

ACCESSORIES & EQUIPMENT

Engine Immobiliser System (w/ Smart Key) (Diagnostic Codes & Circuit Tests) - Sienna

ENGINE IMMOBILISER SYSTEM (W/ SMART KEY SYSTEM)

DTC B2784: ANTENNA COIL OPEN / SHORT

DESCRIPTION

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

DTC No.	DTC Detection Condition	Trouble Area
B2784	Transponder key coil is open or shorted.	• Certification ECU • Engine switch

INSPECTION PROCEDURE

NOTE: If the certification ECU is replaced, register the key. Refer to REGISTRATION .

PROCEDURE

1. CHECK DTC OUTPUT

- Clear the DTCs. Refer to DTC CHECK / CLEAR .
- Recheck for DTCs. Refer to DTC CHECK / CLEAR .

OK

DTC B2784 is not output.

NG --> See step 2

OK --> See step 5

2. REPLACE ENGINE SWITCH

- Replace the engine switch. Refer to REMOVAL .

NEXT: Go to next step

3. REPLACE CERTIFICATION ECU. Refer to REMOVAL

4. CHECK DTC OUTPUT

- Clear the DTCs. Refer to DTC CHECK / CLEAR .
- Recheck for DTCs. Refer to DTC CHECK / CLEAR .

OK

DTC B2784 is not output.

NG --> See step 3

OK --> END (ENGINE SWITCH WAS DEFECTIVE)

5. **USE SIMULATION METHOD TO CHECK. Refer to ELECTRONIC CIRCUIT INSPECTION PROCEDURE**

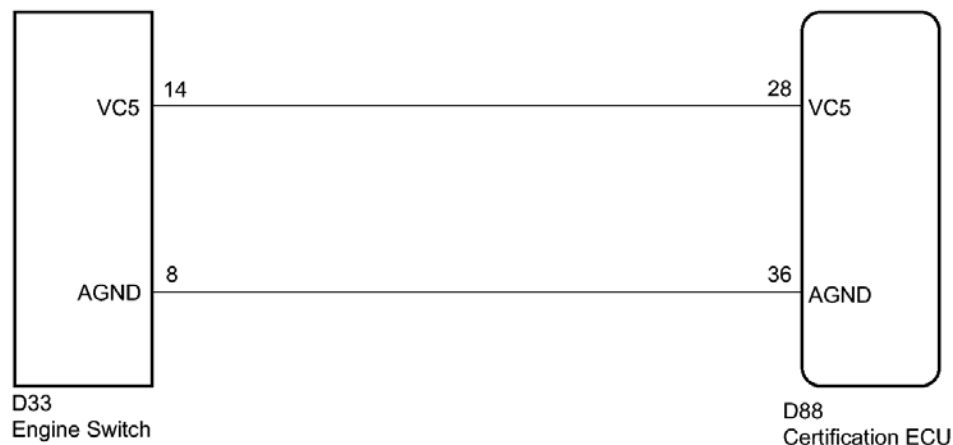
DTC B278A: SHORT TO GND IN IMMOBILISER SYSTEM POWER SOURCE CIRCUIT

DESCRIPTION

This DTC is stored 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

WIRING DIAGRAM



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Fig. 1: Engine Switch Wiring Diagram

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

NOTE: If the certification ECU is replaced, register the key. Refer to REGISTRATION .

PROCEDURE

1. CHECK DTC OUTPUT

- a. Clear the DTCs. Refer to DTC CHECK / CLEAR .
- b. Recheck for DTCs. Refer to DTC CHECK / CLEAR .

OK

DTC B278A is not output.

NG --> See step 2

OK --> See step 6

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

- a. Disconnect the certification ECU 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
D88-28 (VC5) - D33-14 (VC5)	Always	Below 1 ohms
D88-36 (AGND) - D33-8 (AGND)	Always	Below 1 ohms
D88-28 (VC5) - Body ground	Always	10 kohms or higher
D88-36 (AGND) - Body ground	Always	10 kohms or higher

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: Go to next step

3. INSPECT CERTIFICATION ECU

- a. Reconnect the certification ECU connector.
- b. Reconnect the engine switch connector.
- c. Using an oscilloscope, check the waveform.

