENT PANEL JUNCTION BLOCK)

(a) Disconnect the 2B and 2E instrument panel junction block connectors.

(b) Disconnect the E50 and E51 main body ECU connectors.

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

TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
2E-17 (GND1) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
E51-4 (GND2) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
E51-1 (AM1) - Body ground	Y - Body ground*1 L - Body	+B power supply	Always	11 to 14 V

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TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
	ground*2			
E50-6 (AM2) - Body ground	W - Body ground*1 L - Body ground*2	+B power supply	Always	11 to 14 V
2B-30 (BECU) - Body ground	W - Body ground	+B power supply	Always	11 to 14 V

- *1: for TMC Made
- *2: Except for TMC Made

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

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Last Modified: 3-10-2010	6.4 T	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000027KK01FX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): PROBLEM SYMPTOMS TABLE (2010 Corolla)		

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
	ID code box power source circuit	INFO
	Certification ECU power source circuit	INFO
	Steering lock ECU power source circuit	INFO
	Smart key system	INFO
	SFI system	INFO
Security indicator is always ON.	Wire harness or connector	INFO
	Telltale light assembly	-
	Certification ECU (smart key ECU assembly)	-
Security indicator is OFF.	Wire harness or connector	INFO
	Telltale light assembly	-
	Certification ECU (smart key ECU assembly)	-

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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001GV7030X
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): DIAGNOSIS SYSTEM (2010 Corolla)		

DIAGNOSIS SYSTEM

1. DESCRIPTION

(a) The certification ECU (smart key ECU assembly) controls the vehicle's engine immobiliser system functions. Engine immobiliser system data and Diagnostic Trouble Code (DTC) can be read through the vehicle's Data Link Connector 3 (DLC3).

In some cases, a malfunction may be occurring in the 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.

Standard Voltage:
11 to 14 V

If the voltage is below 11 V, recharge or replace the battery before proceeding to the next step.

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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001GV8024X
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): DTC CHECK / CLEAR (2010 Corolla)		

DTC CHECK / CLEAR

1. CHECK DTC

(a) Connect the Techstream to the DLC3.

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

(c) Turn the Techstream on.

(d) Enter the following menus: Body Electrical / (desired system) / Trouble Codes.

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

.

2. CLEAR DTC

(a) Connect the Techstream to the DLC3.

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

(c) Turn the Techstream on.

(d) Enter the following menus: Body Electrical / (desired system) / Trouble Codes.

(e) Clear the DTCs.



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Last Modified: 3-10-2010	6.4 U	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000QYE02CX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): DATA LIST / ACTIVE TEST (2010 Corolla)		

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 engine 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	Engine switch on (IG) signal / ON or OFF	ON: Engine switch on (ACC, IG) or engine started OFF: Engine switch off	-
ACC Switch	Engine switch on (ACC) signal / ON or OFF	ON: Engine switch on (ACC, IG) or engine started OFF: Engine switch off	-
Immobiliser	Immobiliser system status / SET or UNSET	SET: Key is not in cabin UNSET: Key is in cabin	-
Master Key	Master key code signal / MATCH or NO MATCH	MATCH: Master key code is sent NO MATCH: Unmatched master key code is sent	-
Sub Key	Sub-key (Master key) code signal / MATCH or NO MATCH	MATCH: Sub-key (master key) code is sent NO MATCH: Unmatched sub-key (master key) code is sent	-

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TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
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	-

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 engine switch on (IG).

(c) Turn the Techstream on.

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

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

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

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Security Indicator	Security indicator light	ON/OFF	-



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Last Modified: 3-10-2010	6.4 S	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000QY6027X
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): DIAGNOSTIC TROUBLE CODE CHART (2010 Corolla)		

DIAGNOSTIC TROUBLE CODE CHART

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. Engine switch 3. Certification ECU (smart key ECU assembly)	INFO
B2785	Communication Malfunction between ECUs Connected by LIN	1. Certification ECU (smart key ECU assembly) 2. Main body ECU (instrument panel junction block) 3. Steering lock ECU 4. ID code box (immobiliser code ECU) 5. Wire harness or connector	INFO
B2786	No Response from Steering Lock ECU	1. Steering lock ECU 2. Certification ECU (smart key ECU assembly) 3. Wire harness or connector	INFO
B2789	No Response from ID BOX	1. ID code box (immobiliser code ECU) 2. Certification ECU (smart key ECU assembly) 3. Wire harness or connector	INFO
B278A	Short to GND in Immobiliser System Power Source Circuit	1. Wire harness or connector 2. Engine switch 3. Certification ECU (smart key ECU assembly)	INFO
B2790	ID BOX EEPROM Malfunction	ID code box (immobiliser code ECU)	INFO

2. ECM DIAGNOSTIC TROUBLE CODE CHART

HINT:

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

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ECM

DTC CODE	DETECTION ITEM	TROUBLE AREA	SEE PAGE
B2799	Engine Immobiliser System Malfunction	1. Wire harness or connector 2. ECM 3. ID code box (immobiliser code ECU)	INFO
B279A	Theft Deterrent System Communication Line High Fixation	1. Wire harness or connector 2. ECM 3. ID code box (immobiliser code ECU)	INFO
B279C	Theft Deterrent System Presence Detection	ECM	INFO

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000QYJ03DX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): B2784: Antenna Coil Open / Short (2010 Corolla)		

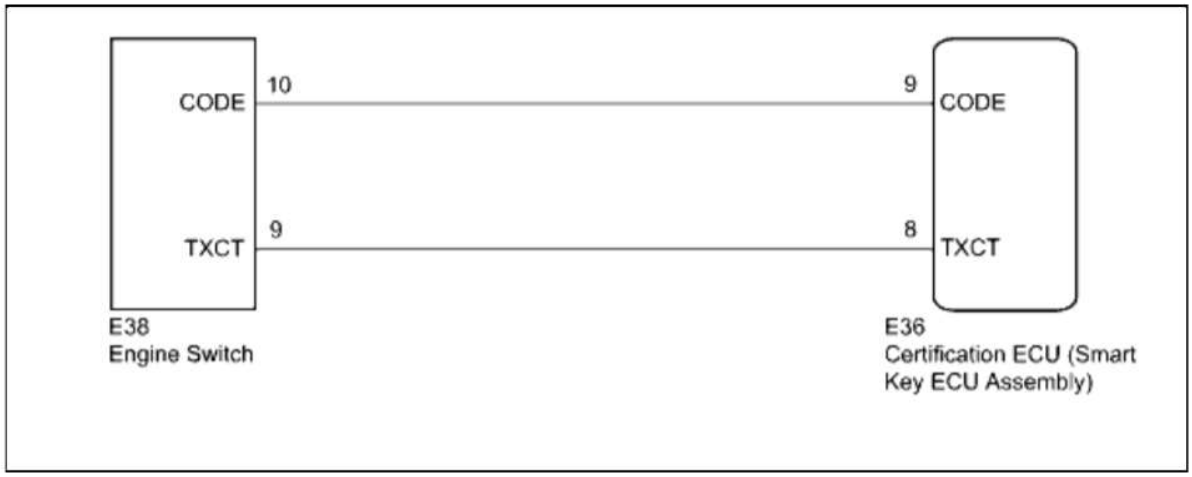
DTC	**B2784**	**Antenna Coil Open / Short**

DESCRIPTION

This DTC is output when there is an open or short in the key coil (built into the engine switch).

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B2784	Antenna coil is open/shorted	• Wire harness or connector • Certification ECU (smart key ECU assembly) • Engine switch

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

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

PROCEDURE

1.	**CHECK DTC OUTPUT**

(a) Clear the DTCs INFO .

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(b) Recheck for DTCs.

OK:

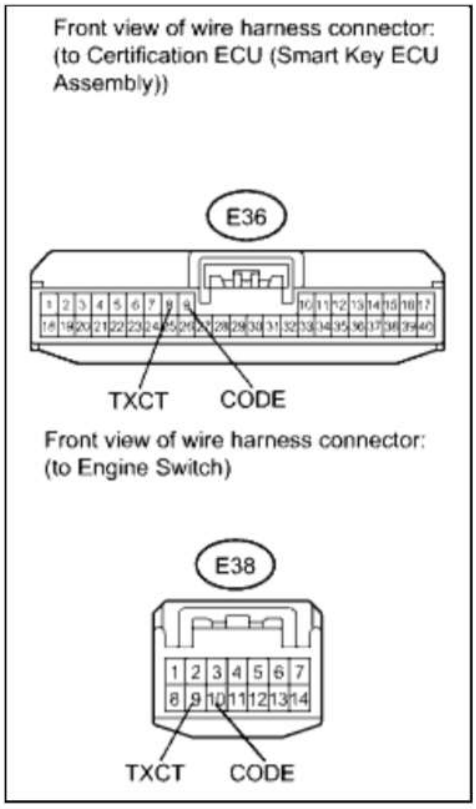
B2784 is not reoutput.

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

OK ▶ **USE SIMULATION METHOD TO CHECK**

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

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



(b) Disconnect the engine switch connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E36-9 (CODE) - E38-10 (CODE)	Always	Below 1 Ω
E36-8 (TXCT) - E38-9 (TXCT)	Always	Below 1 Ω
E36-9 (CODE) - Body ground	Always	10 kΩ or higher

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TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E36-8 (TXCT) - Body ground	Always	10 kΩ or higher

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

OK
▼

3.	REPLACE ENGINE SWITCH

(a) Replace the engine switch INFO.

NEXT
▼

4.	CHECK DTC OUTPUT

(a) Clear the DTCs INFO.

(b) Recheck for DTCs.

OK:
B2784 is not reoutput.

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

OK ▶ **END (ENGINE SWITCH IS DEFECTIVE)**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000030N300MX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): B2785: Communication Malfunction between ECUs Connected by LIN (2010 Corolla)		

DTC	**B2785**	**Communication Malfunction between ECUs Connected by LIN**

DESCRIPTION

Refer to DTC B2785 (LIN Communication System) INFO .

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B2785	• Error in LIN communication between ECUs and an open or short in communication lines • LIN communication from certification ECU stops for a set amount of time or more	• Certification ECU (smart key ECU assembly) • Main body ECU (Instrument panel junction block) • Steering lock ECU • ID code box (immobiliser code ECU) • Wire harness or connector

WIRING DIAGRAM

Refer to DTC B2785 (LIN Communication System) INFO .

INSPECTION PROCEDURE

Refer to DTC B2785 (LIN Communication System) INFO .

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000030N400MX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): B2786: No Response from Steering Lock ECU (2010 Corolla)		

DTC	**B2786**	**No Response from Steering Lock ECU**

DESCRIPTION

Refer to DTC B2786 (LIN Communication System) INFO .

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B2786	No communication between steering lock ECU and main body ECU (instrument panel junction block) for more than 10 seconds	• Steering lock ECU • Certification ECU (smart key ECU assembly) • Wire harness or connector

WIRING DIAGRAM

Refer to DTC B2786 (LIN Communication System) INFO .

INSPECTION PROCEDURE

Refer to DTC B2786 (LIN Communication System) INFO .

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000030N500LX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): B2789: No Response from ID BOX (2010 Corolla)		

DTC	**B2789**	**No Response from ID BOX**

DESCRIPTION

Refer to DTC B2789 (LIN Communication System) INFO .

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B2789	No communication between certification ECU (smart key ECU assembly) and ID code box (immobiliser code ECU) for more than 10 seconds	• ID code box (immobiliser code ECU) • Certification ECU (smart key ECU assembly) • Wire harness or connector

WIRING DIAGRAM

Refer to DTC B2789 (LIN Communication System) INFO .

INSPECTION PROCEDURE

Refer to DTC B2789 (LIN Communication System) INFO .

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000TUF035X
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): B278A: Short to GND in Immobiliser System Power Source Circuit (2010 Corolla)		

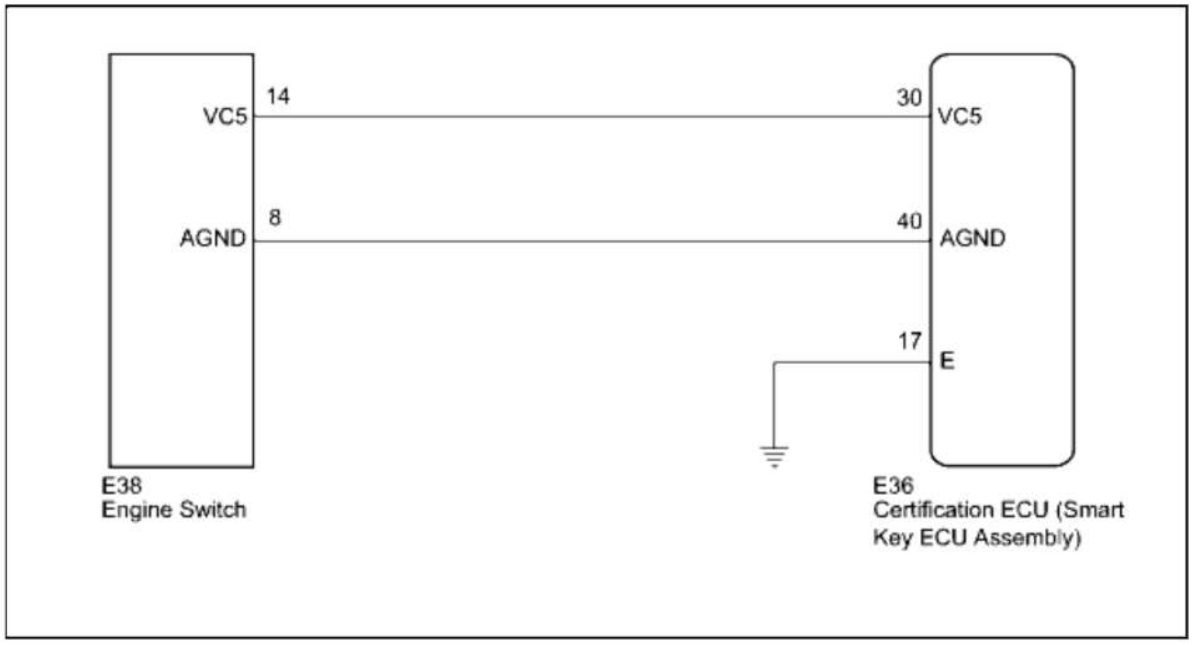
DTC	**B278A**	**Short to GND in Immobiliser System Power Source Circuit**

DESCRIPTION

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

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B278A	Engine switch power source supply line is open or shorted	• Wire harness or connector • Engine switch • Certification ECU (smart key ECU assembly)

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

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

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PROCEDURE

1.	CHECK DTC OUTPUT

(a) Clear the DTCs INFO.

(b) Recheck for DTCs.

OK:

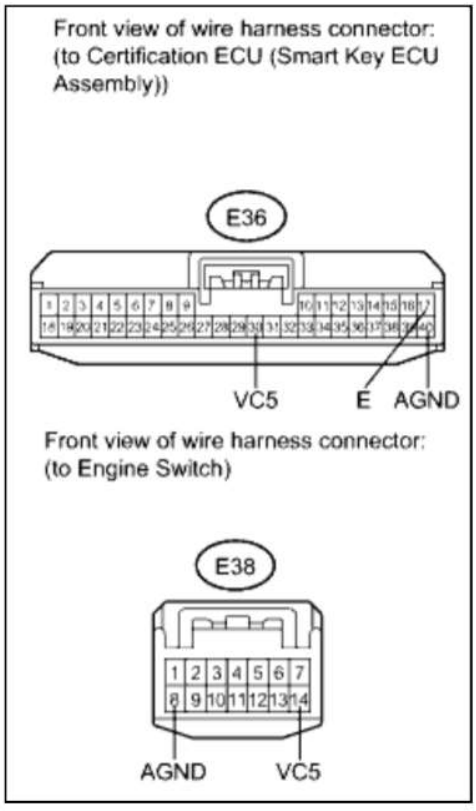
B278A is not reoutput.

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

OK ▶ USE SIMULATION METHOD TO CHECK

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

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



(b) Disconnect the engine switch connector.

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

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Standard Resistance:

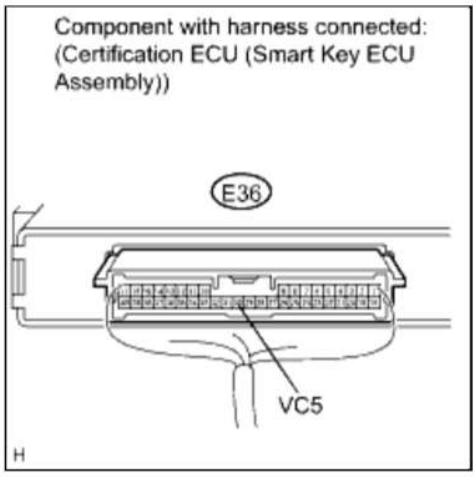
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E36-30 (VC5) - E38-14 (VC5)	Always	Below 1 Ω
E36-40 (AGND) - E38-8 (AGND)	Always	Below 1 Ω
E36-17 (E) - Body ground	Always	Below 1 Ω
E36-30 (VC5) - Body ground	Always	10 kΩ or higher
E36-40 (AGND) - Body ground	Always	10 kΩ or higher

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

OK ▼

3.	CHECK HARNESS AND CONNECTOR (ENGINE SWITCH POWER SOURCE)

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



(b) Reconnect the engine switch connector.

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

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E36-30 (VC5) - Body ground	Key is not in cabin	Below 1 V
E36-30 (VC5) - Body ground	Engine switch pressed	4.6 to 5.4 V

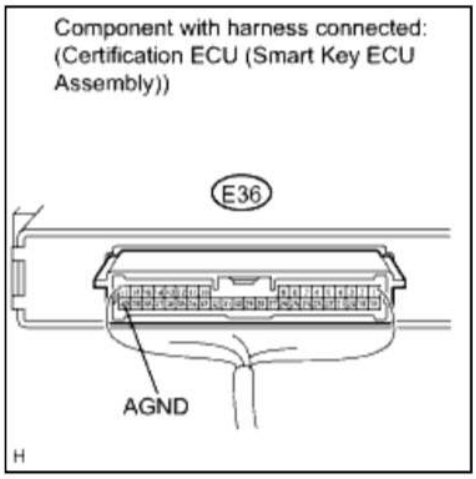
NG ▶ **REPLACE CERTIFICATION ECU (SMART KEY ECU**

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ASSEMBLY)

OK

4.	CHECK HARNESS AND CONNECTOR (ENGINE SWITCH BODY GROUND)



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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E36-40 (AGND) - Body ground	Always	Below 1 Ω

NG ▶ REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

OK ▶ REPLACE ENGINE SWITCH

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000TUG02PX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): B2790: ID BOX EEPROM Malfunction (2010 Corolla)		

DTC	**B2790**	**ID BOX EEPROM Malfunction**

DESCRIPTION

This DTC is output 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)

INSPECTION PROCEDURE

NOTICE:

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 .

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NEXT

3.	ECU COMMUNICATION ID REGISTRATION

(a) Register the ECU communication ID INFO .

NEXT END (ID CODE BOX (IMMOBILISER CODE ECU) IS DEFECTIVE)

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000SJV02YX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): B2799: Engine Immobiliser System Malfunction (2010 Corolla)		

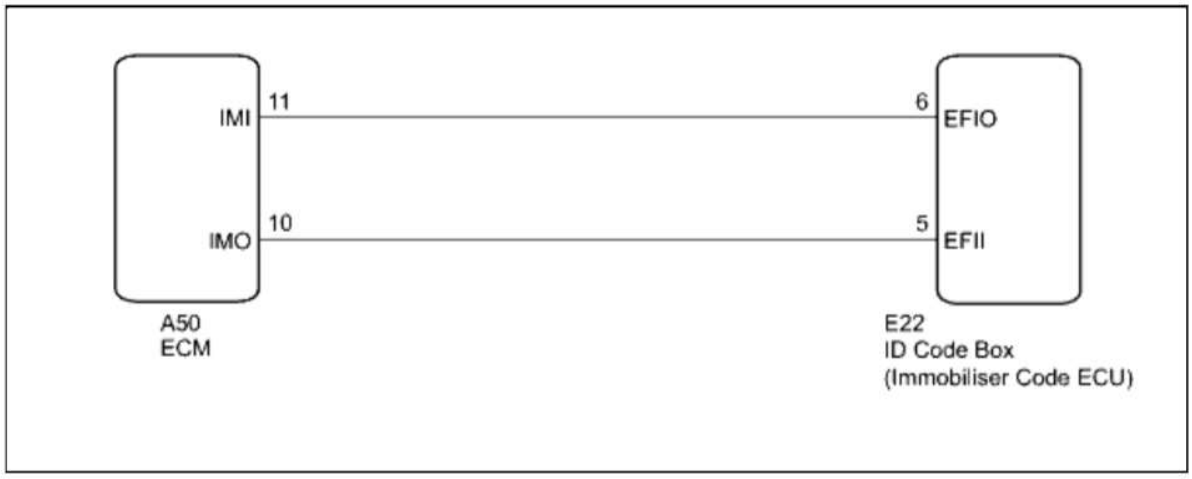
DTC	**B2799**	**Engine Immobiliser System Malfunction**

DESCRIPTION

This DTC is output when one of the following occurs: 1) the ECM detects errors in its own communications with the ID code box (immobiliser code ECU); 2) the ECM detects errors in the communication lines; or 3) the ECU communication ID between the ID code box (immobiliser code ECU) and ECM is different and an engine start is attempted. 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 ECM and ID code box (immobiliser code ECU) • Error in communication lines • Communication ID is different between ID code box (immobiliser code ECU) and ECM during communication	• Wire harness or connector • ECM • ID code box (immobiliser code ECU)

WIRING DIAGRAM



INSPECTION PROCEDURE

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NOTICE:

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

PROCEDURE

1.	**CHECK DTC OUTPUT**

(a) Clear the DTCs INFO .

(b) Recheck for DTCs.

OK:
B2799 is not reoutput.

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.

OK:
B2799 is not reoutput.

NG ▶ **CHECK CONNECTION OF CONNECTOR**

OK ▶ **END (ECU COMMUNICATION ID IS DEFECTIVE)**

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4.	CHECK CONNECTION OF CONNECTOR

(a) Turn the engine switch off.

(b) Check that the connectors are properly connected to the ECM and ID code box (immobiliser code ECU).

OK:

Connectors are properly connected.

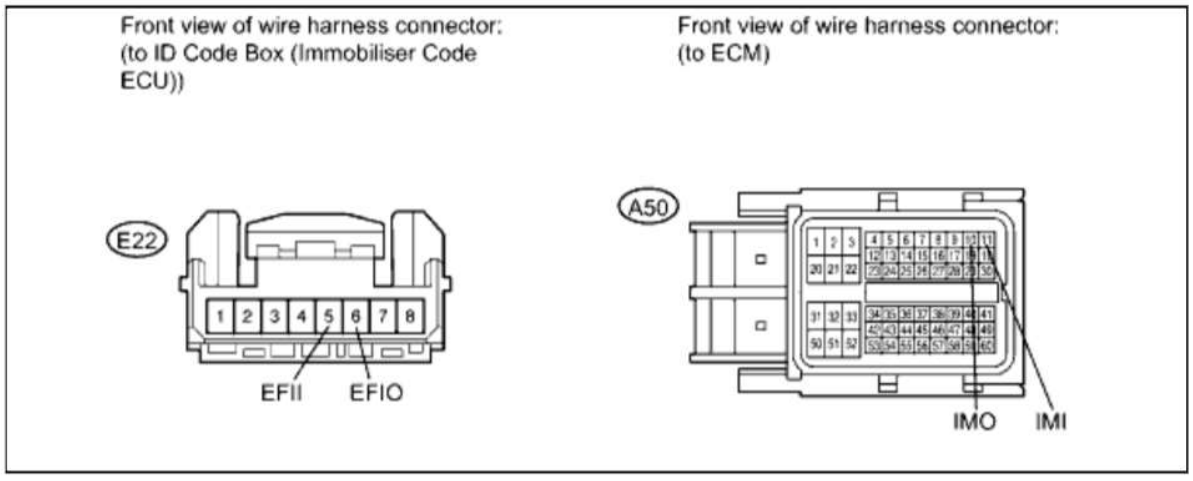
NG ▶ CONNECT CONNECTORS PROPERLY

OK ▼

5.	CHECK HARNESS AND CONNECTOR (ID CODE BOX - ECM)

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

(b) Disconnect the ECM connector.



