2014 ACCESSORIES & EQUIPMENT

Engine Immobilizer System (Diagnostic Codes & Symptom Tests) - GX460

ENGINE IMMOBILIZER SYSTEM

DTC B2779: ENGINE STARTER COMMUNICATION MALFUNCTION [08/2013 -]

DESCRIPTION

If the communication between the remote start ECU and certification ECU cannot be performed even a remote start operation is performed to try changing the power source mode to on (IG) or start the engine, this DTC is stored.

When the remote start ECU does not respond to the certification ECU or the remote start ID code is not registered*, this DTC is stored. When communication with the remote start ECU is established and a remote start operation is performed, this DTC is cleared and is not stored as a past DTC.

HINT:

*: Check "Wireless C Code" in the Data List.

DTC Code	DTC Detection Condition	Trouble Area	DTC Output Confirmation Operation
B2779	One of the following conditions is met (1 trip detection logic*): • A remote start communication error occurs. • Response is not possible. • Registration has not been performed.	• Remote start ECU • Harness or connector • Main body ECU (multiplex network body ECU) • Certification ECU	A remote start operation is performed.

*: Only output while a malfunction is present.

VEHICLE CONDITION AND FAIL-SAFE OPERATION WHEN MALFUNCTION DETECTED

Vehicle Condition when Malfunction Detected	Fail-safe Operation when Malfunction Detected
Engine does not start with remote start operation	Engine cannot be started by remote start operation only

RELATED DATA LIST AND ACTIVE TEST

DTC Code	Data List and Active Test
B2779	• Wireless Starter Com ID • Wireless C Code

WIRING DIAGRAM

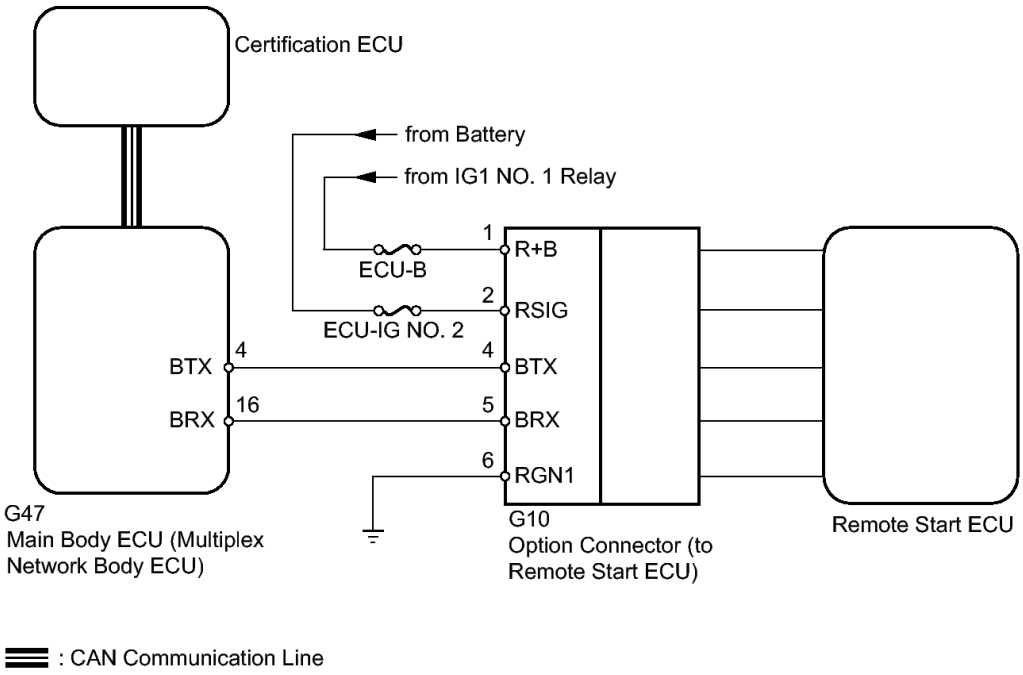


Fig. 1: Remote Start ECU Wiring Diagram
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

NOTE:

- **Inspect the fuses for circuits related to this system before performing the following inspection procedure.**

- **Before performing the inspection, check that DTC U0142 is not output.**
- **Before replacing the certification ECU, refer to Registration. Refer to REGISTRATION [08/2013 -] .**
- **After performing repair, perform the operation that fulfills the DTC output confirmation operation, and then confirm that no DTCs are output again.**

HINT:

In this repair service information, only the terminal numbers used for inspection between the main body ECU and option connector are listed.

PROCEDURE

1. **READ VALUE USING TECHSTREAM**
   a. Turn the engine switch off.

      HINT:

      When using the Techstream with the engine switch off to troubleshoot: Connect the Techstream to the DLC3 and turn a courtesy light switch on and off at 1.5-second intervals until communication between the Techstream and vehicle begins.

   b. Using the Techstream, read the Data List. Refer to **DATA LIST / ACTIVE TEST [08/2013 -]** .

      SMART ACCESS

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Wireless C Code	Registration status between remote start ECU and certification ECU / No Regd or	No Regd: ID not registered between remote start ECU and certification ECU Regd: ID registered	Problems may be caused by the following: • Remote start ECU registration has not been performed.

	Regd	between remote start ECU and certification ECU	• Malfunctions in the certification ECU or remote start ECU.

OK

"Regd" appears on screen.

RESULT

Result	Proceed to
"No Regd" appears on screen	A
"Regd" appears on screen	B

B --> See step 4

A: Go to next step

2. **REGISTER REMOTE START ID**
   a. Register the remote start ID.

NEXT: Go to next step

3. **CHECK REMOTE START**
   a. Check that the engine can be started using the remote start operation.

OK

Engine can be started using remote start operation.

NG --> See step 4

OK --> END (REMOTE START ID IS NOT REGISTERED CORRECTLY)

4. **CHECK HARNESS AND CONNECTOR (MAIN BODY ECU - OPTION CONNECTOR)**

HINT:

In this repair service information, only the terminal numbers used for inspection between the main body ECU and option connector are listed.

a. Disconnect the G47 ECU connector.
b. Disconnect the G10 option connector.
c. Measure the resistance according to the value(s) in the table below.