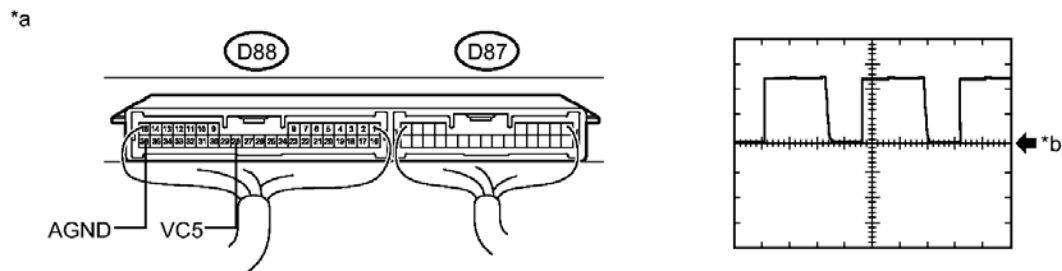


Fig. 2: Checking Certification ECU
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

WAVEFORM

Item	Content
Tester Connection	D88-28 (VC5) - D88-36 (AGND)
Tool Setting	2 V/DIV., 200 ms./DIV.
Condition	• Engine switch off • Key not in cabin • Engine switch pressed within 30 seconds

OK

Waveform is output normally (See **Fig. 2**)

TEXT IN ILLUSTRATION

*a	Component with harness connected (Certification
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	ECU)
*b	GND

NG --> See step 5

OK --> See step 4

4. **REPLACE ENGINE SWITCH. Refer to REMOVAL**
5. **REPLACE CERTIFICATION ECU. Refer to REMOVAL**
6. **USE SIMULATION METHOD TO CHECK. Refer to HOW TO PROCEED WITH TROUBLESHOOTING**

DTC B2799: ENGINE IMMOBILISER SYSTEM MALFUNCTION

DESCRIPTION

This DTC is stored when one of the following occurs: 1) the ECM detects an error in its own communication with the certification ECU; 2) the ECM detects an error in the communication lines; or 3) the ECU communication ID between the certification ECU and ECM is different when an engine start is attempted.

HINT:

Before troubleshooting this DTC, make sure that no certification ECU DTCs are present. If present, troubleshoot the certification ECU DTCs first.

DTC No.	DTC Detection Condition	Trouble Area
B2799	One of the following conditions is met: • Error in communication between ECM and certification ECU • Error in communication lines • Communication ID is different between certification ECU and ECM during communication	• Wire harness or connector • ECM • Certification ECU

WIRING DIAGRAM

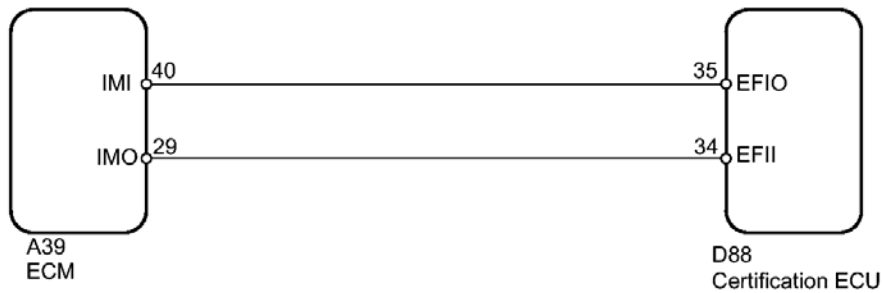


Fig. 3: Certification ECU Wiring Diagram

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

NOTE: If the certification ECU is replaced, register the key. Refer to REGISTRATION .

PROCEDURE

1. CHECK DTC OUTPUT

- a. Clear the DTCs. Refer to DTC CHECK / CLEAR .
- b. Recheck for DTCs. Refer to DTC CHECK / CLEAR .

OK

DTC B2799 is not output.

NG --> See step 2

OK --> See step 9

2. RE-REGISTER ECU COMMUNICATION ID

- a. Re-register the ECU communication ID. Refer to REGISTRATION .