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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E22-5 (EFII) - A50-10 (IMO)	Always	Below 1 Ω
E22-6 (EFIO) - A50-11 (IMI)	Always	Below 1 Ω

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TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E22-5 (EFII) - Body ground	Always	10 kΩ or higher
E22-6 (EFIO) - Body ground	Always	10 kΩ or higher

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

OK
▼

6.	**REPLACE ECM**

(a) Replace the ECM INFO .

NEXT
▼

7.	**REGISTER ECU COMMUNICATION ID**

(a) Register the ECU communication ID INFO .

NEXT
▼

8.	**CHECK DTC OUTPUT**

(a) Clear the DTCs INFO .

(b) Recheck for DTCs.

OK:
B2799 is not reoutput.

NG ▶ **REPLACE ID CODE BOX (IMMOBILISER CODE ECU)**

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OK ▶ END (ECM IS DEFECTIVE)

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000002UBW01AX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): B279A: Theft Deterrent System Communication Line High Fixation (2010 Corolla)		

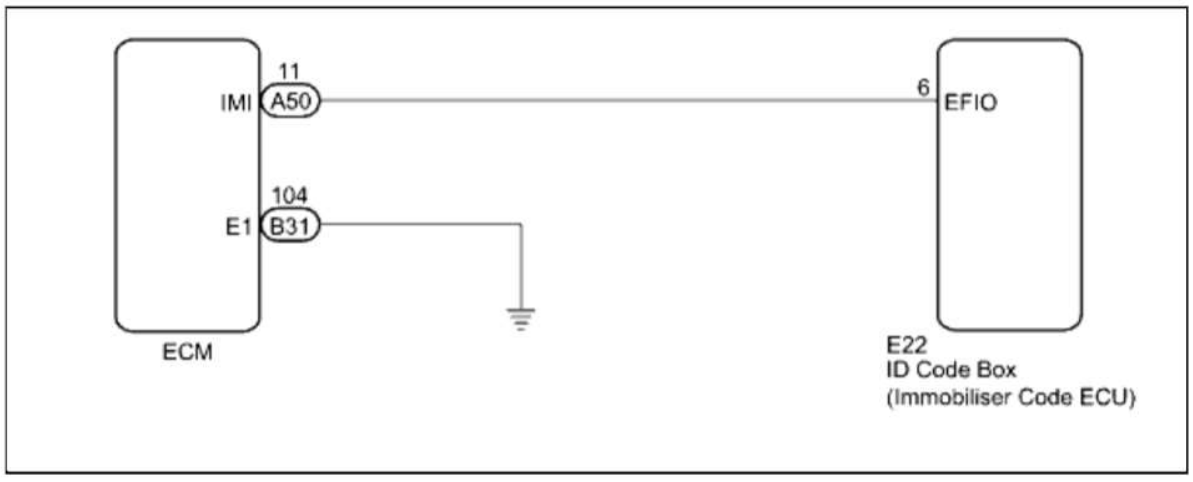
DTC	**B279A**	**Theft Deterrent System Communication Line High Fixation**

DESCRIPTION

If the communication line (EFIO-IMI) to the ID code box (immobiliser code ECU) is stuck on HI output, the ECM outputs this DTC.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B279A	When communication line (EFIO-IMI) between ECM and the immobiliser code ECU is stuck on HI output	• Wire harness or connector • ID code box (immobiliser code ECU) • ECM

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

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

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PROCEDURE

1.	CHECK DTC OUTPUT

(a) 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

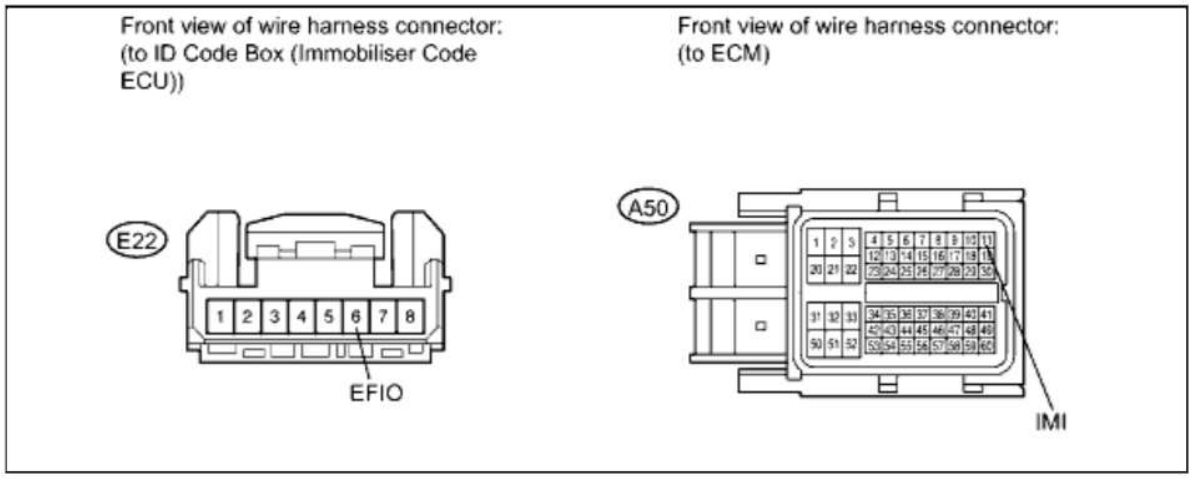
B ▶ GO TO DTC CHART

A ▼

2.	CHECK HARNESS AND CONNECTOR (ID CODE BOX - ECM)

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

(b) Disconnect the ECM connector.



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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E22-6 (EFIO) - A50-11 (IMI)	Always	Below 1 Ω
E22-6 (EFIO) - Body ground	Always	10 kΩ or higher

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E22-6 (EFIO) - Body ground	Always	Below 1 V
A50-11 (IMI) - Body ground	Always	Below 1 V

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

OK ▼

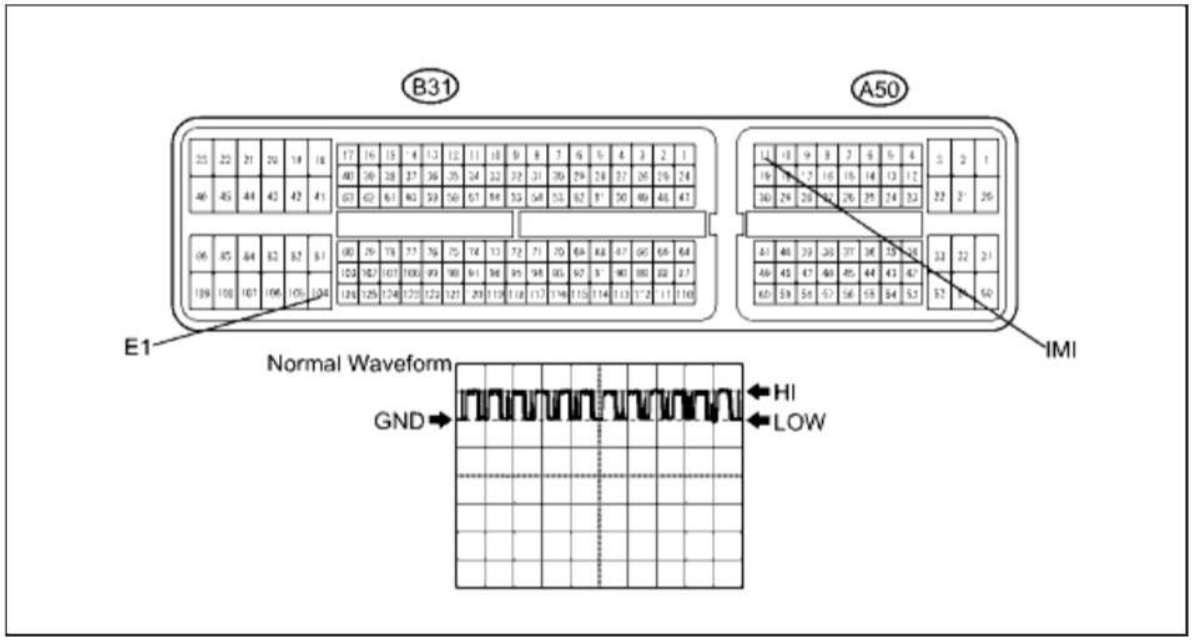
3.	**CHECK ECM (INPUT)**

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

(b) Reconnect the ECM connector.

(c) Measure the waveform.

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Waveform (Reference):

ITEM	CONTENT
Terminal No. (Symbols)	A50-11 (IMI) - B31-104 (E1)
Tool Setting	10 V/DIV., 100 msec./DIV.
Condition	Engine switch on (IG)

NG ▶ **REPLACE ID CODE BOX (IMMOBILISER CODE ECU)**

OK ▶ **REPLACE ECM**

4.	REPLACE ID CODE BOX (IMMOBILISER CODE ECU)

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

NEXT

5.	REGISTER ECU CODE

(a) Register the ECU code INFO.

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NEXT

6.	REGISTER ECU COMMUNICATION ID

(a) Register the ECU communication ID INFO.

NEXT

7.	CHECK DTC OUTPUT

(a) Clear the DTCs INFO.

(b) Recheck for DTCs.

OK:
B279A is not reoutput.

NG ▶ **REPLACE ECM**

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

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000002UBX019X
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): B279C: Theft Deterrent System Presence Detection (2010 Corolla)		

DTC	**B279C**	**Theft Deterrent System Presence Detection**

DESCRIPTION

If an ECM that is incompatible with the engine immobiliser system is installed, the ECM outputs this DTC.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B279C	When ECM that is incompatible with engine immobiliser system is installed	ECM

INSPECTION PROCEDURE

NOTICE:

If the ECM is replaced, register the ECU communication ID INFO .

PROCEDURE

1.	**CHECK DTC OUTPUT**

(a) Clear the DTCs INFO .

(b) Recheck for DTCs.

OK:

DTC B279C is not reoutput.

NG ▶ **REPLACE ECM**

OK ▶ **USE SIMULATION METHOD TO CHECK**

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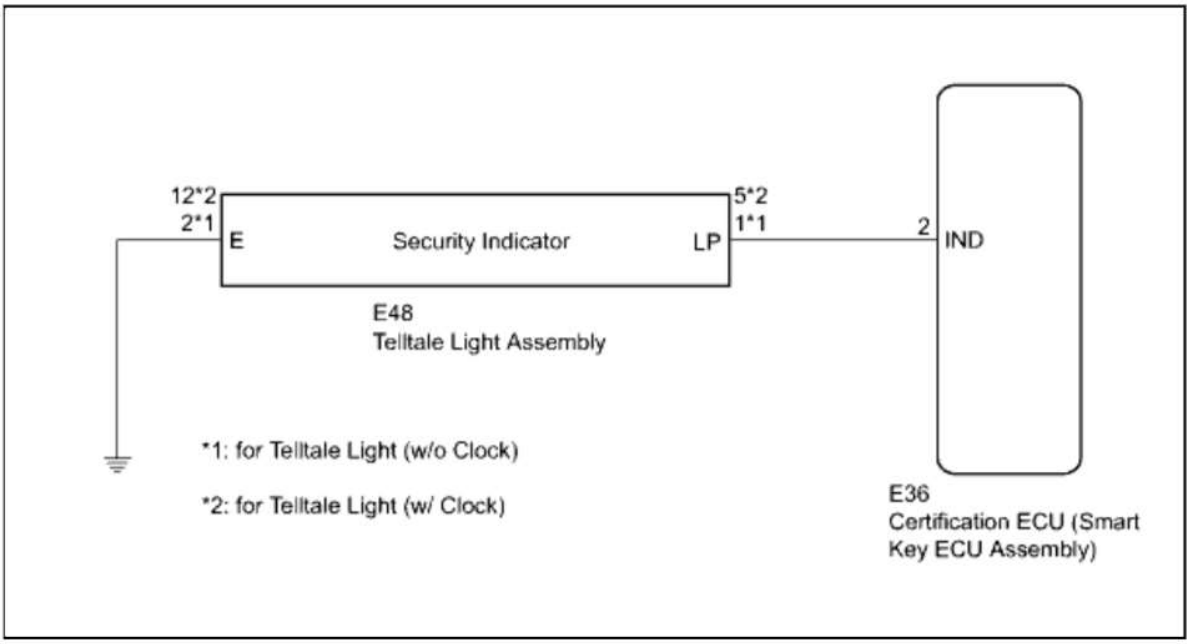
Last Modified: 3-10-2010	6.4 J	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001GV401YX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): Security Indicator Light Circuit (2010 Corolla)		

Security Indicator Light Circuit

DESCRIPTION

The security indicator light blinks continuously due to a continuous signal received from the certification ECU (smart key ECU assembly) while in the armed state.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

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

PROCEDURE

1.	**PERFORM ACTIVE TEST USING TECHSTREAM**

(a) Connect the Techstream to the DLC3.

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

(c) Turn the Techstream on.

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

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

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

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Security Indicator	Security indicator light	ON/OFF	-

OK:

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

NG ▶ **CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - TELLTALE LIGHT ASSEMBLY)**

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

2.	**CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - TELLTALE LIGHT ASSEMBLY)**

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

(b) Disconnect the telltale light assembly connector.

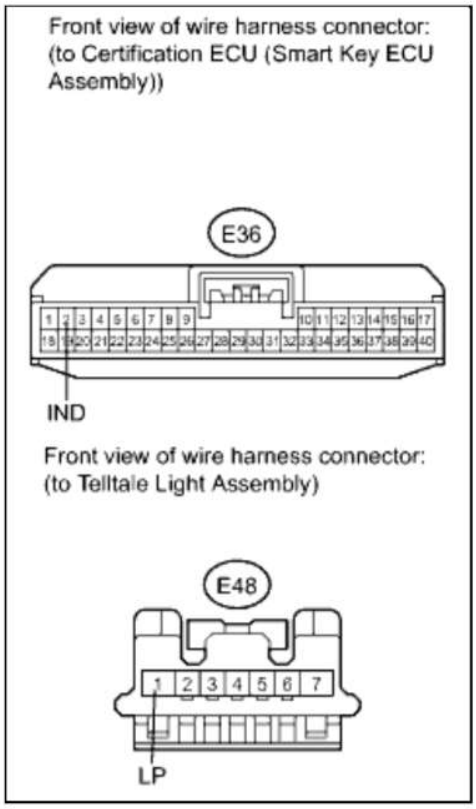
(c) for Telltale Light (w/o Clock):

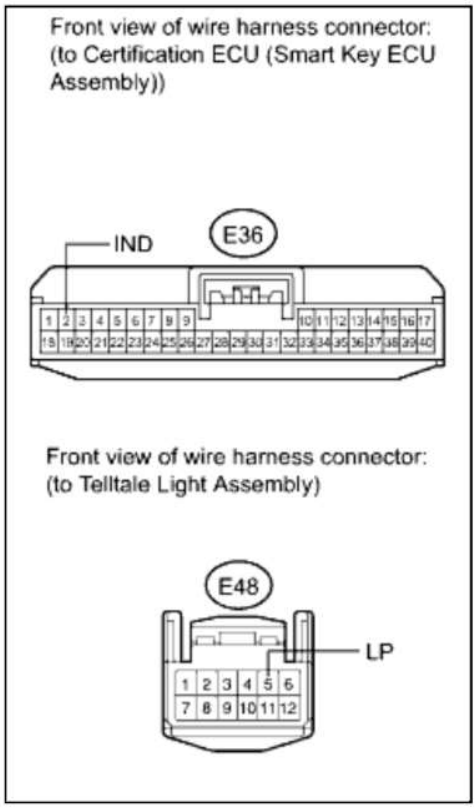
(1) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E36-2 (IND) - E48-1 (LP)	Always	Below 1 Ω
E36-2 (IND) - Body ground	Always	10 kΩ or higher

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(d) for Telltale Light (w/ Clock):

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E36-2 (IND) - E48-5 (LP)	Always	Below 1 Ω
E36-2 (IND) - Body ground	Always	10 kΩ or higher

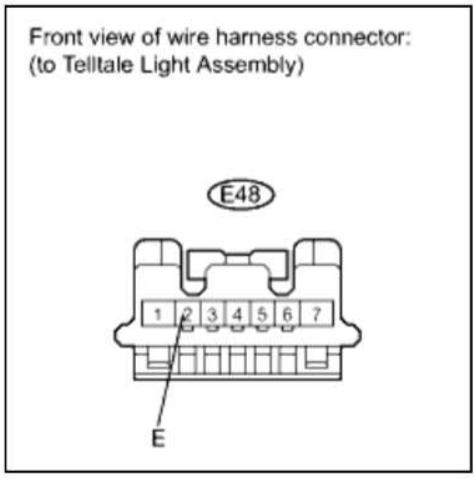
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

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OK

3.	CHECK HARNESS AND CONNECTOR (TELLTALE LIGHT ASSEMBLY - BODY GROUND)

(a) for Telltale Light (w/o Clock):

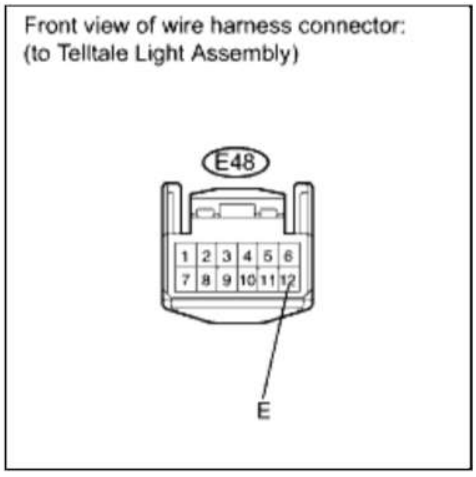


(1) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E48-2 (E) - Body ground	Always	Below 1 Ω

(b) for Telltale Light (w/ Clock):



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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E48-12 (E) - Body ground	Always	Below 1 Ω

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

OK ▶ **REPLACE TELLTALE LIGHT ASSEMBLY**

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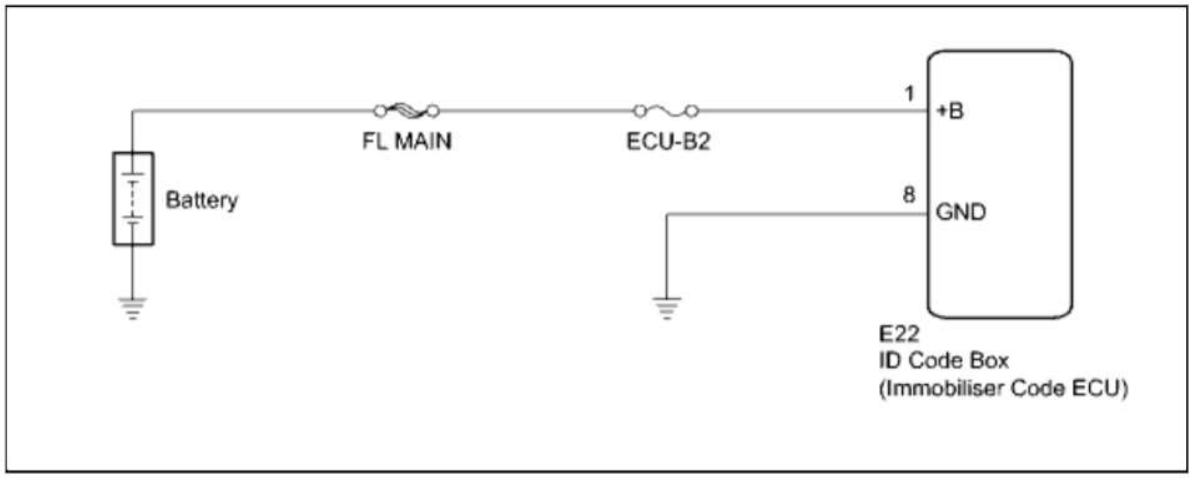
Last Modified: 3-10-2010	6.4 J	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W4502XX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): ID Code Box Power Source Circuit (2010 Corolla)		

ID Code Box Power Source Circuit

DESCRIPTION

This circuit provides power to operate the ID code box (immobiliser code ECU).

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

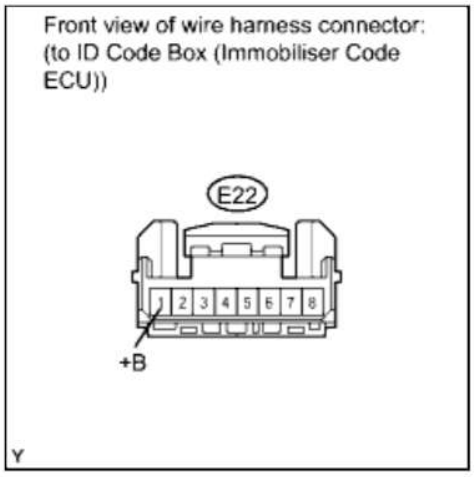
If the ID code box (immobiliser code ECU) is replaced, register the ECU code and ECU communication ID INFO .

