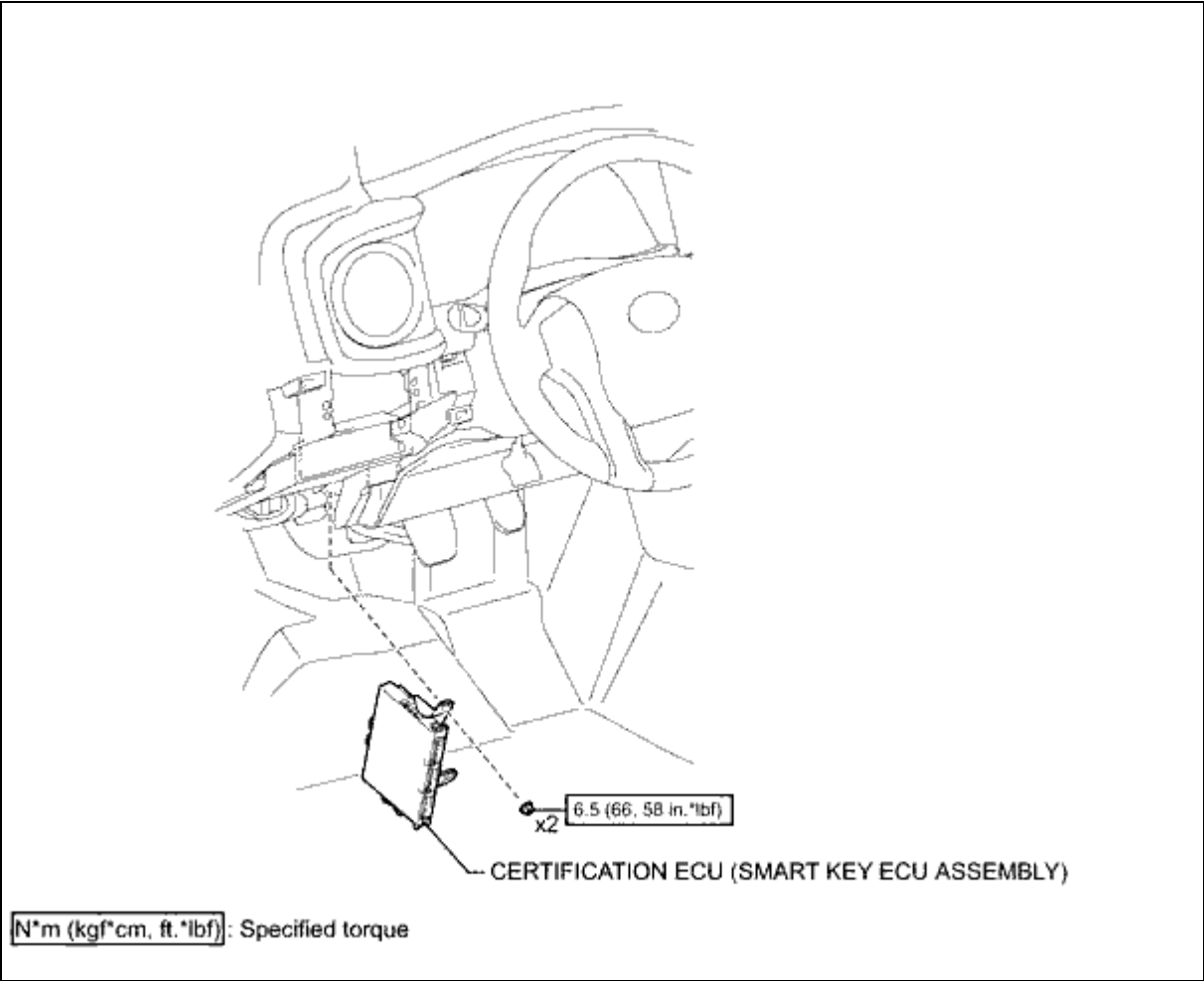


Last Modified: 11-13-2015	6.6 K	Doc ID: RM000005VLU000X
Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: CERTIFICATION ECU: COMPONENTS; 2016 MY Tacoma [08/2015 -]		

COMPONENTS

ILLUSTRATION



Last Modified: 11-13-2015	6.6 A	Doc ID: RM000005VLT000X
Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: CERTIFICATION ECU: INSTALLATION; 2016 MY Tacoma [08/2015 -]		

INSTALLATION

1. INSTALL CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

(a) Install the certification ECU (smart key ECU assembly) with the 2 nuts.

Torque:

6.5 N·m {66 kgf·cm, 58in·lbf}

(b) Engage the clamp to install the wire harness.

(c) Connect the 3 connectors.

2. INSTALL INSTRUMENT PANEL LOWER FINISH PANEL SUB-ASSEMBLY



Last Modified: 11-13-2015	6.6 A	Doc ID: RM000005VLV000X
Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: CERTIFICATION ECU: REMOVAL; 2016 MY Tacoma [08/2015 -]		

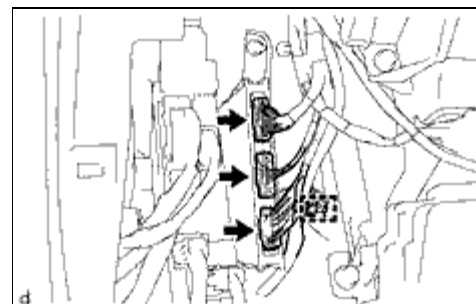
REMOVAL

1. REMOVE INSTRUMENT PANEL LOWER FINISH PANEL SUB-ASSEMBLY

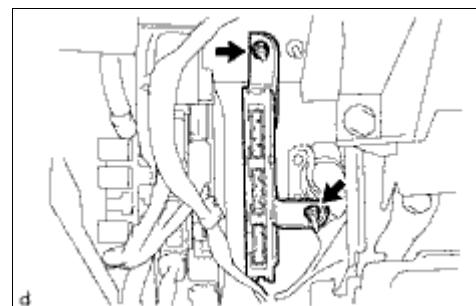
INFO

2. REMOVE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

(a) Disconnect the 3 connectors.



(b) Disengage the clamp to separate the wire harness.



(c) Remove the 2 nuts and certification ECU (smart key ECU assembly).



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Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): B2784; Antenna Coil Open / Short; 2016 MY Tacoma [08/2015 -]		

DTC	B2784	Antenna Coil Open / Short
------------	--------------	----------------------------------

DESCRIPTION

When an open or short circuit is detected in the transponder key amplifier coil built into the engine switch, the certification ECU (smart key ECU assembly) 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 (smart key ECU assembly)) (1 trip detection logic*). - Terminal AGND, 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 - Wire harness or connector - Certification ECU (smart key ECU assembly)	With the shift lever in P, the key held near 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.

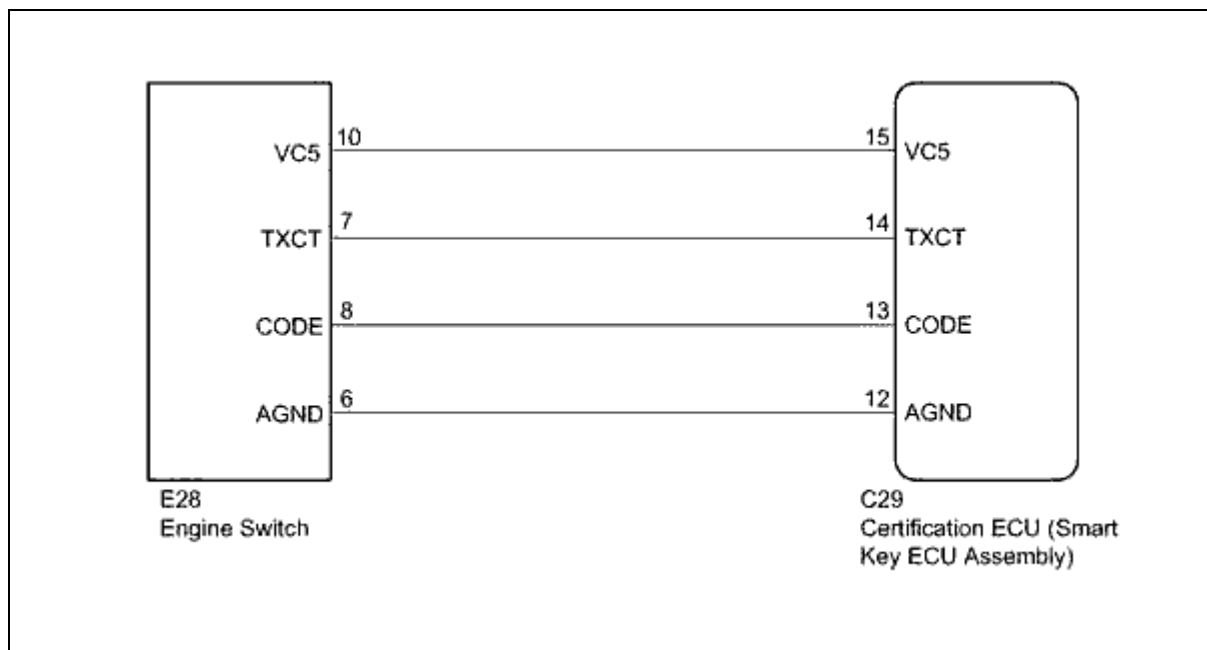
Vehicle Condition and Fail-safe Operation when Malfunction Detected

VEHICLE CONDITION WHEN MALFUNCTION DETECTED	FAIL-SAFE OPERATION WHEN MALFUNCTION DETECTED
Engine cannot be started when key battery is depleted by holding key near 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



INSPECTION PROCEDURE

NOTICE:

- Before replacing the certification ECU (smart key ECU assembly), refer to Registration [INFO](#) .
- After performing repairs, 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 [INFO](#) .

NEXT



2.	CHECK DTC OUTPUT
-----------	-------------------------

(a) Perform "DTC Output Confirmation Operation" procedure.

(b) Check for DTCs [INFO](#) .

OK:

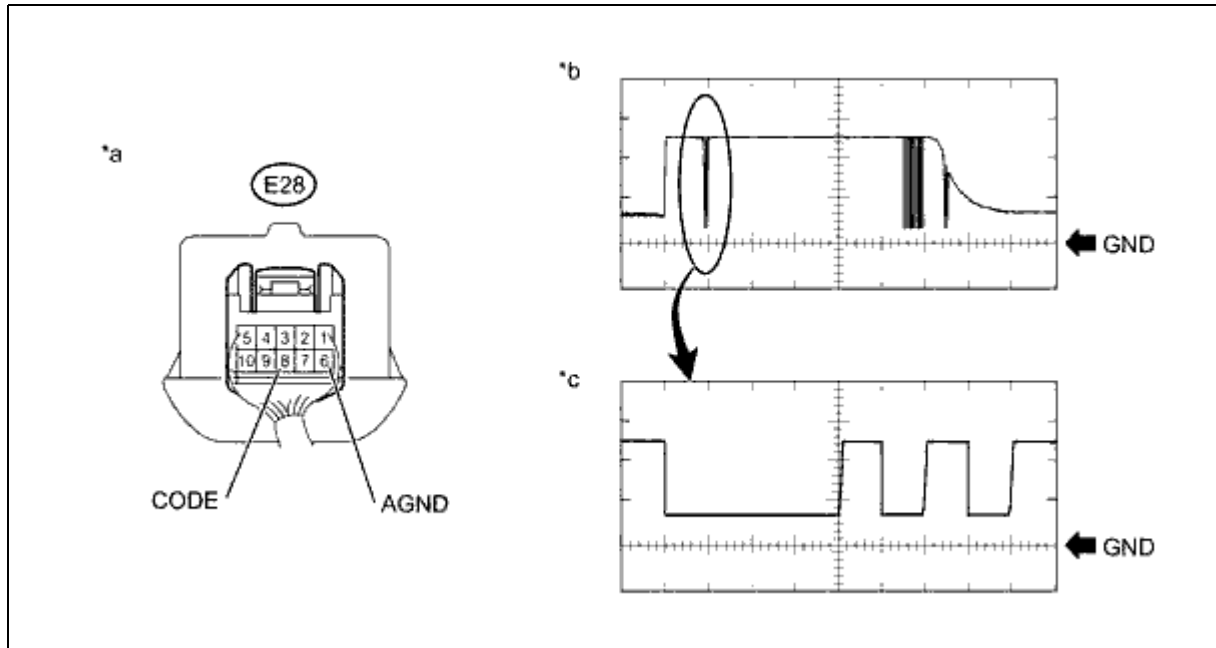
DTC B2784 is not output.

NG **GO TO STEP 3**

OK **USE SIMULATION METHOD TO CHECK**

3.	CHECK ENGINE SWITCH (OUTPUT)
----	------------------------------

(a) Using an oscilloscope, check the waveform.



Text in Illustration

*a	Component with harness connected (Engine Switch)	*b	Waveform
*c	Waveform (detail)	-	-

Measurement Condition:

TESTER CONNECTION	CONDITION	TOOL SETTING	SPECIFIED CONDITION
E28-8 (CODE) - E28-6 (AGND)	Engine switch off, engine switch pressed with key held near engine switch*	1 V/DIV., 20 ms./DIV.	Pulse generation (See waveform)
		2 V/DIV., 100 μs./DIV.	Pulse generation (See waveform (detail))

*: Remove the key battery before performing this inspection.

OK:
The waveform is similar to that shown in the illustration

NG▶ REPLACE ENGINE SWITCH

OK
▼

4. REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

(a) Replace the certification ECU (smart key ECU assembly) with a new one [INFO](#) .

NEXT



5. REGISTER RECOGNITION CODE

(a) Register the key [INFO](#) .

NEXT



6. REGISTER ECU COMMUNICATION ID

(a) Register the ECU communication ID [INFO](#) .

NEXT



7. CLEAR DTC

(a) Clear the DTCs [INFO](#) .

NEXT



8. CHECK FOR DTC

(a) Perform "DTC Output Confirmation Operation" procedure.

(b) Check for DTCs [INFO](#) .

OK:

DTC B2784 is not output.

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



Last Modified: 11-13-2015	6.6 C	Doc ID: RM000000TUF0ESX
Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): B278A; Short to GND in Immobiliser System Power Source Circuit; 2016 MY Tacoma [08/2015 -]		

DTC	B278A	Short to GND in Immobiliser System Power Source Circuit
------------	--------------	--

DESCRIPTION

When there is a short to GND in the power supply for the transponder key amplifier of the engine switch, the certification ECU (smart key ECU assembly) 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*).	• Wire harness or connector • Engine switch • Certification ECU (smart key ECU assembly)	With the shift lever in P, the key held near 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.

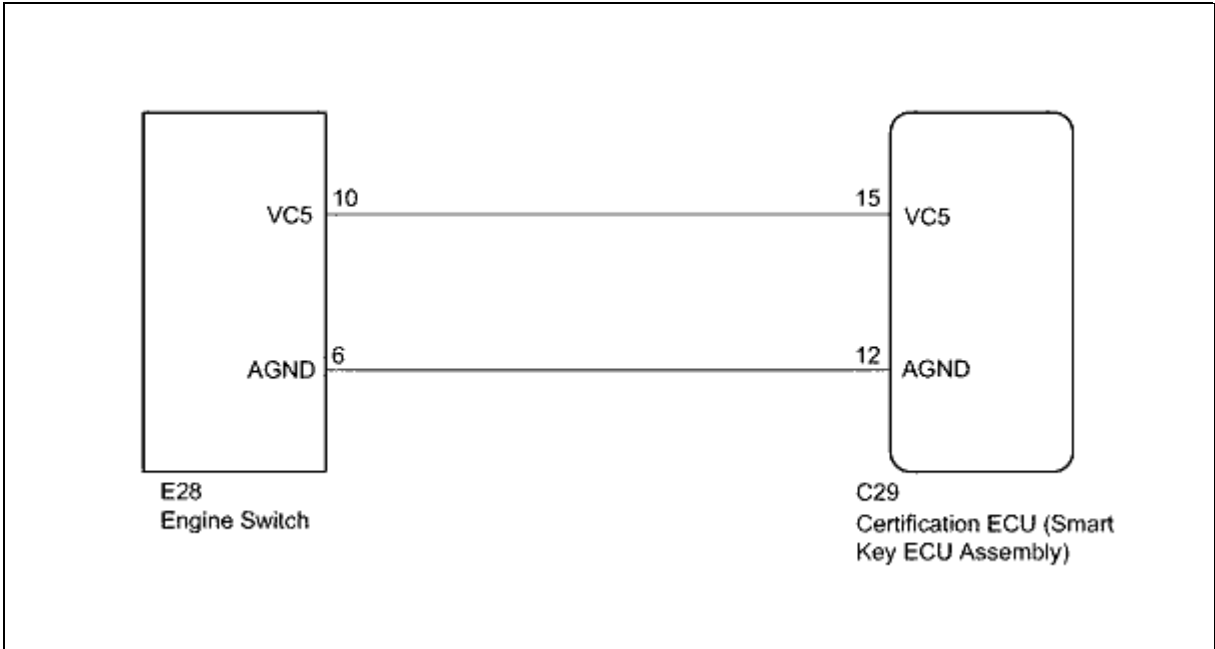
Vehicle Condition and Fail-safe Operation when Malfunction Detected

VEHICLE CONDITION WHEN MALFUNCTION DETECTED	FAIL-SAFE OPERATION WHEN MALFUNCTION DETECTED
Engine cannot be started when key battery is depleted by holding key near 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



INSPECTION PROCEDURE

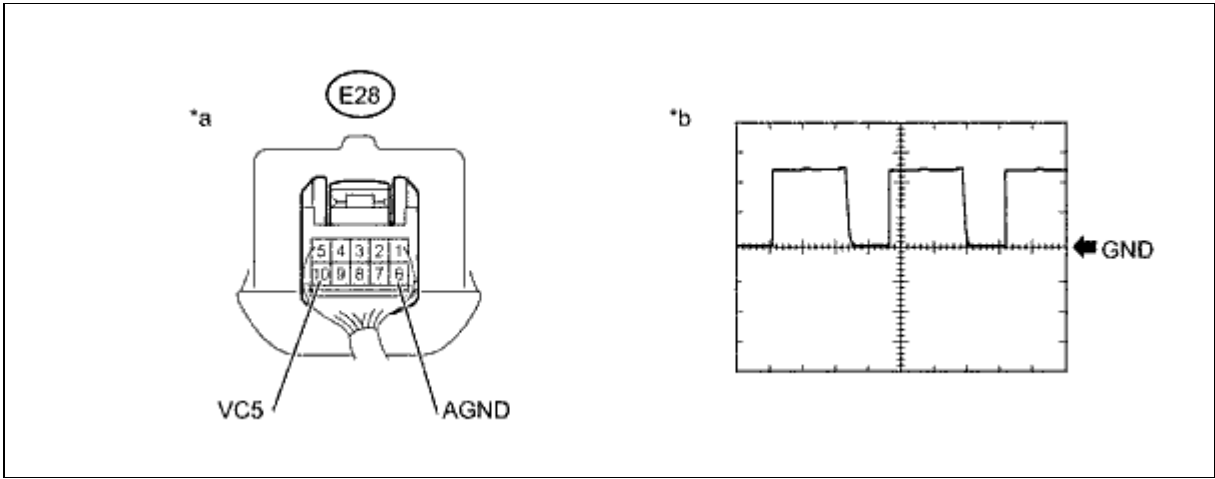
NOTICE:

- Before replacing the certification ECU (smart key ECU assembly), refer to Registration [INFO](#) .
- After performing repairs, perform the operation that fulfills the DTC output confirmation operation, and then confirm that no DTCs are output again.

PROCEDURE

1.	CHECK CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)
----	--

(a) Using an oscilloscope, check the waveform.



Text in Illustration

*a	Component with harness connected (Engine Switch)	*b	Waveform
----	---	----	----------

HINT:

Perform this inspection on the engine switch side.

Measurement Condition:

TESTER CONNECTION	CONDITION	TOOL SETTING	SPECIFIED CONDITION
E28-10 (VC5) - E28-6 (AGND)	Engine switch off, key not in cabin, within 30 seconds after engine switch pressed	2 V/DIV., 200 ms./DIV.	Pulse generation (See waveform)

OK:

The waveform is similar to that shown in the illustration.