NEXT: Go to next step

3. CHECK DTC OUTPUT

- a. Clear the DTCs. Refer to DTC CHECK / CLEAR .
- b. Recheck for DTCs. Refer to DTC CHECK / CLEAR .

OK

DTC B2799 is not output.

NG --> See step 4

OK --> END (ECU COMMUNICATION ID WAS INCORRECT)

4. CHECK CONNECTOR CONNECTION CONDITION

- a. Turn the engine switch off.
- b. Check that the connectors are properly connected to the ECM and certification ECU.

OK

Connectors are properly connected.

NG --> CONNECT CONNECTORS PROPERLY

OK: Go to next step

5. CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - ECM)

- a. Disconnect the certification 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
D88-34 (EFII) - A39-29 (IMO)	Always	Below 1 ohms
D88-35 (EFIO) - A39-40 (IMI)	Always	Below 1 ohms
D88-34 (EFII) - Body ground	Always	10 kohms or higher
D88-35 (EFIO) - Body ground	Always	10 kohms or higher

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: Go to next step

6. REPLACE ECM

- a. Replace the ECM. Refer to **REMOVAL** .

NEXT: Go to next step

7. CHECK DTC OUTPUT

- a. Clear the DTCs. Refer to **DTC CHECK / CLEAR** .
- b. Recheck for DTCs. Refer to **DTC CHECK / CLEAR** .

OK

DTC B2799 is not output.

NG --> See step 8

OK --> END (ECM WAS DEFECTIVE)

8. REPLACE CERTIFICATION ECU. Refer to REMOVAL

9. USE SIMULATION METHOD TO CHECK. Refer to HOW TO PROCEED WITH TROUBLESHOOTING

DTC B279A: THEFT DETERRENT SYSTEM COMMUNICATION LINE HIGH FIXATION

DESCRIPTION

If the communication line (EFIO - IMI) to the certification ECU is stuck high output (e.g. shorted to +B), the ECM stores this DTC.

DTC No.	DTC Detection Condition	Trouble Area
B279A	When the communication line (EFIO - IMI) between ECM and certification ECU is stuck high output.	• Wire harness or connector • Certification ECU • ECM

WIRING DIAGRAM

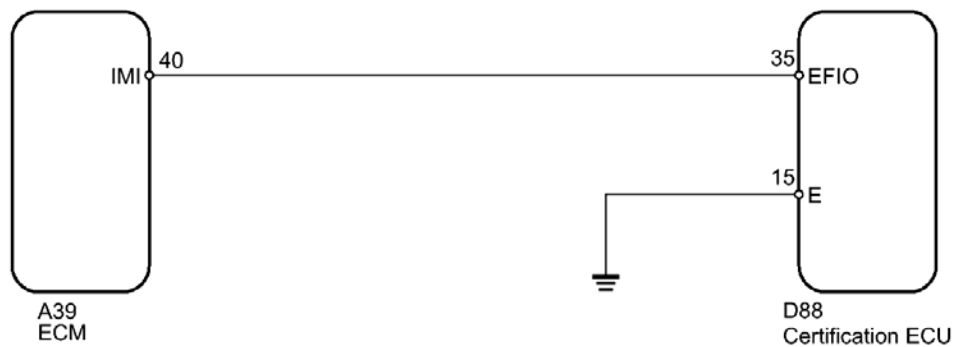


Fig. 4: Certification ECU Circuit Wiring Diagram
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

NOTE: If the certification ECU is replaced, register the key. Refer to REGISTRATION .

PROCEDURE

1. CHECK DTC OUTPUT

- a. Clear the DTCs. Refer to DTC CHECK / CLEAR .
- b. Recheck for DTCs. Refer to DTC CHECK / CLEAR .

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 --> See step 8

A: Go to next step

2. CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - ECM)

- a. Disconnect the certification ECU connector.
- b. Disconnect the ECM connector.
- c. Measure the resistance and voltage according to the value(s) in the table below.