PROCEDURE

1.	**CHECK HARNESS AND CONNECTOR (ID CODE BOX - BATTERY)**

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

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

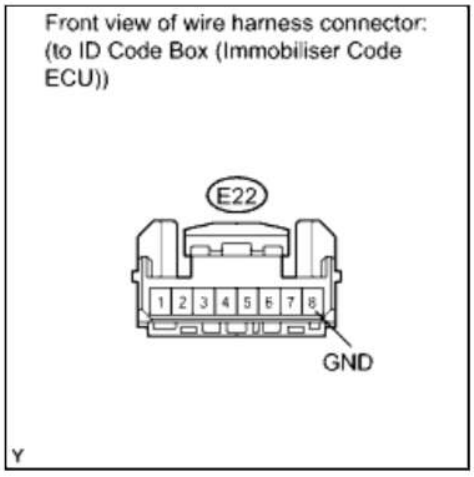
Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E22-1 (+B) - Body ground	Always	11 to 14 V

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

OK ▼

2.	CHECK HARNESS AND CONNECTOR (ID CODE BOX - BODY GROUND)



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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E22-8 (GND) - Body ground	Always	Below 1 Ω

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

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OK	PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE



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Last Modified: 3-10-2010	6.4 J	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001P8X01PX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): Certification ECU Power Source Circuit (2010 Corolla)		

Certification ECU Power Source Circuit

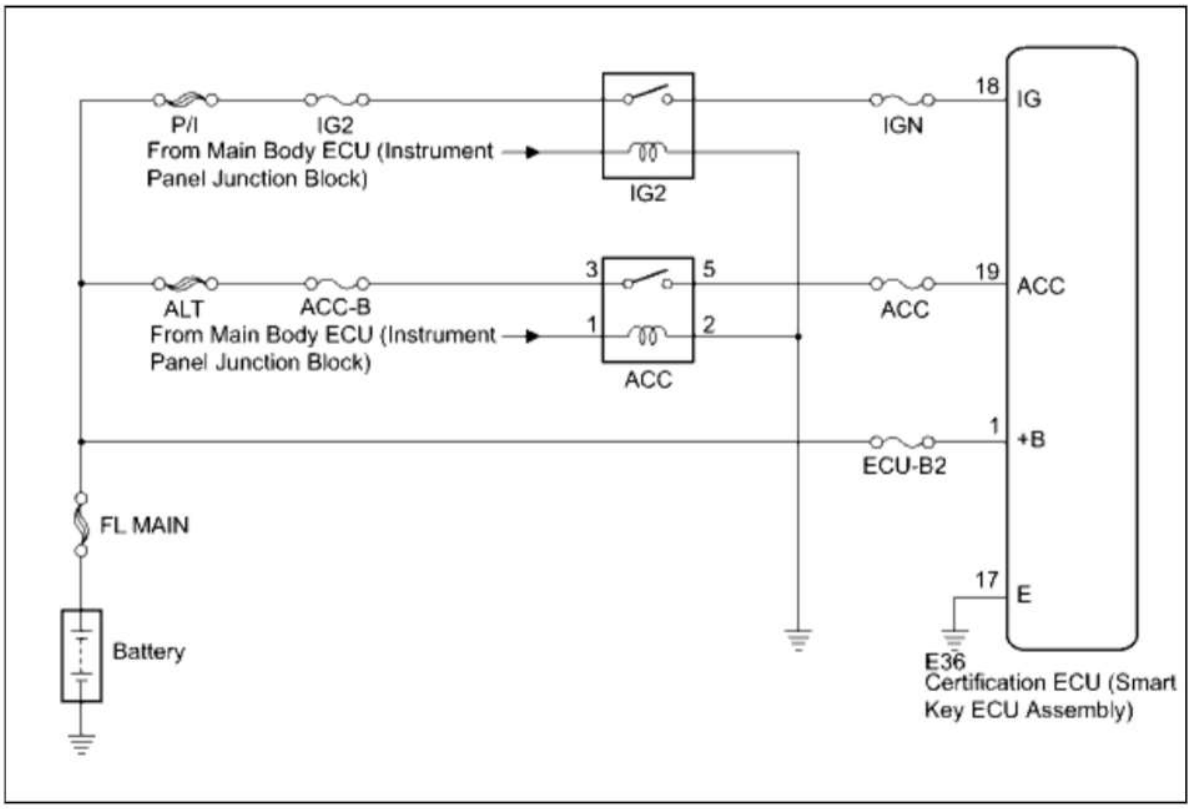
DESCRIPTION

This is the power source circuit of the certification ECU (smart key ECU assembly).

The certification ECU (smart key ECU assembly) controls the following:

- Key verification confirmation
- Electrical key oscillator (door, indoor and outside) control
- Entry door LOCK/UNLOCK request to the main body ECU (instrument panel junction block)
- Steering LOCK/UNLOCK request
- Immobiliser SET/UNSET request to the ID code box (immobiliser code ECU)

WIRING DIAGRAM



INSPECTION PROCEDURE

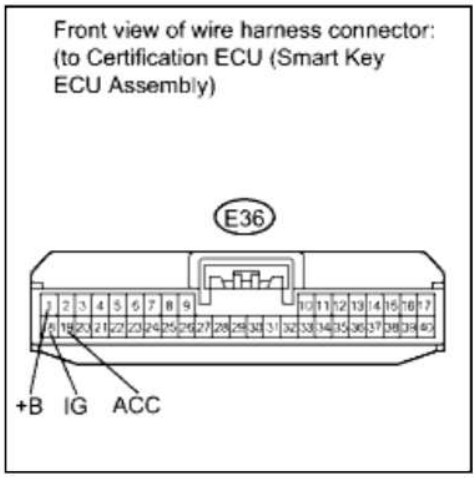
NOTICE:

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

PROCEDURE

1.	**CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - BATTERY)**



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

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

Standard Voltage:

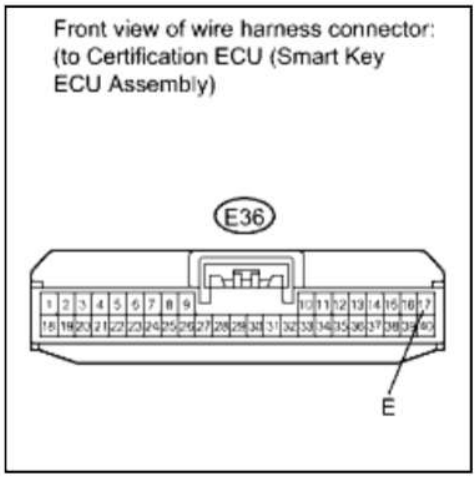
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E36-1 (+B) - Body ground	Always	11 to 14 V
E36-18 (IG) - Body ground	Engine switch off	Below 1 V
E36-18 (IG) - Body ground	Engine switch on (IG)	11 to 14 V
E36-19 (ACC) - Body ground	Engine switch off	Below 1 V
E36-19 (ACC) - Body ground	Engine switch on (ACC)	11 to 14 V

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

OK ▼

2.	**CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - BODY GROUND)**

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E36-17 (E) - Body ground	Always	Below 1 Ω

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

OK ▶ **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE**

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Last Modified: 3-10-2010	6.4 L	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001R4A015X
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): PRECAUTION (2010 Corolla)		

PRECAUTION

1. PRECAUTIONS FOR THE KEY

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

(1) Do not drop or strike the key.

(2) Do not allow the key to be kept in a high temperature place for a long time.

(3) Do not use an ultrasonic washing machine to clean the key.

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

(5) Do not attach any stickers to the key.

2. PRECAUTION FOR RECONNECTING THE BATTERY CABLE

(a) When reconnecting the cable to the negative (-) battery terminal, before starting the engine, wait at least 5 seconds after turning the ignition switch to ON. The engine may start and stall if it is started immediately after reconnecting the battery cable.

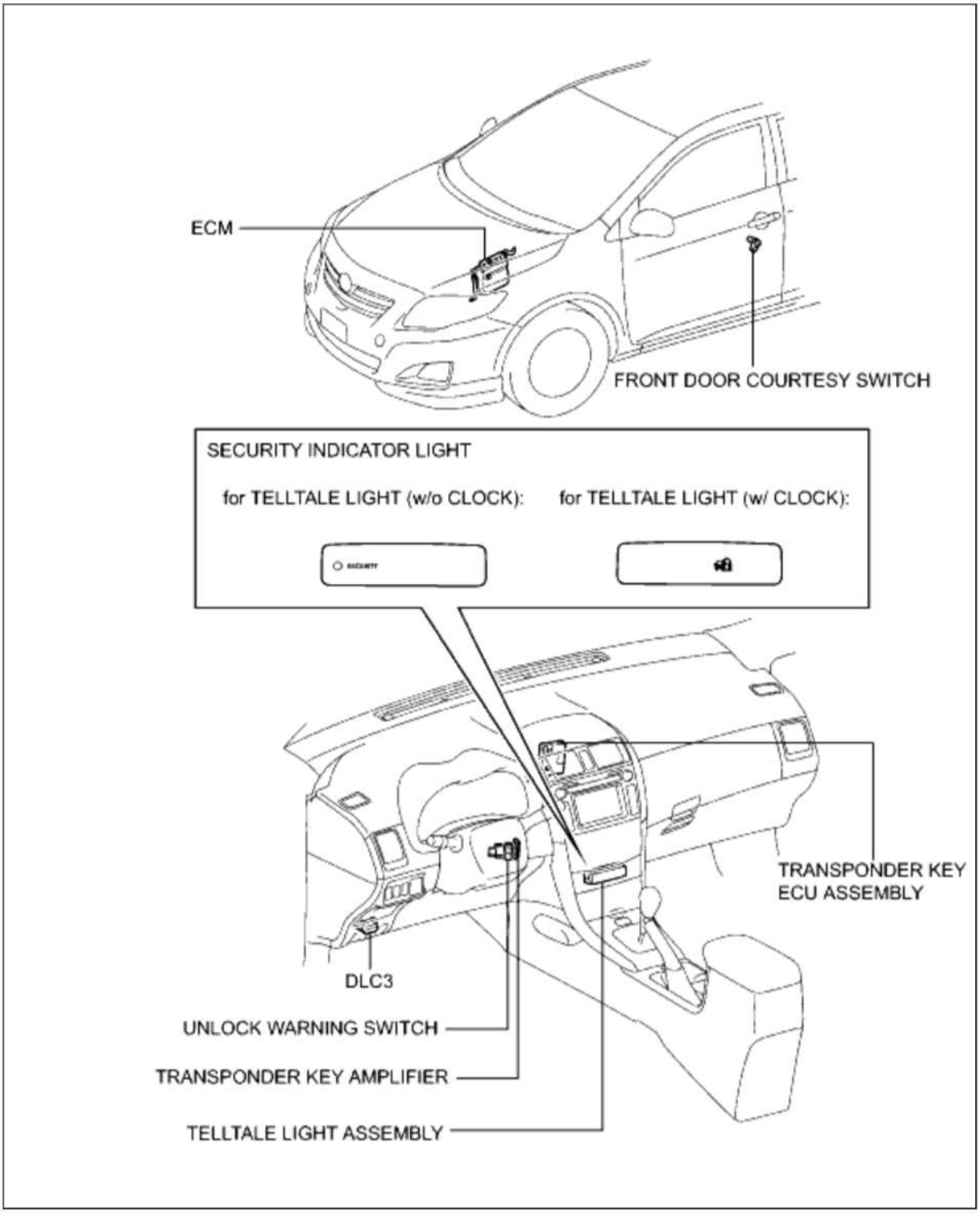
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Last Modified: 3-10-2010	6.4 R	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM00000289L012X
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): PARTS LOCATION (2010 Corolla)		

PARTS LOCATION

ILLUSTRATION

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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001GUQ01EX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): HOW TO PROCEED WITH TROUBLESHOOTING (2010 Corolla)		

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:

- 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?	Driving conditions, weather conditions
How did it happen?	Problem symptoms

NEXT

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3.	INSPECT BATTERY VOLTAGE

(a) Measure the battery voltage.

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.	CRANK ENGINE FOR MORE THAN 10 SECONDS

NEXT

5.	CHECK FOR DTC*

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

(b) Clear the DTCs.

(c) Recheck for DTCs. Try to duplicate the DTCs (SFI system or ECD system and engine immobiliser system) by simulating the symptoms indicated by the DTCs.

Result:

RESULT	PROCEED TO
DTC (SFI system) recurs (for 2ZR-FE)	A
DTC (SFI system) recurs (for 2AZ-FE)	B
DTC (engine immobiliser system) recurs	C

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RESULT	PROCEED TO
DTC does not recur	D

A ▶ INFO **Go to DIAGNOSTIC TROUBLE CODE CHART**

B ▶ INFO **Go to DIAGNOSTIC TROUBLE CODE CHART**

C ▶ INFO **Go to DIAGNOSTIC TROUBLE CODE CHART**

D ▼

6.	READ VALUE USING TECHSTREAM*

(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Turn the Techstream on.

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

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

Immobiliser (Transponder Key ECU Assembly)

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Key SW	Unlock warning switch signal/ON or OFF	ON: Key is in ignition key cylinder OFF: No key is in ignition key cylinder	-

OK:
On the Techstream screen, the item changes between ON and OFF according to the chart above.

NG ▶ INFO **Go to DTC B2780**

OK ▼

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7.	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 9**

A
▼

8.	OVERALL ANALYSIS AND TROUBLESHOOTING*

(a) Data List / Active Test INFO

(b) Terminals of ECU INFO

NEXT
▼

9.	ADJUST, REPAIR OR REPLACE

NEXT
▼

10.	CONFIRMATION TEST

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NEXT END



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Last Modified: 3-10-2010	6.4 M	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM00000120Y013X
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): REGISTRATION (2010 Corolla)		

REGISTRATION

1. DESCRIPTION OF CODE REGISTRATION

HINT:

The key has 2 codes: the key code (immobiliser code) and the wireless code. Both of these codes need to be registered. For the wireless code registration procedures, refer to Wireless Door Lock Control System INFO **.**

(a) When adding master keys or sub keys (Additional registration):

(1) Register the key code (immobiliser code) in the transponder key ECU assembly.

TARGET ECU	REFER TO
Transponder key ECU assembly	Procedure "B"

(b) When replacing the transponder key ECU assembly (New registration):

(1) Register the key code (immobiliser code) in the transponder key ECU assembly.

TARGET ECU	REFER TO
Transponder key ECU assembly	Procedure "A"

(2) Register the ECU communication ID between the new transponder key ECU assembly and the ECM.

TARGET ECU	REFER TO
ECM	Procedure "D"

(c) When replacing the ECM:

(1) Register the ECU communication ID between the transponder key ECU assembly and the new ECM.

TARGET ECU	REFER TO
Transponder key ECU assembly	Procedure "E"

(d) When replacing the transponder key ECU assembly and the ECM:

(1) Register the key codes (immobiliser codes) in the new transponder key ECU assembly.

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TARGET ECU	REFER TO
Transponder key ECU assembly	Procedure "A"

(2) Register the ECU communication ID between the new transponder key ECU assembly and the new ECM.

TARGET ECU	REFER TO
Transponder key ECU assembly	Procedure "E"

(e) When clearing the key code(s):

(1) Clear the key code(s) of lost key(s).

TARGET ECU	REFER TO
Transponder key ECU assembly	Procedure "C"

2. KEY REGISTRATION

(a) New key code registration (Procedure "A"):

NOTICE:

Make sure that no key codes are registered in the transponder key ECU assembly.

HINT:

- In this mode, a maximum of 3 key codes for 2 master keys and 1 sub-key can be registered. The master keys and sub-key can be registered in any order because the transponder key ECU assembly can distinguish between different types of keys.
- New key codes must be registered with the battery connected. The ignition switch can be either on or off.
- When a new transponder key ECU assembly is installed, key codes must be registered in the transponder key ECU assembly.

Automatic Key Code Registration (New Registration)

PROCEDURE	SECURITY INDICATOR LIGHT CONDITION
1. Start	Blinking **HINT:** **Until first key is inserted**
2. Insert the master key into the ignition key cylinder.	ON
3. Techstream operation 1. Select Body Electrical 2. Select Immobiliser 3. Select Utility	OFF for 1 second and then ON

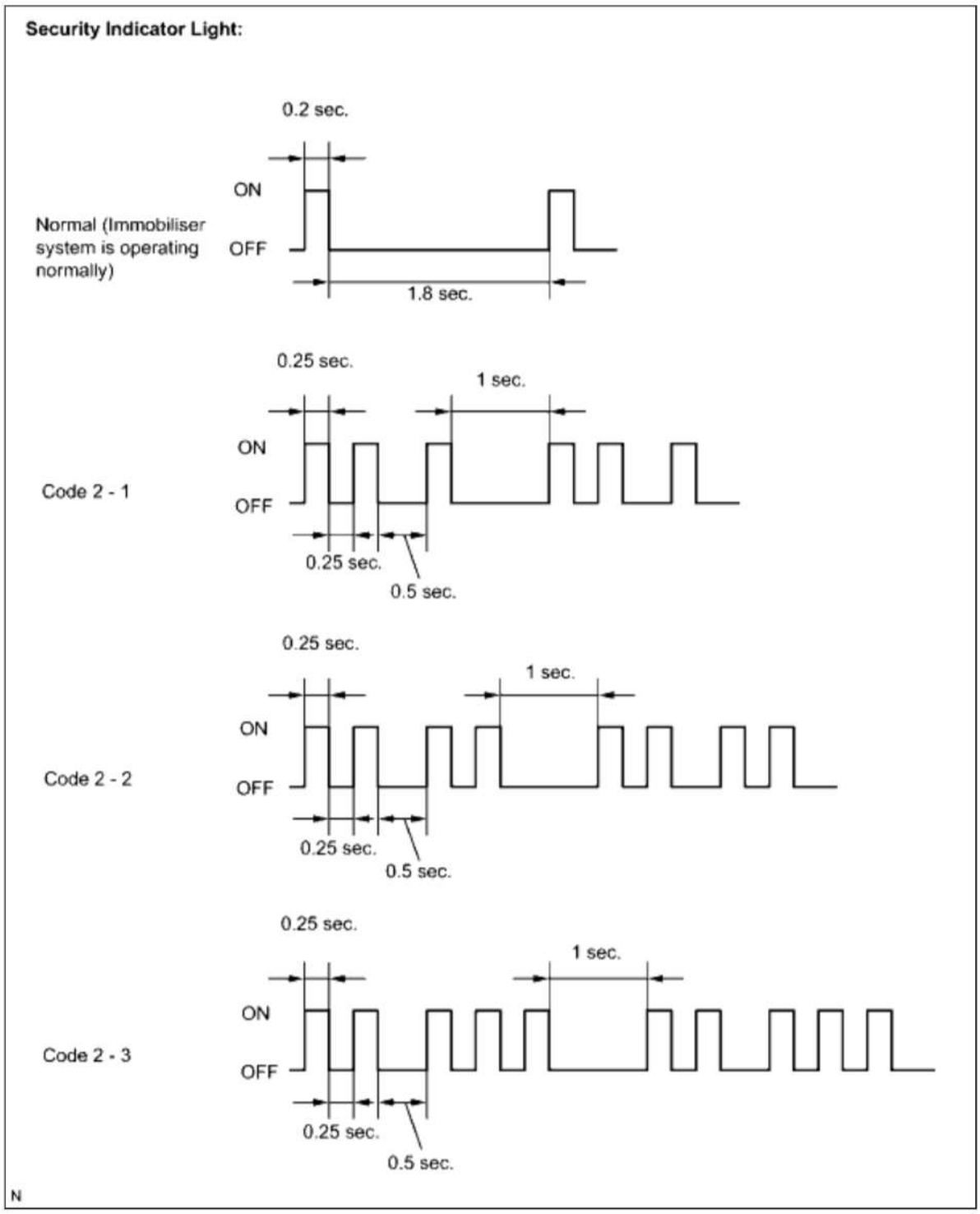
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PROCEDURE	SECURITY INDICATOR LIGHT CONDITION
4. Select Key Registration **HINT:** **After completing the above operation, proceed to the next step in accordance with the prompts on the Techstream screen.**	
4. Remove the key and then select Next on the Techstream.	ON
5. Insert the master key to be registered and then select Next on the Techstream.	OFF for 1 second and then ON
6. Remove the key and then select Next on the Techstream.	ON
7. Insert the sub-key to be registered and then select Next on the Techstream.	OFF for 1 second and then ON for 0.5 seconds and then OFF
8. Remove the key.	Blinking
9. End (Procedure "E")	

HINT:

- When the engine immobiliser system is operating normally and the key is pulled out, the security indicator light blinks continuously.
- If the new key code registration fails, code 2-1 will be output through the security indicator light. Trying to re-register an already registered key will cause code 2-2 to be output when the key is inserted. If the number of registered key codes exceeds the maximum limit, code 2-3 will be output through the security indicator light. The output details are shown below.

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(b) Finish the automatic key code registration mode. The automatic key code registration mode can be forced to end when at least 1 key code (immobiliser code) for the master key has been registered.

HINT:

Follow the instruction on the Techstream screen to end new key code registration mode.

3. REGISTRATION OF ADDITIONAL KEY

(a) Additional registration (Procedure "B"):

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HINT:

- A maximum of 5 key codes and 3 sub-key codes can be registered.
- Registration mode will end if any step is not completed within the specified time.
- When the ignition cylinder or the key cylinder set is replaced, remove the transmitter module from the original master key. Then install this transmitter module to a new key and use the new key as the master key. If necessary, use this master key to register other keys.

NOTICE:

When the ignition key cylinder has been replaced, locking and unlocking doors are possible with the new master key's transmitter module (removed from the original master key). However, the new master key will not be able to lock and unlock doors through the door key cylinder. Keep the original master key. If the battery in the new master key's transmitter module fails, the original master key can be used to lock and unlock doors through the door key cylinder.

Additional Registration

PROCEDURE	TIME TO COMPLETE OPERATION	SECURITY INDICATOR LIGHT CONDITION
1. Start	-	Blinking **HINT:** **Until first key is inserted**
2. Insert the already registered master key into the ignition key cylinder and turn the ignition switch to ON.	-	OFF
3. Techstream operation 1. Select Body Electrical 2. Select Immobiliser 3. Select Utility 4. Select Key Registration **HINT:** **After completing the above operation, proceed to the next step in accordance with the prompts on the Techstream screen.**	Within 120 sec.	ON
4. Remove the master key.	Within 20 sec. **HINT:** **After the Techstream instruction**	ON
5. Insert the key to be registered in the ignition key cylinder.	Within 10 sec.	Blinking
6. Wait for 60 sec. after the key is registered. **HINT:**	-	OFF

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PROCEDURE	TIME TO COMPLETE OPERATION	SECURITY INDICATOR LIGHT CONDITION
The security indicator light goes off.		
7. Remove the key.	-	Blinking
8. End		

HINT:

- A brief outline of key code registration procedures is shown above. For detailed information, refer to the Techstream screen.
- When the engine immobiliser system is operating normally and the key is pulled out, the security indicator light blinks continuously.
- If the key code registration has failed in automatic key code registration mode, code 2-1 will be output through the security indicator light. Trying to re-register an already registered key will cause code 2-2 to be output when the key is inserted. If the number of registered key codes exceeds the maximum limit, code 2-3 will be output through the security indicator light. The details are shown in procedure "A".

4. ERASURE OF KEY CODE

(a) Key code erasure (Procedure "C"):

HINT:

- Performing this procedure will erase all key codes except for the master key, which is used for erasing the key codes. In order to use a key whose code has been erased, a new key code must be registered.
- This procedure will be canceled if each step is not completed within the specified time.

Key Code Erasure

PROCEDURE	TIME TO COMPLETE OPERATION	SECURITY INDICATOR LIGHT CONDITION
1. Start	-	Blinking **HINT:** **Until first key is inserted**
2. Insert the already registered master key in the ignition key cylinder and turn the ignition switch to ON.	-	OFF
3. Techstream operation 1. Select Body Electrical 2. Select Immobiliser 3. Select Utility 4. Select Transponder Code Erasure	Within 120 sec.	ON for 1 sec. then OFF

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PROCEDURE	TIME TO COMPLETE OPERATION	SECURITY INDICATOR LIGHT CONDITION
HINT: **After completing the above operation, proceed to the next step in accordance with the prompts on the Techstream screen.**		
4. Remove the master key.	Within 10 sec. **HINT:** **After the Techstream instruction**	ON
5. End		

HINT:

- A brief outline of key code registration procedures is shown above. For detailed information, refer to the Techstream screen.
- When the engine immobiliser system is operating normally and the key is pulled out, the security indicator light blinks continuously.