Result

RESULT	PROCEED TO
NG	A
OK	B

B  **REPLACE ENGINE SWITCH**

A



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

(a) Disconnect the C29 certification ECU (smart key ECU assembly) connector.

(b) Disconnect the E28 engine switch connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
C29-15 (VC5) - E28-10 (VC5)	Always	Below 1 Ω
C29-12 (AGND) - E28-6 (AGND)	Always	Below 1 Ω
C29-15 (VC5) or E28-10 (VC5) - Body ground	Always	10 k Ω or higher
C29-12 (AGND) or E28-6 (AGND) - Body ground	Always	10 k Ω or higher

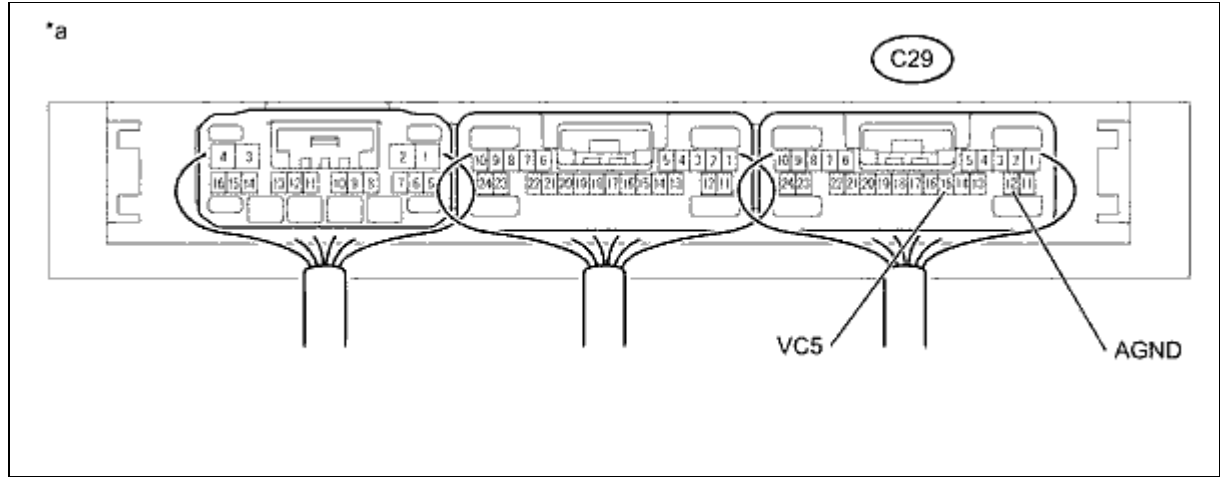
NG  **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK



3.	CHECK CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)
-----------	---

- (a) Reconnect the C29 certification ECU (smart key ECU assembly) connector.
- (b) Reconnect the E28 engine switch connector.
- (c) Measure the voltage according to the value(s) in the table below.



Text in Illustration

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

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
C29-15 (VC5) - C29-12 (AGND)	Engine switch off, brake pedal not depressed, 30 seconds or more elapsed after driver door opened and then closed	Below 1 V

- NG REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)
- OK REPLACE ENGINE SWITCH



Last Modified: 11-13-2015	6.6 C	Doc ID: RM000000TUG0CGX
Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): B278D; Malfunction of ID-BOX Recognition; 2016 MY Tacoma [08/2015 -]		

DTC	B278D	Malfunction of ID-BOX Recognition
------------	--------------	--

DESCRIPTION

When the certification ECU (smart key ECU assembly) detects an input signal indicating that the vehicle is equipped with an ID code box even though the ID code box is not registered, the certification ECU (smart key ECU assembly) stores this DTC.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA	DTC OUTPUT CONFIRMATION OPERATION
B278D	One of the following conditions is met: - The certification ECU (smart key ECU assembly) recognizes that the wire harness judging whether the vehicle is equipped with an ID code box or not is provided even though the ID code box is not registered. - The certification ECU (smart key ECU assembly) receives a LIN signal from the ID code box even though the ID code box is not registered. - The certification ECU (smart key ECU assembly) receives a LIN signal from the ID code box even though the wire harness judging whether the vehicle is equipped with an ID code box or not is not provided.	Misconnection of the ID code box	Always

*: 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
Key registration will be prohibited	-

Related Data List and Active Test

DTC CODE	DATA LIST AND ACTIVE TEST
B278D	-

INSPECTION PROCEDURE

NOTICE:

- Before performing following inspection procedure, check that the ID code box (immobiliser code ECU) is

not installed on the vehicle.

- Before replacing the certification ECU (smart key ECU assembly), refer to Registration **INFO** .
- After performing repairs, 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 **INFO** .

NEXT



2.	CHECK DTC OUTPUT
-----------	-------------------------

(a) Check for DTCs **INFO** .

HINT:

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

OK:

DTC B278D is not output.

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

OK ► **END**



Last Modified: 11-13-2015	6.6 C	Doc ID: RM000002M6X0BFX
Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): B279986; Engine Immobiliser System Signal (Some Circuit Quantity, Reported via Serial Data) Invalid; 2016 MY Tacoma [08/2015 -]		

DTC	B279986	Engine Immobiliser System Signal (Some Circuit Quantity, Reported via Serial Data) Invalid
------------	----------------	---

DESCRIPTION

When there are communication malfunctions between the ECM and certification ECU (smart key ECU assembly), 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
B279986	Either condition is met (1 trip detection logic*1): - A malfunction in the communication or communication lines between the ECM and certification ECU (smart key ECU assembly) - A matching communication code cannot be verified during communication between the ECM and certification ECU (smart key ECU assembly).	- Certification ECU (smart key ECU assembly) - ECM - Wire 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, the engine switch is pressed 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).

*1: 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
----------	---------------------------

DTC CODE	DATA LIST AND ACTIVE TEST
B279986	-

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- When replacing the certification ECU (smart key ECU assembly), refer to Registration [INFO](#) .
- After performing repairs, perform the operation that fulfills the DTC output confirmation operation, and then confirm that no DTCs are output again.

HINT:

When DTC B279986 and the certification ECU (smart key ECU assembly) DTC are output simultaneously, first perform troubleshooting for the certification ECU (smart key ECU assembly) DTC.

PROCEDURE

1.	REGISTER ECU COMMUNICATION ID
----	-------------------------------

(a) Register the ECU communication ID [INFO](#) .

NEXT



2.	CLEAR DTC
----	-----------

(a) Clear the DTCs [INFO](#) .

NEXT



3.	CHECK FOR DTC
-----------	----------------------

- (a) Start the engine.
- (b) Perform "DTC Output Confirmation Operation" procedure.
- (c) Check for DTCs INFO.

OK:

DTC B279986 is not output.

Result

RESULT	PROCEED TO
OK	A
NG (DTC B279986 is output)	B
NG (Other DTCs are output)	C

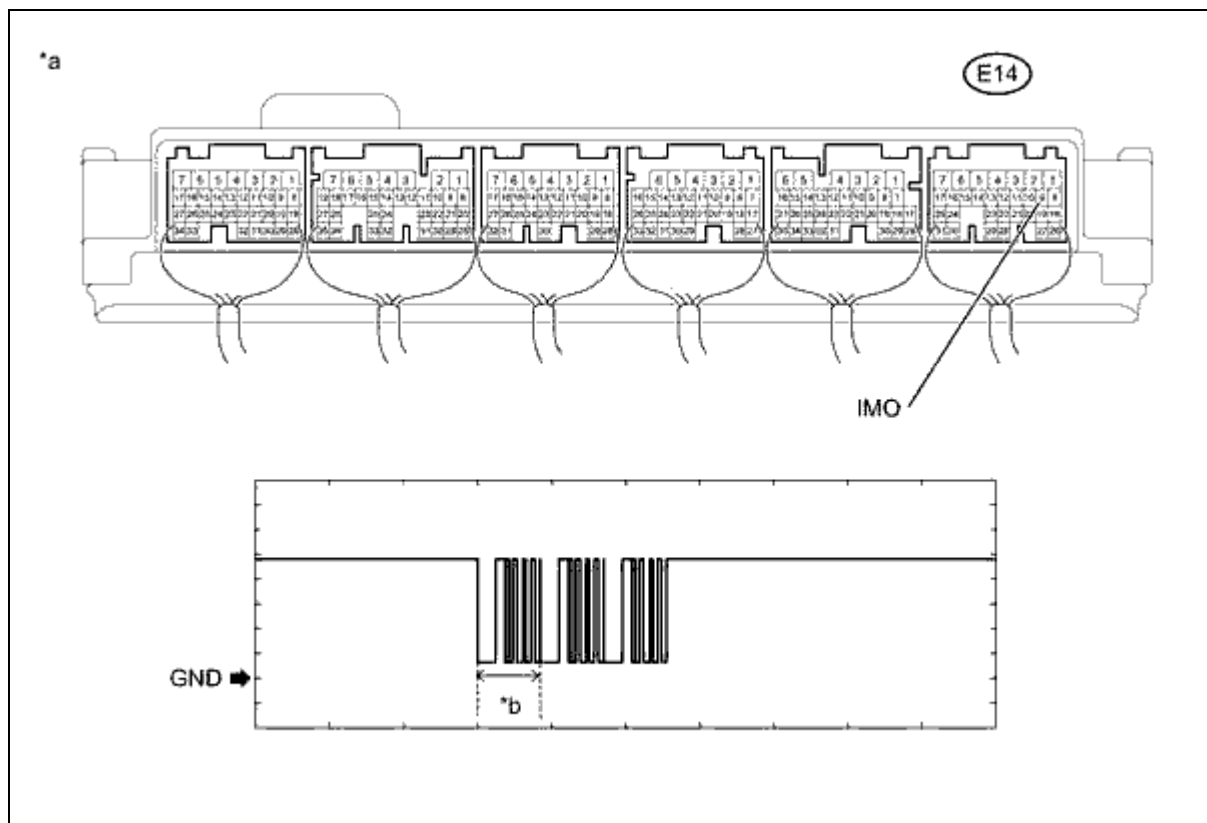
B  **GO TO STEP 4**

C  **GO TO DIAGNOSTIC TROUBLE CODE CHART**

A  **END (COMMUNICATION ID REGISTRATION WAS DEFECTIVE)**

4.	INSPECT ECM (TERMINAL IMO)
-----------	-----------------------------------

- (a) Using an oscilloscope, check the waveform.



Text in Illustration

*a	Component with harness connected (ECM)	*b	Waveform
-----------	--	-----------	----------

Measurement Condition:

TESTER CONNECTION	CONDITION	TOOL SETTING	SPECIFIED CONDITION
E14-9 (IMO) - Body ground	Within 3 seconds of engine start or within 3 seconds of engine switch turned on (IG) after battery cable disconnected and reconnected	2 V/DIV., 500 ms./DIV.	Pulse generation (See waveform)

OK:

The waveform is similar to that shown in the illustration.

Result

RESULT	PROCEED TO
Normal waveform	A
Terminal IMO stuck low (2.4 V or less)	B
Terminal IMO stuck high (12 V), or has abnormal wavelength or shape	C

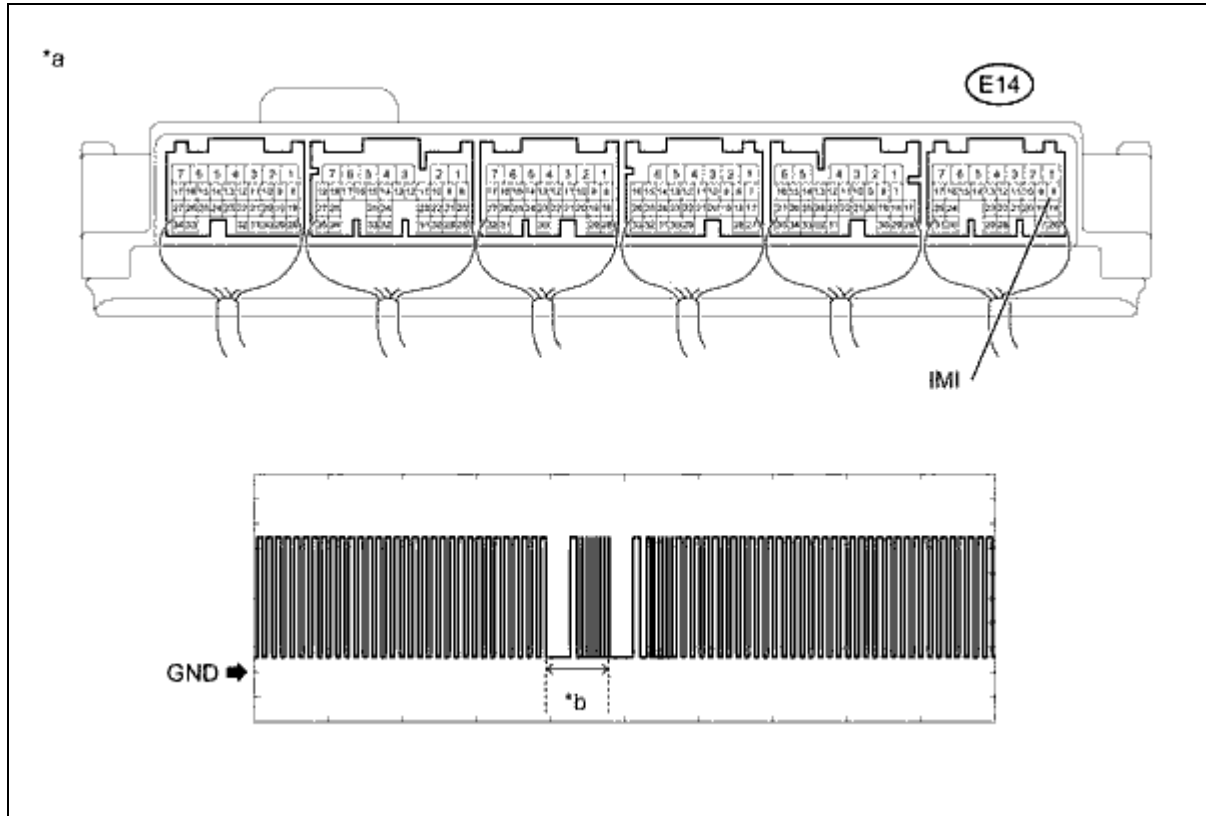
B ► GO TO STEP 8

C ► REPLACE ECM

A
▼

5. INSPECT CERTIFICATION ECU (SMART KEY ECU ASSEMBLY) (TERMINAL IMI)

(a) Using an oscilloscope, check the waveform.



Text in Illustration

*a	Component with harness connected (ECM)	*b	Waveform
----	---	----	----------

Measurement Condition:

TESTER CONNECTION	CONDITION	TOOL SETTING	SPECIFIED CONDITION
E14-8 (IMI) - Body ground	Engine switch on (IG) using registered electrical key transmitter sub-assembly	2 V/DIV., 500 ms./DIV.	Pulse generation (See waveform)

OK:

The waveform is similar to that shown in the illustration.

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

OK
▼

6.	REGISTER ECU COMMUNICATION ID
----	-------------------------------

(a) Register the ECU communication ID INFO .

NEXT
▼

7.	CHECK WHETHER ENGINE STARTS
----	-----------------------------

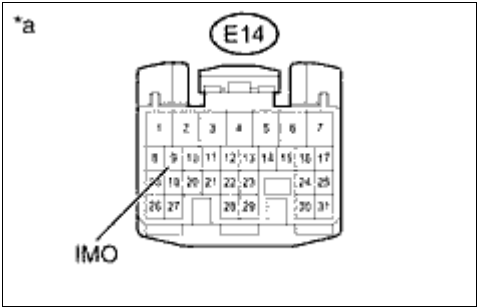
- (a) Using an electrical key transmitter sub-assembly which is registered to the vehicle, turn the engine switch on (IG).
- (b) Check that the engine starts 5 seconds after the engine switch was turned on (IG).
- OK:
Engine starts normally.

NG ► REPLACE ECM

OK ► END (COMMUNICATION ID REGISTRATION WAS DEFECTIVE)

8.	INSPECT ECM (IMO TERMINAL VOLTAGE)
----	------------------------------------

(a) Disconnect the ECM connector.



- (b) Turn the engine switch on (IG).
- (c) Measure the voltage according to the value(s) in the table below.
- Standard Voltage:

TESTER	CONDITION	SPECIFIED CONDITION
--------	-----------	---------------------

CONNECTION		
E14-9 (IMO) - Body ground	Engine switch on (IG) using registered electrical key transmitter sub-assembly	Terminal IMO stuck low (2.4 V or less)
		Terminal IMO stuck high (12 V) or abnormal waveform

Text in Illustration

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

Result

RESULT	PROCEED TO
Terminal IMO stuck low (2.4 V or less)	A
Terminal IMO stuck high (12 V) or abnormal waveform	B

B ► REPLACE ECM

A

9.	CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU (SMART KEY ECU ASSEMBLY) - ECM)
-----------	---

(a) Disconnect the C27 certification ECU (smart key ECU assembly) connector.

(b) Disconnect the E14 ECM connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
C27-7 (EFII) - E14-9 (IMO)	Always	Below 1 Ω
C27-7 (EFII) or E14-9 (IMO) - Body ground	Always	10 k Ω or higher
C27-6 (EFIO) - E14-8 (IMI)	Always	Below 1 Ω
C27-6 (EFIO) or E14-8 (IMI) - Body ground	Always	10 k Ω or higher

NG ► REPAIR OR REPLACE HARNESS OR CONNECTOR

OK ► REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)



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Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): B279A12; Engine Immobiliser System Circuit Short to Battery; 2016 MY Tacoma [08/2015 -]		

DTC	B279A12	Engine Immobiliser System Circuit Short to Battery
------------	----------------	---

DESCRIPTION

When the communication line (IMI - EFIO) between the ECM and certification ECU (smart key ECU assembly) is stuck high, the ECM stores this DTC.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA	DTC OUTPUT CONFIRMATION OPERATION
B279A12	The communication line (IMI - EFIO) between the ECM and certification ECU (smart key ECU assembly) is stuck high (1 trip detection logic*1).	• Wire harness or connector (disconnection or break in wire harness is main cause) • Certification ECU (smart key ECU assembly) • ECM	Turn the engine switch on (IG) and wait 6 seconds.

*1: Only output while a malfunction is present.

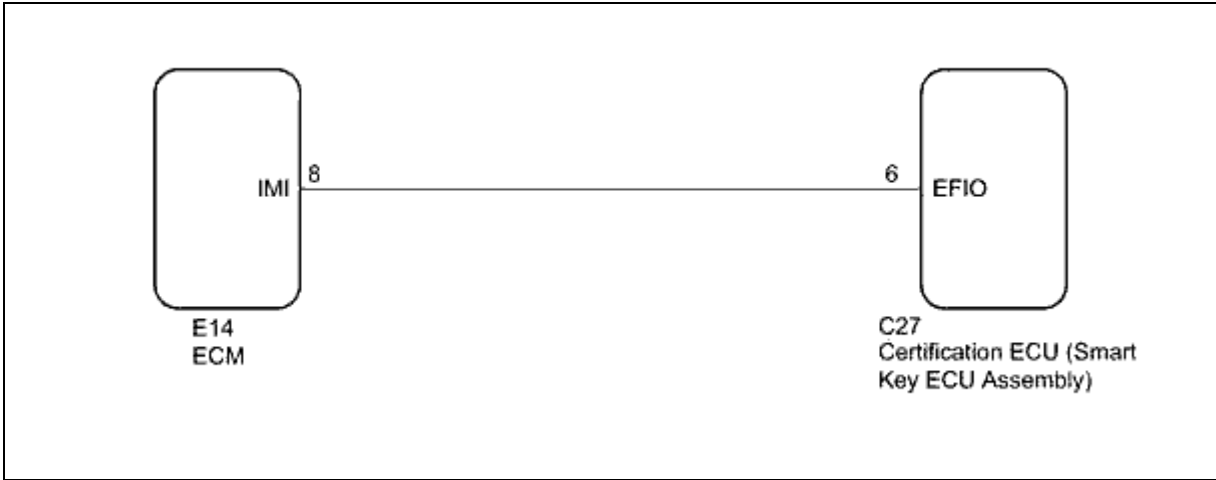
Vehicle Condition and Fail-safe Operation when Malfunction Detected

VEHICLE CONDITION WHEN MALFUNCTION DETECTED	FAIL-SAFE OPERATION WHEN MALFUNCTION DETECTED
Engine cannot be started (initial ignition occurs and engine cranks, then ignition stops)	Engine cannot be started

Related Data List and Active Test

DTC CODE	DATA LIST AND ACTIVE TEST
B279A12	-

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- When replacing the certification ECU (smart key ECU assembly), refer to Registration [INFO](#) .
- After performing repairs, perform the operation that fulfills the DTC output confirmation operation, and then confirm that no DTCs are output again.