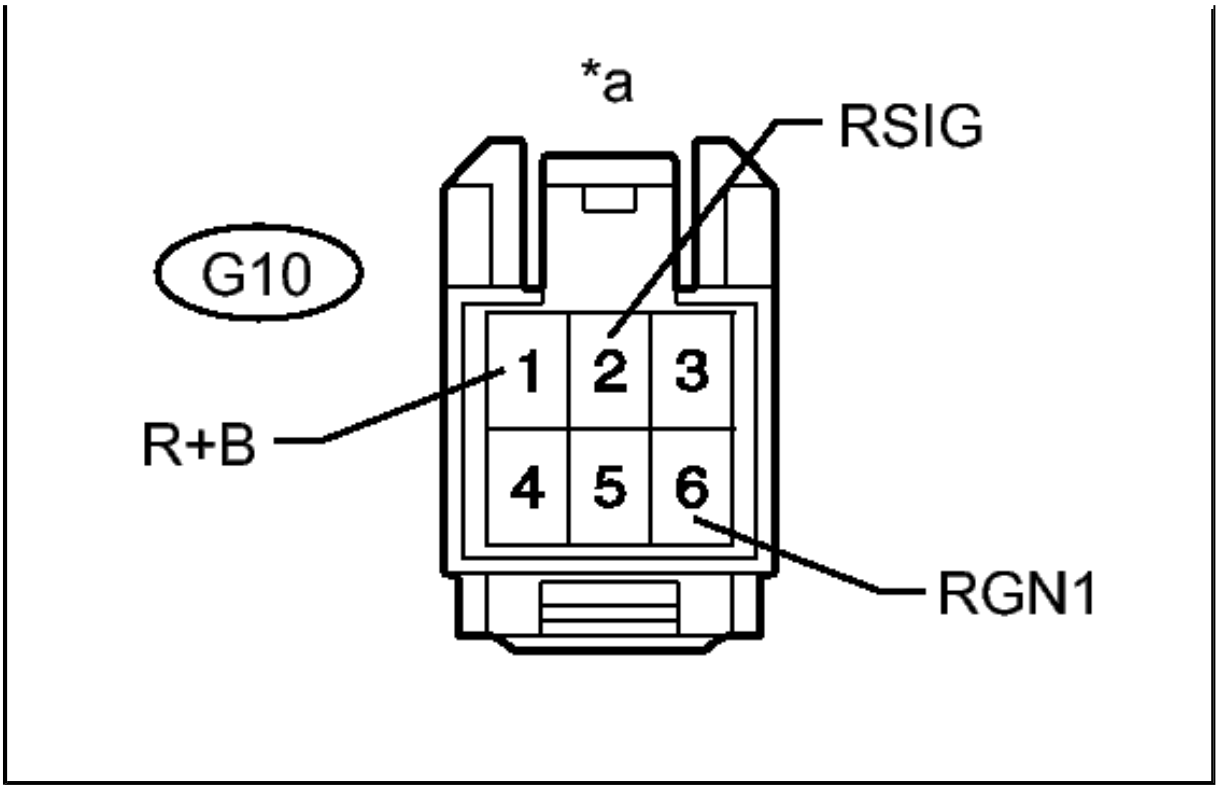
Standard Resistance

Tester Connection	Condition	Specified Condition
G47-4 (BTX) - G10-4 (BTX)	Always	Below 1 ohms
G47-16 (BRX) - G10-5 (BRX)		
G47-4 (BTX) or G10-4 (BTX) - Body ground	Always	10 kohms or higher
G47-16 (BRX) or G10-5 (BRX) - Body ground		

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: Go to next step

5. **CHECK HARNESS AND CONNECTOR (OPTION CONNECTOR - BATTERY AND BODY GROUND)**
   a. Disconnect the G10 option connector.



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

Standard Voltage

Tester Connection	Switch Condition	Specified Condition
G10-1 (R+B) - Body ground	Always	11 to 14 V
G10-2 (RSIG) - Body ground	Engine switch off	Below 1 V
G10-2 (RSIG) - Body ground	Engine switch on (IG)	11 to 14 V

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

Standard Resistance

Tester Connection	Condition	Specified Condition
G10-6 (RGN1) - Body ground	Always	Below 1 ohms

TEXT IN ILLUSTRATION

*a	Front view of option connector (to Remote Start ECU)

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: Go to next step

6. **REPLACE REMOTE START**
   a. Temporarily replace the remote start ECU with a new one.
   b. Register the remote start ID.
   c. Check that the engine can be started using the remote start operation.

      OK

      Engine can be started using remote start operation.

   NG --> See step 7

   OK --> END (REMOTE START ECU IS DEFECTIVE)

7. **REPLACE MAIN BODY ECU (MULTIPLEX NETWORK BODY ECU)**
   a. Temporarily replace the main body ECU with a new or normally functioning one. Refer to **REMOVAL [08/2013 -]** .
   b. Check that the engine can be started using the remote start operation.

      OK

      Engine can be started using remote start operation.

   NG --> See step 8

   OK --> END (MAIN BODY ECU IS DEFECTIVE)

8. **REPLACE CERTIFICATION ECU. Refer to REMOVAL [08/2013 -]**

DTC B2784: ANTENNA COIL OPEN / SHORT [08/2013 -]

DESCRIPTION

When an open or short circuit is detected in the transponder key amplifier coil

built into the engine switch, the certification ECU stores this DTC. This DTC is also stored as a past DTC.

DTC Code	DTC Detection Condition	Trouble Area	DTC Output Confirmation Operation
B2784	The transponder key amplifier coil built into the engine switch is open (see below) or shorted (determined by communication with certification ECU) (1 trip detection logic*). • Terminal VC5, TXCT or CODE is open (includes disconnection of the engine switch). • The transponder key amplifier coil built into the engine switch is open.	• Engine switch • Harness or connector • Certification ECU	With the shift lever in P, the key is held against the engine switch and an engine start operation is performed by pressing and holding the engine switch when the key battery is depleted.

*: Only output while a malfunction is present.

VEHICLE CONDITION AND FAIL-SAFE OPERATION WHEN MALFUNCTION DETECTED

Vehicle Condition when Malfunction Detected	Fail-safe Operation when Malfunction Detected
Engine cannot be started when key battery is depleted by holding key against engine switch and pressing and holding engine switch with shift	-

lever in P	

RELATED DATA LIST AND ACTIVE TEST

DTC Code	Data List and Active Test
B2784	-

WIRING DIAGRAM

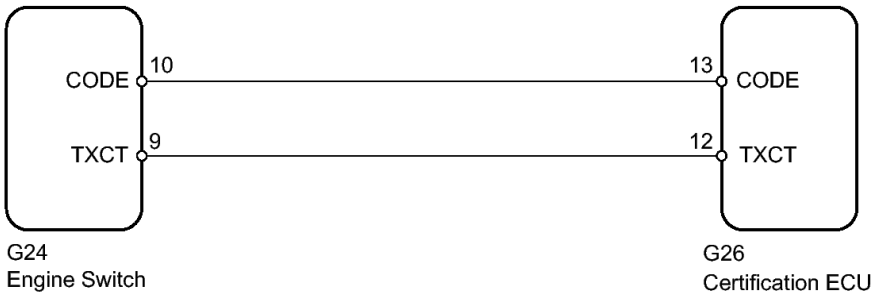


Fig. 2: Engine Switch Wiring Diagram
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

NOTE:

- **Before replacing the certification ECU, refer to Registration. Refer to REGISTRATION [08/2013 -] .**
- **The certification ECU outputs a fixed 5 V power source voltage through a resistance from terminal CODE. The engine switch grounds or does not ground this power source voltage accordingly.**
- **The certification ECU outputs a fixed 5 V power source voltage through a resistance and transistor. The engine switch grounds or does not ground this signal accordingly.**
- **After performing repair, perform the operation that fulfills the DTC output confirmation operation, and then confirm that no DTCs are output again.**

PROCEDURE

1. **CLEAR DTC**

a. Clear the DTCs. Refer to **DTC CHECK / CLEAR [08/2013 -]** .

NEXT: Go to next step

2. **CHECK FOR DTC**
   a. Perform the operation that fulfills the DTC output confirmation operation.
   b. Check for DTCs. Refer to **DTC CHECK / CLEAR [08/2013 -]** .