5. ECU COMMUNICATION ID REGISTRATION

(a) ECU communication ID registration (Procedure "D"):

NOTICE:

- When the transponder key ECU assembly is replaced, the ECU communication ID of the ECM must be registered into the transponder key ECU assembly to match their ECU communication IDs.
- The engine cannot be started unless the ECU communication IDs match.
- Do not turn the ignition switch from on to off 20 times or more before registering the ECU communication ID. Turning the ignition switch from on to off 20 times or more will result in the engine not starting unless the transponder key ECU assembly is replaced with a new one.
- After the registration, turning the ignition switch to the START position may not start the engine on the first try. If so, turn the ignition switch to the START position again.
- After the engine is started, clear DTC B2799 (code for ECM's immobiliser communication error) by either of the following:

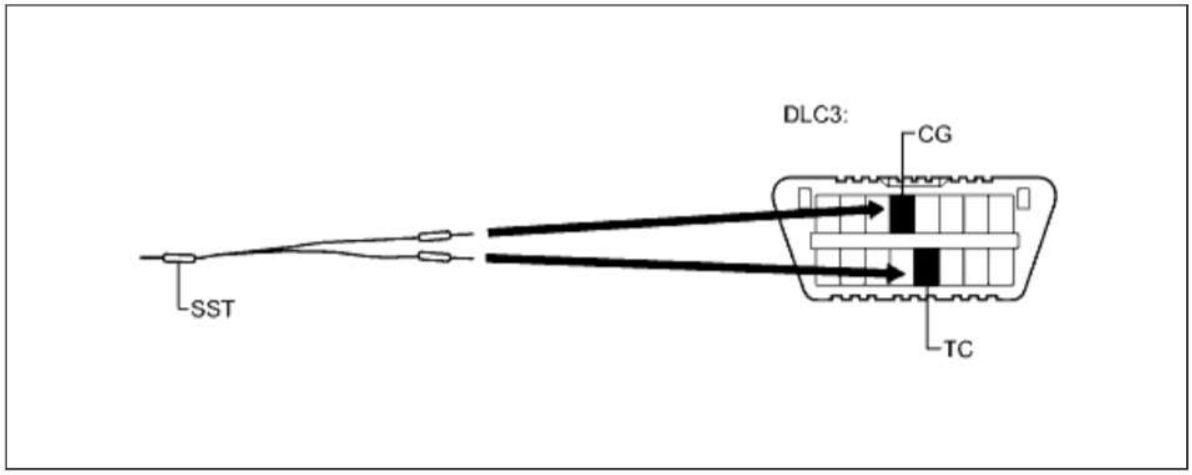
  - Using the Techstream.

  - Disconnecting the battery for 30 seconds.

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

SST: 09843-18040

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(2) Turn the ignition switch to ON and leave the vehicle as is for 30 minutes.

HINT:

Do not start the engine.

(3) Check that the engine starts.

(b) ECU communication ID registration (Procedure "E"):

NOTICE:

The ECU communication ID should be registered when the ECM and transponder key ECU assembly are replaced or when the ECM only is replaced in order to match the ECU communication ID.

ECU Communication ID Registration

PROCEDURE	SECURITY INDICATOR LIGHT CONDITION
1. Start	OFF
2. Insert an already registered key into the ignition key cylinder.	
3. Start the engine.	
4. Check that the engine starts and stays on for more than 3 seconds.	
5. End	

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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001GV6015X
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): SYSTEM DESCRIPTION (2010 Corolla)		

SYSTEM DESCRIPTION

1. ENGINE IMMOBILISER SYSTEM DESCRIPTION

The engine immobiliser system is designed to prevent the vehicle from being stolen. This system uses the transponder key ECU that stores the key codes of authorized ignition keys. If an attempt is made to start the engine using an unauthorized key, the ECU sends a signal to the ECM to prohibit fuel delivery and ignition, effectively disabling the engine.

2. FUNCTION OF MAIN COMPONENTS

COMPONENT	OUTLINE
Transponder key coil/amplifier	When key is inserted in ignition key cylinder, key coil receives key code. Then amplifier amplifies ID code and outputs it to transponder key ECU assembly.
Unlock warning switch assembly	Unlock warning switch assembly detects if key is in ignition key cylinder and outputs results to transponder key ECU assembly.
ECM	ECM receives ID verification results from transponder key ECU assembly. ECM also verifies ECUs. Then judgment of whether to immobiliser engine is made.
Security indicator	Depending on operation of transponder key ECU assembly, security indicator light comes on or starts blinking.

3. SYSTEM FUNCTION

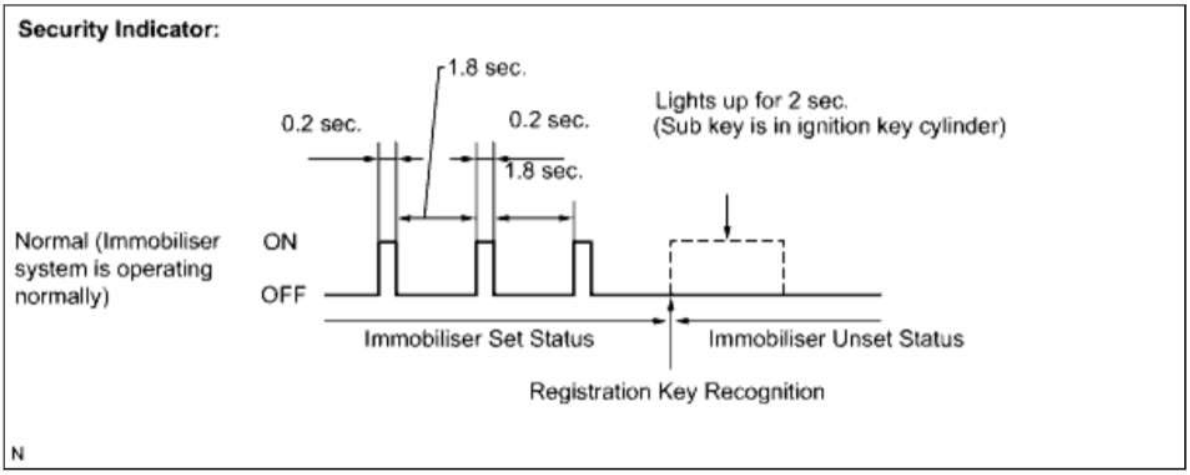
(a) When the transponder key ECU assembly detects that the key unlock warning switch is ON, the ECU provides current to the transponder key coil and produces an electric wave. A transponder chip in the key grip receives the electric wave. Upon receiving the electric wave, the transponder chip outputs a key ID code signal. The transponder key coil receives this signal, which is amplified by the transponder key amplifier, and the signal is transmitted to the ECU.

The ECU matches the key ID code with the vehicle's ID code, which was previously registered in the ECU, and communicates the results to the ECM.

After the identification results show that the key ID code matches the vehicle's ID code and the ECU has confirmed their match: 1) the immobiliser system does not immobilise the engine and the engine starting controls (fuel injection control and ignition control) enter standby mode; and 2) the ECU transmits a security indicator signal that communicates "indicator off" to the clock. Then, the clock turns off the security indicator light.

(b) The security indicator blinking pattern is as shown below (when changing from the immobiliser set status to the unset status):

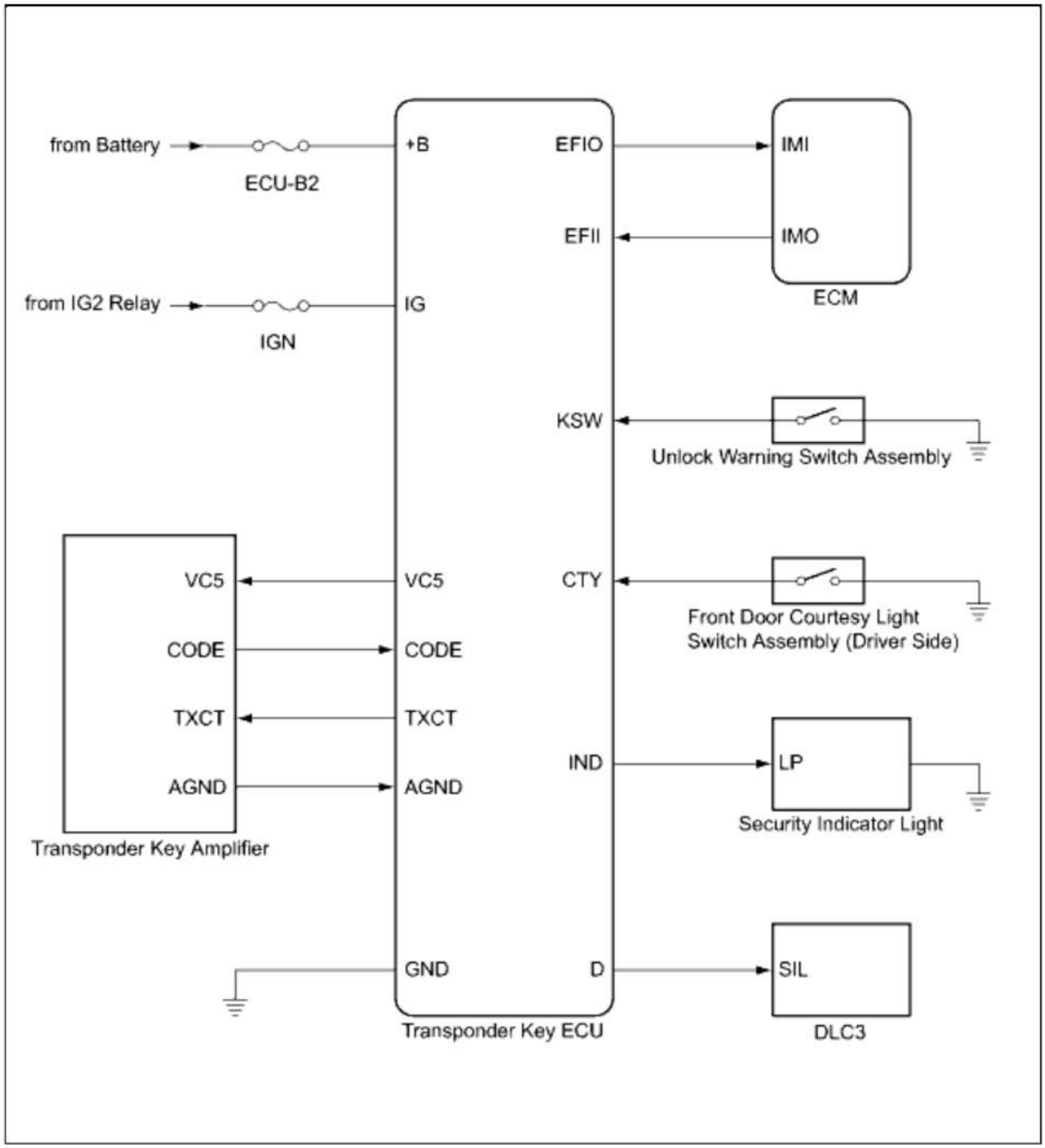
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Last Modified: 3-10-2010	6.4 U	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000014IP019X
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): SYSTEM DIAGRAM (2010 Corolla)		

SYSTEM DIAGRAM



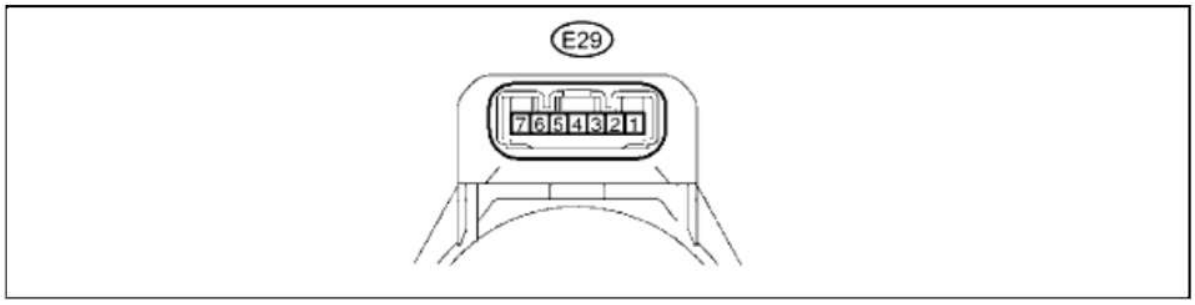
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Last Modified: 3-10-2010	6.4 U	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001GUS017X
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): TERMINALS OF ECU (2010 Corolla)		

TERMINALS OF ECU

1. CHECK TRANSPONDER KEY AMPLIFIER

(a) Disconnect the E29 transponder key amplifier connector.



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

TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
E29-7 (AGND) - Body ground	R - Body ground*1 V - Body ground*2	Ground	Always	Below 1 Ω

- *1: for TMC Made
- *2: Except for TMC Made

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

(c) Reconnect the E29 transponder key amplifier connector.

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

TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
E29-1 (VC5) - E29-7 (AGND)	B - R*1 G - V*2	Power source	No key is in ignition key cylinder	Below 1 V
E29-1 (VC5) - E29-7 (AGND)	B - R*1 G - V*2	Power source	Key is in ignition key cylinder	4.6 to 5.4 V
E29-4 (CODE) - E29-7 (AGND)	P - R*1 SB - V*2	Demodulated signal of key code data	No key is in ignition key cylinder	Below 1 V

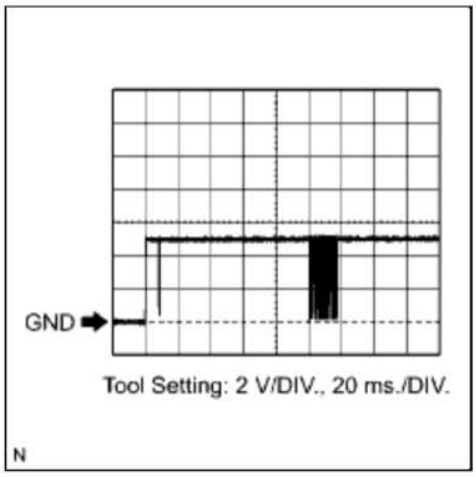
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TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
E29-4 (CODE) - E29-7 (AGND)	P - R*1 SB - V*2	Demodulated signal of key code data	Key is in ignition key cylinder	Waveform 1
E29-5 (TXCT) - E29-7 (AGND)	G - R*1 BE - V*2	Key code output signal	No key is in ignition key cylinder	Below 1 V
E29-5 (TXCT) - E29-7 (AGND)	G - R*1 BE - V*2	Key code output signal	Key is in ignition key cylinder	Waveform 2

- *1: for TMC Made
- *2: Except for TMC Made

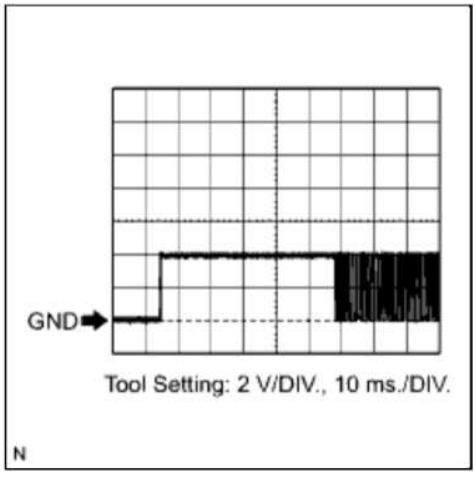
If the result is not as specified, the transponder key amplifier may have a malfunction.

(e) Inspect using an oscilloscope.



(1) Waveform 1 (Reference)

Tester Connection	E29-4 (CODE) - E29-7 (AGND)
Tool Setting	2 V/DIV., 20 ms./DIV.
Condition	Key is in ignition key cylinder



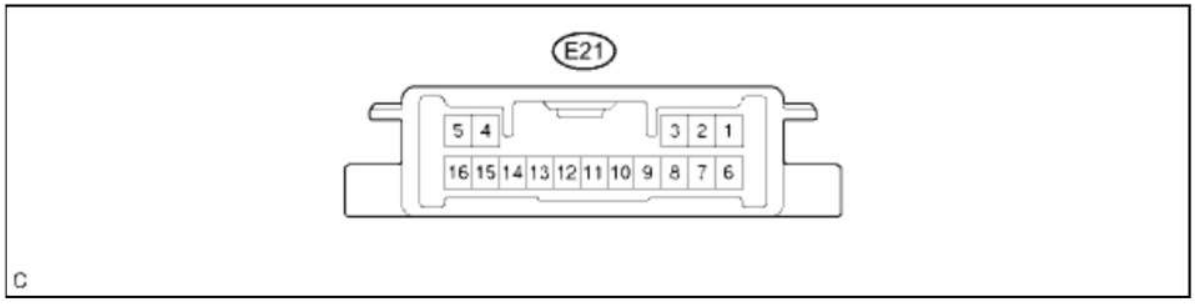
(2) Waveform 2 (Reference)

Tester Connection	E29-5 (TXCT) - E29-7 (AGND)
Tool Setting	2 V/DIV., 10 ms./DIV.
Condition	Key is in ignition key cylinder

2. CHECK TRANSPONDER KEY ECU ASSEMBLY

(a) Disconnect the E21 transponder key ECU assembly connector.

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

TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
E21-16 (GND) - Body ground	BR - Body ground	Ground	Always	Below 1 Ω
E21-1 (+B) - E21-16 (GND)	W - BR*1 BR - BR*2	Battery	Always	11 to 14 V
E21-2 (IG) - E21-16 (GND)	B - BR	Ignition switch signal	Ignition switch off	Below 1 V
E21-2 (IG) - E21-16 (GND)	B - BR	Ignition switch signal	Ignition switch ON	11 to 14 V
E21-3 (KSW) - E21-16 (GND)	L - BR	Unlock warning switch signal	No key is in ignition key cylinder	10 kΩ or higher
E21-3 (KSW) - E21-16 (GND)	L - BR	Unlock warning switch signal	Key is in ignition key cylinder	Below 1 Ω

- *1: for TMC Made
- *2: Except for TMC Made

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

(c) Reconnect the E21 transponder 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
E21-5 (AGND) - Body ground	R - Body ground*1 V - Body ground*2	Ground	Always	Below 1 Ω
E21-3 (KSW) - E21-16 (GND)	L - BR	Unlock warning switch signal	No key is in ignition key cylinder	11 to 14 V
E21-3 (KSW) - E21-16 (GND)	L - BR	Unlock warning switch signal	Key is in ignition key cylinder	Below 1 V

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TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
E21-14 (VC5) - E21-5 (AGND)	B - R*1 G - V*2	Power source	No key is in ignition key cylinder	Below 1 V
E21-14 (VC5) - E21-5 (AGND)	B - R*1 G - V*2	Power source	Key is in ignition key cylinder	4.6 to 5.4 V
E21-4 (TXCT) - E21-5 (AGND)	G - R*1 BE - V*2	Transponder key amplifier communication signal	No key is in ignition key cylinder	Below 1 V
E21-4 (TXCT) - E21-5 (AGND)	G - R*1 BE - V*2	Transponder key amplifier communication signal	Key is in ignition key cylinder	Waveform 1
E21-15 (CODE) - E21-5 (AGND)	P - R*1 SB - V*2	Transponder key amplifier communication signal	No key is in ignition key cylinder	Below 1 V
E21-15 (CODE) - E21-5 (AGND)	P - R*1 SB - V*2	Transponder key amplifier communication signal	Key is in ignition key cylinder	Waveform 2
E21-13 (EFIO) - E21-16 (GND)	P - BR	ECM output signal	Ignition switch off	Below 1 V
E21-13 (EFIO) - E21-16 (GND)	P - BR	ECM output signal	Ignition switch ON	Waveform 3
E21-12 (EFII) - E21-16 (GND)	LG - BR	ECM input signal	Ignition switch off	10 to 14 V
E21-12 (EFII) - E21-16 (GND)	LG - BR	ECM input signal	Within 3 seconds after starter operates and initial combustion occurs, or within 3seconds after ignition switch first turned on (IG) after battery disconnected and connected.	Waveform 4
E21-9 (D) - E21-16 (GND)	W - BR	Diagnostic tester communication	Without communication	Below 1 V
E21-9 (D) - E21-16 (GND)	W - BR	Diagnostic tester communication	During communication	Pulse generation
E21-7 (CTY) - E21-16 (GND)	BR - BR*1 R - BR*2	Door courtesy signal	Switch pushed	11 to 14 V
E21-7 (CTY) - E21-16 (GND)	BR - BR*1 R - BR*2	Door courtesy signal	Switch free	Below 1 V

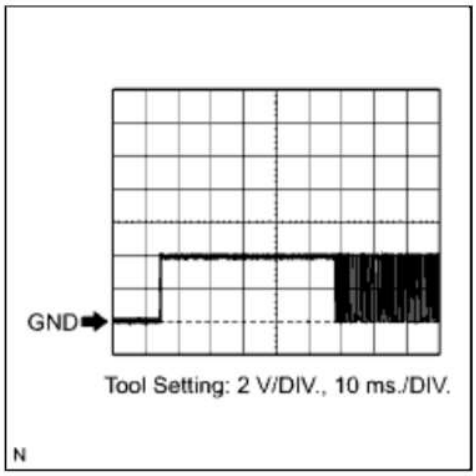
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TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
E21-8 (IND) - E21-16 (GND)	Y - BR	Security indicator signal	Security indicator light is on	11 to 14 V
E21-8 (IND) - E21-16 (GND)	Y - BR	Security indicator signal	Security indicator light is off	Below 1 V

- *1: for TMC Made
- *2: Except for TMC Made

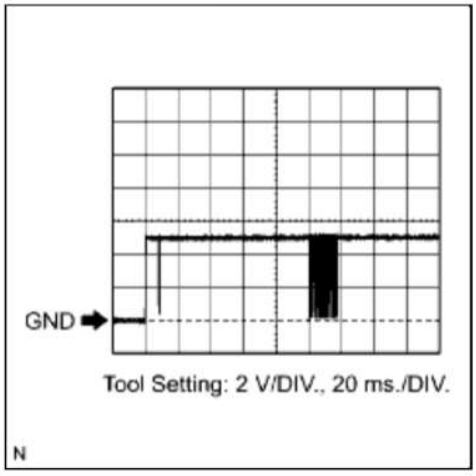
If the result is not as specified, the transponder key ECU assembly may have a malfunction.

(e) Inspect using an oscilloscope.