Standard Resistance

Tester Connection	Condition	Specified Condition
D88-35 (EFIO) - A39-40 (IMI)	Always	Below 1 ohms
D88-35 (EFIO) - Body ground	Always	10 kohms or higher

Standard Voltage

Tester Connection	Condition	Specified Condition
D88-35 (EFIO) - Body ground	Always	Below 1 V

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: Go to next step

3. INSPECT CERTIFICATION ECU

- a. Reconnect the certification ECU connector.
- b. Reconnect the ECM connector.
- c. Using an oscilloscope, check the waveform.

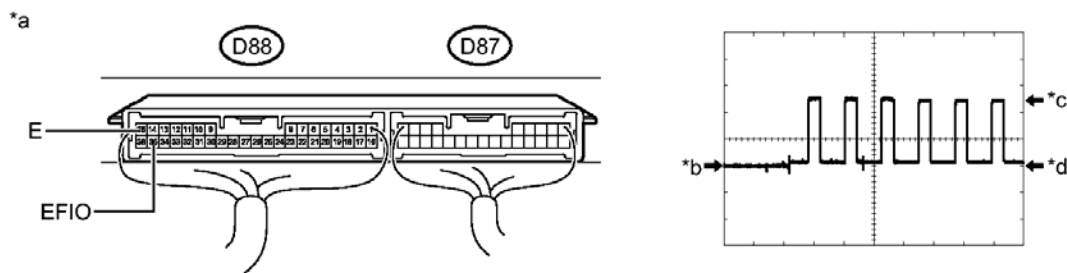


Fig. 5: Checking Certification ECU With Waveform
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*a	Component with harness connected (Certification ECU)	*b	GND
*c	HIGH	*d	LOW

WAVEFORM

Item	Content
Tester Connection	D88-35 (EFIO) - D88-15 (E)
Tool Setting	5 V/DIV., 50 msec./DIV.
Condition	Engine switch on (IG)

OK

Waveform is output normally (See **Fig. 5**).

NG --> See step 9

OK: Go to next step

4. REPLACE CERTIFICATION ECU

- Replace the certification ECU. Refer to **REMOVAL** .

NEXT: Go to next step

5. KEY REGISTRATION

- Register the key. Refer to **REGISTRATION** .

NEXT: Go to next step

6. REGISTER ECU COMMUNICATION ID

- a. Register the ECU communication ID. Refer to **REGISTRATION** .

NEXT: Go to next step

7. CHECK DTC OUTPUT

- a. Clear the DTCs. Refer to **DTC CHECK / CLEAR** .
- b. Recheck for DTCs. Refer to **DTC CHECK / CLEAR** .

OK

DTC B279A is not output.

NG --> See step 9

OK --> END (CERTIFICATION ECU WAS DEFECTIVE)

8. GO TO DIAGNOSTIC TROUBLE CODE CHART. Refer to **DIAGNOSTIC TROUBLE CODE CHART**

9. REPLACE ECM. Refer to **REMOVAL**

DTC B279C: THEFT DETERRENT SYSTEM PRESENCE DETECTION

DESCRIPTION

If an ECM that is incompatible with the engine immobiliser system is installed, the ECM stores this DTC.

DTC No.	DTC Detection Condition	Trouble Area
B279C	When an ECM that is incompatible with engine immobiliser system is installed.	ECM

INSPECTION PROCEDURE

PROCEDURE

1. CHECK DTC OUTPUT

- a. Clear the DTCs. Refer to **DTC CHECK / CLEAR** .
- b. Recheck for DTCs. Refer to **DTC CHECK / CLEAR** .

OK

DTC B279C is not output.