HINT:

When DTC B279A12 and the certification ECU (smart key ECU assembly) DTC are output simultaneously, first perform troubleshooting for the certification ECU (smart key ECU assembly) DTC.

PROCEDURE

1.	CLEAR DTC
----	-----------

(a) Clear the DTCs [INFO](#) .

NEXT



2.	CHECK FOR DTC
----	---------------

(a) Turn the engine switch on (IG) and wait 10 seconds.

(b) Check for DTCs [INFO](#) .

Result

RESULT	PROCEED TO
DTC or B279A12 is output	A
DTC or B279A12 and other DTCs are output	B

HINT:

If DTCs other than DTC B279A12 are output, troubleshoot those DTCs first.

B  **GO TO DIAGNOSTIC TROUBLE CODE CHART**

A



3.	CHECK CONNECTION OF CONNECTOR
-----------	--------------------------------------

(a) Turn the engine switch off.

(b) Check that the connectors are properly connected to the ECM and certification ECU (smart key ECU assembly).

OK:

Connectors are properly connected.

NG  **CONNECT CONNECTORS PROPERLY**

OK



4.	CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU (SMART KEY ECU ASSEMBLY) - ECM)
-----------	---

(a) Disconnect the C27 certification ECU (smart key ECU assembly) connector.

(b) Disconnect the E14 ECM connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
C27-6 (EFIO) - E14-8 (IMI)	Always	Below 1 Ω
C27-6 (EFIO) or E14-8 (IMI) - Body ground	Always	10 k Ω or higher

NG  **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK



5. REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

(a) Replace the certification ECU (smart key ECU assembly) with a new one [INFO](#) .

NEXT



6. REGISTER RECOGNITION CODES

(a) Register the key [INFO](#) .

NEXT



7. REGISTER ECU COMMUNICATION ID

(a) Register the ECU communication ID [INFO](#) .

NEXT



8. CLEAR DTC

(a) Clear the DTCs [INFO](#) .

NEXT



9. CHECK FOR DTC

(a) Check for DTCs [INFO](#) .

HINT:

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

OK:

DTC B279A12 is not output.

NG ► **REPLACE ECM**

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



Last Modified: 11-13-2015	6.6 C	Doc ID: RM000002UBX0CZX
Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): B279C95; Engine Immobiliser System Incorrect Assembly; 2016 MY Tacoma [08/2015 -]		

DTC	B279C95	Engine Immobiliser System Incorrect Assembly
------------	----------------	---

DESCRIPTION

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

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA	DTC OUTPUT CONFIRMATION OPERATION
B279C95	An ECM that is incompatible with the engine immobiliser system is installed (1 trip detection logic*).	ECM	Check for DTCs.

*: 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
B279C95	-

INSPECTION PROCEDURE

PROCEDURE

1.	CLEAR DTC
-----------	------------------

(a) Clear the DTCs  .

NEXT



2.	CHECK FOR DTC
-----------	----------------------

(a) Check for DTCs  .

OK:

DTC B279C95 is not output.

NG ► **REPLACE ECM**

OK ► **USE SIMULATION METHOD TO CHECK**



Last Modified: 11-13-2015	6.6 U	Doc ID: RM000002M6V05TX
Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): DATA LIST / ACTIVE TEST; 2016 MY Tacoma [08/2015 -]		

DATA LIST / ACTIVE TEST

1. DATA LIST

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.

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.

- Connect the Techstream to the DLC3.
- Turn the engine switch on (IG).
- Turn the Techstream on.
- Enter the following menus: Body Electrical / Smart Key / Data List.
- Read the Data List according to the display on the Techstream.

Smart Key

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Ignition Switch*9	Engine switch status / ON or OFF	ON: Engine switch on (IG) OFF: Engine switch off	Use this Data List item to help determine the cause when all the smart key system/wireless functions do not operate.
#Codes	Number of trouble codes / Min: 0, Max: 255	Number of stored DTCs displayed	-
Immobilizer when IG-ON	Engine immobiliser system status when engine switch on (IG) / SET or UNSET	SET: Engine immobiliser system set (driver door open and closed with engine switch on (IG)) UNSET: Engine immobiliser system not set with engine switch on (IG) or engine immobiliser system unset for 40 times after engine immobiliser system set	-
Immobiliser*9	Engine immobiliser system status determined by certification ECU (smart key ECU	Set: Engine immobiliser system set (engine start prohibited) (engine switch off)	If "Set" is displayed, the engine start function is prohibited. • When "Set" is displayed, the security indicator light blinks.

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
	assembly) / Set or Unset	Unset: Engine immobiliser system unset (engine start permitted) (engine switch on (ACC) or on (IG))	The security indicator light is not linked with the steering lock system.
Master Key	Whether master key ID code matches ID code registered in certification ECU (smart key ECU assembly) / Match or No Match	Match: ID code of master key matches ID code registered in certification ECU (smart key ECU assembly) No Match: ID code of master key does not match ID code registered in certification ECU (smart key ECU assembly)	-
Sub Key	Whether sub key ID code matches ID code registered in certification ECU (smart key ECU assembly) / Match or No Match	Match: ID code of sub key matches ID code registered in certification ECU (smart key ECU assembly) No Match: ID code of sub key does not match ID code registered in certification ECU (smart key ECU assembly)	-
BCC Malfunction*1	BCC signal status of transponder chip / OK or NG	OK: BCC signal normal NG: BCC signal malfunction (malfunction in code computation in key/certification ECU (smart key ECU assembly))	Problems may be caused by the following: - Communication errors due to wave interference (LF). - Malfunctions in the key or certification ECU (smart key ECU assembly).
Abnormal Status*1	Transponder chip status signal / OK or NG	OK: Transponder chip status signal normal NG: Transponder chip status signal malfunction (malfunction in code computation in key/certification ECU (smart key ECU assembly))	Problems may be caused by the following: - Communication errors due to wave interference (LF). - Malfunctions in the key or certification ECU (smart key ECU assembly).
Different Encrypt Code*1	Code status between transponder chip and certification ECU (smart key ECU assembly) / OK	OK: Codes of transponder chip and certification ECU (smart key ECU assembly) match	Problems may be caused by the following: A key from a different vehicle is being used.

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
	or NG	NG: Codes of transponder chip and certification ECU (smart key ECU assembly) do not match	Malfunctions in the key or certification ECU (smart key ECU assembly).
Different Serial Number*1	Vehicle serial number / OK or NG	OK: Signal from transponder chip and vehicle serial number stored in the certification ECU (smart key ECU assembly) match NG: Signal from transponder chip and vehicle serial number stored in the certification ECU (smart key ECU assembly) do not match	Problems may be caused by the following: - A key from a different vehicle is being used. - Malfunctions in the key or certification ECU (smart key ECU assembly).
Frame Error	State of data sent from key / OK or NG	OK: No problem with data sent from key NG: Problem with data sent from key	Problems may be caused by the following: - Communication errors due to wave interference. - Malfunctions in the key or certification ECU (smart key ECU assembly).
Response	Key response to signal from certification ECU (smart key ECU assembly) / OK or NG	OK: Key responds to signal from certification ECU (smart key ECU assembly) NG: Key does not respond to signal from certification ECU (smart key ECU assembly)	Problems may be caused by the following: - A key from a different vehicle is being used. - Malfunctions in the key, certification ECU (smart key ECU assembly) or engine switch.
Engine Start Condition*2	Engine start permission from certification ECU (smart key ECU assembly) / OK or NG	OK: Engine start permitted by certification ECU (smart key ECU assembly) NG: Engine start prohibited by certification ECU (smart key ECU assembly)	-
ID-BOX Sleep Condition*9	Certification ECU (smart key ECU assembly) sleep mode status / Yes or No	Yes: Certification ECU (smart key ECU assembly) sleep mode possible No: Certification ECU (smart key ECU	-

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
		assembly) sleep mode not possible	
ID-BOX Start Condition*3	Certification ECU (smart key ECU assembly) status / Yes or No	Yes: Wake-up signal sent by certification ECU (smart key ECU assembly) No: Wake-up signal not sent by certification ECU (smart key ECU assembly)	-
Engine Start Request*4, *9	Request to certification ECU (smart key ECU assembly) to permit ECM to start engine / OK or NG	OK: Engine start permission request signal received by certification ECU (smart key ECU assembly) NG: Engine start permission request signal not received by certification ECU (smart key ECU assembly)	If OK is not displayed, the immobiliser cannot be unset by the ECM.
3bit Code Request	3-bit code request condition / OK or NG	OK: 3-bit code request condition signal received NG: 3-bit code request condition signal not received	-
L Code Check*5	L code verification result / OK or NG	OK: L code verification result normal NG: L code verification result abnormal	Problem may be caused by the following: • Registration has not been performed for the certification ECU (smart key ECU assembly) or steering lock ECU (steering lock actuator or upr bracket assembly). • Malfunctions in the certification ECU (smart key ECU assembly) or steering lock ECU (steering lock actuator or upr bracket assembly).
Unlock Request Receive*6, *9	Status of steering unlock command from certification ECU (smart key ECU assembly) / OK or NG	OK: Certification ECU (smart key ECU assembly) sends steering unlock command (within 10 seconds of engine switch turned on (ACC) or	If OK is not displayed even when the steering unlock conditions are met, the certification ECU (smart key ECU assembly) may be malfunctioning.

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
		on (IG), or of engine start operation performed) NG: Certification ECU (smart key ECU assembly) does not send steering unlock command (engine switch not turned on (ACC) or on (IG), and engine start operation not performed)	
Lock Request Receive*7, *9	Status of steering lock command from certification ECU (smart key ECU assembly) / OK or NG	OK: Certification ECU (smart key ECU assembly) sends steering lock command (within 10 seconds of any door opened with shift lever in P and engine switch off) NG: Certification ECU (smart key ECU assembly) does not send steering lock command (no door opened with shift lever in P and engine switch off)	If OK is not displayed even when the steering lock conditions are met, the certification ECU (smart key ECU assembly) may be malfunctioning.
L Code Check (Past)	L code verification result (past) / OK or NG(Past)	OK: Verification confirmed (past) NG(Past): Verification not confirmed (past)	-
EFI Code Receive*8, *9	Certification information sent to certification ECU (smart key ECU assembly) from ECM when ECM receives engine start permission signal from certification ECU (smart key ECU assembly) / OK or NG	OK: Signal from ECM to unset engine immobiliser received by certification ECU (smart key ECU assembly) NG: Signal from ECM to unset engine immobiliser not received by certification ECU (smart key ECU assembly)	-
EFI communication	State of communication to unset immobiliser between certification ECU (smart key ECU assembly) and ECM / OK or NG	OK: Communication to unset immobiliser has started between certification ECU (smart key ECU assembly) and ECM NG: Communication to unset immobiliser has not started between certification ECU (smart	If this item displays "NG" even though the conditions to unset the immobiliser have been met and the Engine Start Request Data List item displays "OK", the ECM may be malfunctioning. When the engine cannot be started, use this Data List item during troubleshooting.

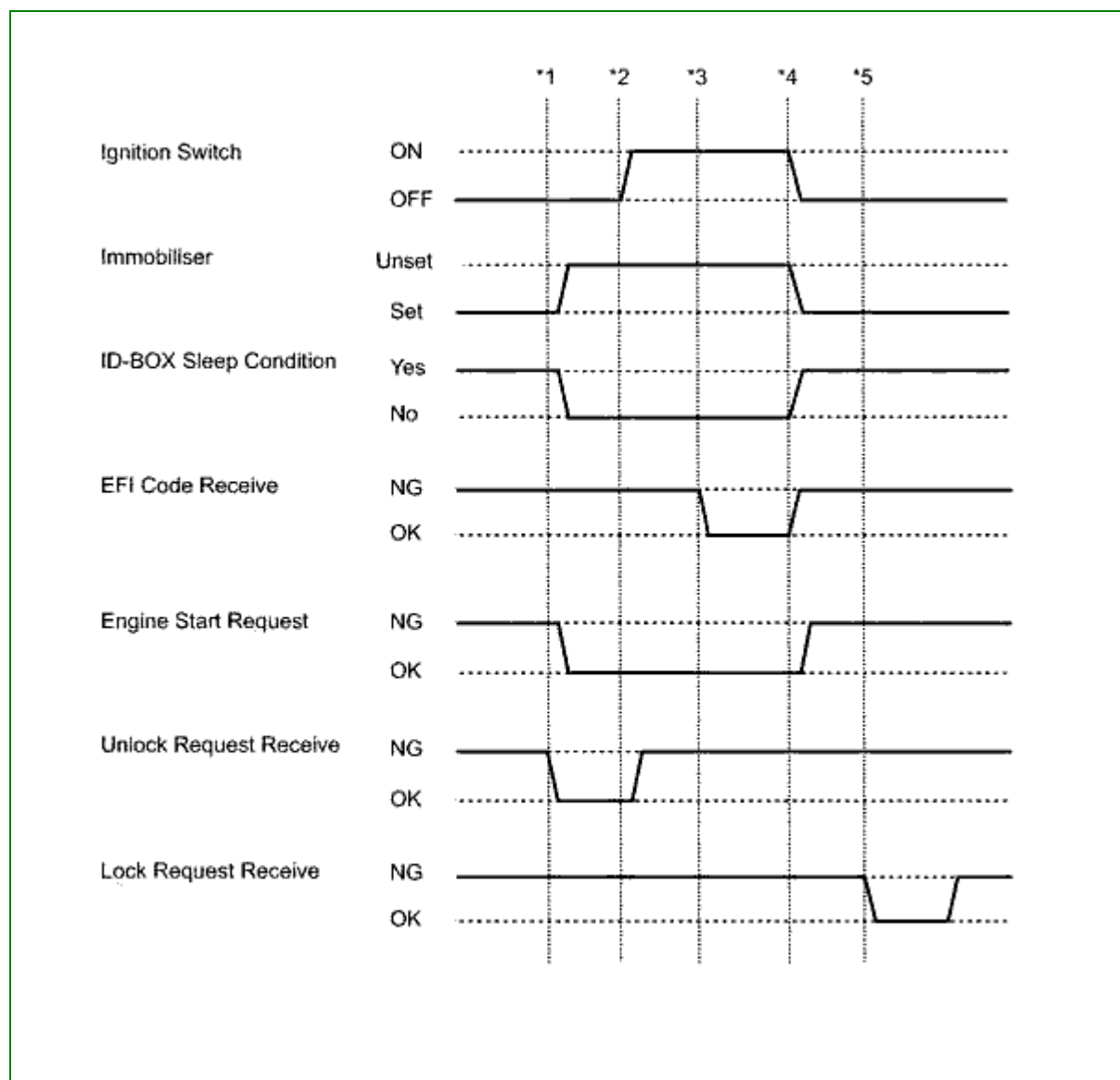
TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
		key ECU assembly) and ECM	

HINT:

- *1: This indicates that there is a problem with the communication format between the key and certification ECU (smart key ECU assembly). Wave interference, key or certification ECU (smart key ECU assembly) malfunctions, the key of another vehicle being used, etc. are possible causes.
- *2: Engine start is permitted when it is confirmed that the steering is unlocked and there are no malfunctions in the steering lock system. If engine start is not permitted, a steering lock ECU (steering lock actuator or upr bracket assembly) malfunction (relay, driver, etc.), an IGE circuit malfunction (harness or connector, certification ECU (smart key ECU assembly)), or a steering lock sensor malfunction are possible causes.
- *3: This indicates that transmission of the wake-up signal is possible ("Yes" indicates that the signal to begin verification-related LIN communication is being sent). When the steering lock motor is operating and an IGE ON signal is received (there is a steering lock operation request), or when communication is being performed between the certification ECU (smart key ECU assembly) and ECM, the display changes to "Yes".
- *4: This indicates that the engine start permission request signal (EGST) output from the ECM is being received by the certification ECU (smart key ECU assembly).
- *5: This indicates the certification results of the certification codes of the steering lock ECU (steering lock actuator or upr bracket assembly) and certification ECU (smart key ECU assembly).

When the steering lock ECU (steering lock actuator or upr bracket assembly) receives an unlock request from the certification ECU (smart key ECU assembly), confirmation of the certification ECU (smart key ECU assembly) L code is performed. If the L code matches, the steering lock ECU (steering lock actuator or upr bracket assembly) unlocks the steering.

- *6: The certification ECU (smart key ECU assembly) outputs a steering lock unlock request for 10 seconds after the engine switch is turned on (ACC) or on (IG), or an engine start operation is performed.
- *7: The certification ECU (smart key ECU assembly) outputs a steering lock lock request for 10 seconds after the engine switch is turned off and any door is opened with the shift lever in P.
- *8: This indicates that the certification ECU (smart key ECU assembly) is receiving verification information from the ECM. If the ECM can send the information, the display changes to "OK".
- *9: Please refer to the following Data List of the actual vehicle.



With the engine switch off and the shift lever in P, perform the following procedures and check the power source mode.

*1: Without depressing the brake pedal, press the engine switch and check that the power source mode turns on (ACC).

*2: Without depressing the brake pedal, press the engine switch and check that the power source mode turns on (IG).

*3: While depressing the brake pedal, press the engine switch and check that the engine starts.

*4: Press the engine switch and check that the power source mode turns off.

*5: Door is opened (steering lock operation starts when door is opened).

(f) Enter the following menus: Powertrain / Engine / Data List.

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

Engine

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Immobiliser Fuel Cut	Status of immobiliser fuel cut / ON or OFF	-	-

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) According to the display on the Techstream, perform the Active Test.

Smart Key

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Immobiliser Indicator	Security indicator light	OFF/ON	-



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Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): DIAGNOSIS SYSTEM; 2016 MY Tacoma [08/2015 -]		

DIAGNOSIS SYSTEM

1. DESCRIPTION

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

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

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

2. CHECK DLC3

- (a) Check the DLC3 .

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.

4. START FUNCTION PROBLEM SYMPTOMS

SYMPTOM	SUSPECTED AREA	COMPONENT MALFUNCTION	POSSIBLE OUTPUT DTCS	RELATED DATA LIST ITEM
Engine cannot be started*1	Certification ECU (smart key ECU assembly)	Open or short circuit inside ECU	• B278A • B2799 • B279A	• Ignition Switch • #Codes • Immobilizer when IG=ON • Immobiliser • Master Key • Sub Key • BCC Malfunction • Abnormal Status • Different Encrypt Code • Different Serial Number • Frame Error • Response • Wireless Starter Com ID • Wireless C Code • Engine Start

SYMPTOM	SUSPECTED AREA	COMPONENT MALFUNCTION	POSSIBLE OUTPUT DTCS	RELATED DATA LIST ITEM
				Condition • ID-BOX Sleep Condition • ID-BOX Start Condition • Engine Start Request • 3bit Code Request • L Code Check • Unlock Request Receive • Lock Request Receive • L Code Check (Past) • EFI Code Receive • EFI communication
	ECM	Open or short circuit inside ECU	• B2799 • B279A • B279C	EFI Code Receive
	SFI system	ECM incompatible with installed engine immobiliser system	B279C	• Engine Start Condition • EFI Code Receive
Power source mode cannot be changed*1	Engine switch	Open or short circuit inside switch	B278A	• Ignition Switch • Unlock Request Receive • Lock Request Receive
	Certification ECU (smart key ECU assembly)	Open or short circuit inside ECU	• B2271 • B2274	• Ignition Switch • Immobilizer when IG=ON • Immobiliser
Steering lock lock/unlock not possible*2	Steering lock ECU (steering lock actuator or upper bracket)	• Open or short circuit inside ECU • Actuator stuck	• B2781 • B2782 • B2788	• Unlock Request Receive • Lock Request Receive

*1: Refer to Problem Symptoms Table for Smart Key System (for Start Function).