      OK

      DTC B2784 is not output.

   NG --> See step 3

   OK --> See step 8

3. **CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - ENGINE SWITCH)**
   a. Disconnect the G26 ECU connector.
   b. Disconnect the G24 switch connector.
   c. Measure the resistance according to the value(s) in the table below.

      Standard Resistance

Tester Connection	Condition	Specified Condition
G26-13 (CODE) - G24-10 (CODE)	Always	Below 1 ohms
G26-12 (TXCT) - G24-9 (TXCT)		
G26-13 (CODE) or G24-10 (CODE) - Body ground	Always	10 kohms or higher
G26-12 (TXCT) or G24-9 (TXCT) - Body ground		

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: Go to next step

4. **REPLACE ENGINE SWITCH**
   a. Temporarily replace the engine switch with a new or normally functioning one. Refer to **REMOVAL [08/2013 -]** .

NEXT: Go to next step

5. **CLEAR DTC**
   a. Clear the DTCs. Refer to **DTC CHECK / CLEAR [08/2013 -]** .

NEXT: Go to next step

6. **CHECK FOR DTC**
   a. Perform the operation that fulfills the DTC output confirmation operation.
   b. Check for DTCs. Refer to **DTC CHECK / CLEAR [08/2013 -]** .

   OK

   DTC B2784 is not output.

NG --> See step 7

OK --> END (ENGINE SWITCH IS DEFECTIVE)

7. **REPLACE CERTIFICATION ECU. Refer to REMOVAL [08/2013 -]**
8. **USE SIMULATION METHOD TO CHECK. Refer to ELECTRONIC CIRCUIT INSPECTION PROCEDURE [08/2013 -]**

DTC B278A: SHORT TO GND IN IMMOBILIZER SYSTEM POWER SOURCE CIRCUIT [08/2013 -]

DESCRIPTION

When there is a short to GND in the power supply for the transponder key amplifier of the engine switch, the certification ECU stores this DTC.

DTC Code	DTC Detection Condition	Trouble Area	DTC Output Confirmation Operation

B278A	A short to GND in the power supply of the transponder key amplifier of the engine switch (VC5 - VC5) (1 trip detection logic*).	• Harness or connector • Engine switch • Certification ECU	With the shift lever in P, the key is held against the engine switch and an engine start operation is performed by pressing and holding the engine switch when the key battery is depleted.

*: Only output while a malfunction is present.

VEHICLE CONDITION AND FAIL-SAFE OPERATION WHEN MALFUNCTION DETECTED

Vehicle Condition when Malfunction Detected	Fail-safe Operation when Malfunction Detected
Engine cannot be started when key battery is depleted by holding key against engine switch and pressing and holding engine switch with shift lever in P	-

RELATED DATA LIST AND ACTIVE TEST

DTC Code	Data List and Active Test
B278A	-

WIRING DIAGRAM

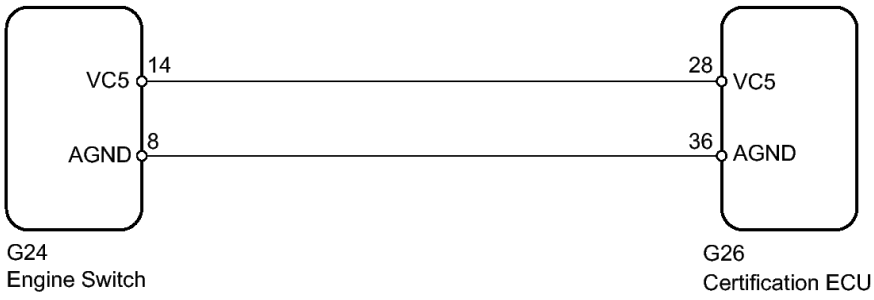


Fig. 3: Engine Switch Wiring Diagram
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

NOTE:

- **Before replacing the certification ECU, refer to Registration. Refer to REGISTRATION [08/2013 -] .**
- **The fixed 5 V power source voltage in the engine switch is output through a resistance from terminal VC5.**
- **Terminal AGND is grounded through both the engine switch and certification ECU.**
- **After performing repair, perform the operation that fulfills the DTC output confirmation operation, and then confirm that no DTCs are output again.**

PROCEDURE

1. **CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - ENGINE SWITCH)**
   a. Disconnect the G26 ECU connector.
   b. Disconnect the G24 switch connector.
   c. Measure the resistance according to the value(s) in the table below.

   Standard Resistance

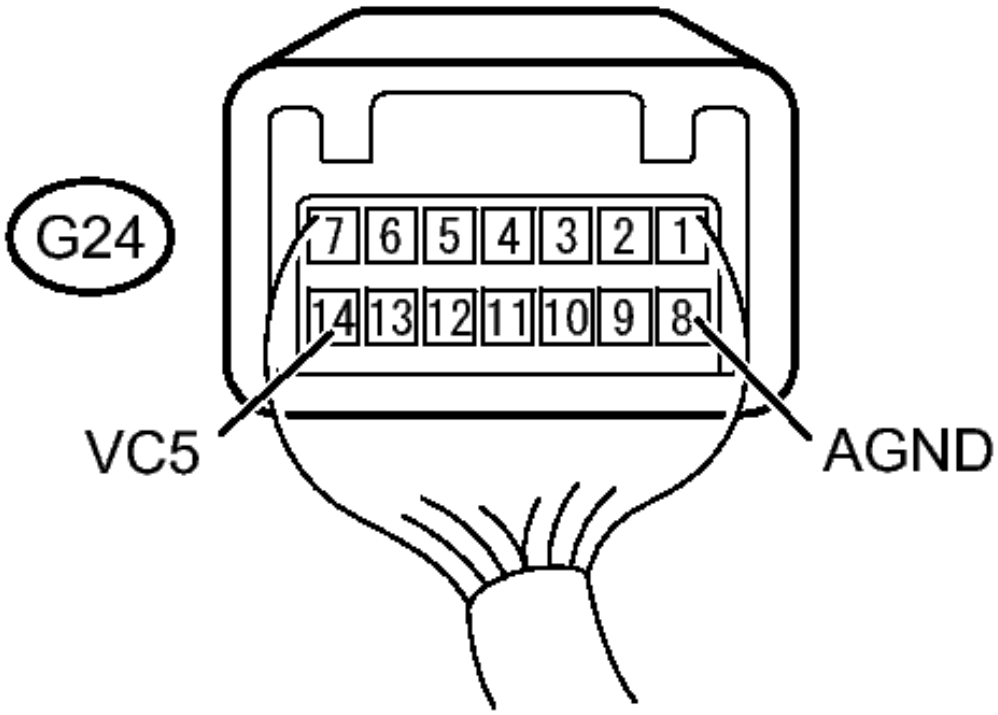
Tester Connection	Condition	Specified Condition
G26-28 (VC5) - G24-14 (VC5)		