(1) Waveform 1 (Reference)

Tester Connection	E21-4 (TXCT) - E21-5 (AGND)
Tool Setting	2 V/DIV., 10 ms./DIV.
Condition	Key is in ignition key cylinder

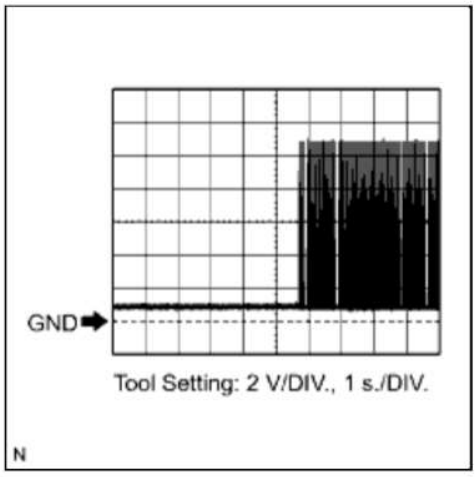


(2) Waveform 2 (Reference)

Tester Connection	E21-15 (CODE) - E21-5 (AGND)
Tool Setting	2 V/DIV., 20 ms./DIV.
Condition	Key is in ignition key cylinder

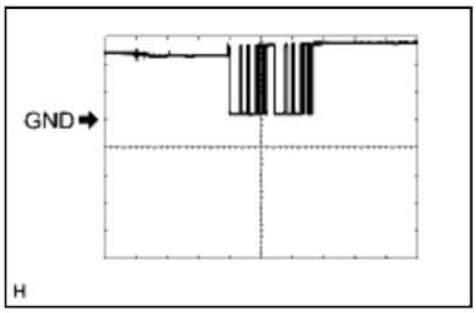
(3) Waveform 3 (Reference)

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Tester Connection	E21-13 (EFIO) - E21-16 (GND)
Tool Setting	2 V/DIV., 1 s./DIV.
Condition	Ignition switch ON

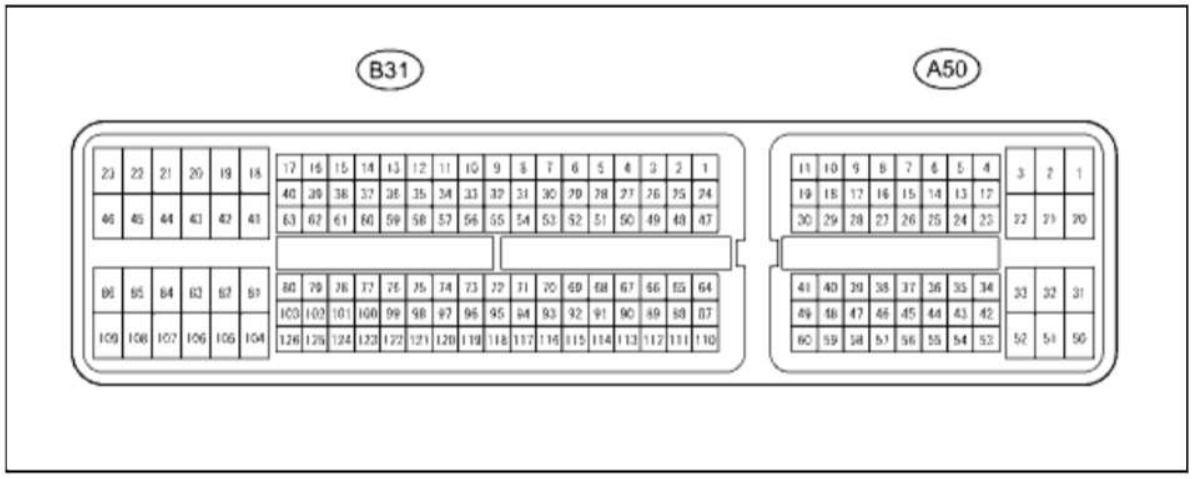
(4) Waveform 4 (Reference)



Tester Connection	E21-12 (EFII) - E21-16 (GND)
Tool Setting	5 V/DIV., 500 ms./DIV.
Condition	Within 3 seconds after starter operates and initial combustion occurs, or within 3seconds after ignition switch first turned on (IG) after battery disconnected and connected.

3. CHECK ECM

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



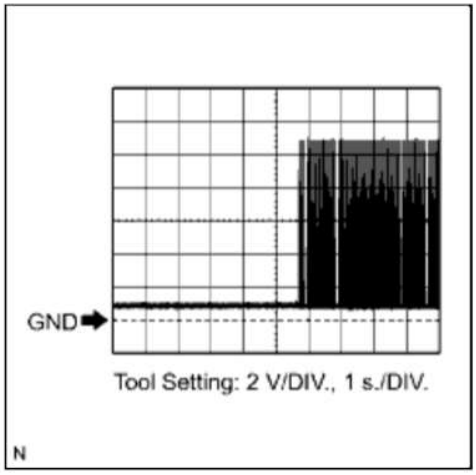
TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
A50-11 (IMI) - B31-104 (E1)	P - BR	Transponder key ECU input signal	Ignition switch off	Below 1 V

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TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
A50-11 (IMI) - B31-104 (E1)	P - BR	Transponder key ECU input signal	Ignition switch ON	Waveform 1
A50-10 (IMO) - B31-104 (E1)	LG-B - BR	Transponder key ECU output signal	Ignition switch off	10 to 14 V
A50-10 (IMO) - B31-104 (E1)	LG-B - BR	Transponder key ECU output signal	Within 3 seconds after starter operates and initial combustion occurs, or within 3seconds after ignition switch first turned on (IG) after battery disconnected and connected.	Waveform 2

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

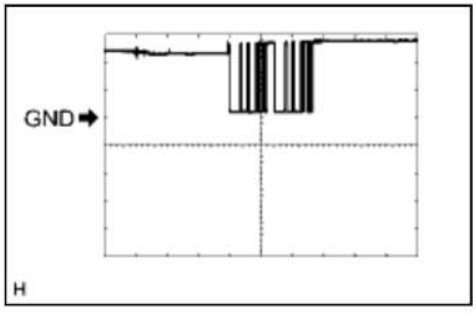
(b) Inspect using an oscilloscope.



(1) Waveform 1 (Reference)

Tester Connection	A50-11 (IMI) - B31-104 (E1)
Tool Setting	2 V/DIV., 1 s./DIV.
Condition	Ignition switch ON

(2) Waveform 2 (Reference)



Tester Connection	A50-10 (IMO) - B31-104 (E1)
Tool Setting	5 V/DIV., 500 ms./DIV.
Condition	Within 3 seconds after starter operates and initial combustion occurs, or within 3seconds after ignition switch first turned on (IG) after battery disconnected and connected.

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Last Modified: 3-10-2010	6.4 T	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000002921017X
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): PROBLEM SYMPTOMS TABLE (2010 Corolla)		

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
Unable to register the key.	Door courtesy switch circuit	INFO
	Wire harness or connector	INFO
	Transponder key ECU assembly	-
Engine does not start.	Key	INFO
	ECU power source circuit	INFO
	SFI system (for 2AZ-FE)	INFO
	SFI system (for 2ZR-FE)	INFO
	Transponder key ECU assembly	-
Security indicator is always ON.	Transponder key ECU assembly	INFO
	Wire harness or connector	-
	Telltale light assembly	-
Security indicator is OFF.	Transponder key ECU assembly	INFO
	Wire harness or connector	-
	Telltale light assembly	-
Security indicator is blinking abnormally.	Transponder key ECU assembly	-
Engine immobiliser system DTCs are not output.	Wire harness or connector	INFO
	Transponder key ECU assembly	-

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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001GV7031X
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): DIAGNOSIS SYSTEM (2010 Corolla)		

DIAGNOSIS SYSTEM

1. DESCRIPTION

(a) The transponder key ECU controls the vehicle's immobiliser system functions. Immobiliser system data and Diagnostic Trouble Code (DTC) can be read through the vehicle's Data Link Connector 3 (DLC3).

In some cases, a malfunction may be occurring in the 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.

Standard Voltage:
11 to 14 V

If the voltage is below 11 V, recharge or replace the battery before proceeding to the next step.

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Last Modified: 3-10-2010	6.4 U	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001GVA015X
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): DATA LIST / ACTIVE TEST (2010 Corolla)		

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 ignition switch to ON.

(c) Turn the Techstream on.

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

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

Immobiliser (Transponder Key ECU Assembly)

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Key SW	Unlock warning switch signal/ON or OFF	ON: Key is in ignition key cylinder OFF: No key is in ignition key cylinder	-
IG SW	Ignition switch signal/ON or OFF	ON: Ignition switch ON or START OFF: Ignition switch ACC or OFF	-
Immobiliser	Immobiliser system status/SET or UNSET	UNSET: Ignition switch ON SET: Without key	-
Permit (Start)	Permit (Start) signal/OK or NG	NG: No permission for engine start OK: Engine start permission	-
Response	Transponder chip data/NG or OK	NG: Data error OK: Data OK	-
Frame Error	Transponder chip data/NG or OK	NG: Data error OK: Data OK	-

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TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Different Serial Number	Transponder chip data/NG or OK	NG: Data error OK: Data OK	-
Different Encrypt Code	Transponder chip data/NG or OK	NG: Data error OK: Data OK	-
Abnormal Status	Transponder chip data/NG or OK	NG: Data error OK: Data OK	-
Bcc Malfunction	Transponder chip data/NG or OK	NG: Incorrect data being sent OK: Correct data being sent	-
Sub Key	Sub key code signal/NOMATCH or MATCH	NOMATCH: Non-matching sub key code is sent MATCH: Sub key code is sent	-
Master Key	Master key code signal/NOMATCH or MATCH	NOMATCH: Non-matching master key code is sent MATCH: Master key code is sent	-
Transponder S-Code	Number of registered sub key/min. 0, max. 15	Number of registered sub key	-
Transponder M-Code	Number of registered master key/min. 0, max. 15	Number of registered master key	-
Reg Code Space Full	Memory space for key codes registration/NOT FULL or FULL	NOT FULL: More key code registration possible FULL: No more key code registration possible	-
+B	Power source/BRAKE or Normal	BRAKE: Power source open NORMAL: Power source normal	-
Antenna Coil Status	Transponder key amplifier coil condition/Normal or Fail	NORMAL: Antenna coil is normal FAIL: Antenna coil is malfunctioning	-

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.

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(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Turn the Techstream on.

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

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

Immobiliser (Transponder Key ECU Assembly)

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Security Indicator	Security indicator Light	ON/OFF	-



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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001GV8025X
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): DTC CHECK / CLEAR (2010 Corolla)		

DTC CHECK / CLEAR

1. CHECK DTC

(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Turn the Techstream on.

(d) Enter the following menus: Body Electrical / (desired system) / Trouble Codes.

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

.

2. CLEAR DTC

(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Turn the Techstream on.

(d) Enter the following menus: Body Electrical / (desired system) / Trouble Codes.

(e) Clear the DTCs.



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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001GV001EX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): B2780: Push Switch / Key Unlock Warning Switch Malfunction (2010 Corolla)		

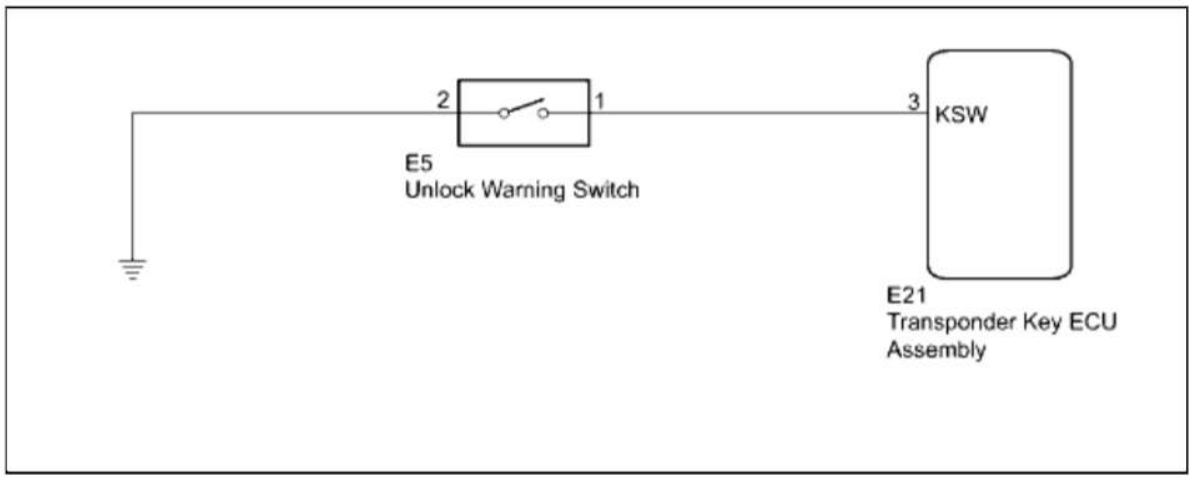
DTC	**B2780**	**Push Switch / Key Unlock Warning Switch Malfunction**

DESCRIPTION

This DTC will be output if the transponder key ECU assembly does not detect that the unlock warning switch is ON even when the ignition switch is ON. Under normal conditions, the unlock warning switch assembly is ON when the ignition switch is ON.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B2780	"Unlock warning switch ON" is not detected when ignition switch is ON	• Wire harness or connector • Unlock warning switch assembly • Transponder key ECU assembly

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

If the transponder key ECU assembly is replaced, register the key and ECU communication ID INFO .

PROCEDURE

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1.	READ VALUE USING TECHSTREAM

(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Turn the Techstream on.

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

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

Immobiliser (Transponder Key ECU Assembly)

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Key SW	Unlock warning switch signal/ON or OFF	ON: Key is in ignition key cylinder OFF: No key is in ignition key cylinder	-

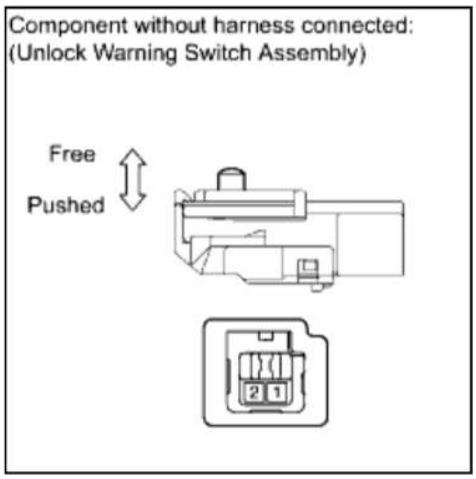
OK:

On the Techstream screen, the item changes between ON and OFF according to the chart above.

NG ▶ **INSPECT UNLOCK WARNING SWITCH ASSEMBLY**

OK ▶ **REPLACE TRANSPONDER KEY ECU ASSEMBLY**

2.	INSPECT UNLOCK WARNING SWITCH ASSEMBLY



(a) Remove the unlock warning switch assembly INFO.

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

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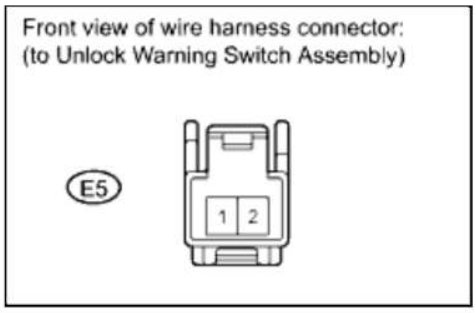
Standard Resistance:

TESTER CONNECTION	SWITCH POSITION	SPECIFIED CONDITION
1 - 2	Switch pushed (Key set)	Below 1 Ω
1 - 2	Switch free (Key removed)	10 kΩ or higher

NG ▶ **REPLACE UNLOCK WARNING SWITCH ASSEMBLY**

OK ▼

3.	**CHECK HARNESS AND CONNECTOR (UNLOCK WARNING SWITCH - BODY GROUND)**



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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E5-2 - Body ground	Always	Below 1 Ω

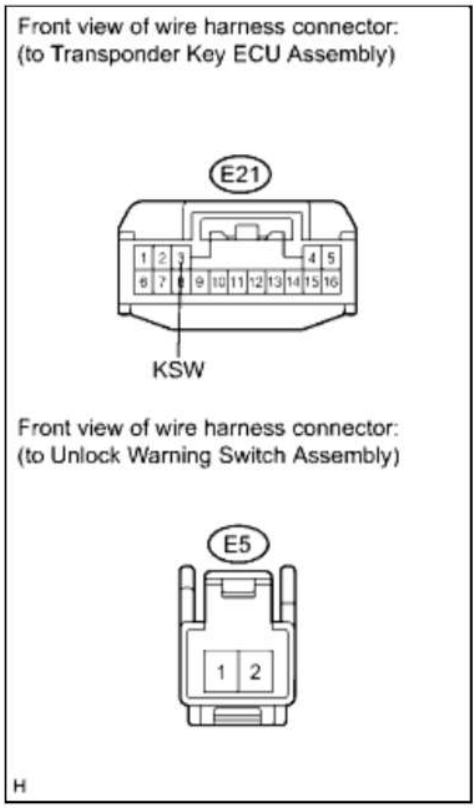
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

4.	**CHECK HARNESS AND CONNECTOR (TRANSPONDER KEY ECU - UNLOCK WARNING SWITCH)**

(a) Disconnect the transponder key ECU assembly connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E21-3 (KSW) - E5-1	Always	Below 1 Ω
E5-1 - Body ground	Always	10 kΩ or higher

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

OK ▶ **REPLACE TRANSPONDER KEY ECU ASSEMBLY**

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Last Modified: 3-10-2010	6.4 S	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM00000292H018X
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): DIAGNOSTIC TROUBLE CODE CHART (2010 Corolla)		

DIAGNOSTIC TROUBLE CODE CHART

1. TRANSPONDER KEY ECU DIAGNOSTIC TROUBLE CODE CHART

Transponder Key ECU Assembly

DTC CODE	DETECTION ITEM	TROUBLE AREA	SEE PAGE
B2780	Push Switch / Key Unlock Warning Switch Malfunction	1. Wire harness or connector 2. Unlock warning switch assembly 3. Transponder key ECU assembly	INFO
B2784	Antenna Coil Open / Short	1. Wire harness or connector 2. Transponder key amplifier 3. Transponder key ECU assembly	INFO
B2793	Transponder Chip Malfunction	Key	INFO
B2794	Unmatched Encryption Code	Key	INFO
B2795	Unmatched Key Code	Key	INFO
B2796	No Communication in Immobiliser System	1. Key 2. Transponder key amplifier 3. Transponder key ECU assembly	INFO
B2797	Communication Malfunction No. 1	1. Key 2. Transponder key amplifier 3. Transponder key ECU assembly	INFO
B2798	Communication Malfunction No. 2	1. Key 2. Transponder key amplifier 3. Transponder key ECU assembly	INFO

2. ECM DIAGNOSTIC TROUBLE CODE CHART

HINT:

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

ECM

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DTC CODE	DETECTION ITEM	TROUBLE AREA	SEE PAGE
B2799	Engine Immobiliser System Malfunction	1. Wire harness or connector 2. ECM 3. Transponder key ECU assembly	INFO
B279A	Theft Deterrent System Communication Line High Fixation	1. Wire harness or connector 2. Transponder key ECU assembly 3. ECM	INFO
B279C	Theft Deterrent System Presence Detection	ECM	INFO



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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001GV501DX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): B2784: Antenna Coil Open / Short (2010 Corolla)		

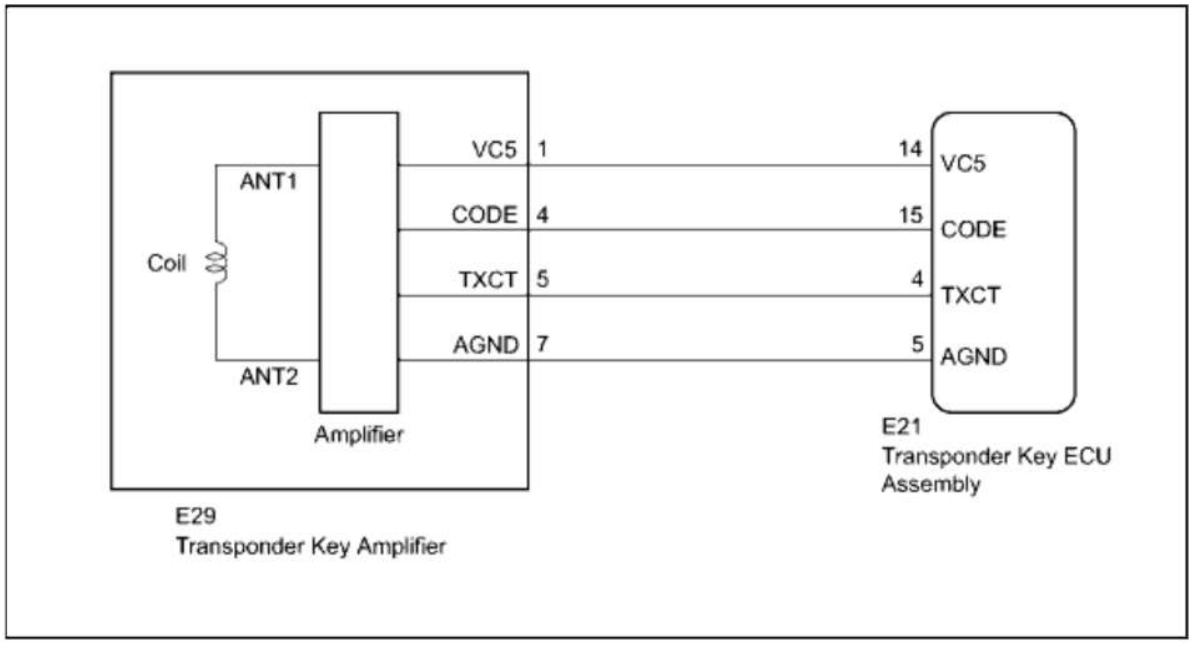
DTC	**B2784**	**Antenna Coil Open / Short**

DESCRIPTION

The transponder key coil is built into the transponder key amplifier and receives a key code signal from the transponder chip in the key. This signal is amplified by the amplifier, then it is output to the transponder key ECU assembly.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B2784	Antenna coil is open/shorted	• Wire harness or connector • Transponder key amplifier • Transponder key ECU assembly

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

If the transponder key ECU assembly is replaced, register the key and ECU communication ID INFO .

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PROCEDURE

1.	**READ VALUE USING TECHSTREAM**

(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Turn the Techstream on.

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

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

Immobiliser (Transponder Key ECU Assembly)

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Antenna Coil Status	Transponder key amplifier coil condition/Normal or Fail	Normal: Antenna coil is normal Fail: Antenna coil is malfunctioning	-

OK:
On the Techstream screen, the item displays Normal according to the chart above.

NG ▶ **CHECK HARNESS AND CONNECTOR (TRANSPONDER KEY ECU - TRANSPONDER KEY AMPLIFIER)**

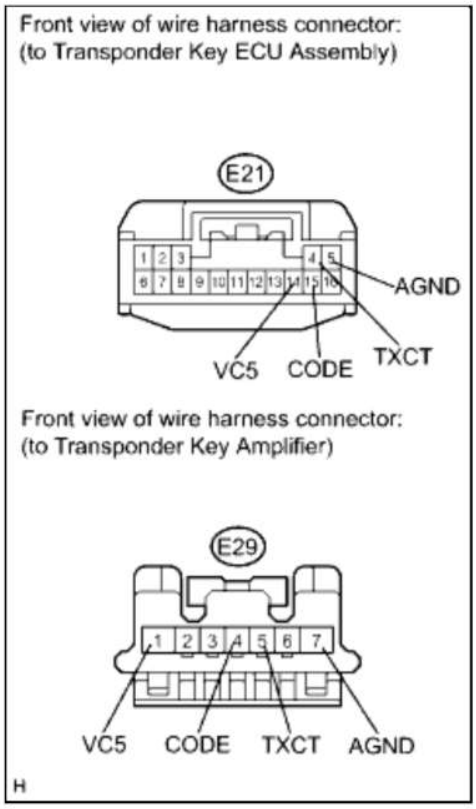
OK ▶ **REPLACE TRANSPONDER KEY ECU ASSEMBLY**

2.	**CHECK HARNESS AND CONNECTOR (TRANSPONDER KEY ECU - TRANSPONDER KEY AMPLIFIER)**

(a) Disconnect the transponder key ECU assembly connector.