*2: Refer to Problem Symptoms Table for Steering Lock System.



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Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): DIAGNOSTIC TROUBLE CODE CHART; 2016 MY Tacoma [08/2015 -]		

DIAGNOSTIC TROUBLE CODE CHART

HINT:

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

Certification ECU (Smart Key ECU Assembly)

DTC CODE	DETECTION ITEM	SEE PAGE
B2784	Antenna Coil Open / Short	INFO
B278A	Short to GND in Immobiliser System Power Source Circuit	INFO
B278D	Malfunction of ID-BOX Recognition	INFO

ECM

DTC CODE	DETECTION ITEM	SEE PAGE
B279986	Engine Immobiliser System Signal (Some Circuit Quantity, Reported via Serial Data) Invalid	INFO
B279A12	Engine Immobiliser System Circuit Short to Battery	INFO
B279C95	Engine Immobiliser System Incorrect Assembly	INFO



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Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): DTC CHECK / CLEAR; 2016 MY Tacoma [08/2015 -]		

DTC CHECK / CLEAR

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.
- Refer to the Techstream operator's manual for further details.

1. CHECK FOR IMMOBILISER DTC

- Connect the Techstream to the DLC3.
- Turn the engine switch on (IG).
- Turn the Techstream on.
- Enter the following menus: Body Electrical / Smart Key / Trouble Codes.
- Check for DTCs.

2. CHECK FOR ECM DTC

- Connect the Techstream to the DLC3.
- Turn the engine switch on (IG).
- Turn the Techstream on.
- Enter the following menus: Powertrain / Engine and ECT / Trouble Codes.
- Check for DTCs.

3. CLEAR IMMOBILISER DTC

- Connect the Techstream to the DLC3.
- Turn the engine switch on (IG).
- Turn the Techstream on.
- Enter the following menus: Body Electrical / Smart Key / Trouble Codes.
- Clear the DTCs.

4. CLEAR ECM DTC

- Connect the Techstream to the DLC3.
- Turn the engine switch on (IG).
- Turn the Techstream on.
- Enter the following menus: Powertrain / Engine and ECT / Trouble Codes.
- Clear the DTCs.



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Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): HOW TO PROCEED WITH TROUBLESHOOTING; 2016 MY Tacoma [08/2015 -]		

HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

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

1.	VEHICLE BROUGHT TO WORKSHOP
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NEXT



2.	INSPECT BATTERY VOLTAGE
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(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.

HINT:

A simple method to determine whether the battery is discharged is to operate the horn.

NEXT



3.	TURN ENGINE SWITCH ON (IG)
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HINT:

If the engine switch cannot be turned on (IG), communication with the Techstream can be confirmed by connecting the Techstream to the vehicle and turning a courtesy light switch on and off at intervals of 1.5 seconds or less until communication between the Techstream and vehicle begins.

NEXT



4. CHECK COMMUNICATION FUNCTION OF CAN COMMUNICATION SYSTEM*

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

Result

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

B  **GO TO CAN COMMUNICATION SYSTEM**

A



5. CHECK COMMUNICATION FUNCTION OF LIN COMMUNICATION SYSTEM*

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

Result

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

B  **GO TO LIN COMMUNICATION SYSTEM**

A



6. CHECK FOR DTC*

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

(b) Based on the DTCs output above, proceed to each diagnostic procedure.

Result

RESULT	PROCEED TO
DTC is not output	A

RESULT	PROCEED TO
SFI system DTC is output	B
Steering lock system DTC is output	C
Engine immobiliser system DTC is output	D

B ► GO TO DIAGNOSTIC TROUBLE CODE CHART

C ► GO TO DIAGNOSTIC TROUBLE CODE CHART

D ► GO TO DIAGNOSTIC TROUBLE CODE CHART

A

7.	PROBLEM SYMPTOMS TABLE
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(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*
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(a) Data List / Active Test [INFO](#)

(b) Terminals of ECU [INFO](#)

NEXT

9. REPAIR OR REPLACE

NEXT



10. CHECK FOR DTC*

(a) Clear the DTCs [INFO](#) .

(b) Check for DTCs [INFO](#) .

HINT:

Before checking for DTCs, perform the "DTC Output Confirmation Operation" of each diagnostic procedure

[INFO](#) .

Result

RESULT	PROCEED TO
DTC is not output	A
Engine immobiliser system DTC is output	B

B **GO TO DIAGNOSTIC TROUBLE CODE CHART**

A **END**



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Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): Immobiliser System does not Operate Properly; 2016 MY Tacoma [08/2015 -]		

Immobiliser System does not Operate Properly

DESCRIPTION

The engine immobiliser system compares the ID code that is registered in the certification ECU (smart key ECU assembly) with the ID code of the transponder chip that is embedded in the electrical key transmitter sub-assembly.

WIRING DIAGRAM

[INFO](#) .

INSPECTION PROCEDURE

CAUTION:

- The engine immobiliser system uses the LIN communication system. Inspect the communication function by following How to Proceed with Troubleshooting. Troubleshoot the engine immobiliser system after confirming that the communication systems are functioning properly [INFO](#) .
- Before replacing the ECM or certification ECU (smart key ECU assembly), refer to Registration [INFO](#) .
- After repair, confirm that no DTCs are output by performing "DTC Output Confirmation Operation".

HINT:

If an engine immobiliser system or SFI system DTC is output, first perform troubleshooting for the engine immobiliser system or SFI system DTC.

PROCEDURE

1.	CHECK FOR DTC
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(a) Check for DTCs [INFO](#) .

Result

RESULT	PROCEED TO
DTCs are not output	A
DTCs are output	B

B  **GO TO DIAGNOSTIC TROUBLE CODE CHART**

A

2.	READ VALUE USING TECHSTREAM (IMMOBILISER FUEL CUT)
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- (a) Connect the Techstream to the DLC3.
- (b) Turn the engine switch on (IG).
- (c) Turn the Techstream on.
- (d) Enter the following menus: Powertrain / Engine / Data List.
- (e) Read the Data List according to the display on the Techstream.

Engine

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Immobiliser Fuel Cut	Status of immobiliser fuel cut / ON or OFF	-	-

OK:

OFF is displayed after the engine is started.

Result

RESULT	PROCEED TO
NG	A
OK	B

B  **GO TO SFI SYSTEM****A**

3.	CHECK WHETHER ENGINE STARTS
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- (a) Check that the engine starts 5 seconds after the engine switch turned on (IG).

OK:

Engine starts normally.

Result

RESULT	PROCEED TO
NG	A

RESULT	PROCEED TO
OK	B

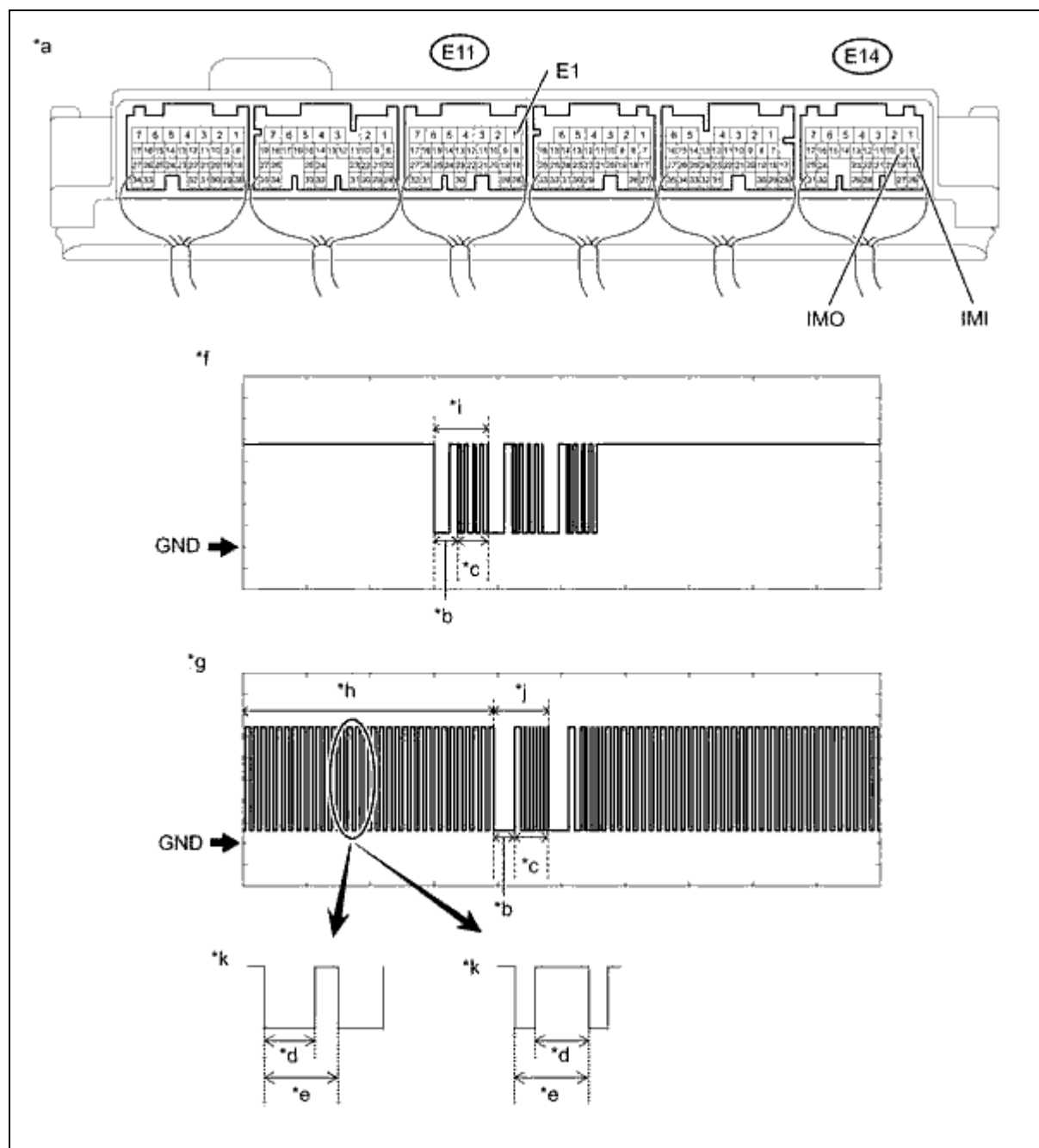
B  **USE SIMULATION METHOD TO CHECK**

A



4.	INSPECT ECM (TERMINAL IMI AND IMO)
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(a) Using an oscilloscope, check the waveform.



Text in Illustration

*a	Component with harness connected (ECM)	*b	Approximately 160 ms
*c	Approximately 270 ms	*d	Approximately 40 ms
*e	Approximately 60 ms	*f	Waveform (IMO)
*g	Waveform (IMI)	*h	Waveform A
*i	Waveform B	*j	Waveform C
*j	Waveform A (detail)	-	-

NOTICE:

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

Measurement Condition:

TESTER CONNECTION	CONDITION	TOOL SETTING	SPECIFIED CONDITION
E14-9 (IMO) - E11-1 (E1)	Within 3 seconds of engine start or within 3 seconds of engine switch turned on (IG) after battery cable disconnected and reconnected	2 V/DIV., 500 ms./DIV.	Pulse generation (See waveform (IMO))
E14-8 (IMI) - E11-1 (E1)	Within 3 seconds of engine start or within 3 seconds of engine switch turned on (IG) after battery cable disconnected and reconnected	2 V/DIV., 500 ms./DIV.	Pulse generation (See waveform (IMI))

Result

RESULT	PROCEED TO
Normal waveform	A
Waveform A not output, or has abnormal wavelength or shape	B
Waveform B not output, or has abnormal wavelength or shape	C
Waveform C not output, or has abnormal wavelength or shape	D

B ► **GO TO STEP 7**

C ► **REPLACE ECM**

D ► **GO TO STEP 8**

A
▼

5.	REGISTER ECU COMMUNICATION ID
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(a) Register the ECU communication ID  .

NEXT
▼

6.	CHECK WHETHER ENGINE STARTS
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(a) Check that the engine starts.

OK:

Engine starts normally.

NG  **GO TO STEP 8**

OK  **END (COMMUNICATION ID REGISTRATION WAS DEFECTIVE)**

7. CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU (SMART KEY ECU ASSEMBLY) - ECM)

(a) Disconnect the C27 certification ECU (smart key ECU assembly) connector.

(b) Disconnect the E14 ECM connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
C27-7 (EFII) - E14-9 (IMO)	Always	Below 1 Ω
C27-6 (EFIO) - E14-8 (IMI)	Always	Below 1 Ω
C27-7 (EFII) or E14-9 (IMO) - Body ground	Always	10 k Ω or higher
C27-6 (EFIO) or E14-8 (IMI) - Body ground	Always	10 k Ω or higher

NG  **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

8. REPLACE CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

(a) Replace the certification ECU (smart key ECU assembly) with a new one  .

NEXT

9. REGISTER RECOGNITION CODE

(a) Register the recognition codes in the ECUs  .

NEXT



10.	REGISTER ECU COMMUNICATION ID
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(a) Register the ECU communication ID  .

NEXT



11.	CHECK WHETHER ENGINE STARTS
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(a) Check that the engine starts.

OK:

Engine starts normally.

NG  **GO TO SFI SYSTEM**

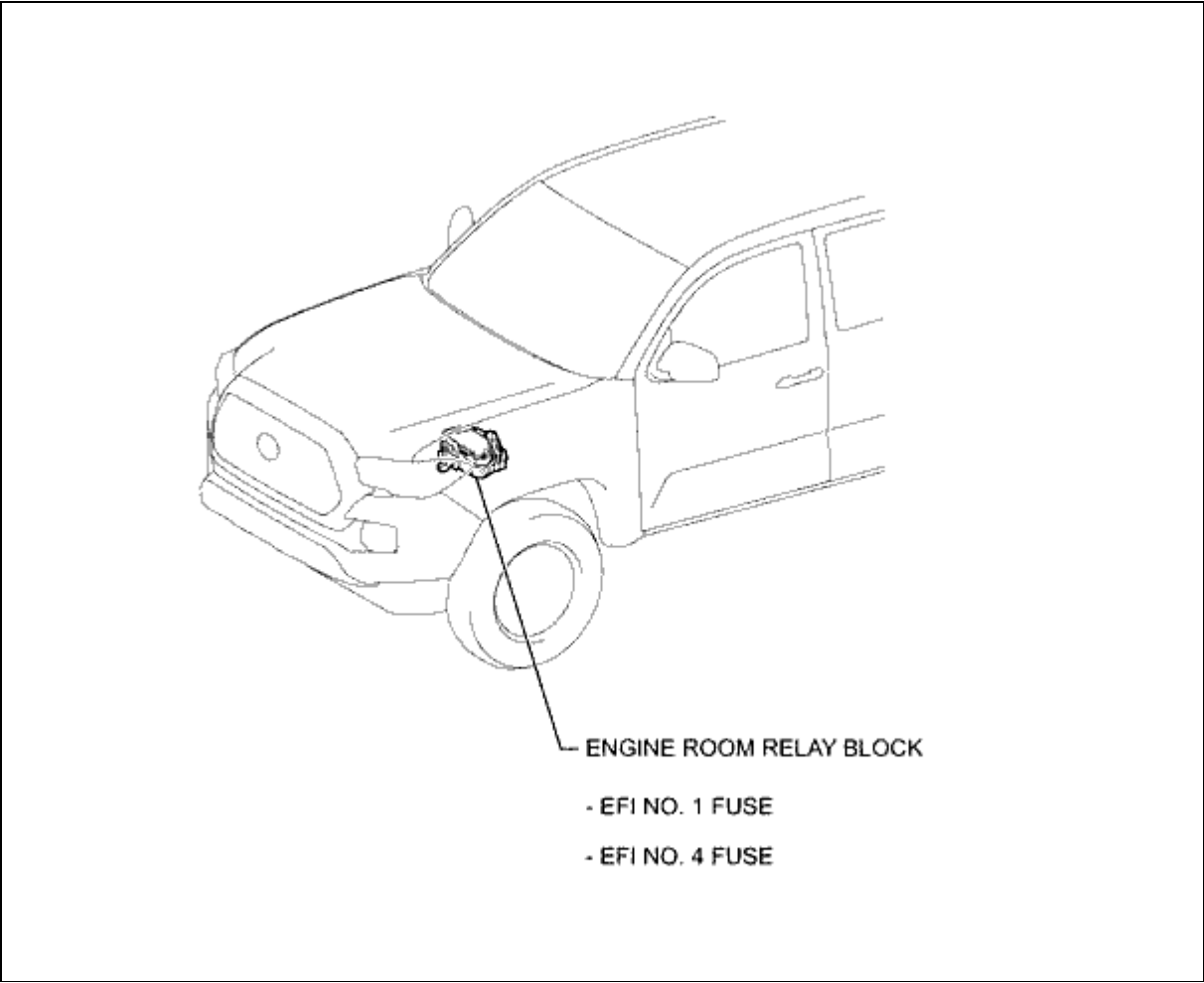
OK  **END (CERTIFICATION ECU (SMART KEY ECU ASSEMBLY) WAS DEFECTIVE)**



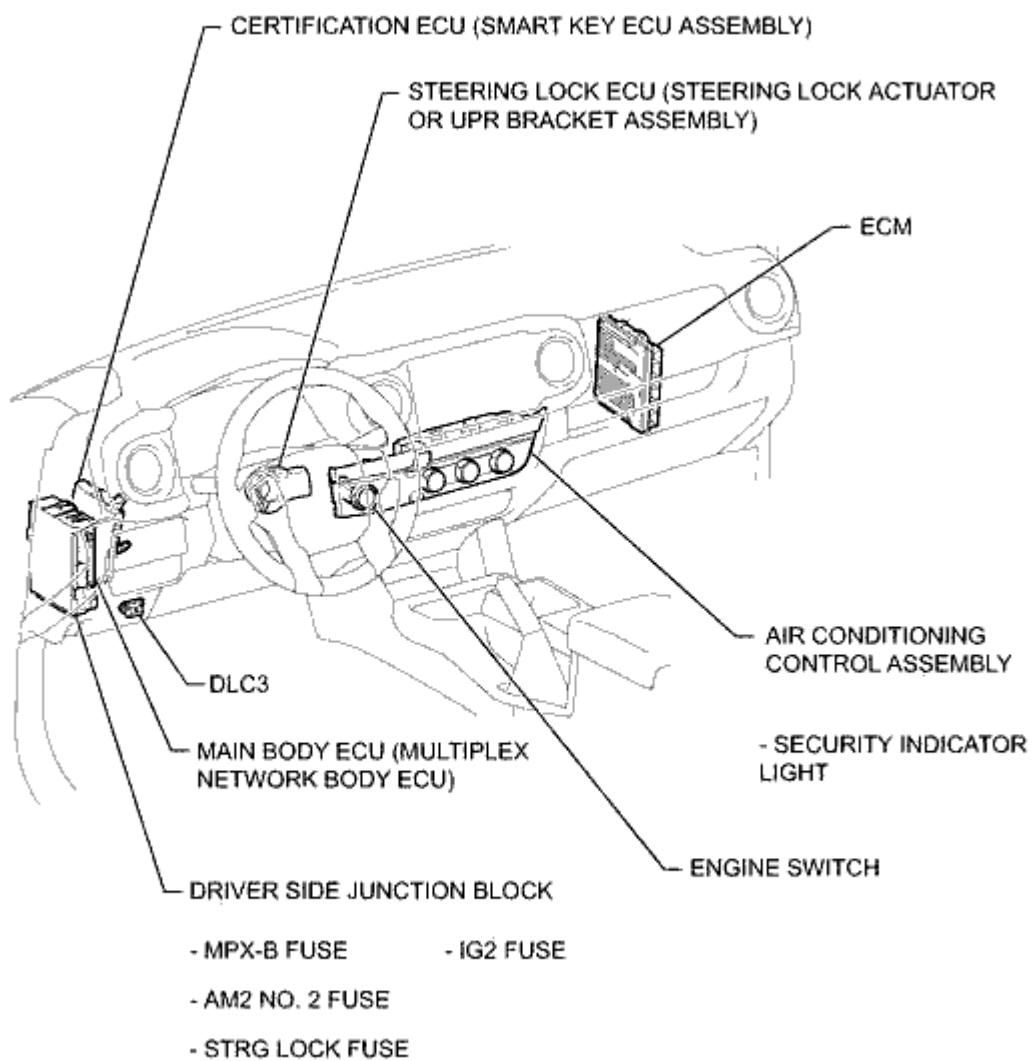
Last Modified: 11-13-2015	6.6 R	Doc ID: RM0000038ZT04CX
Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): PARTS LOCATION; 2016 MY Tacoma [08/2015 -]		

PARTS LOCATION

ILLUSTRATION



ILLUSTRATION



Last Modified: 11-13-2015	6.6 L	Doc ID: RM000000PVN0DXX
Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): PRECAUTION; 2016 MY Tacoma [08/2015 -]		

PRECAUTION

1. PRECAUTIONS WHEN USING TECHSTREAM

- 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 or less intervals until communication between the Techstream and vehicle begins.
- After all DTCs are cleared, check if the trouble occurs again 6 seconds after turning the engine switch on (IG).