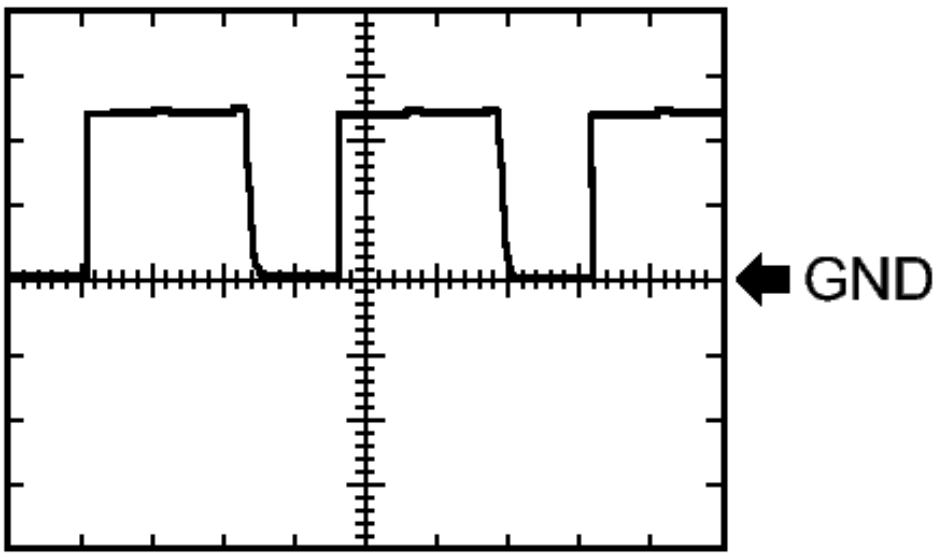
G26-36 (AGND) - G24-8 (AGND)	Always	Below 1 ohms
G26-28 (VC5) or G24-14 (VC5) - Body ground	Always	10 kohms or higher
G26-36 (AGND) or G24-8 (AGND) - Body ground		

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: Go to next step

2. **CHECK CERTIFICATION ECU**
   a. Using an oscilloscope, check the waveform.


*a
G24
7 6 5 4 3 2 1
14 13 12 11 10 9 8
VC5
AGND


GND

HINT:

Perform this inspection on the engine switch side.

MEASUREMENT CONDITION

Item	Content
Tester Connection	G24-14 (VC5) - G24-8 (AGND)
Tool Setting	2 V/DIV., 200 ms./DIV.
Condition	After engine switch turned off, within 30 seconds of any door opened and closed, or brake pedal depressed

OK

Waveform is output normally (refer to illustration).

TEXT IN ILLUSTRATION

*a	Component with harness connected (Engine Switch)

NG --> See step 3

OK --> See step 4

3. **REPLACE CERTIFICATION ECU. Refer to REMOVAL [08/2013 -]**
4. **REPLACE ENGINE SWITCH. Refer to REMOVAL [08/2013 -]**

DTC B2790: ID BOX EEPROM MALFUNCTION [08/2013 -]

DESCRIPTION

When an internal malfunction occurs in the ID code box, the certification ECU stores this DTC.

DTC Code	DTC Detection Condition	Trouble Area	DTC Output Confirmation Operation
	An internal malfunction		An immobilizer

B2790	occurs in the ID code box (EEPROM access malfunction) (1 trip detection logic*).	• ID code box • Certification ECU	set/unset operation is performed (the engine switch is turned off or on (IG) while carrying the key).

*: Only output while a malfunction is present.

VEHICLE CONDITION AND FAIL-SAFE OPERATION WHEN MALFUNCTION DETECTED

Vehicle Condition when Malfunction Detected	Fail-safe Operation when Malfunction Detected
• Engine running: Engine cannot be started next time • Engine stopped: Engine cannot be started	-

RELATED DATA LIST AND ACTIVE TEST

DTC Code	Data List and Active Test
B2790	-

INSPECTION PROCEDURE

NOTE:

- **Before replacing the certification ECU, refer to Registration. Refer to REGISTRATION [08/2013 -] .**
- **After performing repair, perform the operation that fulfills the DTC output confirmation operation, and then confirm that no DTCs are output again.**

PROCEDURE

1. **REPLACE ID CODE BOX**
   a. Replace the ID code box. Refer to **REMOVAL [08/2013 -]** .

   NEXT: Go to next step

2. **CLEAR DTC**

a. Clear the DTCs. Refer to **DTC CHECK / CLEAR [08/2013 -]** .

NEXT: Go to next step

3. **REGISTER RECOGNITION CODES**
   a. Register the recognition codes in the ECUs. Refer to **REGISTRATION [08/2013 -]** .

NEXT: Go to next step

4. **REGISTER ECU COMMUNICATION ID**
   a. Register the ECU communication ID. Refer to **REGISTRATION [08/2013 -]** .

NEXT: Go to next step

5. **CHECK FOR DTC**
   a. Check for DTCs. Refer to **DTC CHECK / CLEAR [08/2013 -]** .

HINT:

Before checking for DTCs, perform the "DTC Output Confirmation Operation" procedure.

OK

DTC B2790 is not output.

NG --> See step 6

OK --> END (ID CODE BOX IS DEFECTIVE)

6. **REPLACE CERTIFICATION ECU. Refer to REMOVAL [08/2013 -]**

DTC B2799: ENGINE IMMOBILIZER SYSTEM MALFUNCTION [08/2013 -]

DESCRIPTION

When there are communication malfunctions between the ECM and ID code box, or when the communication ID codes do not match, the ECM stores this DTC.

DTC Code	DTC Detection Condition	Trouble Area	DTC Output Confirmation Operation
B2799	Either condition is met (1 trip detection logic*): • A malfunction in the communication or communication lines between the ECM and ID code box. • A matching communication code cannot be verified during communication between the ECM and ID code box.	• ID code box • ECM • Harness or connector	Either condition is met: • Within 10 seconds of an engine start operation being performed (with the shift lever in P and the brake pedal depressed, press the engine switch while carrying the key). If there is a malfunction, the engine stops (communication begins within 3 seconds of the engine start operation being performed, and DTCs are stored after 6 seconds). • 10 seconds after the engine switch is turned on (IG) after reconnecting the cable to the negative (-) battery terminal (communication begins within 3 seconds of the engine switch being turned on

			(IG), and DTCs are stored after 6 seconds).

*: Only output while a malfunction is present.

VEHICLE CONDITION AND FAIL-SAFE OPERATION WHEN MALFUNCTION DETECTED

Vehicle Condition when Malfunction Detected	Fail-safe Operation when Malfunction Detected
Engine cannot be started	-

RELATED DATA LIST AND ACTIVE TEST

DTC Code	Data List and Active Test
B2799	-

WIRING DIAGRAM

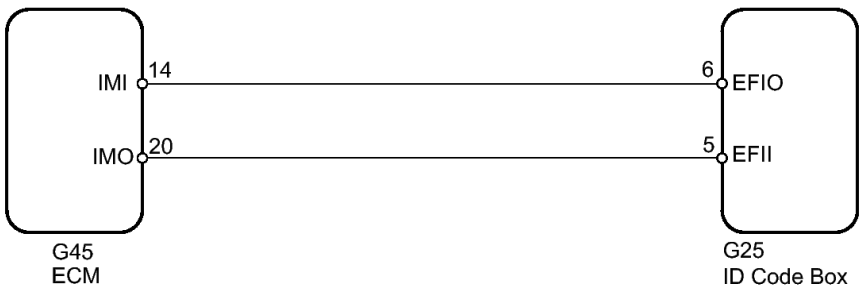


Fig. 4: ECM Wiring Diagram
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

NOTE:

- **When replacing the ID code box, refer to Registration. Refer to REGISTRATION [08/2013 -] .**
- **The fixed 12 V power source voltage in the ECM is output through a resistance from terminal IMI. The ID code box grounds or does not ground this power source voltage accordingly.**

- **The fixed 12 V power source voltage in the ID code box is output through a resistance from terminal EFII. The ECM grounds or does not ground this power source voltage accordingly.**
- **After performing repair, perform the operation that fulfills the DTC output confirmation operation, and then confirm that no DTCs are output again.**

HINT:

When DTC B2799 and the certification ECU DTC are output simultaneously, first perform troubleshooting for the certification ECU DTC.