(b) Disconnect the transponder key amplifier 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
E21-4 (TXCT) - E29-5 (TXCT)	Always	Below 1 Ω
E21-5 (AGND) - E29-7 (AGND)	Always	Below 1 Ω
E21-14 (VC5) - E29-1 (VC5)	Always	Below 1 Ω
E21-15 (CODE) - E29-4 (CODE)	Always	Below 1 Ω
E21-4 (TXCT) - Body ground	Always	10 kΩ or higher
E21-5 (AGND) - Body ground	Always	10 kΩ or higher
E21-14 (VC5) - Body ground	Always	10 kΩ or higher
E21-15 (CODE) - Body ground	Always	10 kΩ or higher

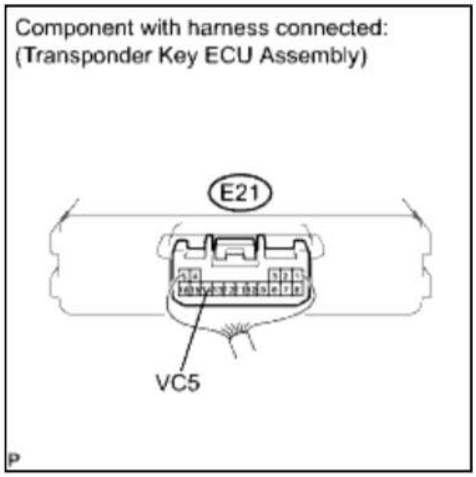
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

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3.	INSPECT TRANSPONDER KEY ECU ASSEMBLY (TRANSPONDER KEY AMPLIFIER POWER SOURCE)

(a) Reconnect the transponder key ECU assembly connector.



(b) Reconnect the transponder key amplifier connector.

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

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E21-14 (VC5) - Body ground	No key is in ignition key cylinder	Below 1 V
E21-14 (VC5) - Body ground	Key is in ignition key cylinder	4.6 to 5.4 V

NG ▶ **REPLACE TRANSPONDER KEY ECU ASSEMBLY**

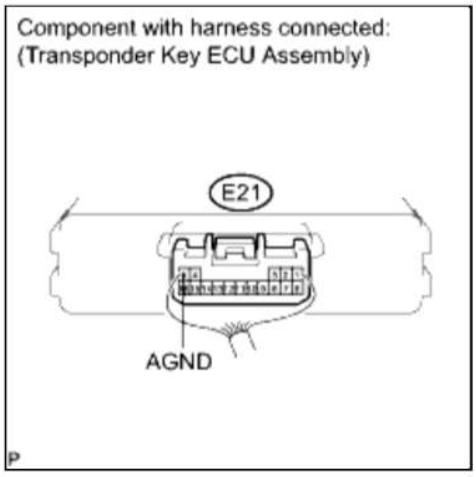
OK ▼

4.	INSPECT TRANSPONDER KEY ECU ASSEMBLY (TRANSPONDER KEY AMPLIFIER GROUND)

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

Standard Resistance:

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TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E21-5 (AGND) - Body ground	Always	Below 1 Ω

NG ▶ **REPLACE TRANSPONDER KEY ECU ASSEMBLY**

OK ▶ **REPLACE TRANSPONDER KEY AMPLIFIER**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001GV1016X
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): B2793: Transponder Chip Malfunction (2010 Corolla)		

DTC	**B2793**	**Transponder Chip Malfunction**

DESCRIPTION

This DTC is output when a malfunction is found in the key during key code registration or a key code is not registered normally. Replace the key if the key code registration is not performed normally and this DTC is detected.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B2793	Transponder chip malfunction	Key

INSPECTION PROCEDURE

NOTICE:

If the key is replaced, register the key INFO .

PROCEDURE

1.	**CLEAR DTC**

(a) Clear the DTCs INFO .

NEXT

2.	**RE-REGISTER KEY**

(a) Re-register the key INFO .

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NEXT

3.	**CHECK ENGINE START**

(a) Check that the engine starts.

OK:

The engine starts.

NG ▶ **REPLACE KEY**

OK ▶ **END (KEY REGISTRATION IS DEFECTIVE)**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001GV2011X
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): B2794: Unmatched Encryption Code (2010 Corolla)		

DTC	**B2794**	**Unmatched Encryption Code**

DESCRIPTION

This DTC is output when a key with an incomplete key code is inserted into the ignition key cylinder.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B2794	Key with incomplete key code is inserted	Key

INSPECTION PROCEDURE

NOTICE:

If the key is replaced, register the key INFO .

PROCEDURE

1.	**REPLACE KEY**

(a) Replace the key.

NEXT

2.	**KEY REGISTRATION**

(a) Register the key INFO .

NEXT **END (KEY IS DEFECTIVE)**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001GUW011X
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): B2795: Unmatched Key Code (2010 Corolla)		

DTC	**B2795**	**Unmatched Key Code**

DESCRIPTION

This DTC is output when a key with a key code that has not been registered in the ECU is inserted into the ignition key cylinder.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B2795	Key with unregistered key code is inserted	Key

INSPECTION PROCEDURE

NOTICE:

If the key is replaced, register the key INFO .

PROCEDURE

1.	**CLEAR DTC**

(a) Clear the DTCs INFO .

NEXT

2.	**RE-REGISTER KEY**

(a) Re-register the key INFO .

NEXT

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3.	**CHECK ENGINE START**

(a) Check that the engine starts.

OK:

The engine starts.

NG ▶ **REPLACE KEY**

OK ▶ **END (KEY REGISTRATION IS DEFECTIVE)**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001GUX01EX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): B2796,B2798: No Communication in Immobiliser System (2010 Corolla)		

DTC	**B2796**	**No Communication in Immobiliser System**

DTC	**B2798**	**Communication Malfunction No. 2**

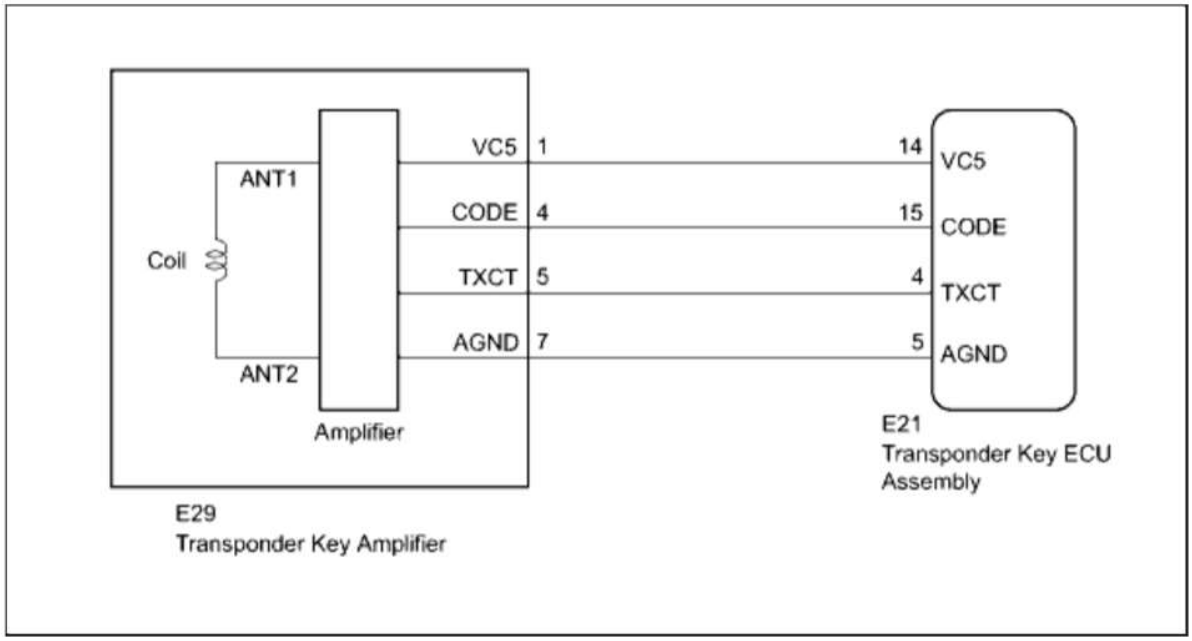
DESCRIPTION

These DTCs are output if a key that does not have a transponder chip is inserted into the ignition key cylinder or if communication between the key and the transponder key ECU assembly is impossible.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B2796	The key code cannot be transmitted	• Key • Transponder key amplifier • Transponder key ECU assembly
B2798	Key code identification cannot be completed within the specified time (0.15 to 0.5 sec.)	• Key • Transponder key amplifier • Transponder key ECU assembly

WIRING DIAGRAM

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INSPECTION PROCEDURE

NOTICE:

- If the transponder key ECU assembly is replaced, register the key and ECU communication ID INFO .
- If the key is replaced, register the key INFO .

PROCEDURE

1.	**READ VALUE USING TECHSTREAM**

(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Turn the Techstream on.

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

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

Immobiliser (Transponder Key ECU Assembly)

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Immobiliser	Immobiliser system status/SET or UNSET	UNSET: Ignition switch ON SET: Without key	-

OK:

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On the Techstream screen, the item changes between UNSET and SET according to the chart above.

NG ▶ CHECK KEY

OK ▶ REPLACE TRANSPONDER KEY ECU ASSEMBLY

2.	CHECK KEY

(a) Insert the vehicle's other key into the ignition key cylinder.

(b) Check that the engine starts with this key.

OK:
The engine starts.

NG ▶ REPLACE TRANSPONDER KEY AMPLIFIER

OK ▼

3.	RE-REGISTER KEY

(a) Re-register the key INFO.

NEXT ▼

4.	CHECK ENGINE START

(a) Check that the engine starts.

OK:
The engine starts.

NG ▶ REPLACE KEY

OK ▶ END (KEY REGISTRATION IS DEFECTIVE)

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5.	REPLACE TRANSPONDER KEY AMPLIFIER

(a) Replace the transponder key amplifier INFO .

NEXT

6.	CHECK ENGINE START

(a) Check that the engine starts.

OK:

The engine starts.

NG ▶ **REPLACE TRANSPONDER KEY ECU ASSEMBLY**

OK ▶ **END (TRANSPONDER KEY AMPLIFIER IS DEFECTIVE)**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001GUY01EX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): B2797: Communication Malfunction No. 1 (2010 Corolla)		

DTC	**B2797**	**Communication Malfunction No. 1**

DESCRIPTION

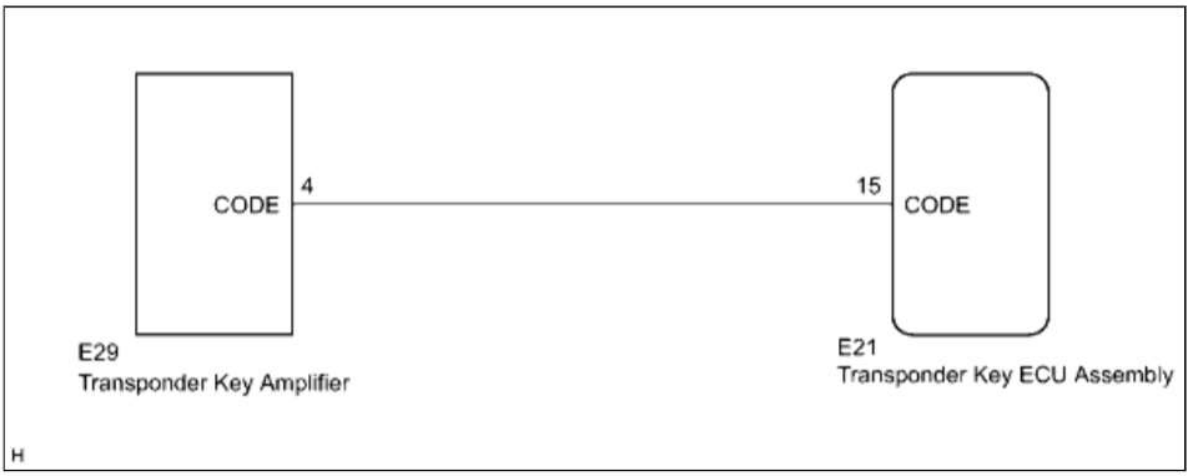
This DTC is output when an error occurs in communication between the transponder key amplifier and the transponder key ECU assembly.

HINT:

Some noise is found in the communication line.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B2797	Keys are positioned too close to each other, or noise occurs in communication line	• Key • Transponder key amplifier • Transponder key ECU assembly

WIRING DIAGRAM



INSPECTION PROCEDURE

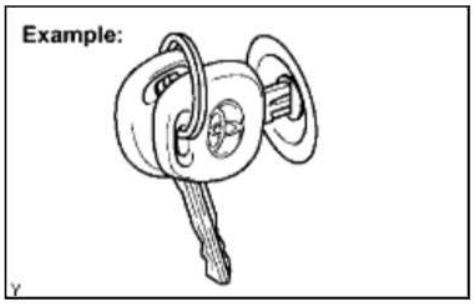
NOTICE:

If the transponder key ECU assembly is replaced, register the key and ECU communication ID INFO .

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PROCEDURE

1.	CHECK KEY



(a) Check whether the ignition key being used is near other ignition keys, as shown in the illustration. Also, check whether the key ring is in contact with the key grip.

Result:

RESULT	PROCEED TO
Key is not near other keys and key ring is not in contact with key grip.	A
Key is near other keys and/or key ring is in contact with key grip.	B

A ▶ **REPLACE TRANSPONDER KEY AMPLIFIER**

B ▼

2.	CHECK DTC OUTPUT

(a) Separate the keys from each other, or remove the key ring.

(b) Clear the DTCs [INFO].

(c) Insert a key into the ignition key cylinder and remove the key. Repeat for all the other keys of the vehicle.

OK:

No code is output.

NG ▶ **REPLACE TRANSPONDER KEY AMPLIFIER**

OK ▶ **END (KEYS ARE POSITIONED TOO CLOSE TO EACH OTHER)**

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3.	REPLACE TRANSPONDER KEY AMPLIFIER

(a) Replace the transponder key amplifier INFO .

NEXT

4.	CHECK ENGINE START

(a) Check that the engine starts.

OK:

The engine starts.

NG ▶ **REPLACE TRANSPONDER KEY ECU ASSEMBLY**

OK ▶ **END (TRANSPONDER KEY AMPLIFIER IS DEFECTIVE)**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000002M6X01DX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): B2799: Engine Immobiliser System Malfunction (2010 Corolla)		

DTC	**B2799**	**Engine Immobiliser System Malfunction**

DESCRIPTION

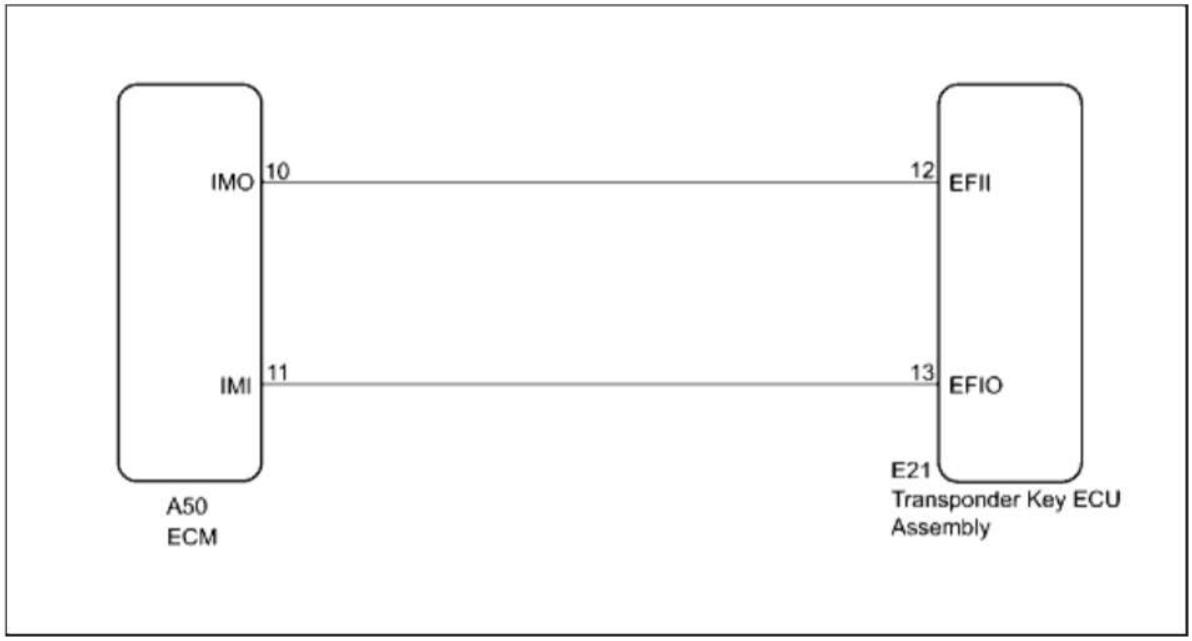
This DTC is output when one of the following occurs: 1) the ECM detects errors in its own communications with the transponder key ECU assembly; 2) the ECM detects errors in the communication lines; or 3) the ECU communication ID between the transponder key ECU assembly and ECM is different and an engine start is attempted.

Before troubleshooting for this DTC, make sure that no transponder key ECU assembly DTCs are present. If present, troubleshoot the transponder key ECU assembly DTCs first.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B2799	One of following conditions is met: • Error in communication between ECM and transponder key ECU assembly • Error in communication lines • Communication ID is different during communication with transponder key ECU assembly	• Wire harness or connector • ECM • Transponder key ECU assembly

WIRING DIAGRAM

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INSPECTION PROCEDURE

NOTICE:

- If the transponder key ECU assembly is replaced, register the key and ECU communication ID INFO .
- If the ECM is replaced, register the ECU communication ID INFO .

PROCEDURE

1.	**CHECK DTC OUTPUT**

(a) Clear the DTCs INFO .

(b) Recheck for DTCs.

OK:

DTC B2799 is not reoutput.

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 .

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NEXT

3.	CHECK DTC OUTPUT

(a) Clear the DTCs INFO.

(b) Recheck for DTCs.

OK:
DTC B2799 is not reoutput.

NG ▶ **CHECK CONNECTION OF CONNECTOR**

OK ▶ **END (ECU COMMUNICATION ID IS DEFECTIVE)**

4.	CHECK CONNECTION OF CONNECTOR

(a) Turn the ignition switch off.

(b) Check that the connectors are properly connected to the ECM and the transponder key ECU.

OK:
Connectors are properly connected.

NG ▶ **CONNECT CONNECTORS PROPERLY**

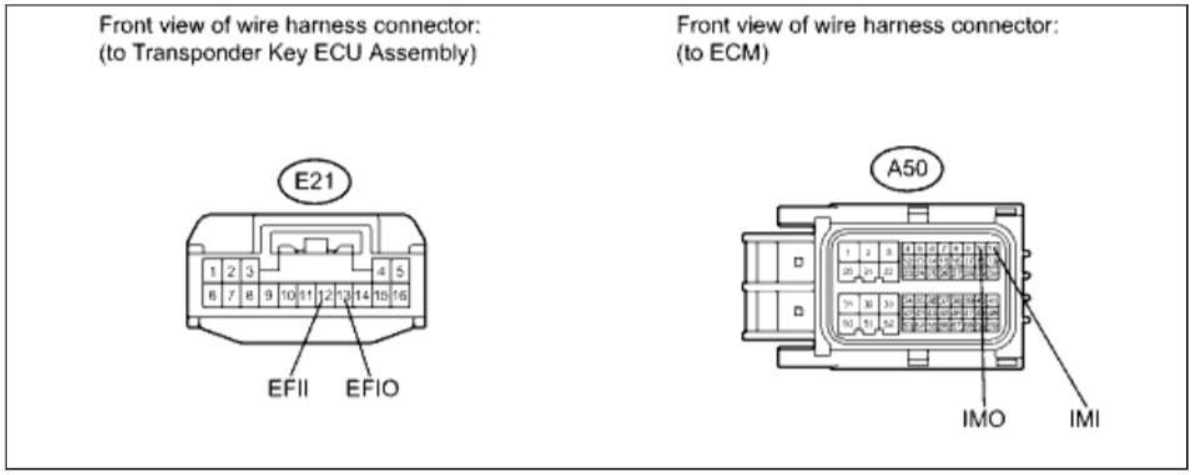
OK

5.	CHECK HARNESS AND CONNECTOR (TRANSPONDER KEY ECU - ECM)

(a) Disconnect the transponder key ECU assembly connector.

(b) Disconnect the ECM 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
E21-12 (EFII) - A50-10 (IMO)	Always	Below 1 Ω
E21-13 (EFIO) - A50-11 (IMI)	Always	Below 1 Ω
E21-12 (EFII) - Body ground	Always	10 kΩ or higher
E21-13 (EFIO) - Body ground	Always	10 kΩ or higher

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

OK
▼

6.	**REPLACE ECM**

(a) Replace the ECM.

INFO for 2ZR-FE)

INFO for 2AZ-FE)

NEXT
▼

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7.	REGISTER ECU COMMUNICATION ID

(a) Register the ECU communication ID INFO .

NEXT

8.	CHECK DTC OUTPUT

(a) Clear the DTCs INFO .

(b) Recheck for DTCs.

OK:
DTC B2799 is not reoutput.

NG ▶ **REPLACE TRANSPONDER KEY ECU ASSEMBLY**

OK ▶ **END (ECM IS DEFECTIVE)**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000002UEB00OX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): B279A: Theft Deterrent System Communication Line High Fixation (2010 Corolla)		

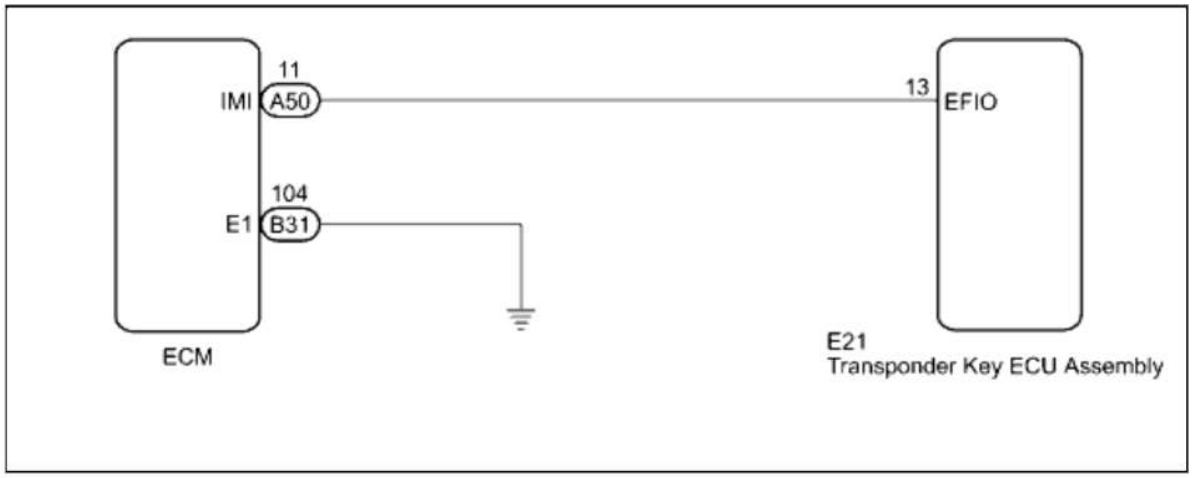
DTC	**B279A**	**Theft Deterrent System Communication Line High Fixation**

DESCRIPTION

If the communication line (EFIO-IMI) to the transponder key ECU assembly is stuck on HI output, the ECM outputs this DTC.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B279A	Communication line (EFIO-IMI) between ECM and the transponder key ECU assembly is stuck on HI output	• Wire harness or connector • Transponder key ECU assembly • ECM

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- If the transponder key ECU assembly is replaced, register the key and ECU communication ID INFO .
- If the ECM is replaced, register the ECU communication ID INFO .

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PROCEDURE

1.	CHECK DTC OUTPUT

(a) Recheck for DTCs INFO .