2. PRECAUTION FOR REGISTRATION

- If replacing any of the following parts, refer to the registration procedures [INFO](#).

NOTICE:

Any keys or ECUs for which registration has been performed cannot be reused.

- Certification ECU (smart key ECU assembly)
 - Steering lock ECU (steering lock actuator or upr bracket assembly)
 - Electrical key transmitter sub-assembly
- After replacing the steering lock ECU (steering lock actuator or upr bracket assembly), confirm the lock/unlock operation of the steering lock.

Operation

STEERING LOCK	OPERATION CONDITION
Locks	With the engine switch off, open and close any door.
Unlocks	Turn the engine switch from off to on (ACC) or on (IG).

3. PRECAUTIONS FOR BATTERY

- Immediately after disconnecting and reconnecting the battery cable, the entry unlock function may not operate. If this occurs, the entry unlock function can be restored by performing a wireless door lock and unlock operation.
- When the battery is discharged, if the battery of another vehicle is used to jump start the engine, move the shift lever to P and open and close the driver door with the engine switch off before starting the engine.
- After the battery is removed and reinstalled, be sure to wait 10 seconds or more before the next engine start. The engine may not start immediately after the battery is reinstalled.

HINT:

- After disconnecting and reconnecting the battery cable, the engine may not start on the first attempt. If this occurs, turn the engine switch off. The engine will start normally from the second time onward.
- When the battery cable is disconnected and reconnected, the power source mode returns to the mode it was in before the battery cable was disconnected.



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Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): PROBLEM SYMPTOMS TABLE; 2016 MY Tacoma [08/2015 -]		

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.
- If the problem only occurs in certain locations or at certain times of day, check for wave interference.
- If the vehicle components are added, check for wave interference from the added components.

Engine Immobiliser System (w/ Smart Key System)

SYMPTOM	SUSPECTED AREA	SEE PAGE
Security indicator light does not blink	Proceed to "Security Indicator Light Does not Blink"	INFO
Engine immobiliser system does not operate properly	Proceed to "Immobiliser System does not Operate Properly"	INFO
Engine cannot be started*1	Certification ECU (smart key ECU assembly)	INFO
	ECM	INFO
	SFI system	INFO
Power source mode cannot be changed*1	Engine switch	INFO
	Certification ECU (smart key ECU assembly)	INFO
Steering lock lock/unlock not possible*2	Steering lock ECU (steering lock actuator or upr bracket assembly)	INFO

*1: Refer to Problem Symptoms Table for Smart Key System (for Start Function).

*2: Refer to Problem Symptoms Table for Steering Lock System.



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Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): REGISTRATION; 2016 MY Tacoma [08/2015 -]		

REGISTRATION

1. DESCRIPTION OF CODE REGISTRATION

HINT:

- Registering an ID code enables the entry and start function, wireless door lock control function and engine immobiliser function to be operated.
- Code registration is needed when the certification ECU (smart key ECU assembly), steering lock ECU (steering lock actuator or upr bracket assembly) or electrical key transmitter sub-assembly is replaced with a new one.
- This vehicle does not have a key slot. Therefore, while facing the logo side of the electrical key transmitter sub-assembly towards the engine switch, hold the transmitter near the engine switch as shown in the

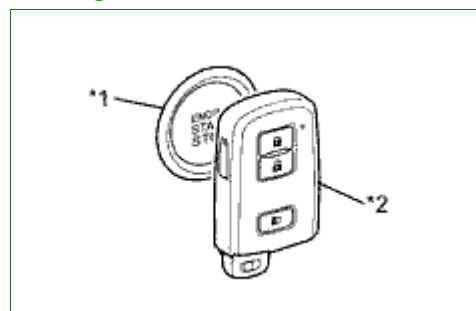


illustration to register the electrical key transmitter sub-assembly.

Text in Illustration

*1	Engine Switch
*2	Electrical Key Transmitter Sub-assembly

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

HINT:

- The following procedures require the use of the Techstream:
 - New key ID registration
 - Additional key ID registration
 - Key ID erasure
- A maximum of 7 keys can be registered (this includes any keys registered when the vehicle was purchased).
- In the chart below, the numbers in the "Procedure" column (1, 2, 3, etc.) indicate the step numbers. Perform the steps in numerical order.

CUSTOMER REQUEST/CONDITION	REGISTRATION PROCEDURE CONDITION	PROCEDURE	REFER TO
Registering additional key	Customer must bring at least 1 key	1. Register additional keys as necessary (additional key ID registration)	PROCEDURE "C"

CUSTOMER REQUEST/CONDITION	REGISTRATION PROCEDURE CONDITION	PROCEDURE	REFER TO
- Replacing a key (e.g., when replacing an old key with a new one) - Making a lost key unusable NOTICE: If the customer brings at least 1 key, it is possible to perform these procedures. However, if any additional keys are registered before reregistering the customer's keys, the customer's keys cannot be reregistered and become unusable. Therefore, if the customer does not bring all of their keys, be sure to explain to them that any keys not brought will become unusable after additional keys are registered. HINT: After key ID erasure, any remaining keys that are not reregistered at this time cannot be used. Therefore, immediately after key ID erasure, be sure to reregister all available remaining keys.	Customer must bring at least 1 key	1. Using remaining key, clear all registered keys except one (key ID erasure)	PROCEDURE "D"
		2. Register additional keys as necessary (additional key ID registration)	PROCEDURE "C"
All keys are lost	-	1. Reset all keys (all keys ID erasure (key code reset))	PROCEDURE "E"
		2. Register all keys (new key ID registration)	PROCEDURE "A"

3. PART REPLACEMENT AND KEY REGISTRATION PROCEDURES

(a) If a malfunctioning ECU is discovered through troubleshooting of the smart key system, use the ECU replacement and key registration procedures in the table below.

HINT:

- The following procedures require the use of the Techstream:
 - New key ID registration
 - Additional key ID registration
 - Key ID erasure
 - ECU code registration
- A maximum of 7 keys can be registered (this includes any keys registered when the vehicle was purchased).
- In the chart below, the numbers in the "Procedure" column (1, 2, 3, etc.) indicate the step numbers. Perform the steps in numerical order.

MALFUNCTIONING ECU	CONDITION	PROCEDURE	REFER TO
Certification ECU (smart key ECU assembly)	Customer has brought all keys	1. Replace certification ECU (smart key ECU assembly)	-
		2. Reregister all customer's keys	PROCEDURE "B"*1

MALFUNCTIONING ECU	CONDITION		PROCEDURE	REFER TO
	Some keys are lost	Key ID codes can be registered and cleared	3. ECU communication ID registration	PROCEDURE "G"*1
			1. Clear key codes (key ID erasure)	PROCEDURE "D"
			2. Perform additional key registration procedure (additional key ID registration) HINT: If some keys are not registered during above step, they will be disabled because they cannot be registered later.	PROCEDURE "C"*1
			3. Replace certification ECU (smart key ECU assembly)	-
			4. Reregister all keys	PROCEDURE "B"
			5. ECU communication ID registration	PROCEDURE "G"
		Key ID codes cannot be either registered or cleared	1. Replace certification ECU (smart key ECU assembly)	-
			2. Replace steering lock ECU (steering lock actuator or upr bracket assembly)	-
			3. Reregister all keys (new key ID registration) HINT: If some keys are not registered during above step, they will be disabled because they cannot be registered later.	PROCEDURE "A"
			4. ECU communication ID registration	PROCEDURE "G"
Certification ECU (smart key ECU assembly)	All keys are lost		1. Replace certification ECU (smart key ECU assembly)	-
			2. Replace steering lock ECU (steering lock actuator or upr bracket assembly)	-
			3. Register all keys (new key ID registration)	PROCEDURE "A"
			4. ECU communication ID registration	PROCEDURE "G"

MALFUNCTIONING ECU	CONDITION	PROCEDURE	REFER TO
Steering lock ECU (steering lock actuator or upr bracket assembly)	Customer has brought at least 1 key	1. Replace steering lock ECU (steering lock actuator or upr bracket assembly)	-
		2. Register recognition codes in ECUs (ECU code registration)	PROCEDURE "F"
	All keys are lost	1. Replace certification ECU (smart key ECU assembly)	-
		2. Replace steering lock ECU (steering lock actuator or upr bracket assembly)	-
		3. Register all keys (new key ID registration)	PROCEDURE "A"
		4. ECU communication ID registration	PROCEDURE "G"

*1 : It is only necessary to perform processes 1 through 3.

4. KEY REGISTRATION (PROCEDURE "A")

(a) New key ID registration:

HINT:

In the chart below, the numbers in the "Procedure" column (1, 2, 3, etc.) indicate the step numbers. Perform the steps in numerical order.

PROCESS	PROCEDURE
1. Start of registration	1. Prepare all new keys to be registered and place them outside vehicle. Bring 1 new key inside vehicle. 2. Connect Techstream to DLC3 3. While holding new key, turn engine switch on (IG) HINT: Engine switch cannot be turned on (IG) more than 10 times. To continue key registration procedure with engine switch off, use either method below: ○ Connect Techstream to DLC3 and turn courtesy light switch on and off at interval of 1.5 seconds until communication between Techstream and vehicle begins (Techstream screen changes when communication begins). ○ Connect Techstream to DLC3 and select "Manual" from initial screen on Techstream. Then select "Key Code Registration" under model code. 4. Turn Techstream on 5. Enter following menus: Smart Key / Utility / Smart Code Registration
2. Confirmation of ECU code	Perform operation according to prompts on Techstream screen HINT: Mode is automatically selected by Techstream (new registration mode or add mode)

PROCESS	PROCEDURE
3. Verification of unregistered key*	1. While facing logo side of unregistered transmitter toward engine switch, hold transmitter near engine switch. 2. Confirm that wireless door lock buzzer sounds twice (short beep) 3. Bring key for which operations have been completed outside vehicle. Then bring another new key for which operations are to be performed into vehicle.
4. Registration of ID code	Perform operation according to prompts on Techstream screen
5. End of registration	Finish new key ID code registration

- *: Repeat this process for each key which is to be registered to 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 from process 1 again.
- If "Smart Key System" is canceled, registration cannot be performed  .

5. KEY REGISTRATION (PROCEDURE "B")

(a) New key ID registration:

HINT:

In the chart below, the numbers in the "Procedure" column (1, 2, 3, etc.) indicate the step numbers. Perform the steps in numerical order.

PROCESS	PROCEDURE
1. Start of registration	1. Prepare all registered keys and any keys to be registered and place them outside vehicle. Bring 1 registered key inside vehicle. 2. Connect Techstream to DLC3 3. While holding registered key, turn engine switch on (IG) HINT: Engine switch cannot be turned on (IG) more than 10 times. To continue key registration procedure with engine switch off, use either method below: ○ Connect Techstream to DLC3 and turn courtesy light switch on and off at interval of 1.5 seconds until communication between Techstream and vehicle begins (Techstream screen changes when communication begins). ○ Connect Techstream to DLC3 and select "Manual" from initial screen on Techstream. Then select "Key Code Registration" under model code. 4. Turn Techstream on 5. Enter following menus: Smart Key / Utility / Smart Code Registration
2. Confirmation of ECU code	Perform operation according to prompts on Techstream screen HINT: Mode is automatically selected by Techstream (new registration mode or add mode)
3. Confirmation of all registered keys*1	1. While facing logo side of registered transmitter toward engine switch, hold transmitter near engine switch.

PROCESS	PROCEDURE
	2. Confirm that wireless door lock buzzer sounds once (short beep) 3. Bring key for which operations have been completed outside vehicle. Then bring another key for which operations are to be performed into vehicle.
4. Confirmation of ECU code	Perform operation according to prompts on Techstream screen
5. Verification of unregistered key*2	1. While facing logo side of unregistered transmitter toward engine switch, hold transmitter near engine switch. 2. Confirm that wireless door lock buzzer sounds twice (short beep) 3. Bring key for which operations have been completed outside vehicle. Then bring another key for which operations are to be performed into vehicle.
6. Registration of ID code	Perform operation according to prompts on Techstream screen
7. End of registration	Finish new key ID code registration

- *1: Repeat this process for each key registered to 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 from process 1 again. When performing the key confirmation procedure for a key, 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 to 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 from process 1 again.
- If "Smart Key System" is canceled, registration cannot be performed  .

6. KEY REGISTRATION (PROCEDURE "C")

(a) Additional key ID registration:

HINT:

In the chart below, the numbers in the "Procedure" column (1, 2, 3, etc.) indicate the step numbers. Perform the steps in numerical order.

PROCESS	PROCEDURE
1. Start of registration	1. Prepare all keys to be registered and place them outside vehicle. Then bring 1 registered key into vehicle. 2. Connect Techstream to DLC3 3. While holding registered key, turn engine switch on (IG) 4. Turn Techstream on 5. Enter following menus: Smart Key / Utility / Smart Code Registration
2. Confirmation of registered key*1	1. Perform operation according to prompts on Techstream screen 2. While facing logo side of registered transmitter toward engine switch, hold transmitter near engine switch. 3. Confirm that wireless door lock buzzer sounds once (short beep)
3. Confirmation of ECU code	Perform operation according to prompts on Techstream screen

PROCESS	PROCEDURE
4. Verification of unregistered key*2	1. While facing logo side of unregistered transmitter toward engine switch, hold transmitter near engine switch. 2. Confirm that wireless door lock buzzer sounds twice (short beep)
5. Registration of ID code	Perform operation according to prompts on Techstream screen
6. End of registration	Finish key ID code registration

- *1: Perform this process for one of the keys registered to the vehicle. Finish the procedure within 30 seconds. If the procedure is not finished within the specified time, perform the registration from process 1 again.
- *2: Repeat this process for each key which is to be registered to 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 from process 1 again.
- If "Smart Key System" is canceled, registration cannot be performed  .

7. KEY REGISTRATION (PROCEDURE "D")

(a) Key ID erasure:

HINT:

- This procedure clears all the registered key codes except one master key code.
- In the chart below, the numbers in the "Procedure" column (1, 2, 3, etc.) indicate the step numbers. Perform the steps in numerical order.

PROCESS	PROCEDURE
1. Start of erasure	1. Connect Techstream to DLC3 2. While holding registered key, turn engine switch on (IG) 3. Turn Techstream on 4. Enter following menus: Smart Key / Utility / Smart Code Erasure
2. Confirmation of registered key*	1. Perform operation according to prompts on Techstream screen 2. While facing logo side of registered transmitter toward engine switch, hold transmitter near engine switch. 3. Confirm that wireless door lock buzzer sounds once (short beep)
3. Confirmation of ECU code	Perform operation according to prompts on Techstream screen
4. Erasure of ID code	Perform operation according to prompts on Techstream screen
5. End of erasure	Finish key ID code erasure

- *: Perform this process for one of the keys registered to the vehicle. Finish the procedure within 30 seconds. If the procedure is not finished within the specified time, perform the erasure from process 1 again.
- If "Smart Key System" is canceled, registration cannot be performed  .

8. KEY REGISTRATION (PROCEDURE "E")

(a) All keys ID erasure:

HINT:

In the chart below, the numbers in the "Procedure" column (1, 2, 3, etc.) indicate the step numbers. Perform the steps in numerical order.

PROCESS	PROCEDURE
1. Start of erasure	1. Connect Techstream to DLC3 2. While holding registered key, turn engine switch on (IG) 3. Turn Techstream on 4. Enter following menus: Smart Key / Utility / Smart Code Reset 5. Read "Seed Number" sent from TIS according to Techstream screen 6. Input "Pass-Code Number" sent from TIS according to Techstream screen
2. Confirmation of ECU code	Perform operation according to prompts on Techstream screen
3. Erasure of ID code	1. Perform operation according to prompts on Techstream screen 2. Wait for 15 minutes
4. End of erasure	Finish key ID code erasure

If "Smart Key System" is canceled, registration cannot be performed .

9. KEY REGISTRATION (PROCEDURE "F")

(a) ECU code registration:

HINT:

In the chart below, the numbers in the "Procedure" column (1, 2, 3, etc.) indicate the step numbers. Perform the steps in numerical order.

PROCESS	PROCEDURE
1. Start of registration	1. Connect Techstream to DLC3 2. While holding registered key, turn engine switch on (IG) HINT: Engine switch cannot be turned on (IG) more than 10 times. To continue key registration procedure with engine switch off, use either method below: ○ Connect Techstream to DLC3 and turn courtesy light switch on and off at interval of 1.5 seconds or less until communication between Techstream and vehicle begins (Techstream screen changes when communication begins). ○ Connect Techstream to DLC3 and select "Manual" from initial screen on Techstream. Then select "Key Code Registration" under model code. 3. Turn Techstream on 4. Enter following menus: Smart Key / Utility / ECU Communication ID Registration / ID code box and Steering Lock

PROCESS	PROCEDURE
2. Confirmation of registered key*	1. While facing logo side of registered transmitter toward engine switch, hold transmitter near engine switch. 2. Confirm that wireless door lock buzzer sounds once (short beep)
3. Erasure of ECU code	Perform operation according to prompts on Techstream screen
4. End of registration	Finish ECU code registration

- *: Perform this process for one of the keys registered to the vehicle. Finish the procedure within 30 seconds. If the procedure is not finished within the specified time, perform the registration from process 1 again.
- If "Smart Key System" is canceled, registration cannot be performed INFO.
- If there are any electronic devices near the driver seat which may cause wave interference, such as cell phones, personal computers, portable music players, other electrical key transmitter sub-assemblies, etc., turn them off or move them away from the driver seat.

10. KEY REGISTRATION (PROCEDURE "G")

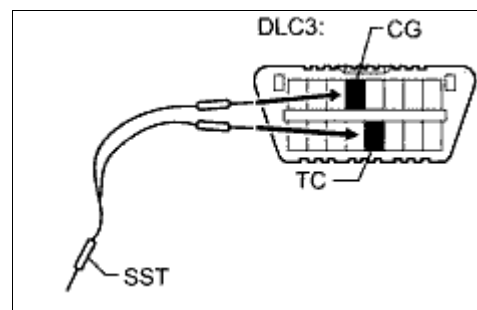
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(a) ECU communication ID registration:

NOTICE:

- The ECU communication ID should be registered when the certification ECU (smart key ECU assembly) is replaced in order for the ECU communication ID to match.
- The engine cannot be started unless the ECU communication ID is registered.
- After registration, pressing the engine switch may not start the engine on the first try. If so, press the engine switch again.
- After the engine is started, clear DTC B2799 (code for ECM immobiliser communication error) using either of the following methods:
 - Use the Techstream.
 - Disconnect the cable from the negative (-) battery terminal for 30 seconds.

(1) Using SST, connect terminals 13 (TC) and 4 (CG) of the DLC3.



- (2) Turn the engine switch on (IG) (do not start the engine) and leave it as is for 30 minutes.
- (3) Turn the engine switch off and disconnect terminals 13 (TC) and 4 (CG).
- (4) Check that the engine starts and stays on for more than 3 seconds.