PROCEDURE

1. **CLEAR DTC**
   a. Clear the DTCs. Refer to **DTC CHECK / CLEAR [08/2013 -]** .

   NEXT: Go to next step

2. **CHECK FOR DTC**
   a. Check for DTCs. Refer to **DTC CHECK / CLEAR [08/2013 -]** .

      HINT:

      Before checking for DTCs, perform the "DTC Output Confirmation Operation" procedure.

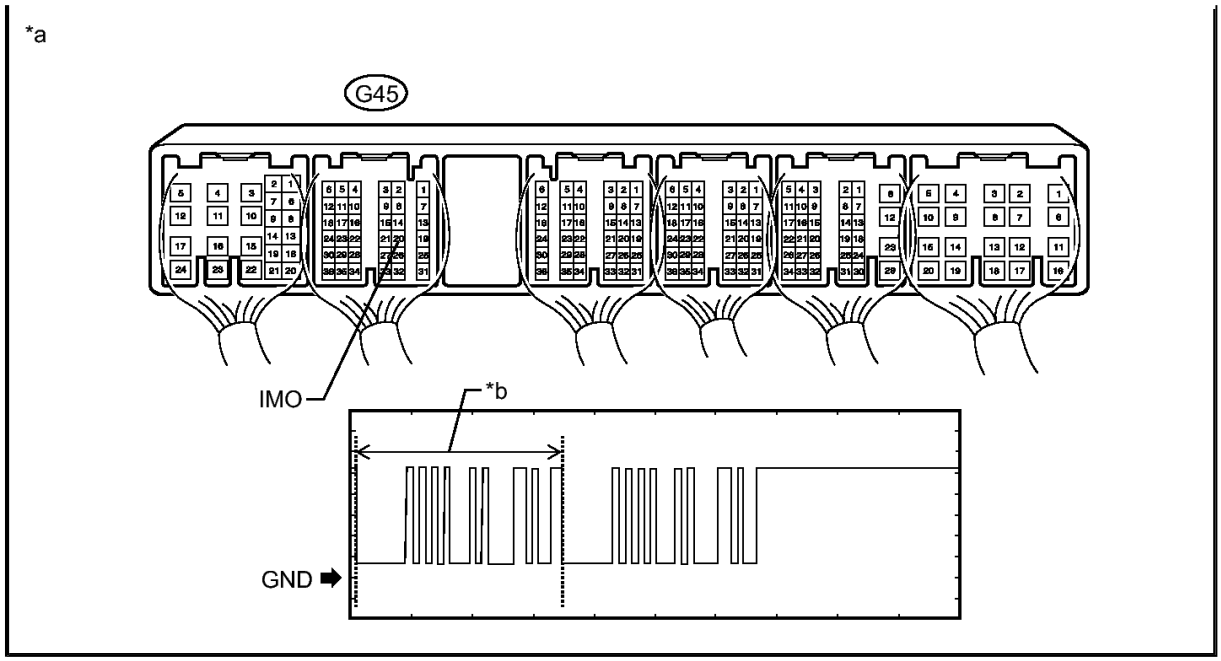
      OK

      DTC B2799 is not output.

   NG --> See step 3

   OK --> See step 18

3. **CHECK ECM (IMO)**
   a. Using an oscilloscope, check the waveform.



TEXT IN ILLUSTRATION

*a	Component with harness connected (ECM)	-	-

MEASUREMENT CONDITION

Item	Content
Tester Connection	G45-20 (IMO) - Body ground
Tool Setting	2 V/DIV., 200 ms./DIV.
Condition	Within 3 seconds of engine start or within 3 seconds of engine switch turned on (IG) after battery cable disconnected and reconnected

HINT:

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

OK

Waveform is output normally (refer to illustration).

RESULT

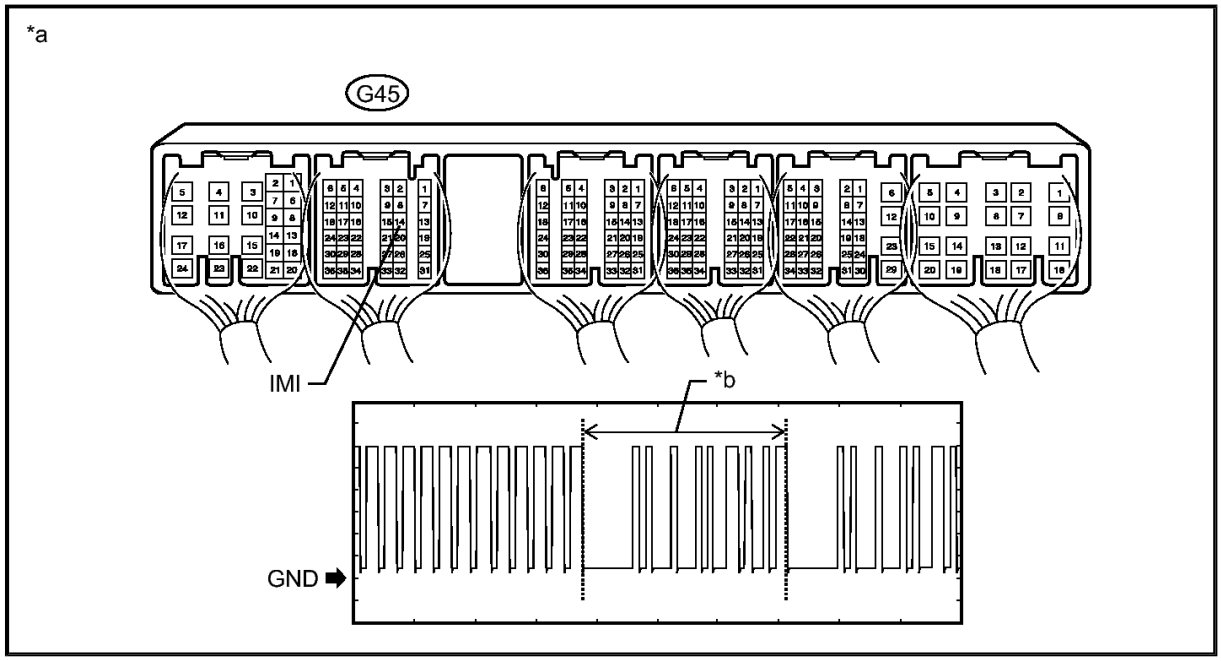
Result	Proceed to
Normal waveform	A
Waveform*b has abnormal wavelength or shape	B
Terminal IMO stuck high (12 V)	
Terminal IMO stuck low (2.4 V or less)	C

B --> See step 7

C --> See step 10

A: Go to next step

4. **CHECK ECM (IMI)**
   a. Using an oscilloscope, check the waveform.