HINT:

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

Result:

RESULT	PROCEED TO
DTC B279A and other DTCs reoutput	A
DTC B279A reoutput	B

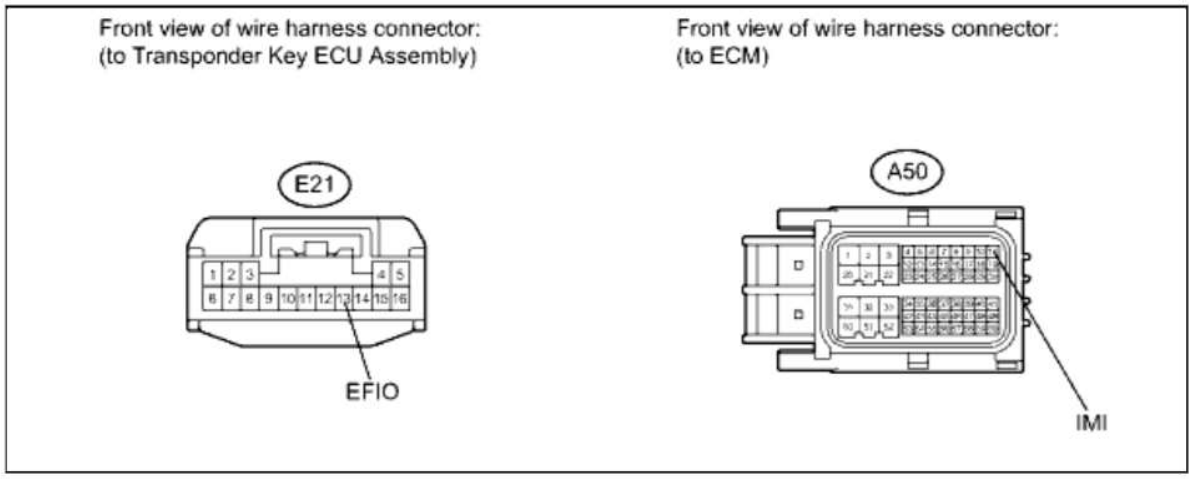
A ▶ GO TO DTC CHART

B ▼

2.	CHECK HARNESS AND CONNECTOR (TRANSPONDER KEY ECU - ECM)

(a) Disconnect the transponder key ECU assembly connector.

(b) Disconnect the ECM connector.



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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E21-13 (EFIO) - A50-11 (IMI)	Always	Below 1 Ω
E21-13 (EFIO) - Body ground	Always	10 kΩ or higher

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E21-13 (EFIO) - Body ground	Always	Below 1 V

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

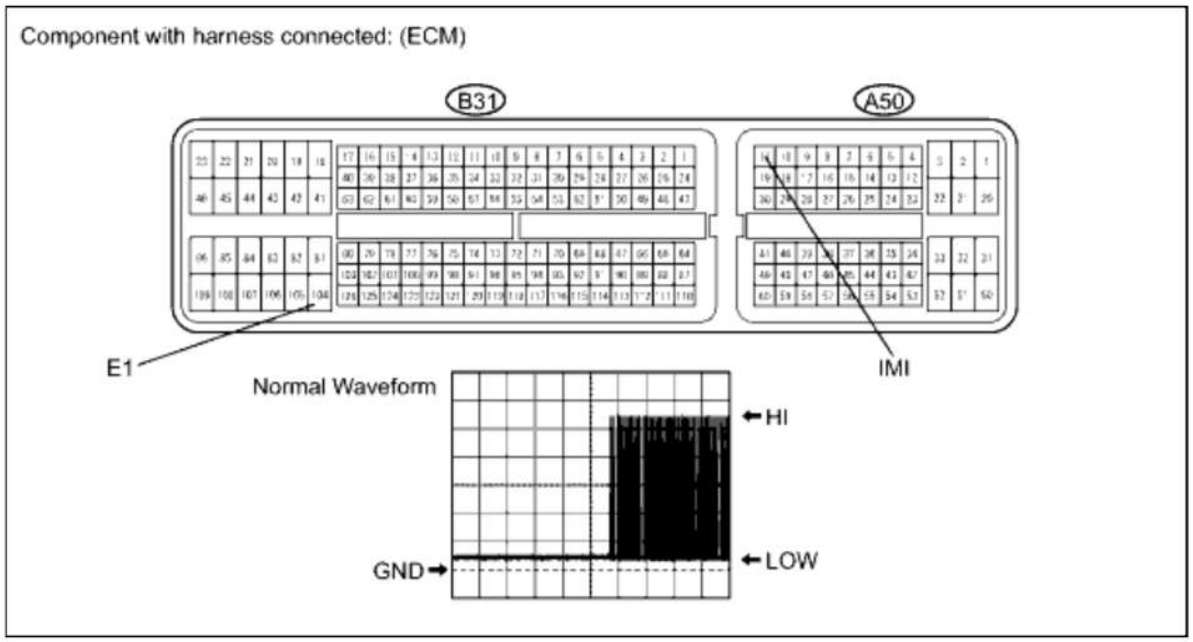
OK ▼

3.	**CHECK ECM (INPUT)**

(a) Reconnect the transponder key ECU assembly connector.

(b) Reconnect the ECM connector.

(c) Measure the waveform.



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Waveform 1 (Reference):

ITEM	CONTENT
Terminal No. (Symbols)	A50-11 (IMI) - B31-104 (E1)
Tool Setting	2 V/DIV., 1 s./DIV.
Condition	Ignition switch ON

Result:

RESULT	PROCEED TO
OK (for 2ZR-FE)	A
OK (for 2AZ-FE)	B
NG	C

B ▶ **REPLACE ECM**

A ▶ **REPLACE ECM**

C
▼

4.	**REPLACE TRANSPONDER KEY ECU ASSEMBLY**

(a) Replace the transponder key ECU assembly INFO.

NEXT
▼

5.	**REGISTER KEY**

(a) Register the key INFO.

NEXT

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6.	REGISTER ECU COMMUNICATION ID

(a) Register the ECU communication ID INFO.

NEXT

7.	CHECK DTC OUTPUT

(a) Clear the DTCs INFO.

(b) Recheck for DTCs.

OK:
B279A is not reoutput.
Result:

RESULT	PROCEED TO
NG (for 2ZR-FE)	A
NG (for 2ZA-FE)	B
OK	C

B ▶ **REPLACE ECM**

A ▶ **REPLACE ECM**

C ▶ **END (TRANSPONDER KEY ECU IS DEFECTIVE)**

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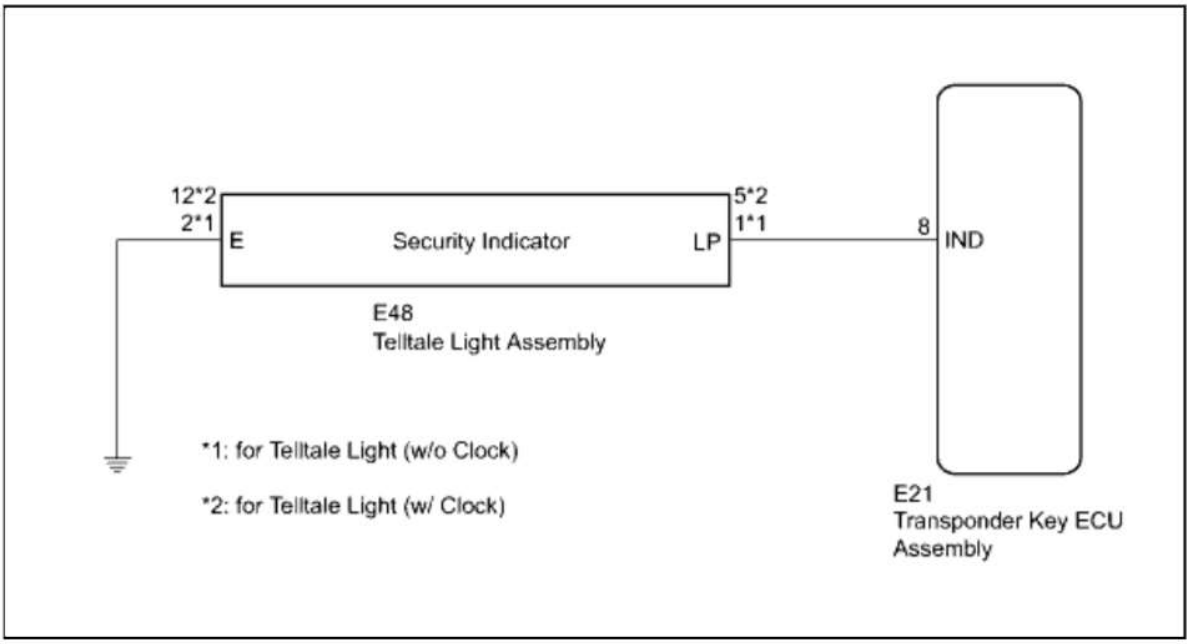
Last Modified: 3-10-2010	6.4 J	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001GV401ZX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): Security Indicator Light Circuit (2010 Corolla)		

Security Indicator Light Circuit

DESCRIPTION

The security indicator light blinks continuously due to a continuous signal received from the transponder key ECU assembly while in the armed state.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

If the transponder key ECU assembly is replaced, register the key and ECU communication ID INFO .

PROCEDURE

1.	**PERFORM ACTIVE TEST USING TECHSTREAM**

(a) Connect the Techstream to the DLC3.

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(b) Turn the ignition switch to ON.

(c) Turn the Techstream on.

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

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

Immobiliser (Transponder Key ECU Assembly)

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Security Indicator	Security indicator light	ON/OFF	-

OK:
The security indicator turns on and off according to the Techstream operation.

NG ▶ **CHECK HARNESS AND CONNECTOR (TRANSPONDER KEY ECU - SECURITY INDICATOR LIGHT)**

OK ▶ **REPLACE TRANSPONDER KEY ECU ASSEMBLY**

2.	**CHECK HARNESS AND CONNECTOR (TRANSPONDER KEY ECU - SECURITY INDICATOR LIGHT)**

(a) Disconnect the transponder key ECU assembly connector.

(b) Disconnect the telltale light assembly connector.

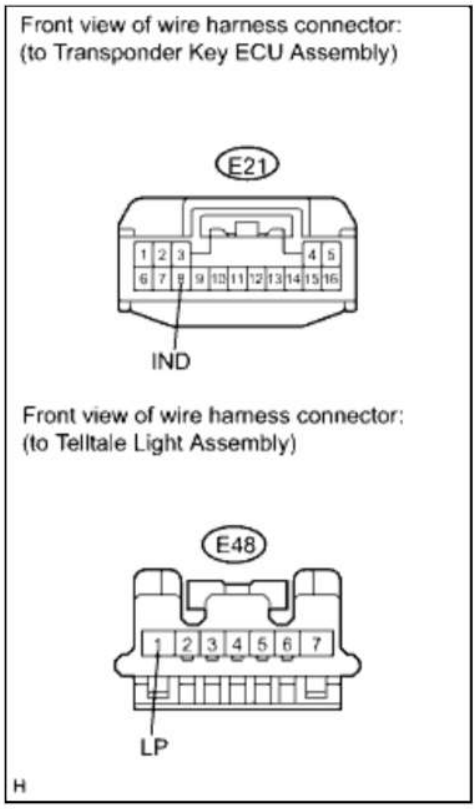
(c) for Telltale Light (w/o Clock):

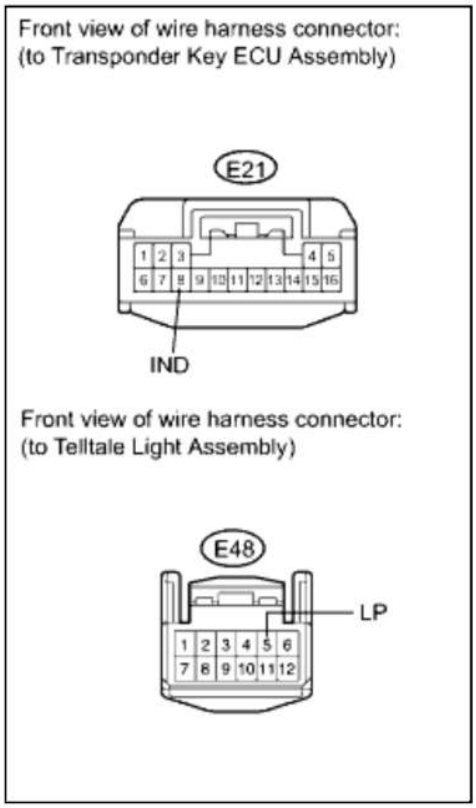
(1) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E21-8 (IND) - E48-1 (LP)	Always	Below 1 Ω
E21-8 (IND) - Body ground	Always	10 kΩ or higher

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(d) for Telltale Light (w/ Clock):

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E21-8 (IND) - E48-5 (LP)	Always	Below 1 Ω
E21-8 (IND) - Body ground	Always	10 kΩ or higher

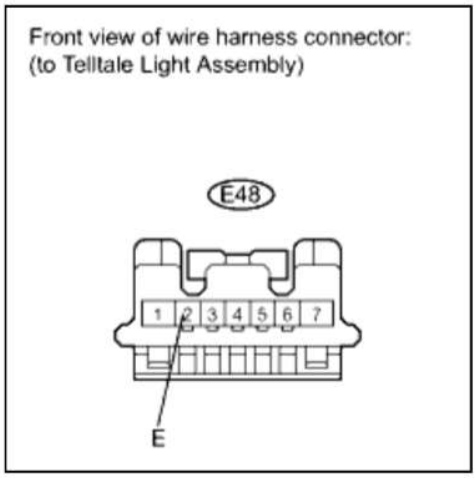
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

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OK

3.	CHECK HARNESS AND CONNECTOR (SECURITY INDICATOR LIGHT - BODY GROUND)

(a) for Telltale Light (w/o Clock):

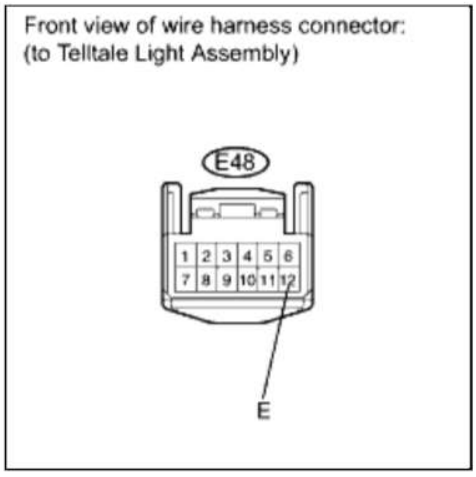


(1) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E48-2 (E) - Body ground	Always	Below 1 Ω

(b) for Telltale Light (w/ Clock):



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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E48-12 (E) - Body ground	Always	Below 1 Ω

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

OK ▶ **REPLACE TELLTALE LIGHT ASSEMBLY**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000002UEC00OX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): B279C: Theft Deterrent System Presence Detection (2010 Corolla)		

DTC	**B279C**	**Theft Deterrent System Presence Detection**

DESCRIPTION

If an ECM that is incompatible with the engine immobiliser system is installed, the ECM outputs this DTC.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
B279C	ECM that is incompatible with engine immobiliser system is installed	ECM

INSPECTION PROCEDURE

NOTICE:

If the ECM is replaced, register the ECU communication ID INFO .

PROCEDURE

1.	**CHECK DTC OUTPUT**

(a) Clear the DTCs INFO .

(b) Recheck for DTCs.

OK:

DTC B279C is not reoutput.

Result:

RESULT	PROCEED TO
DTC B279C is reoutput (for 2ZR-FE)	A
DTC B279C is reoutput (for 2AZ-FE)	B
DTC B279C is not reoutput	C

B ▶ REPLACE ECM

A ▶ USE SIMULATION METHOD TO CHECK

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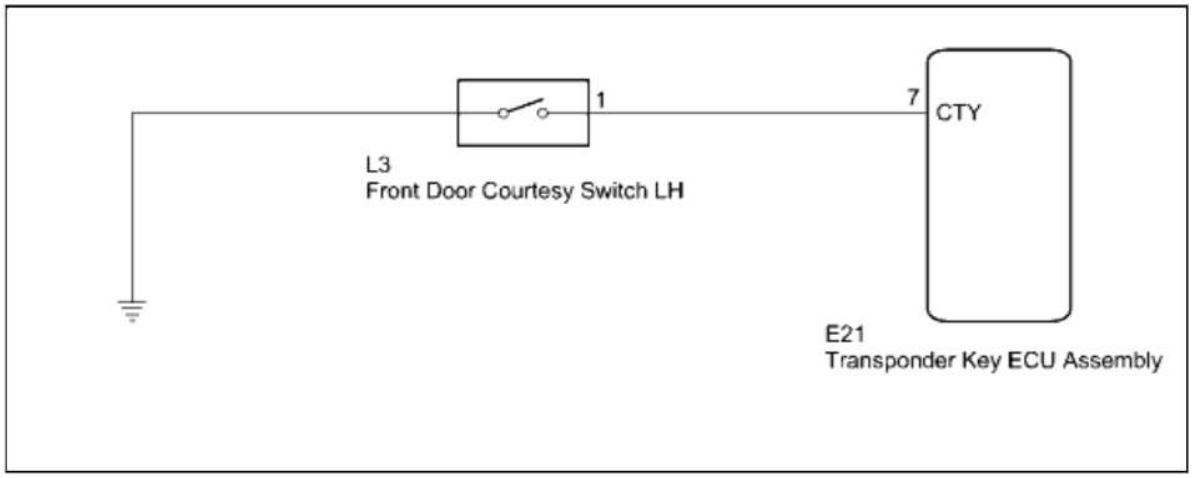
Last Modified: 3-10-2010	6.4 J	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001GUZ00SX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): Door Courtesy Switch Circuit (2010 Corolla)		

Door Courtesy Switch Circuit

DESCRIPTION

When an additional transponder key is registered, the transponder key ECU assembly detects the front door courtesy light switch open/close condition, and enters the key registration mode.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

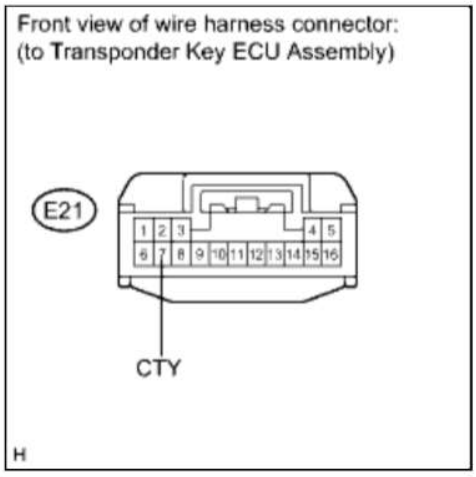
If the transponder key ECU assembly is replaced, register the key and ECU communication ID INFO .

PROCEDURE

1.	**CHECK HARNESS AND CONNECTOR (FRONT DOOR COURTESY LIGHT SWITCH CIRCUIT)**

(a) Disconnect the transponder key ECU assembly connector.

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

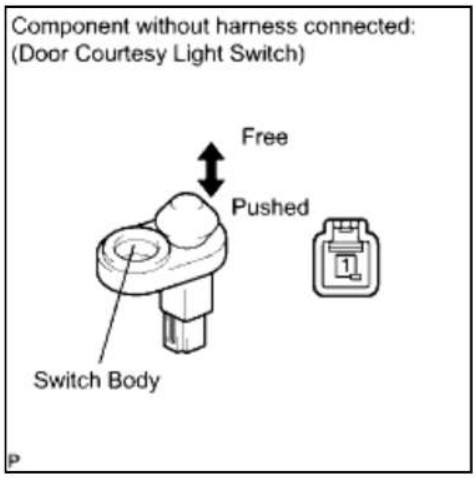
Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E21-7 (CTY) - Body ground	Courtesy switch pushed (Door closed)	10 kΩ or higher
E21-7 (CTY) - Body ground	Courtesy switch free (Door open)	Below 1 Ω

NG ▶ **INSPECT FRONT DOOR COURTESY LIGHT SWITCH ASSEMBLY**

OK ▶ **REPLACE TRANSPONDER KEY ECU ASSEMBLY**

2.	**INSPECT FRONT DOOR COURTESY LIGHT SWITCH ASSEMBLY**



(a) Remove the driver side front door courtesy light switch INFO .

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

Standard Resistance:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
1 - Switch body	Courtesy switch pushed (Door closed)	10 kΩ or higher
1 - Switch body	Courtesy switch free (Door open)	Below 1 Ω

NG ▶ **REPLACE FRONT DOOR COURTESY LIGHT SWITCH ASSEMBLY**

OK ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (TRANSPONDER KEY ECU - FRONT DOOR COURTESY LIGHT SWITCH)**

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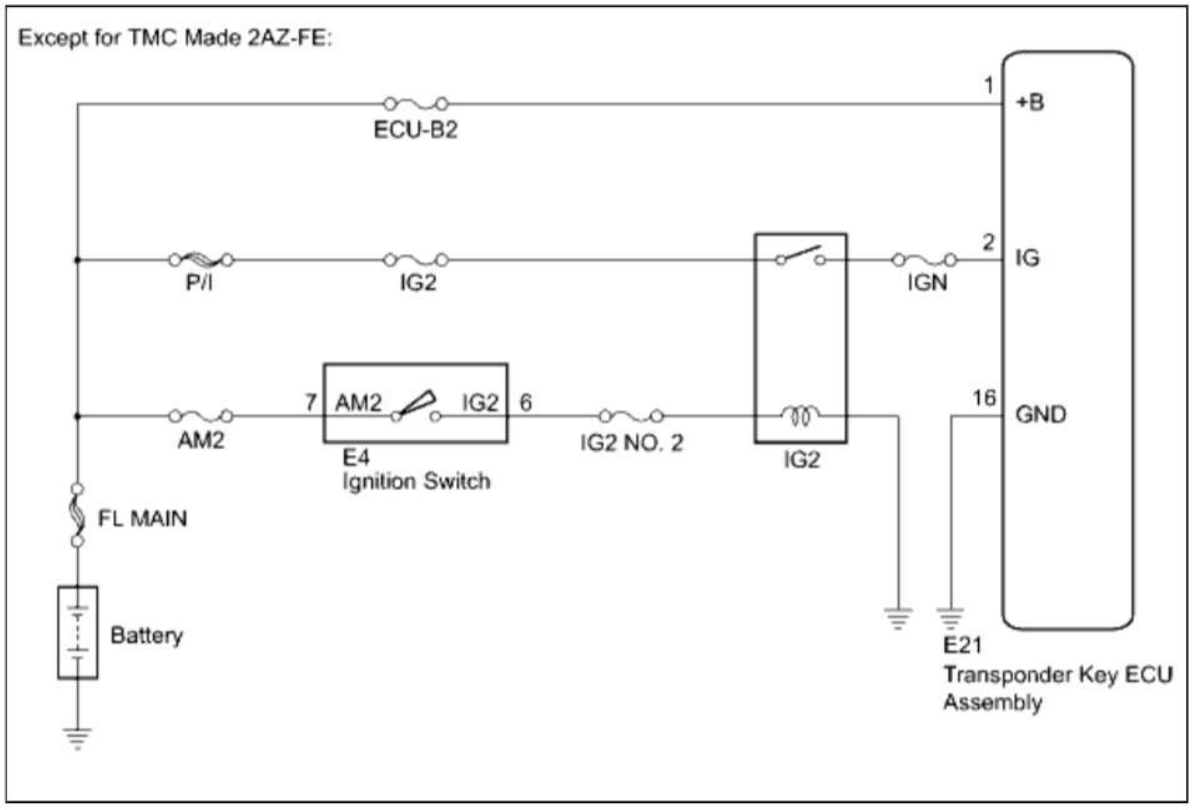
Last Modified: 3-10-2010	6.4 J	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001GUU017X
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): ECU Power Source Circuit (2010 Corolla)		

ECU Power Source Circuit

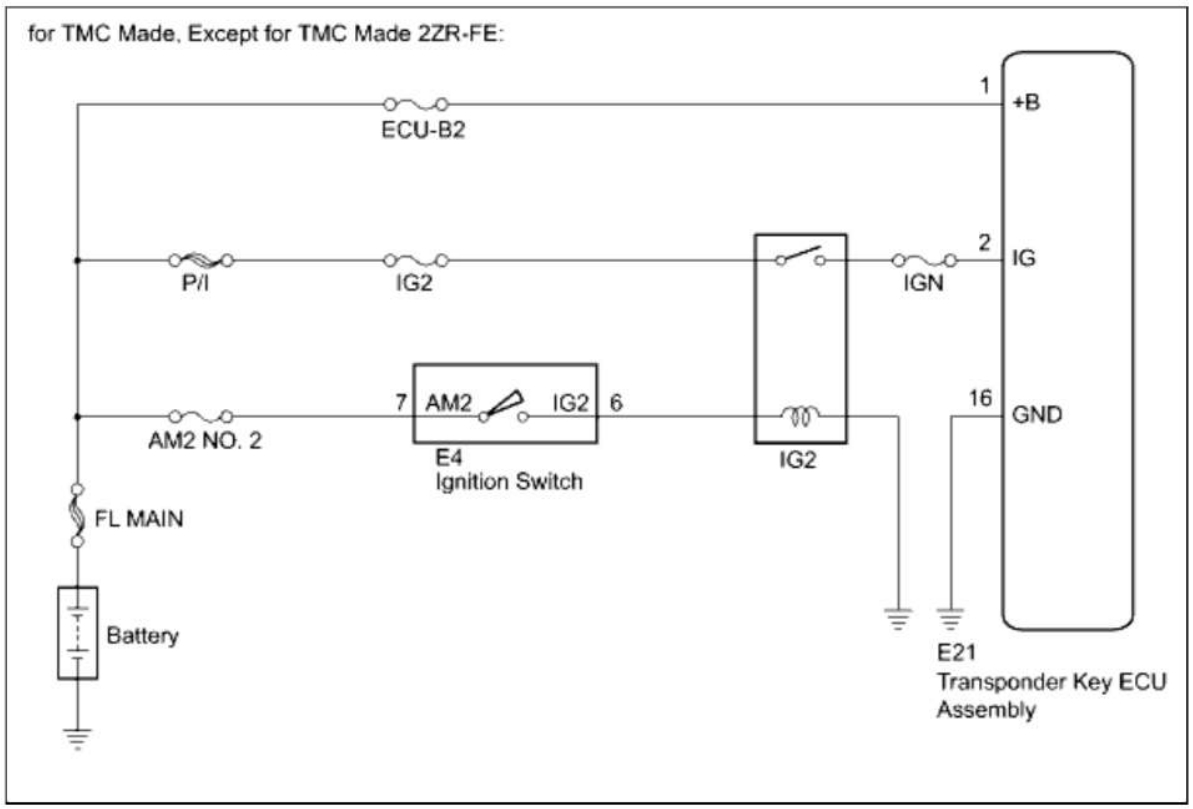
DESCRIPTION

This circuit provides power to operate the transponder key ECU assembly.