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Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): SYSTEM DESCRIPTION; 2016 MY Tacoma [08/2015 -]		

SYSTEM DESCRIPTION

1. ENGINE IMMOBILISER SYSTEM DESCRIPTION

- (a) The engine immobiliser system determines whether or not to enable starting of the SFI system based on a comparison of the key ID code and the vehicle pre-registered code. The engine immobiliser system compares the vehicle certification ECU (smart key ECU assembly) pre-registered ID code with the key-embedded transponder chip ID code. If the ID codes do not match, the engine immobiliser system activates and the SFI system cannot be started. The certification ECU (smart key ECU assembly) manages communication with the SFI system and steering lock ECU (steering lock actuator or upr bracket assembly). 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 starting of the SFI system.

2. SYSTEM FUNCTION

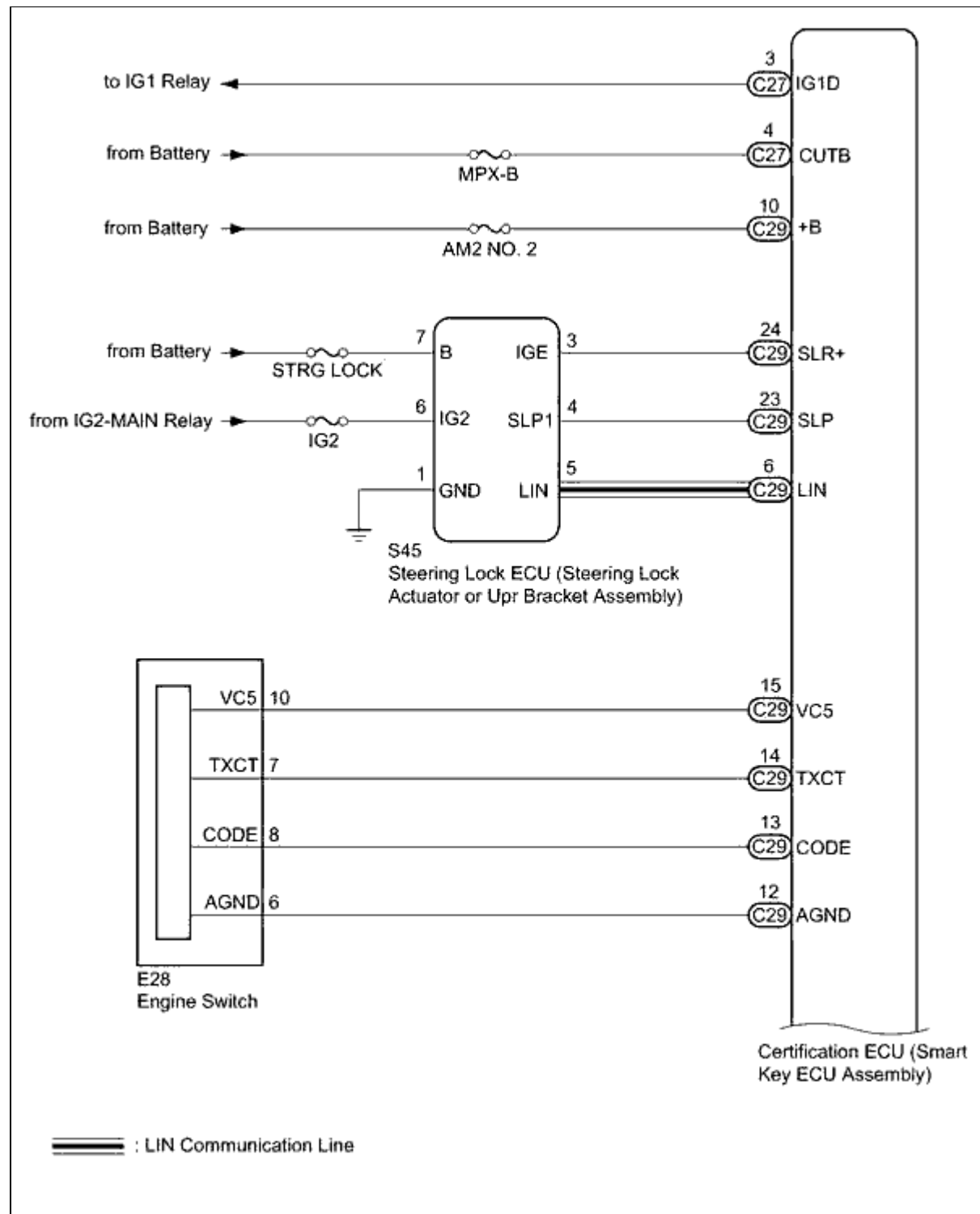
- (a) Push-button start function

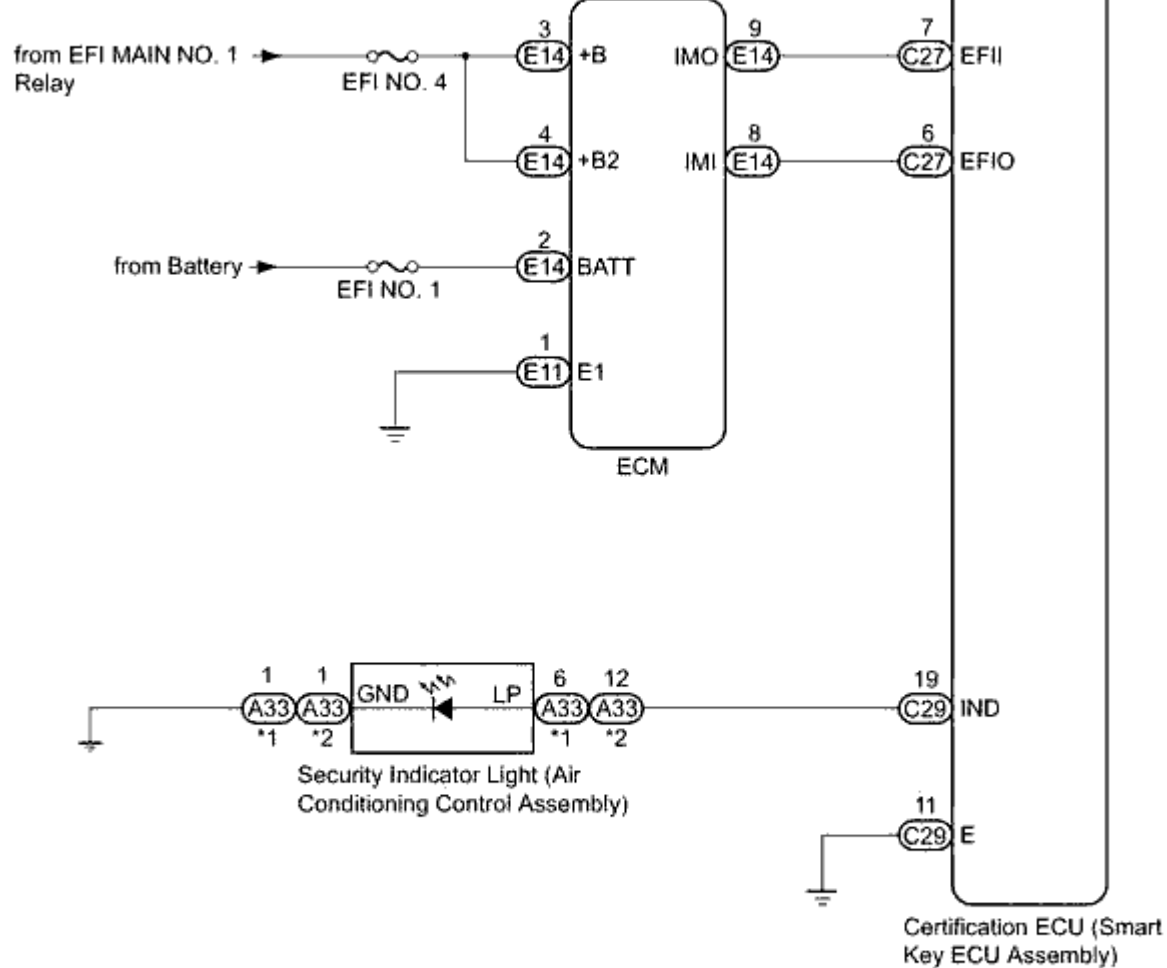
- (1) When the driver (or an occupant) gets in the vehicle and depresses the brake pedal while carrying the key, the certification ECU (smart key ECU assembly) generates a request signal and sends it to the indoor electrical key oscillator. When the request signal is received, the indoor electrical key oscillator sends another request signal in order to detect whether the key is inside the vehicle. When the key receives this request signal, it sends back an ID code which includes a response code. The ID code sent from the key is sent to the certification ECU (smart key ECU assembly) via the door control receiver. When the ID code is received, the certification ECU (smart key ECU assembly) analyzes the code. If the certification result is normal, the smart warning light is displayed on the multi-information display. When the smart warning light illuminates is displayed, and the driver presses the engine switch, the certification ECU (smart key ECU assembly) recognizes the engine start signal, turns the ACC relay on and turns the IG1 and IG2 relays on in that order after 0.025 seconds. At this time, the certification ECU (smart key ECU assembly) confirms that the power source mode has changed and supplies the steering lock actuator with power. Then the steering lock ECU (steering lock actuator or upr bracket assembly) confirms that the certification ECU (smart key ECU assembly) is the proper ECU and operates the steering lock actuator motor until the steering lock is unlocked. After the steering lock is unlocked, the steering lock ECU (steering lock actuator or upr bracket assembly) sends an unlock completion signal to the certification ECU (smart key ECU assembly). When this signal is received, the certification ECU (smart key ECU assembly) sends an immobiliser unset command signal to the SFI system after confirming that the certification ECU (smart key ECU assembly) is the proper ECU. Then the certification ECU (smart key ECU assembly) sends a security indicator light off signal to the air conditioning control assembly.



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Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): SYSTEM DIAGRAM; 2016 MY Tacoma [08/2015 -]		

SYSTEM DIAGRAM





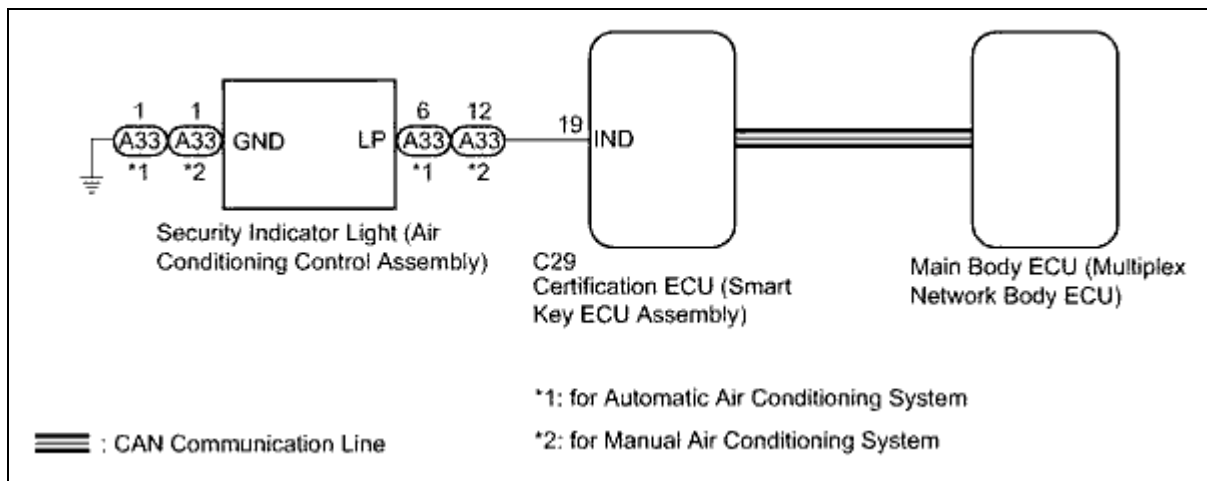
Last Modified: 11-13-2015	6.6 J	Doc ID: RM000000W120DKX
Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): Security Indicator Light Does not Blink; 2016 MY Tacoma [08/2015 -]		

Security Indicator Light Does not Blink

DESCRIPTION

- The certification ECU (smart key ECU assembly) blinks the security indicator light when the immobiliser is set (engine switch off, or driver door is opened and closed with engine switch on (IG)).
- The certification ECU (smart key ECU assembly) receive the security indicator light signal from the main body ECU (multiplex network body ECU) via CAN communication when the theft deterrent system is arming preparation state or alarm sounding state. Then, certification ECU (smart key ECU assembly) blinks the security indicator light.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- Before replacing the certification ECU (smart key ECU assembly), refer to the Registration [INFO](#) .
- The engine immobiliser system (w/ Smart Key System) uses the CAN communication system. Inspect the communication function by following How to Proceed with Troubleshooting [INFO](#) . Troubleshoot the engine immobiliser system (w/ Smart Key System) after confirming that the communication systems are functioning properly.

PROCEDURE

1.	PERFORM ACTIVE TEST USING TECHSTREAM (SECURITY INDICATOR LIGHT)
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- Connect the Techstream to the DLC3.
- 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
Immobiliser Indicator	Security indicator light	OFF/ON	-

OK:

The security indicator light operates normally.

NG  **GO TO STEP 3**

OK



2.	CHECK SECURITY INDICATOR LIGHT OPERATION
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(a) When the immobiliser is set, check that the security indicator light blinks.*1

OK:

The security indicator light blinks normally.

(b) When the theft deterrent system is in the arming preparation state, check that the security indicator light on .*2

OK:

The security indicator light is on normally.

Result

RESULT	PROCEED TO
*1 is NG (*2 is OK)	A
*2 is NG (*1 is OK)	B

B  **REPLACE MAIN BODY ECU (MULTIPLEX NETWORK BODY ECU)**

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

3.	CHECK HARNESS AND CONNECTOR (SECURITY INDICATOR LIGHT (AIR CONDITIONING CONTROL ASSEMBLY) - CERTIFICATION ECU (SMART KEY ECU ASSEMBLY))
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- (a) Disconnect the A33 security indicator light (air conditioning control assembly) connector.
- (b) Disconnect the C29 certification ECU (smart key ECU assembly) connector.
- (c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A33-6 (LP) - C29-19 (IND)*1	Always	Below 1 Ω
A33-6 (LP) or C29-19 (IND) - Body ground*1	Always	10 k Ω or higher
A33-1 (GND) - Body ground*1	Always	Below 1 Ω
A33-12 (LP) - C29-19 (IND)*2	Always	Below 1 Ω
A33-12 (LP) or C29-19 (IND) - Body ground*2	Always	10 k Ω or higher

*1: for Automatic Air Conditioning System

*2: for Manual Air Conditioning System

NG  **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK



4.	CHECK CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)
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- (a) Reconnect the C29 certification ECU (smart key ECU assembly) connector.
- (b) Measure the voltage and check the pulse according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A33-6 (LP) - A33-1 (GND)*1	Engine switch off → engine switch on (IG)	Pulse generation → Below 2 V
A33-12 (LP) - A33-1 (GND)*2	Engine switch off → engine switch on (IG)	Pulse generation → Below 2 V

*1: for Automatic Air Conditioning System

*2: for Manual Air Conditioning System

Result

RESULT	PROCEED TO
OK (for Automatic Air Conditioning System)	A
OK (for Manual Air Conditioning System)	B
NG	C

B ► REPLACE SECURITY INDICATOR LIGHT (AIR
CONDITIONING CONTROL ASSEMBLY)

C ► REPLACE CERTIFICATION ECU (SMART KEY ECU
ASSEMBLY)

A ► REPLACE SECURITY INDICATOR LIGHT (AIR
CONDITIONING CONTROL ASSEMBLY)



Last Modified: 11-13-2015	6.6 U	Doc ID: RM000000QY70DHX
Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/ Smart Key System): TERMINALS OF ECU; 2016 MY Tacoma [08/2015 -]		

TERMINALS OF ECU

1. CHECK ENGINE SWITCH



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

TERMINAL NO. (SYMBOL)	INPUT/OUTPUT	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION	RELATED DATA LIST ITEM/DTC
E28-6 (AGND) - Body ground	-	Y - Body ground	Transponder key amplifier ground	Always	Below 1 Ω	-
E28-7 (TXCT) - E28-6 (AGND)	Input	R - Y	Immobiliser communication input	Engine switch off, brake pedal not depressed, 30 seconds or more elapsed after driver door opened and then closed	Below 1 V	-
E28-8 (CODE) - E28-6 (AGND)	Output	SB - Y	Immobiliser communication output	Engine switch off, brake pedal not depressed, 30 seconds or more elapsed after driver door opened and then closed	Below 1 V	-
E28-10 (VC5) - E28-6 (AGND)	Input	W - Y	Transponder key amplifier power supply	Engine switch off, brake pedal not depressed, 30 seconds or more elapsed after driver door opened and then closed	Below 1 V	-

(b) Check for pulses according to the value(s) in the table below.

TERMINAL	INPUT/OUTPUT	WIRING	TERMINAL	CONDITION	SPECIFIED	RELATED DATA LIST ITEM/DTC
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NO. (SYMBOL)		COLOR	DESCRIPTION		CONDITION	
E28-7 (TXCT) - E28-6 (AGND)	Input	R - Y	Signal input from certification ECU (smart key ECU assembly) (Code sent from certification ECU (smart key ECU assembly) to transponder key amplifier built into engine switch, and then transmitted by transponder key amplifier antenna as radio waves)	Engine switch off, key not in cabin, within 30 seconds after engine switch pressed	Pulse generation (See waveform 1)	• BCC Malfunction • Abnormal Status • Different Encrypt Code • Different Serial Number • Frame Error • Response HINT: If immobiliser key code certification communication is not performed correctly, the malfunction may be indicated by one or more of the Data List items listed above
E28-8 (CODE) - E28-6 (AGND)	Output	SB - Y	Signal output to certification ECU (smart key ECU assembly) (Radio waves from transponder key amplifier built into engine switch used to detect key information. Key information then sent to certification ECU (smart key ECU assembly))	Engine switch off, engine switch pressed with key held near engine switch*	Pulse generation (See waveform 2)	
E28-10 (VC5) - E28-6 (AGND)	Input	W - Y	Transponder key amplifier power supply (Power supplied from	Engine switch off, key not in cabin, within 30	Pulse generation (See waveform 3)	

			certification ECU (smart key ECU assembly) when transponder key amplifier built into engine switch activated)	seconds after engine switch pressed	
--	--	--	---	-------------------------------------	--

If the result is not as specified, the engine switch may be malfunctioning.

HINT:

*: Remove the key battery before performing this inspection.

(c) Inspect using an oscilloscope.

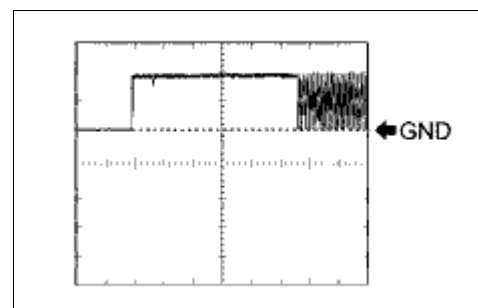
NOTICE:

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

(1) Waveform 1 (Reference)

Measurement Condition

ITEM	CONTENT
Tester Connection	E28-7 (TXCT) - E28-6 (AGND)
Tool Setting	2 V/DIV., 20 ms./DIV.
Condition	Engine switch off, key not in cabin, within 30 seconds after engine switch pressed



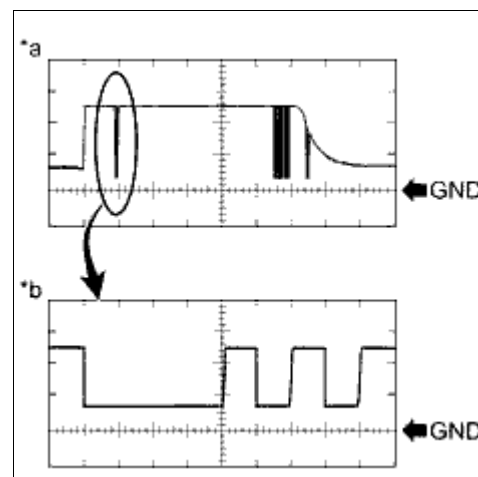
(2) Waveform 2 (Reference)

Text in Illustration

*a	Waveform
*b	Waveform (detail)

Measurement Condition

ITEM	CONTENT
Tester Connection	E28-8 (CODE) - E28-6 (AGND)
Tool Setting	- Waveform 1 V/DIV., 20 ms./DIV. - Waveform (detail) 2 V/DIV., 100 μs./DIV.