TEXT IN ILLUSTRATION

*a	Component with harness connected (ECM)	-	-

MEASUREMENT CONDITION

Item	Content

Tester Connection	G45-14 (IMI) - Body ground
Tool Setting	2 V/DIV., 200 ms./DIV.
Condition	Engine switch on (IG)

HINT:

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

OK

Waveform is output normally (refer to illustration).

RESULT

Result	Proceed to
Normal waveform	A
Waveform*b not output, or has abnormal wavelength or shape	B

B --> See step 12

A: Go to next step

5. **REGISTER RECOGNITION CODES**
   a. Register the recognition codes in the ECUs. Refer to **REGISTRATION [08/2013 -]** .

NEXT: Go to next step

6. **REGISTER ECU COMMUNICATION ID**
   a. Register the ECU communication ID. Refer to **REGISTRATION [08/2013 -]** .
   b. Check that the engine can be started with a registered key.

      OK

      Engine can be started with a registered key.

NG --> See step 7

OK --> END (ECU COMMUNICATION ID IS NOT REGISTERED CORRECTLY)

7. **REPLACE ECM**
   a. Temporarily replace the ECM with a new or normally functioning one. Refer to **REMOVAL [08/2013 -]** .

NEXT: Go to next step

8. **CLEAR DTC**
   a. Clear the DTCs. Refer to **DTC CHECK / CLEAR [08/2013 -]** .

NEXT: Go to next step

9. **CHECK FOR DTC**
   a. Check for DTCs. Refer to **DTC CHECK / CLEAR [08/2013 -]** .

   HINT:

   Before checking for DTCs, perform the "DTC Output Confirmation Operation" procedure.

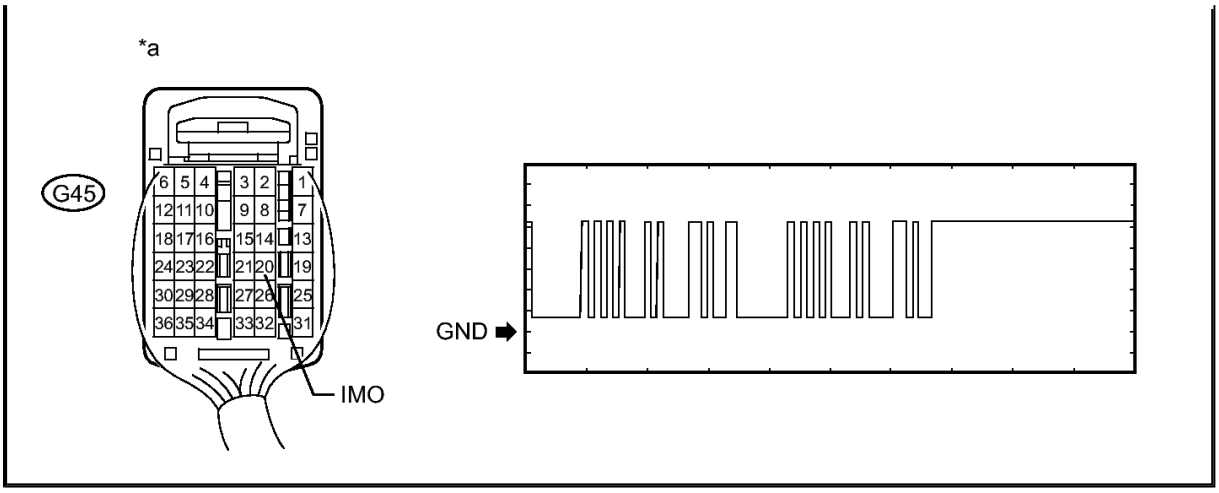
   OK

   DTC is not output.

NG --> See step 19

OK --> END (ECM IS DEFECTIVE)

10. **CHECK ID CODE BOX (IMO)**
    a. Disconnect the G45 ECM connector.



TEXT IN ILLUSTRATION

*a	Rear view of wire harness connector (to ECM)	-	-

b. Using an oscilloscope, check the waveform.

HINT:

Perform this inspection on the ECM side.

MEASUREMENT CONDITION

Item	Content
Tester Connection	G45-20 (IMO) - Body ground
Tool Setting	2 V/DIV., 200 ms./DIV.
Condition	Within 3 seconds of engine start or within 3 seconds of engine switch turned on (IG) after battery cable disconnected and reconnected

HINT:

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

OK

Waveform is output normally (refer to illustration).

RESULT

Result	Proceed to
Terminal IMO low output (2.4 V or less)	A
Terminal IMO high output (12 V)	B

B --> See step 15

A: Go to next step

11. **CHECK HARNESS AND CONNECTOR (ID CODE BOX - ECM)**
    a. Disconnect the G25 box connector.
    b. Disconnect the G45 ECM connector.
    c. Measure the resistance according to the value(s) in the table below.

    Standard Resistance

Tester Connection	Condition	Specified Condition
G25-5 (EFII) - G45-20 (IMO)	Always	Below 1 ohms
G25-5 (EFII) or G45-20 (IMO) - Body ground	Always	10 kohms or higher

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: Go to next step

12. **REPLACE ID CODE BOX**
    a. Replace the ID code box with a new one. Refer to **REMOVAL [08/2013 -]** .

NEXT: Go to next step

13. **CLEAR DTC**
    a. Clear the DTCs. Refer to **DTC CHECK / CLEAR [08/2013 -]** .
    b. Register the recognition codes in the ECUs. Refer to **REGISTRATION [08/2013 -]** .
    c. Register the ECU communication ID. Refer to **REGISTRATION**

[08/2013 -]

NEXT: Go to next step

14. **CHECK FOR DTC**
    a. Check for DTCs. Refer to **DTC CHECK / CLEAR [08/2013 -]** .

       HINT:

       Before checking for DTCs, perform the "DTC Output Confirmation Operation" procedure.

       OK

       DTC is not output.

    NG --> See step 19

    OK --> END (ID CODE BOX IS DEFECTIVE)

15. **REPLACE ECM**
    a. Temporarily replace the ECM with a new or normally functioning one. Refer to **REMOVAL [08/2013 -]** .

    NEXT: Go to next step

16. **CLEAR DTC**
    a. Clear the DTCs. Refer to **DTC CHECK / CLEAR [08/2013 -]** .

    NEXT: Go to next step

17. **CHECK FOR DTC**
    a. Check for DTCs. Refer to **DTC CHECK / CLEAR [08/2013 -]** .

       HINT:

       Before checking for DTCs, perform the "DTC Output Confirmation Operation" procedure.

       OK

DTC is not output.