WIRING DIAGRAM



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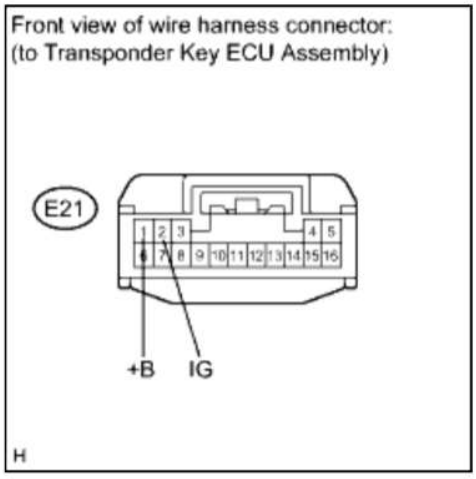
INSPECTION PROCEDURE

NOTICE:

If the transponder key ECU assembly is replaced, register the key and ECU communication ID INFO .

PROCEDURE

1.	**CHECK HARNESS AND CONNECTOR (TRANSPONDER KEY ECU - BATTERY)**



(a) Disconnect the transponder key ECU assembly connector.

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

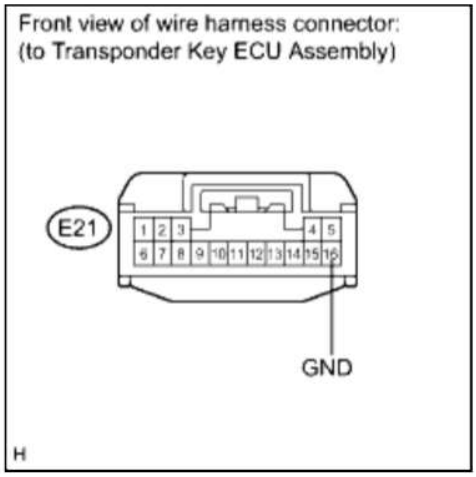
Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E21-1 (+B) - Body ground	Always	11 to 14 V
E21-2 (IG) - Body ground	Ignition switch off	Below 1 V
E21-2 (IG) - Body ground	Ignition switch ON	11 to 14 V

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

OK ▼

2.	CHECK HARNESS AND CONNECTOR (TRANSPONDER KEY ECU - BODY GROUND)



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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E21-16 (GND) - Body ground	Always	Below 1 Ω

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

OK ▶ **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE**

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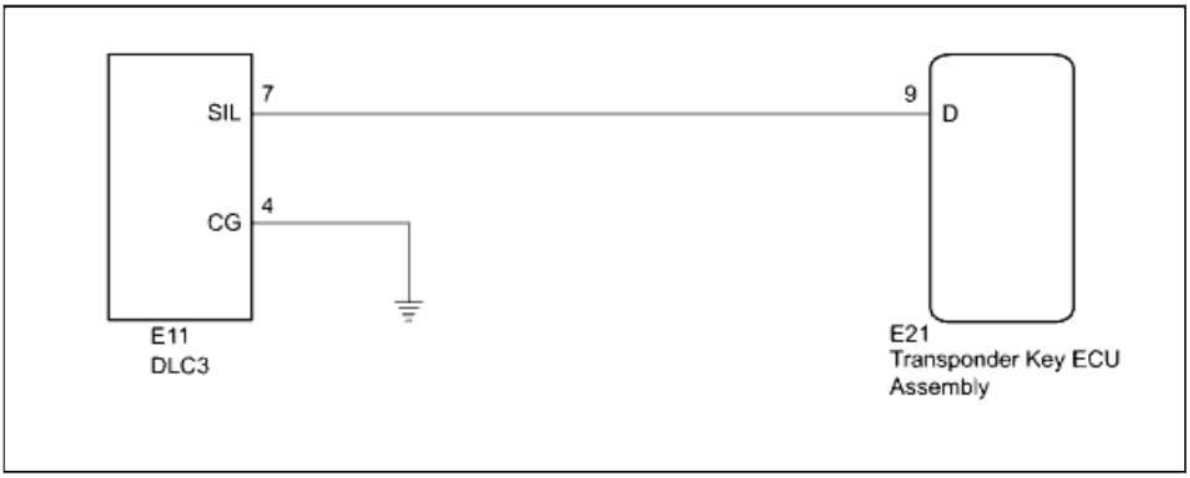
Last Modified: 3-10-2010	6.4 J	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001GUV00ZX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): Diagnosis Circuit (2010 Corolla)		

Diagnosis Circuit

DESCRIPTION

This circuit is used to read the DTCs that are output from the transponder key ECU assembly with the Techstream.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

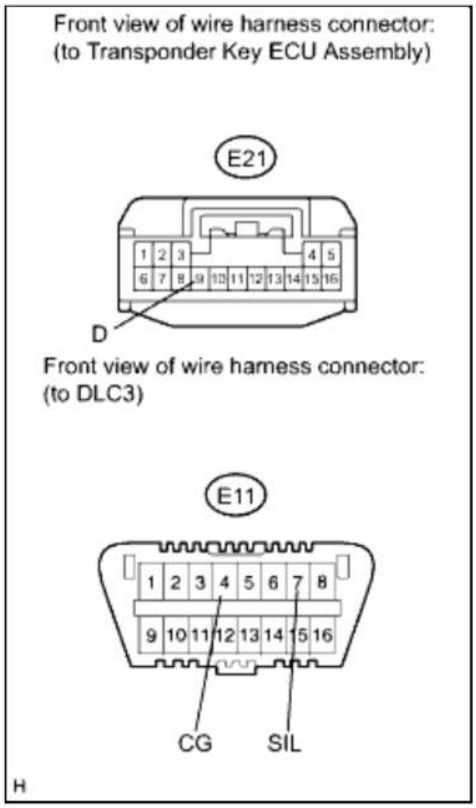
If the transponder key ECU assembly is replaced, register the key and ECU communication ID INFO .

PROCEDURE

1.	**CHECK HARNESS AND CONNECTOR (DLC3 - TRANSPONDER KEY ECU AND BODY GROUND)**

(a) Disconnect the transponder key ECU assembly connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E21-9 (D) - E11-7 (SIL)	Always	Below 1 Ω
E11-4 (CG) - Body ground	Always	Below 1 Ω
E21-9 (D) - Body ground	Always	10 kΩ or higher

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

OK ▶ **REPLACE TRANSPONDER KEY ECU ASSEMBLY**

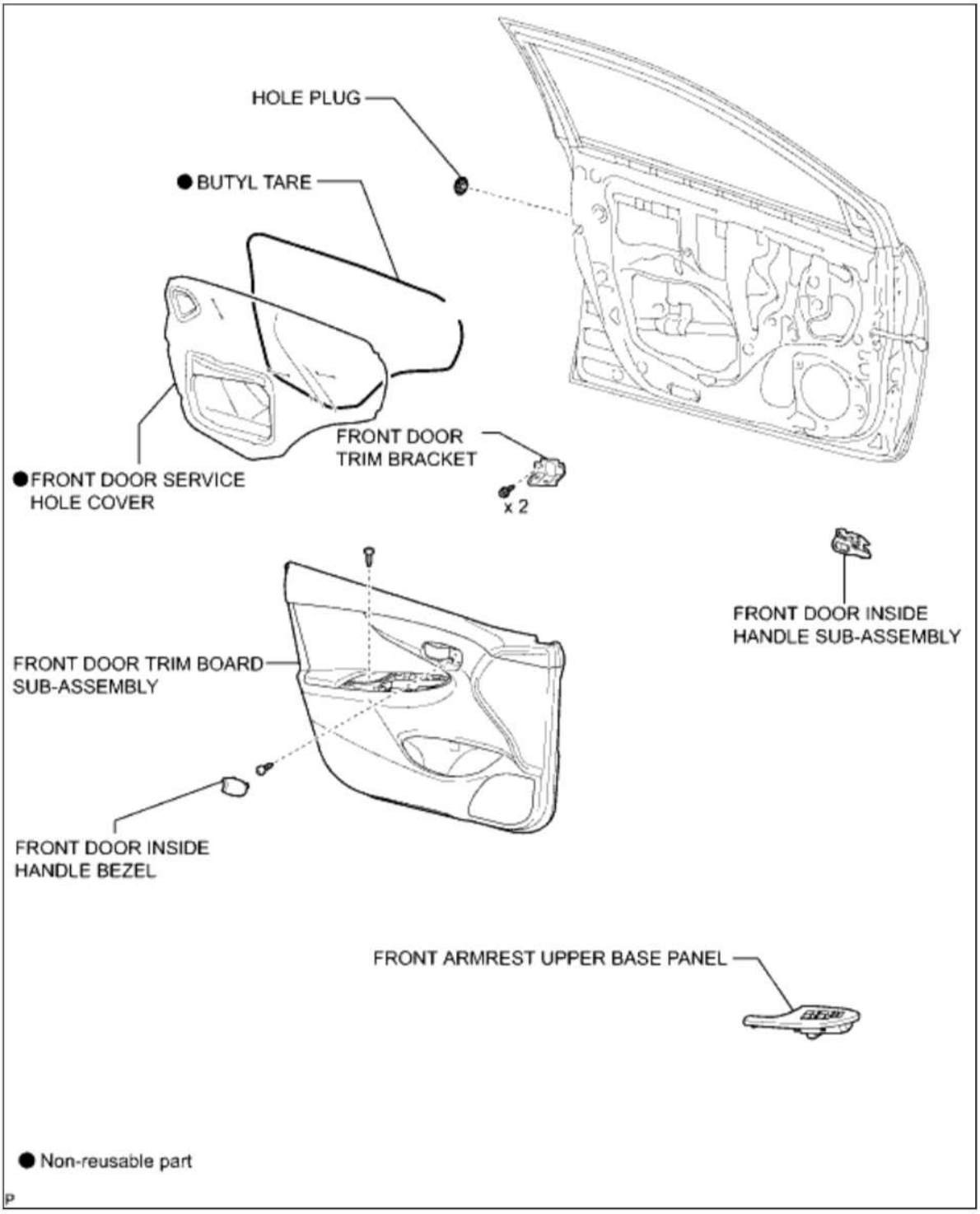
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Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000002Y7Z00GX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENTRY LOCK AND UNLOCK SWITCH: COMPONENTS (2010 Corolla)		

COMPONENTS

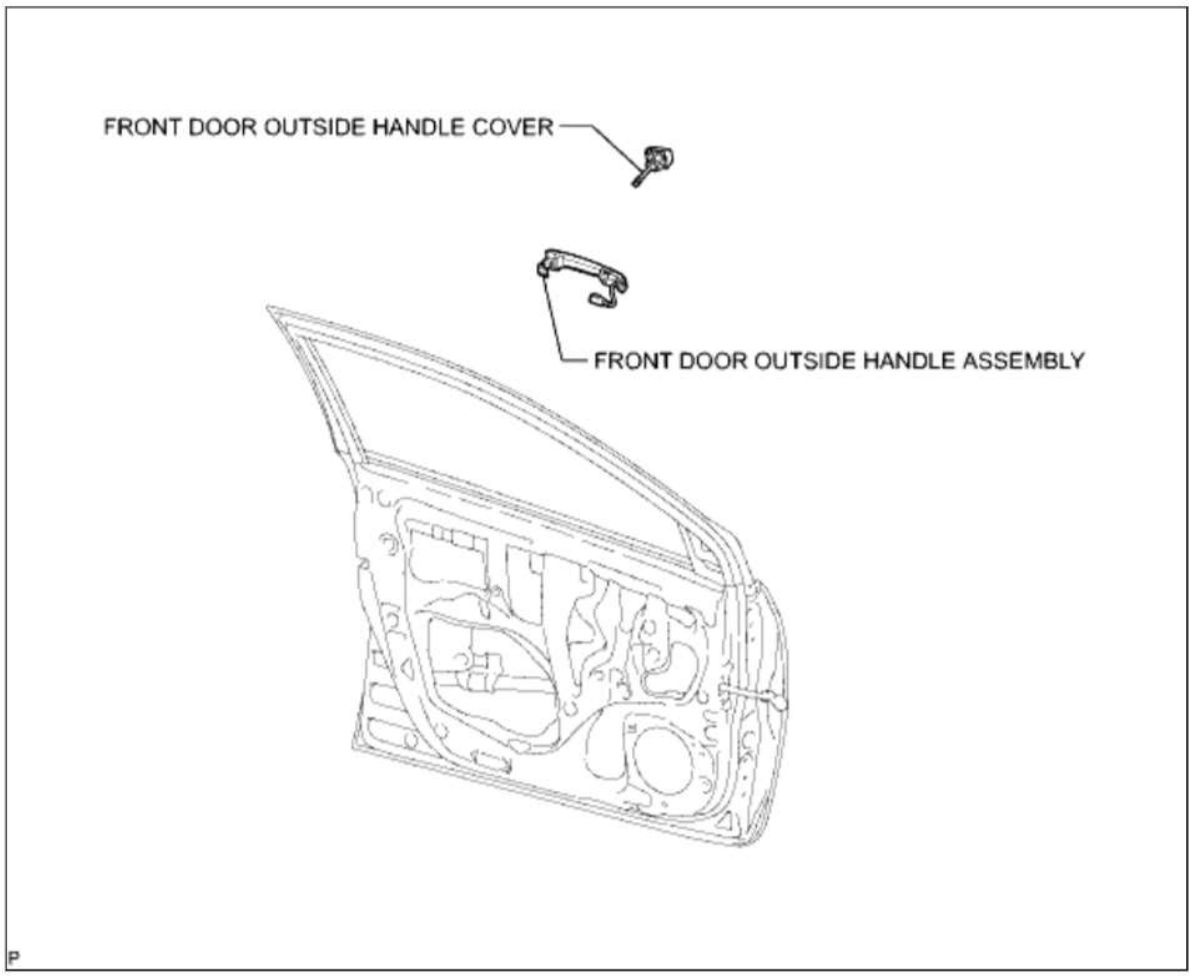
ILLUSTRATION

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ILLUSTRATION

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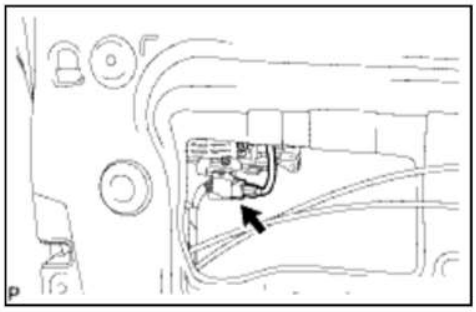


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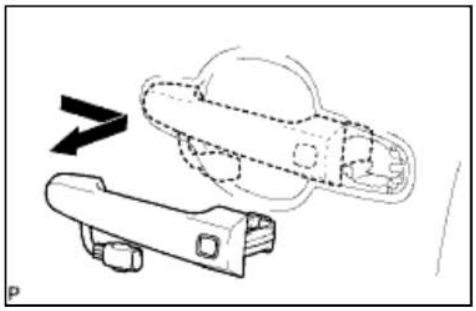
Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000002Y8000CX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENTRY LOCK AND UNLOCK SWITCH: REMOVAL (2010 Corolla)		

REMOVAL

1. **REMOVE FRONT DOOR INSIDE HANDLE BEZEL** INFO
2. **REMOVE FRONT ARMREST UPPER BASE PANEL** INFO
3. **REMOVE FRONT DOOR TRIM BOARD SUB-ASSEMBLY** INFO
4. **REMOVE FRONT DOOR INSIDE HANDLE SUB-ASSEMBLY** INFO
5. **REMOVE FRONT DOOR TRIM BRACKET** INFO
6. **REMOVE FRONT DOOR SERVICE HOLE COVER** INFO
7. **REMOVE FRONT DOOR OUTSIDE HANDLE COVER** INFO
8. **REMOVE FRONT DOOR OUTSIDE HANDLE ASSEMBLY**



(a) Disconnect the connector.



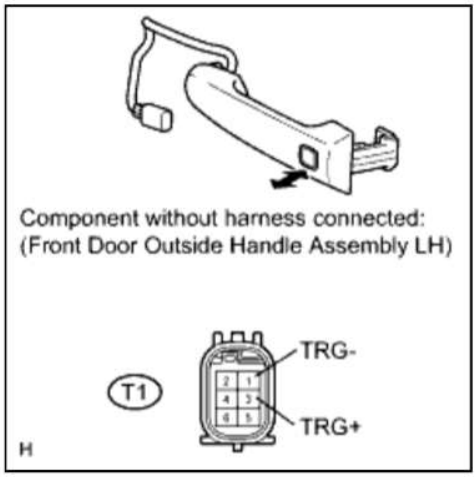
(b) Remove the front door outside handle assembly as shown in the illustration.

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Last Modified: 3-10-2010	6.4 G	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000002Y7Y00HX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENTRY LOCK AND UNLOCK SWITCH: INSPECTION (2010 Corolla)		

INSPECTION

1. INSPECT FRONT DOOR OUTSIDE HANDLE ASSEMBLY LH



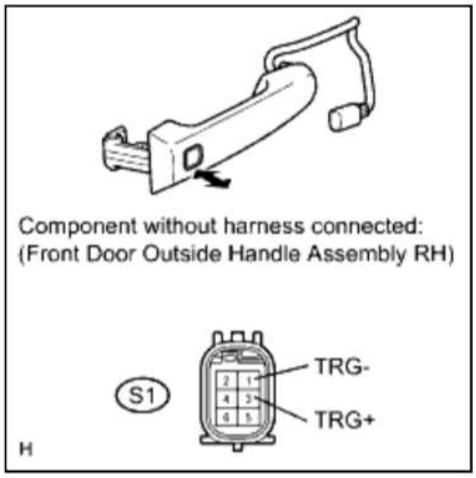
(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
T1-1 (TRG-) - T1-3 (TRG+)	Lock switch not pushed	10 kΩ or higher
T1-1 (TRG-) - T1-3 (TRG+)	Lock switch pushed	Below 1 Ω

If the result is not specified, replace the front door outside handle assembly LH.

2. INSPECT FRONT DOOR OUTSIDE HANDLE ASSEMBLY RH



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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
S1-1 (TRG-) - S1-3 (TRG+)	Lock switch not pushed	10 kΩ or higher
S1-1 (TRG-) - S1-3 (TRG+)	Lock switch pushed	Below 1 Ω

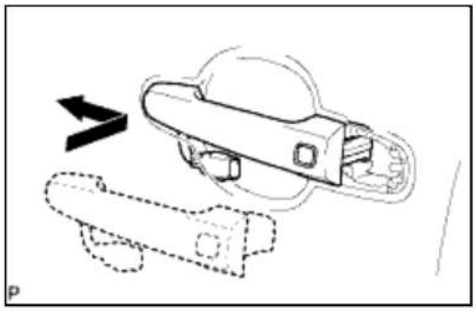
If the result is not specified, replace the front door outside handle assembly RH.

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000002Y7X00CX
Title: THEFT DETERRENT / KEYLESS ENTRY: ENTRY LOCK AND UNLOCK SWITCH: INSTALLATION (2010 Corolla)		

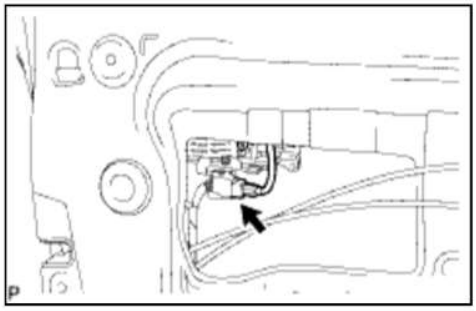
INSTALLATION

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. Next, slide the front door outside handle assembly toward the front of the vehicle to install it.



(c) Connect the connector.

2. INSTALL FRONT DOOR OUTSIDE HANDLE COVER INFO

3. INSTALL FRONT DOOR SERVICE HOLE COVER INFO

4. INSTALL FRONT DOOR TRIM BRACKET INFO

5. INSTALL FRONT DOOR INSIDE HANDLE SUB-ASSEMBLY INFO

6. INSTALL FRONT DOOR TRIM BOARD SUB-ASSEMBLY INFO

7. INSTALL FRONT ARMREST UPPER BASE PANEL (for Driver Side without Power Window) INFO

8. INSTALL FRONT DOOR INSIDE HANDLE BEZEL INFO

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