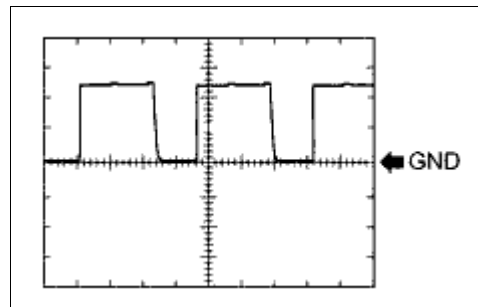
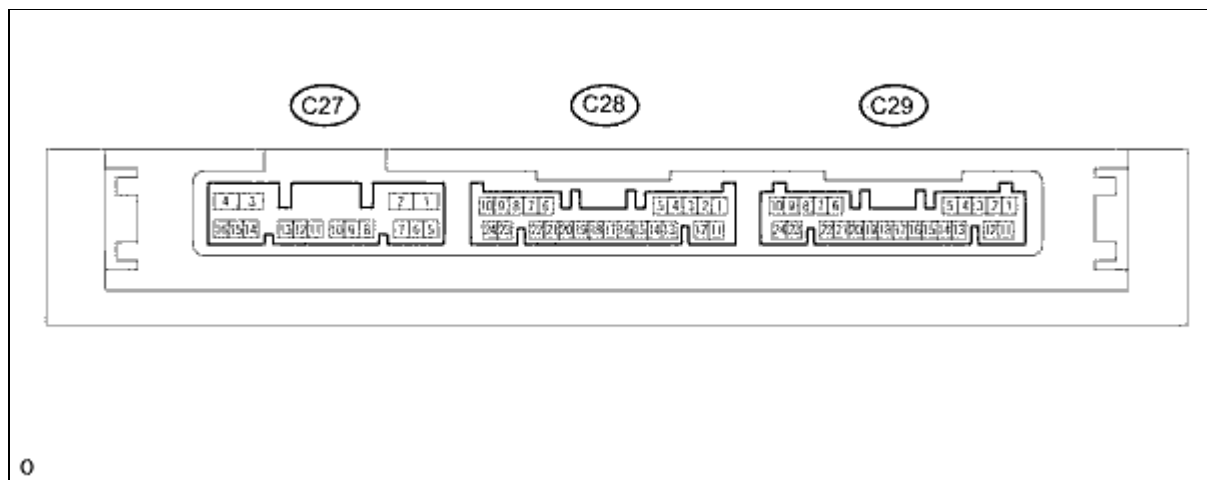
HINT:

*: Remove the key battery before performing this inspection.

(3) Waveform 3 (Reference)

Measurement Condition

ITEM	CONTENT
Tester Connection	E28-10 (VC5) - E28-6 (AGND)
Tool Setting	2 V/DIV., 200 ms./DIV.
Condition	Engine switch off, key not in cabin, within 30 seconds after engine switch pressed

**2. CHECK CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)**

(a) Disconnect the C27 and C29 certification ECU (smart key ECU assembly) connectors.

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

TERMINAL NO. (SYMBOL)	INPUT/OUTPUT	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION	RELATED DATA LIST ITEM/DTC
C29-10 (+B) - C29-11 (E)	Input	P - W-B	+B power supply	Always	11 to 14 V	-
C27-4 (CUTB) - C29-11 (E)	Input	GR - W-B	Dark current cut pin	Always	11 to 14 V	-
C29-11 (E) - Body ground	-	W-B - Body ground	Ground	Always	Below 1 Ω	-

(c) Reconnect the C27 and C29 certification ECU (smart key ECU assembly) connectors.

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

TERMINAL NO.	INPUT/OUTPUT	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION	RELATED DATA LIST ITEM/DTC
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(SYMBOL)						
C27-3 (IG1D) - C29-11 (E)	Input	B - W-B	Ignition power supply	Engine switch off → on (IG)	Below 1 V → 11 to 14 V	Ignition Switch
C29-19 (IND) - C29-11 (E)	Output	V - W-B	Security indicator output	Engine switch off → on (IG)	Pulse generation → Below 2 V	-
C29-14 (TXCT) - C29-12 (AGND)	Output	R - Y	Signal output to transponder key amplifier	Engine switch off, brake pedal not depressed, 30 seconds or more elapsed after driver door opened and then closed	Below 1 V	• BCC Malfunction • Abnormal Status • Different Encrypt Code • Different Serial Number • Frame Error • Response
C29-13 (CODE) - C29-12 (AGND)	Input	SB - Y	Signal input from transponder key amplifier	Engine switch off, brake pedal not depressed, 30 seconds or more elapsed after driver door opened and then closed	Below 1 V	
C29-15 (VC5) - C29-12 (AGND)	Output	W - Y	Transponder key amplifier power supply	Engine switch off, brake pedal not depressed, 30 seconds or more elapsed after driver door opened and then closed	Below 1 V	
C29-12 (AGND) - Body ground	-	Y - Body ground	Transponder key amplifier ground	Always	Below 1 Ω	
C27-7 (EFII) - C29-11 (E)	Input	Y - W-B	EFI communication input (Signal input from ECM to certification ECU (smart key ECU assembly))	Engine switch off	11 to 14 V	
C27-6 (EFIO) - C29-11 (E)	Output	SB - W-B	EFI communication output (Signal output	Engine switch off	11 to 14 V	• B2799 • B279A • Engine Start Request • EFI Code Receive

			from certification ECU (smart key ECU assembly) to ECM)			
--	--	--	---	--	--	--

(e) Check for pulses according to the value(s) in the table below.

TERMINAL NO. (SYMBOL)	INPUT/OUTPUT	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION	RELATED DATA LIST ITEM/DTC
C29-14 (TXCT) - C29-12 (AGND)	Output	R - Y	Signal output to transponder key amplifier (Code sent from certification ECU (smart key ECU assembly) to transponder key amplifier built into engine switch, and then transmitted by transponder key amplifier antenna as radio waves)	Engine switch off, key not in cabin, within 30 seconds after engine switch pressed	Pulse generation (See waveform 1)	• BCC Malfunction • Abnormal Status • Different Encrypt Code • Different Serial Number • Frame Error • Response
C29-13 (CODE) - C29-12 (AGND)	Input	SB - Y	Signal input from transponder key amplifier (Radio waves from transponder key amplifier built into engine switch used to detect key information. Key information then sent to certification ECU (smart key ECU assembly))	Engine switch off, engine switch pressed with key held near engine switch*	Pulse generation (See waveform 2)	
C29-15 (VC5) - C29-12 (AGND)	Output	W - Y	Transponder key amplifier power supply (Power supplied from certification ECU (smart key ECU assembly) when transponder key amplifier built into engine switch activated)	Engine switch off, key not in cabin, within 30 seconds after engine switch pressed	Pulse generation (See waveform 3)	

TERMINAL NO. (SYMBOL)	INPUT/OUTPUT	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION	RELATED DATA LIST ITEM/DTC
C27-7 (EFII) - C29-11 (E)	Input	Y - W-B	EFI communication input (Signal input from ECM to certification ECU (smart key ECU assembly))	Within 3 seconds of engine start or within 3 seconds of engine switch turned on (IG) after battery cable disconnected and reconnected	Pulse generation (See waveform 4)	• B2799 • B279A • Engine Start Request • EFI Code Receive
C27-6 (EFIO) - C29-11 (E)	Output	SB - W-B	EFI communication output (Signal output from certification ECU (smart key ECU assembly) to ECM)	Engine switch on (IG) using registered electrical key transmitter sub-assembly	Pulse generation (See waveform 5)	

If the result is not as specified, the certification ECU (smart key ECU assembly) may be malfunctioning.

HINT:

*: Remove the key battery before performing this inspection.

(f) Inspect using an oscilloscope.

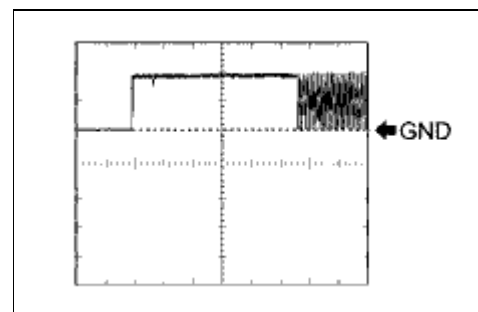
NOTICE:

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

(1) Waveform 1 (Reference)

Measurement Condition

ITEM	CONTENT
Tester Connection	C29-14 (TXCT) - C29-12 (AGND)
Tool Setting	2 V/DIV., 20 ms./DIV.
Condition	Engine switch off, key not in cabin, within 30 seconds after engine switch pressed



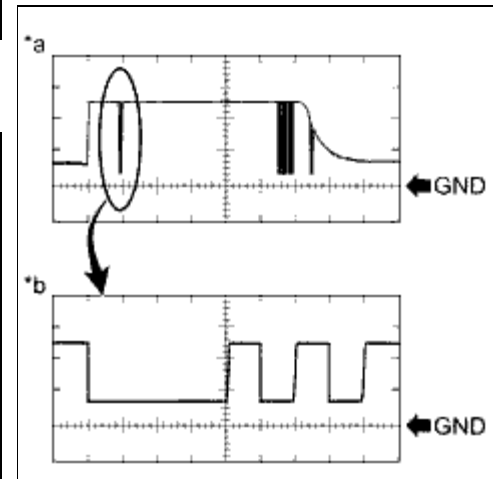
(2) Waveform 2 (Reference)

Text in Illustration

*a	Waveform
*b	Waveform (detail)

Measurement Condition

ITEM	CONTENT
Tester Connection	C29-13 (CODE) - C29-12 (AGND)
Tool Setting	• Waveform 1 V/DIV., 20 ms./DIV. • Waveform (detail) 2 V/DIV., 100 μs./DIV.
Condition	Engine switch off, engine switch pressed with key held near engine switch*



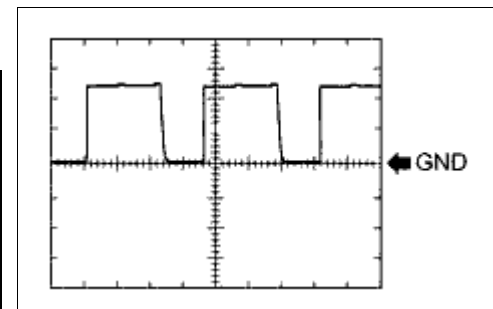
HINT:

*: Remove the key battery before performing this inspection.

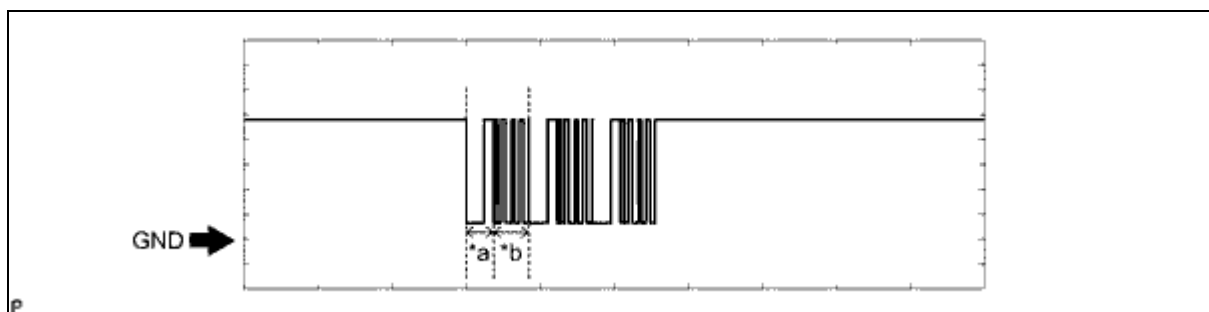
(3) Waveform 3 (Reference)

Measurement Condition

ITEM	CONTENT
Tester Connection	C29-15 (VC5) - C29-12 (AGND)
Tool Setting	2 V/DIV., 200 ms./DIV.
Condition	Engine switch off, key not in cabin, within 30 seconds after engine switch pressed



(4) Waveform 4 (Reference)



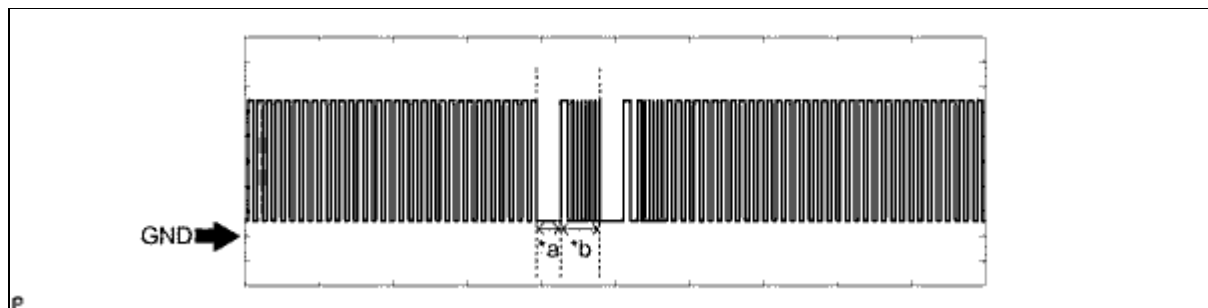
Text in Illustration

*a	Approximately 160 ms	*b	Approximately 270 ms
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Measurement Condition

ITEM	CONTENT
Tester Connection	C27-7 (EFII) - C29-11 (E)
Tool Setting	2 V/DIV., 500 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

(5) Waveform 5 (Reference)



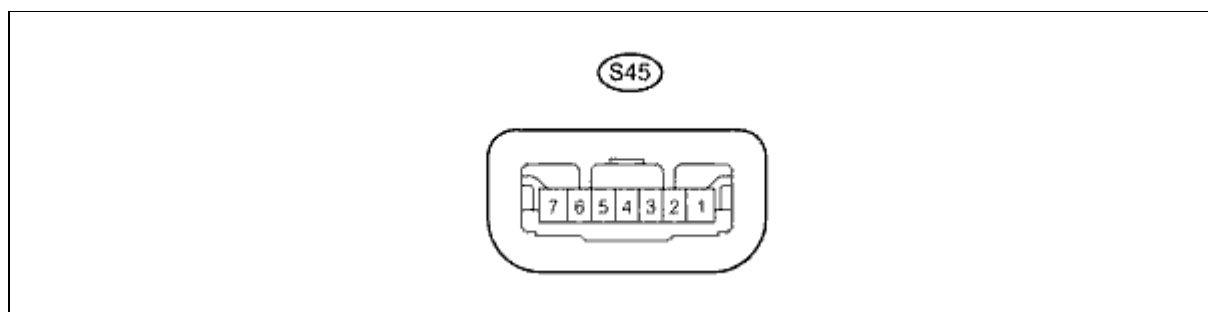
Text in Illustration

*a	Approximately 160 ms	*b	Approximately 270 ms
----	----------------------	----	----------------------

Measurement Condition

ITEM	CONTENT
Tester Connection	C27-6 (EFIO) - C29-11 (E)
Tool Setting	2 V/DIV., 500 ms./DIV.
Condition	Engine switch on (IG) using registered electrical key transmitter sub-assembly

3. CHECK STEERING LOCK ECU (STEERING LOCK ACTUATOR OR UPR BRACKET ASSEMBLY)



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

TERMINAL NO. (SYMBOL)	INPUT/OUTPUT	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION	RELATED DATA LIST ITEM/DTC
S45-1 (GND) -	-	W-B - Body	Ground	Always	Below 1 Ω	-

TERMINAL NO. (SYMBOL)	INPUT/OUTPUT	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION	RELATED DATA LIST ITEM/DTC
Body ground		ground				
S45-3 (IGE) - S45-1 (GND)	Input	Y - W-B	Steering lock motor operation permission signal (motor operation permission signal supplied by certification ECU (smart key ECU assembly))	Steering lock motor operates when all conditions met, and then door opened: • Shift lever in P • Steering unlocked • Engine switch turned off	Pulse generation (See waveform 1)	• Power Supply Short • Unlock Request Receive • Lock Request Receive
S45-4 (SLP1) - S45-1 (GND)	Output	BE - W-B	Steering lock bar position signal (signal output from steering unlock sensor)	Steering locked → unlocked*1	11 to 14 V → Below 1.5 V	• Push Start Error • Sensor Value
S45-6 (IG2) - S45-1 (GND)	Input	B - W-B	IG signal (IG2 power supply input for steering lock motor)	Engine switch off → on (IG)	Below 1 V → 11 to 14 V	• B2788 • Ignition Switch
S45-7 (B) - Body ground	Output	R - Body ground	Constant power supply	Always	11 to 14 V	B2788

If the result is not as specified, the steering lock ECU (steering lock actuator or upr bracket assembly) may be malfunctioning.

HINT:

*1: The steering locks when any door is opened with the shift lever in P and the engine switch off. The steering unlocks when the engine switch is turned on (ACC).

(b) Inspect using an oscilloscope.

NOTICE:

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

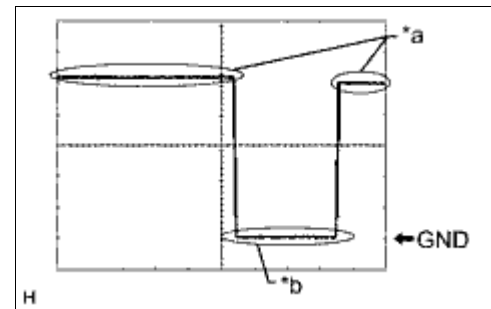
(1) Waveform 1 (Reference)

Text in Illustration

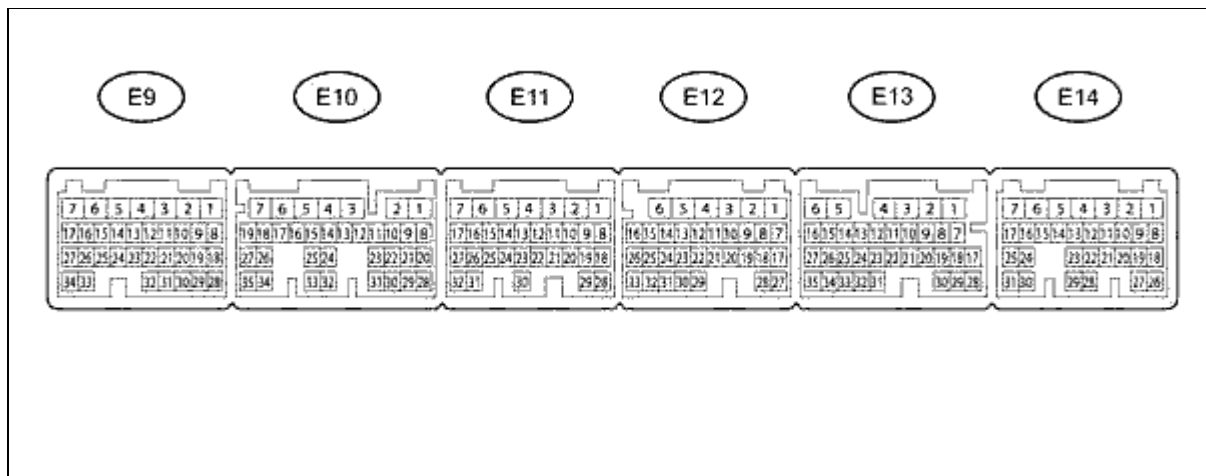
*a	Steering lock motor not operating
*b	Steering lock motor operating

Measurement Condition

ITEM	CONTENT
Tester Connection	S45-3 (IGE) - S45-1 (GND)
Tool Setting	2 V/DIV., 200 ms./DIV.
Condition	Steering lock motor operates when all conditions met, and then door opened: • Shift lever in P • Steering unlocked • Engine switch turned off



4. CHECK ECM



HINT:

The standard voltage between each pair of ECM terminals is shown in the table below. The appropriate conditions for checking each pair of terminals are also indicated. The result of checks should be compared with the standard voltage for that pair of terminals, displayed in the "Specified Condition" column. The illustration above can be used as a reference to identify the ECM terminal locations.