NG --> See step 19

OK --> END (ECM IS DEFECTIVE)

18. **USE SIMULATION METHOD TO CHECK. Refer to ELECTRONIC CIRCUIT INSPECTION PROCEDURE [08/2013 -]**
19. **GO TO DIAGNOSTIC TROUBLE CODE CHART. Refer to DIAGNOSTIC TROUBLE CODE CHART [08/2013 -]**

DTC B279A: THEFT DETERRENT SYSTEM COMMUNICATION LINE HIGH FIXATION [08/2013 -]

DESCRIPTION

When the communication line (IMI - EFIO) between the ECM and ID code box is stuck on HI output, the ECM stores this DTC.

DTC Code	DTC Detection Condition	Trouble Area	DTC Output Confirmation Operation
B279A	The communication line (IMI - EFIO) between the ECM and ID code box is stuck on HI output (1 trip detection logic*).	• Harness or connector (disconnection or break in wire harness is main cause) • ID code box • ECM	Turn the engine switch on (IG) and wait 6 seconds.

*: Only output while a malfunction is present.

VEHICLE CONDITION AND FAIL-SAFE OPERATION WHEN MALFUNCTION DETECTED

Vehicle Condition when Malfunction Detected	Fail-safe Operation when Malfunction Detected
Engine cannot be started (initial ignition occurs and engine cranks,	Engine cannot be started

then ignition stops)	

RELATED DATA LIST AND ACTIVE TEST

DTC Code	Data List and Active Test
B279A	-

WIRING DIAGRAM

Fig. 5: ECM Wiring Diagram
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

NOTE:

- **When replacing the ID code box, refer to Registration. Refer to REGISTRATION [08/2013 -] .**
- **The fixed 12 V power source voltage in the ECM is output through a resistance from terminal IMI. The ID code box grounds or does not ground this power source voltage accordingly.**
- **After performing repair, perform the operation that fulfills the DTC output confirmation operation, and then confirm that no DTCs are output again.**

HINT:

When DTC B279A and the certification ECU DTC are output simultaneously, first perform troubleshooting for the certification ECU DTC.

PROCEDURE

1. **CLEAR DTC**
   a. Clear the DTCs. Refer to **DTC CHECK / CLEAR [08/2013 -]** .

   NEXT: Go to next step

2. **CHECK FOR DTC**
   a. Turn the engine switch on (IG) and wait 10 seconds.
   b. Check for DTCs. Refer to **DTC CHECK / CLEAR [08/2013 -]** .

   RESULT

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

   HINT:

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

   B --> See step 10

   A: Go to next step

3. **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.

   OK

   Connectors are properly connected.

   NG --> CONNECT CONNECTORS PROPERLY

   OK: Go to next step

4. **CHECK HARNESS AND CONNECTOR (ID CODE BOX - ECM)**
   a. Disconnect the G25 box connector.

b. Disconnect the G45 ECM connector.
c. Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Condition	Specified Condition
G25-6 (EFIO) - G45-14 (IMI)	Always	Below 1 ohms
G25-6 (EFIO) or G45-14 (IMI) - Body ground	Always	10 kohms or higher

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

Standard Voltage

Tester Connection	Condition	Specified Condition
G45-14 (IMI) - Body ground	Always	Below 1 V

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: Go to next step

5. **REPLACE ID CODE BOX**
   a. Replace the ID code box with a new one. Refer to **REMOVAL [08/2013 -]** .

NEXT: Go to next step

6. **CLEAR DTC**
   a. Clear the DTCs. Refer to **DTC CHECK / CLEAR [08/2013 -]** .

NEXT: Go to next step

7. **REGISTER RECOGNITION CODES**
   a. Register the recognition codes in the ECUs. Refer to **REGISTRATION [08/2013 -]** .

NEXT: Go to next step

8. **REGISTER ECU COMMUNICATION ID (ID CODE BOX - ECM)**
   a. Register the ECU communication ID. Refer to **REGISTRATION [08/2013 -]** .

   NEXT: Go to next step

9. **CHECK FOR DTC**
   a. Check for DTCs. Refer to **DTC CHECK / CLEAR [08/2013 -]** .

      HINT:

      Before checking for DTCs, perform the "DTC Output Confirmation Operation" procedure.

      OK

      DTC B279A is not output.

   NG --> See step 12

   OK --> END (ID CODE BOX IS DEFECTIVE)

10. **Go to DIAGNOSTIC TROUBLE CODE CHART. Refer to DIAGNOSTIC TROUBLE CODE CHART [08/2013 -]**
11. **REPLACE ECM. Refer to REMOVAL [08/2013 -]**
12. **REPLACE ECM. Refer to REMOVAL [08/2013 -]**

DTC B279C: THEFT DETERRENT SYSTEM PRESENCE DETECTION [08/2013 -]

DESCRIPTION

This code is stored when an ECM that is incompatible with the engine immobilizer system is installed to the vehicle.

DTC Code	DTC Detection Condition	Trouble Area	DTC Output Confirmation Operation
B279C	An ECM that is incompatible with the engine	ECM	Check for DTCs.

	immobilizer system is installed (1 trip detection logic*).		

*: Only output while a malfunction is present.

VEHICLE CONDITION AND FAIL-SAFE OPERATION WHEN MALFUNCTION DETECTED

Vehicle Condition when Malfunction Detected	Fail-safe Operation when Malfunction Detected
Engine cannot be started	-

RELATED DATA LIST AND ACTIVE TEST

DTC Code	Data List and Active Test
B279C	-

INSPECTION PROCEDURE

PROCEDURE

1. **REPLACE CURRENT ECM WITH PROPER ECM**
   a. Replace the current ECM with the proper ECM. Refer to **REMOVAL [08/2013 -]** .

NEXT --> END

SECURITY INDICATOR LIGHT DOES NOT BLINK [08/2013 -]

DESCRIPTION

The certification ECU blinks the security indicator light when the immobilizer is set (the engine switch is off).

WIRING DIAGRAM

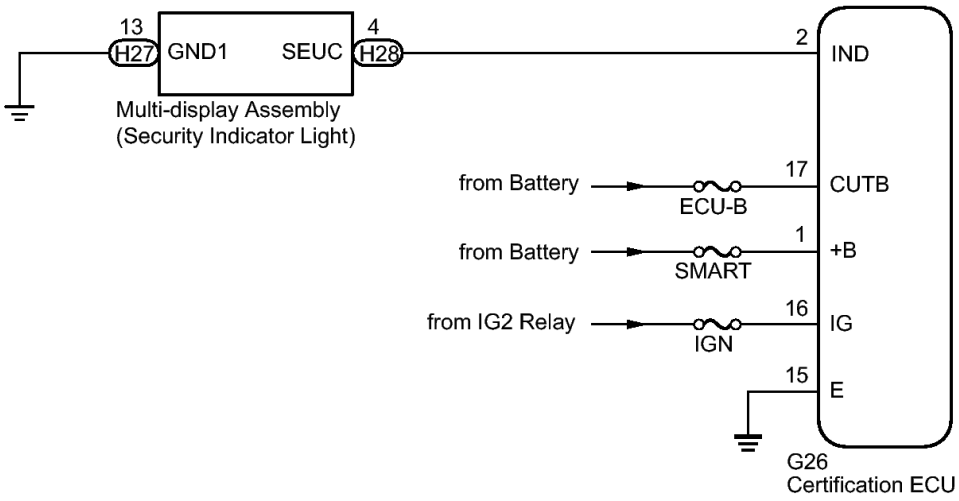


Fig. 6: Certification ECU Wiring Diagram
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

NOTE:

- **Inspect the fuses for circuits related to this system before performing the following inspection procedure.**
- **Before replacing the certification ECU, refer to Registration. Refer to REGISTRATION [08/2013 -] .**

PROCEDURE

1. **CHECK FOR DTC**
   a. Check for DTCs. Refer to **DTC CHECK / CLEAR [08/2013 -]** .