NG --> See step 3

OK --> See step 2

2. **USE SIMULATION METHOD TO CHECK. Refer to HOW TO PROCEED WITH TROUBLESHOOTING**
3. **REPLACE ECM. Refer to REMOVAL**

CIRCUIT TESTS

Security Indicator Light Circuit

DESCRIPTION

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

WIRING DIAGRAM

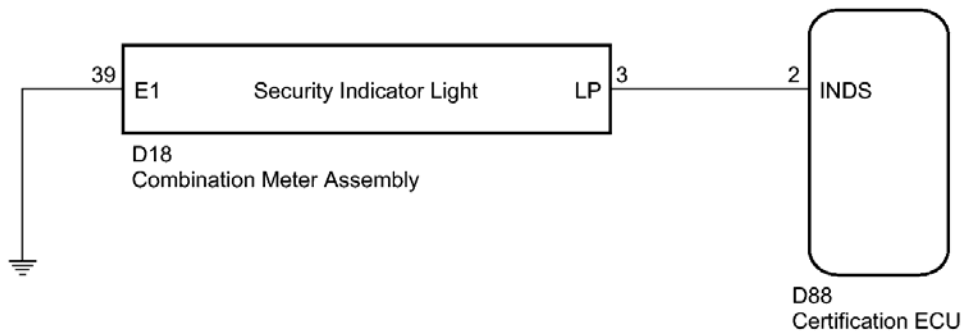


Fig. 6: Security Indicator Light Wiring Diagram
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

NOTE: If the certification ECU is replaced, register the key and ECU communication ID.
Refer to REGISTRATION .

PROCEDURE

1. **PERFORM ACTIVE TEST USING TECHSTREAM (SECURITY INDICATOR)**
 - 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

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

OK

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

NG --> See step 2

OK --> See step 4

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

- Disconnect the certification ECU connector.
- Disconnect the combination meter assembly connector.
- Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Condition	Specified Condition
D88-2 (INDS) - D18-3 (LP)	Always	Below 1 ohms
D88-2 (INDS) - Body ground	Always	10 kohms or higher
D18-3 (LP) - Body ground	Always	10 kohms or higher

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

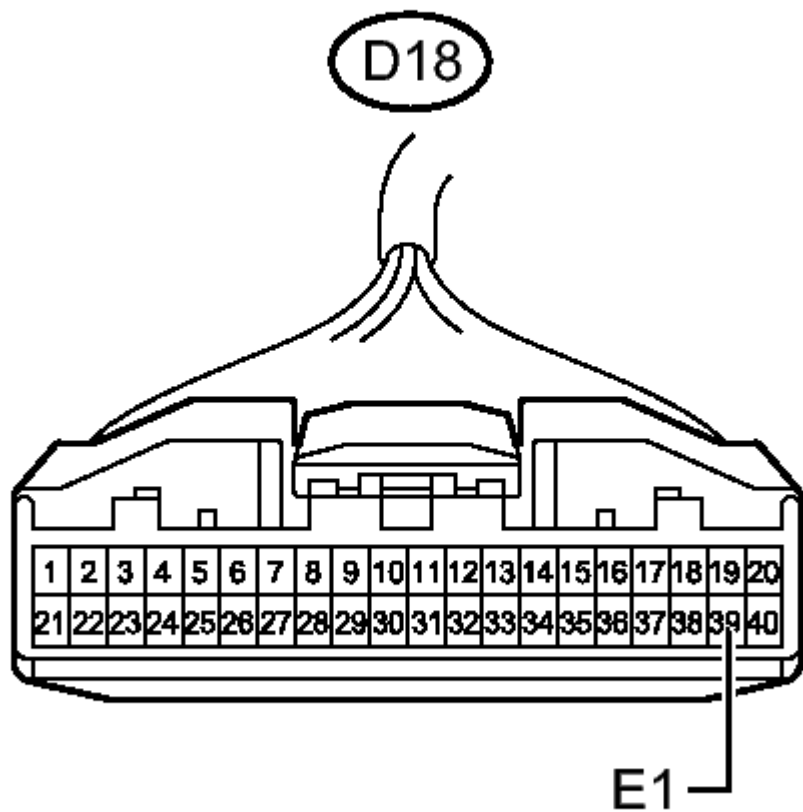
OK: Go to next step

- REPLACE COMBINATION METER ASSEMBLY. Refer to REMOVAL**
- REPLACE CERTIFICATION ECU. Refer to REMOVAL**
- CHECK HARNESS AND CONNECTOR (COMBINATION METER ASSEMBLY - BODY**

GROUND)

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

*a



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Fig. 7: Measuring Resistance Of Combination Meter Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard Resistance

Tester Connection	Condition	Specified Condition
D18-39 (E1) - Body ground	Always	Below 1 ohms

TEXT IN ILLUSTRATION



*a	Front view of wire harness connector (to Combination Meter Assembly)
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NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK --> See step 3