      OK

      DTC is not output.

   NG --> See step 8

   OK: Go to next step

2. **PERFORM ACTIVE TEST USING TECHSTREAM (SECURITY INDICATOR LIGHT)**
   a. Check that the security indicator light illuminates when operating it

with the Active Test. Refer to **DATA LIST / ACTIVE TEST [08/2013 -]** .

SMART ACCESS

Tester Display	Test Part	Control Range	Diagnostic Note
Immobilizer Indicator	Security indicator light	ON/OFF	The test is possible when the following conditions are met: • The key is in the cabin. • The engine switch is on (IG).

OK

Security indicator light can be turned on and off using Techstream.

NG --> See step 4

OK: Go to next step

3. **READ VALUE USING TECHSTREAM**
   a. Turn the engine switch off.

      HINT:

      When using the Techstream with the engine switch off to troubleshoot: Connect the Techstream to the DLC3 and turn a courtesy light switch on and off at 1.5-second intervals until communication between the Techstream and vehicle begins.

   b. Using the Techstream, read the Data List. Refer to **DATA LIST / ACTIVE TEST [08/2013 -]** .

      SMART ACCESS

	Measurement	Normal	

Tester Display	Item/Range	Condition	Diagnostic Note
Immobilizer	Engine immobilizer system status determined by certification ECU / Set or Unset	Set: Engine immobilizer set (engine start prohibited) (engine switch off) Unset: Engine immobilizer unset (engine start permitted) (engine switch on (ACC) or on (IG))	When the engine immobilizer system does not change to the unset state, this item can be used to determine if the cause is the certification ECU or ID code box.

OK

"Set" appears on screen.

NG --> See step 6

OK --> See step 7

4. **CHECK HARNESS AND CONNECTOR (SECURITY INDICATOR LIGHT - CERTIFICATION ECU)**
   a. Disconnect the H27 and H28 display connectors.
   b. Disconnect the G26 certification ECU connector.
   c. Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Condition	Specified Condition
H28-4 (SEUC) - G26-2 (IND)	Always	Below 1 ohms
H27-13 (GND1) - Body ground	Always	Below 1 ohms
H28-4 (SEUC) or G26-2 (IND) - Body ground	Always	10 kohms or higher

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: Go to next step

5. **REPLACE SECURITY INDICATOR LIGHT**
   a. Temporarily replace the security indicator light with a new or normally functioning one. Refer to **REMOVAL [08/2013 -]** .
   b. When the immobilizer is set (the engine switch is off), check that the security indicator light blinks.

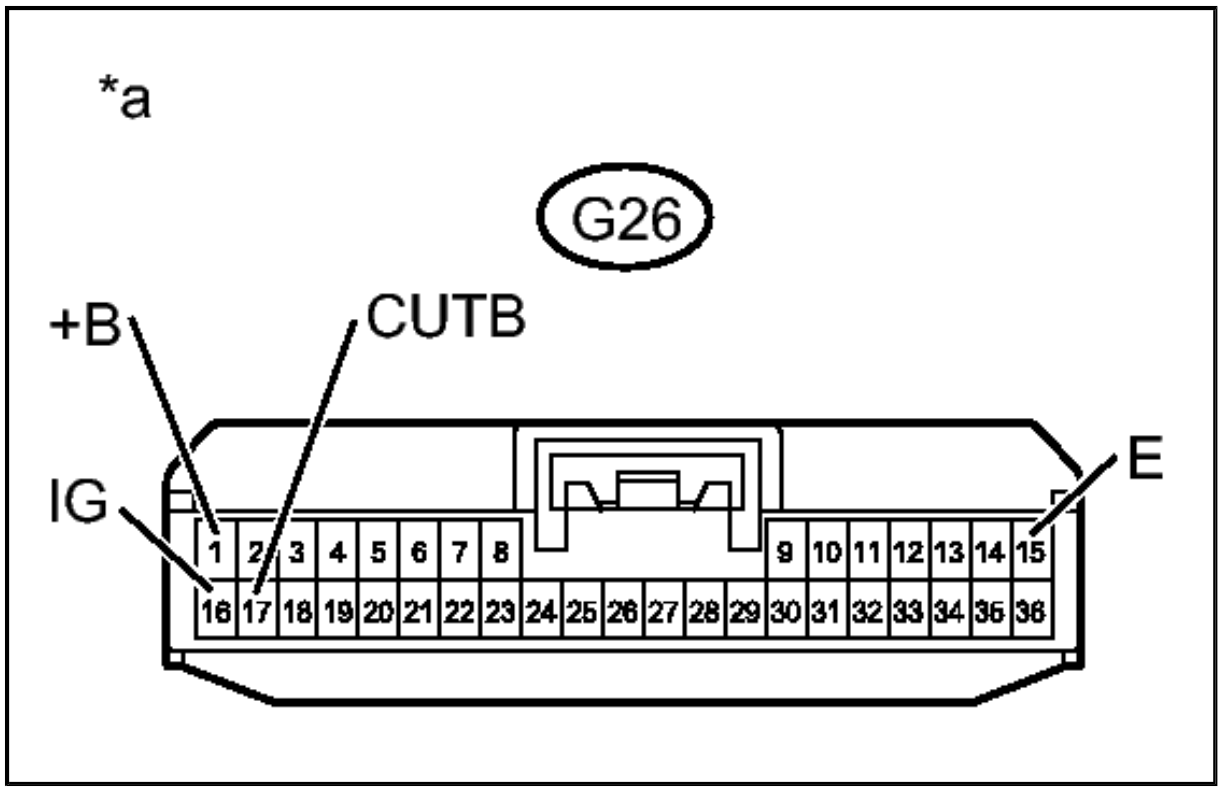
      OK

      Security indicator light blinks.

NG --> See step 7

OK --> END

6. **CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - BATTERY AND BODY GROUND)**
   a. Disconnect the G26 certification ECU connector.



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

Standard Voltage

Tester Connection	Switch Condition	Specified Condition
G26-1 (+B) - Body ground	Always	11 to 14 V
G26-16 (IG) - Body ground	Engine switch off	Below 1 V
G26-16 (IG) - Body ground	Engine switch on (IG)	11 to 14 V
G26-17 (CUTB) - Body ground	Always	11 to 14 V

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

Standard Resistance

Tester Connection	Condition	Specified Condition
G26-15 (E) - Body ground	Always	Below 1 ohms

TEXT IN ILLUSTRATION

*a	Front view of wire harness connector (to Certification ECU)

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK --> See step 7

7. **REPLACE CERTIFICATION ECU. Refer to REMOVAL [08/2013 -]**
8. **GO TO DIAGNOSTIC TROUBLE CODE CHART. Refer to DIAGNOSTIC TROUBLE CODE CHART [08/2013 -]**