TERMINAL NO. (SYMBOL)	INPUT/OUTPUT	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION	RELATED DATA LIST ITEM/DTC
E11-1 (E1) - Body ground	-	W-B - Body ground	Ground	Always	Below 1 Ω	-

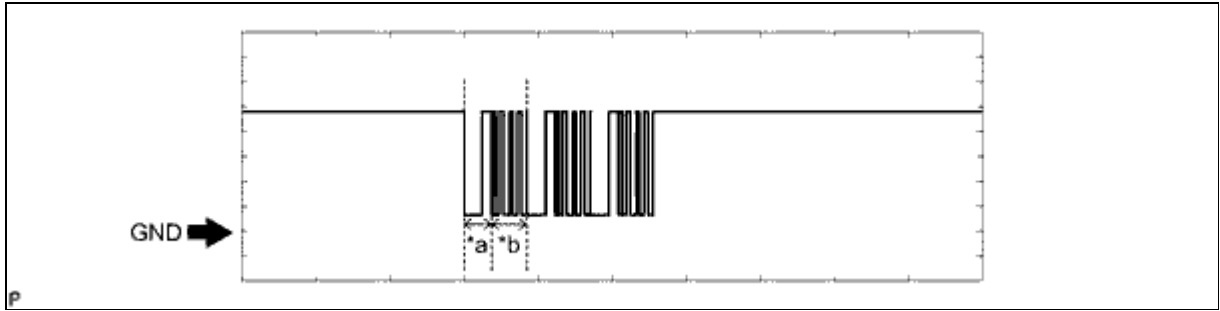
TERMINAL NO. (SYMBOL)	INPUT/OUTPUT	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION	RELATED DATA LIST ITEM/DTC
E14-2 (BATT) - E11-1 (E1)	Input	L - W-B	+B power supply	Always	11 to 14 V	-
E14-3 (+B) - E11-1 (E1)	Input	B - W-B	+B power supply	Engine switch on (IG)	11 to 14 V	-
E14-4 (+B2) - E11-1 (E1)	Input	B - W-B	+B power supply	Engine switch on (IG)	11 to 14 V	-
E14-9 (IMO) - E11-1 (E1)	Input	Y - W-B	Certification ECU (smart key ECU assembly) communication input	Engine switch off	11 to 14 V	-
E14-9 (IMO) - E11-1 (E1)	Input	Y - W-B	Certification ECU (smart key ECU assembly) communication input	Within 3 seconds of engine start or within 3 seconds of engine switch turned on (IG) after battery cable disconnected and reconnected	Pulse generation (See waveform 1)	-
E14-8 (IMI) - E11-1 (E1)	Output	SB - W-B	Certification ECU (smart key ECU assembly) communication output	Engine switch off	11 to 14 V	-
E14-8 (IMI) - E11-1 (E1)	Output	SB - W-B	Certification ECU (smart key ECU assembly) communication output	Engine switch on (IG) using registered electrical key transmitter sub-assembly	Pulse generation (See waveform 2)	-

(a) Inspect using an oscilloscope.

NOTICE:

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

(1) Waveform 1 (Reference)



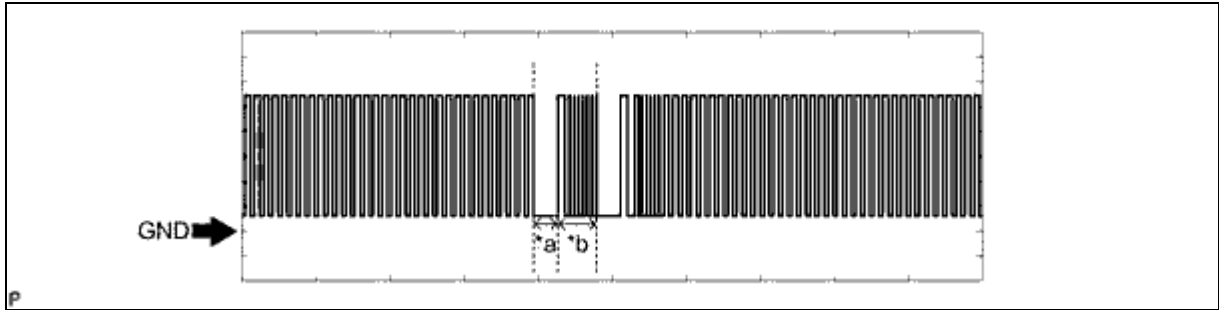
Text in Illustration

*a	Approximately 160 ms	*b	Approximately 270 ms
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Measurement Condition

ITEM	CONTENT
Tester Connection	E14-9 (IMO) - E11-1 (E1)
Tool Setting	2 V/DIV., 500 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

(2) Waveform 2 (Reference)



Text in Illustration

*a	Approximately 160 ms	*b	Approximately 270 ms
----	----------------------	----	----------------------

Measurement Condition

ITEM	CONTENT
Tester Connection	E14-8 (IMI) - E11-1 (E1)
Tool Setting	2 V/DIV., 500 ms./DIV.
Condition	Engine switch on (IG) using registered electrical key transmitter sub-assembly



Last Modified: 11-13-2015	6.6 C	Doc ID: RM000001GV0056X
Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): B2780; Push Switch / Key Unlock Warning Switch Malfunction; 2016 MY Tacoma [08/2015 -]		

DTC	B2780	Push Switch / Key Unlock Warning Switch Malfunction
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DESCRIPTION

This DTC is stored if the transponder key ECU assembly does not detect that the unlock warning switch assembly is ON even when the key is in the ignition key cylinder. Under normal conditions, the unlock warning switch assembly is ON when the key is in the ignition key cylinder.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA	DTC OUTPUT CONFIRMATION OPERATION
B2780	The unlock warning switch assembly is not detected as being on when the ignition switch is ON (1 trip detection logic*).	• Wire harness or connector • Unlock warning switch assembly • Transponder key ECU assembly	Insert the door control transmitter assembly into the ignition key cylinder.

*: Only output while a malfunction is present.

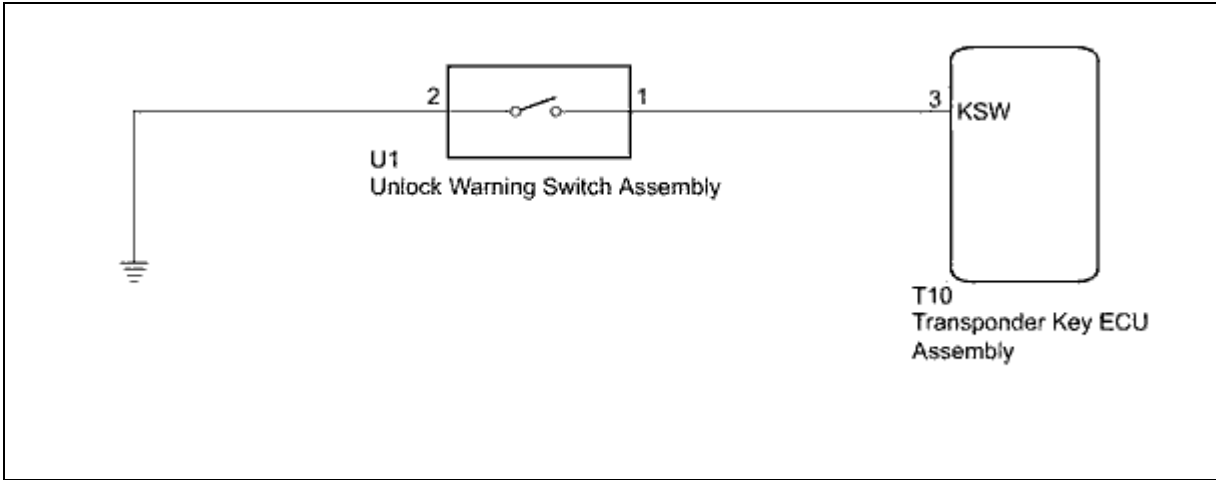
Vehicle Condition and Fail-safe Operation when Malfunction Detected

VEHICLE CONDITION WHEN MALFUNCTION DETECTED	FAIL-SAFE OPERATION WHEN MALFUNCTION DETECTED
Engine cannot be started	-

Related Data List and Active Test

DTC NO.	DATA LIST AND ACTIVE TEST
B2780	Key SW

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- If the transponder key ECU assembly is replaced, refer to Registration [INFO](#) .
- After repair, confirm that no DTCs are output by performing "DTC Output Confirmation Operation".

PROCEDURE

1.	CLEAR DTC
----	------------------

(a) Clear the DTCs [INFO](#) .

NEXT



2.	CHECK FOR DTC
----	----------------------

(a) Perform "DTC Output Confirmation Operation" procedure.

(b) Check for DTCs [INFO](#) .

OK:
DTC B2780 is not output.

Result

RESULT	PROCEED TO
DTC B2780 is output	A
DTC B2780 is not output	B

B **USE SIMULATION METHOD TO CHECK**

A



3. INSPECT UNLOCK WARNING SWITCH ASSEMBLY

- (a) Remove the unlock warning switch assembly  .
- (b) Inspect the unlock warning switch assembly  .

NG  **REPLACE UNLOCK WARNING SWITCH ASSEMBLY**

OK



4. CHECK HARNESS AND CONNECTOR (TRANSPONDER KEY ECU ASSEMBLY - UNLOCK WARNING SWITCH ASSEMBLY - BODY GROUND)

- (a) Disconnect the T10 transponder key ECU assembly connector.
- (b) Disconnect the U1 unlock warning switch assembly connector.
- (c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
T10-3 (KSW) - U1-1	Always	Below 1 Ω
T10-3 (KSW) or U1-1 - Body ground	Always	10 k Ω or higher
U1-2 - Body ground	Always	Below 1 Ω

NG  **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK  **REPLACE TRANSPONDER KEY ECU ASSEMBLY**



Last Modified: 11-13-2015	6.6 C	Doc ID: RM000001GV5058X
Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): B2784; Antenna Coil Open / Short; 2016 MY Tacoma [08/2015 -]		

DTC	B2784	Antenna Coil Open / Short
------------	--------------	----------------------------------

DESCRIPTION

When an open or short circuit is detected in the antenna coil built into the transponder key coil, the transponder key ECU assembly stores this DTC.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA	DTC OUTPUT CONFIRMATION OPERATION
B2784	The antenna coil in the transponder key coil is open/shorted.	• Wire harness or connector • Transponder key coil • Transponder key ECU assembly	Insert the door control transmitter assembly into the ignition key cylinder, turn the ignition switch from off to ON and wait at least 20 seconds.

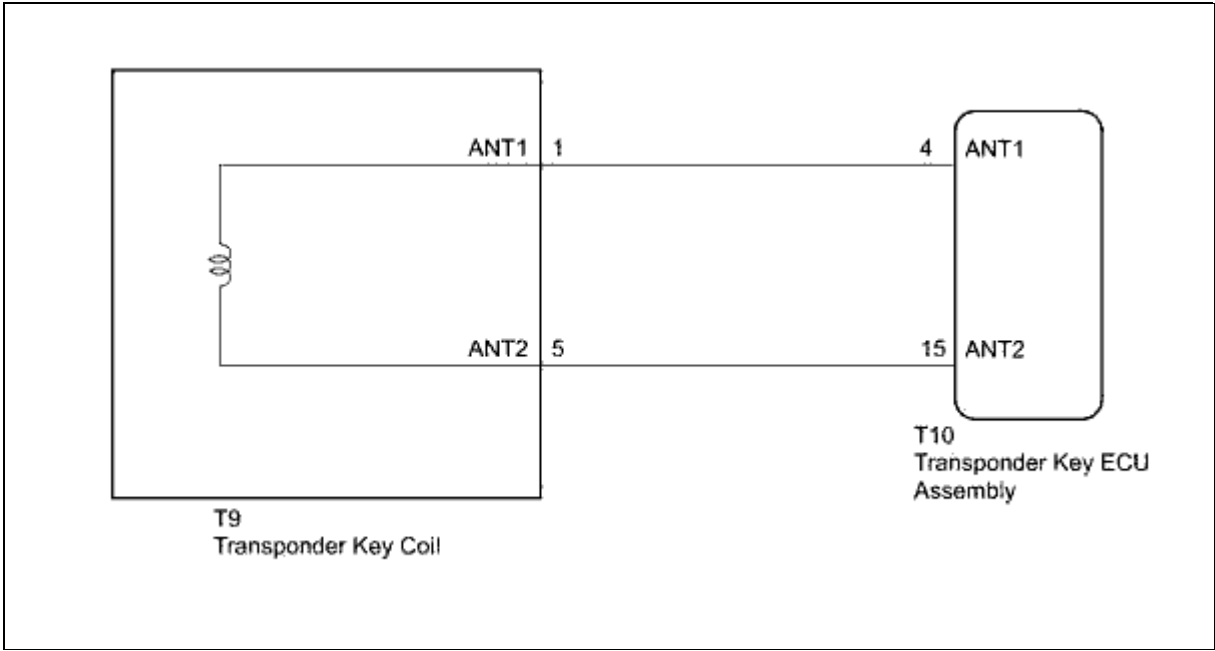
Vehicle Condition and Fail-safe Operation when Malfunction Detected

VEHICLE CONDITION WHEN MALFUNCTION DETECTED	FAIL-SAFE OPERATION WHEN MALFUNCTION DETECTED
Engine cannot be started	-

Related Data List and Active Test

DTC NO.	DATA LIST AND ACTIVE TEST
B2784	Antenna Coil Status

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- If the transponder key ECU assembly is replaced, refer to Registration [INFO](#) .
- After repair, confirm that no DTCs are output by performing "DTC Output Confirmation Operation".

PROCEDURE

1.	CLEAR DTC
----	-----------

(a) Clear the DTCs [INFO](#) .

NEXT



2.	CHECK FOR DTC
----	---------------

(a) Perform "DTC Output Confirmation Operation" procedure.

(b) Check for DTCs [INFO](#) .

OK:

DTC B2784 is not output.

Result

RESULT	PROCEED TO
DTC B2784 is output	A

RESULT	PROCEED TO
DTC B2784 is not output	B

B ► **USE SIMULATION METHOD TO CHECK**

A



3.	CHECK CONNECTION OF CONNECTOR
-----------	--------------------------------------

(a) Check that the connector is properly connected to the transponder key coil.

NEXT



4.	CLEAR DTC
-----------	------------------

(a) Clear the DTCs  .

NEXT



5.	CHECK FOR DTC
-----------	----------------------

(a) Perform "DTC Output Confirmation Operation" procedure.

(b) Check for DTCs.  .

OK:

DTC B2784 is not output.

Result

RESULT	PROCEED TO
DTC B2784 is not output	A
DTC B2784 is output	B

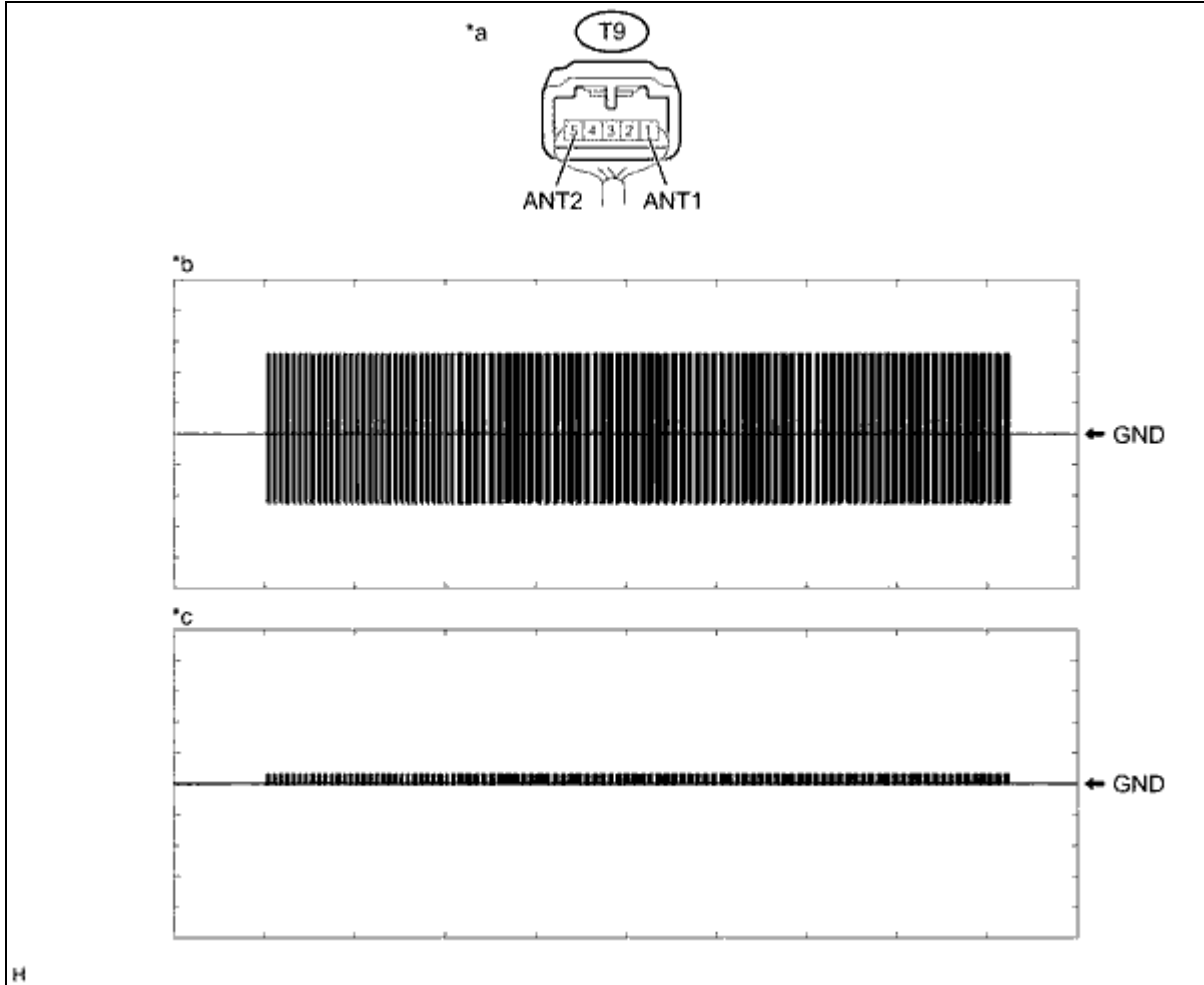
B ► **GO TO STEP 6**

A ► **END (CONNECTOR WAS NOT CONNECTED)**

PROPERLY)

6. CHECK TRANSPONDER KEY COIL (OUTPUT)

(a) Using an oscilloscope, check the waveform.



Text in Illustration

*a	Component with harness connected (Transponder Key Coil)	*b	Waveform 1
*c	Waveform 2	-	-

Measurement Condition:

TESTER CONNECTION	CONDITION	TOOL SETTING	SPECIFIED CONDITION
T9-1 (ANT1) - Body ground	Within 3 seconds of inserting door control transmitter assembly into ignition key cylinder	2 V/DIV., 500 ms./DIV.	Pulse generation (See waveform 1)
T9-5 (ANT2) - Body ground	Within 3 seconds of inserting door control transmitter assembly into ignition key cylinder	2 V/DIV., 500 ms./DIV.	Pulse generation (See waveform 2)

OK:

Waveform is similar to that shown in the illustration.

Result

RESULT	PROCEED TO
NG	A
OK	B

B  **REPLACE TRANSPONDER KEY COIL**

A



7.	CHECK HARNESS AND CONNECTOR (TRANSPONDER KEY ECU ASSEMBLY - TRANSPONDER KEY COIL)
-----------	--

- (a) Disconnect the T10 transponder key ECU assembly connector.
- (b) Disconnect the T9 transponder key coil connector.
- (c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
T10-4 (ANT1) - T9-1 (ANT1)	Always	Below 1 Ω
T10-15 (ANT2) - T9-5 (ANT2)	Always	Below 1 Ω
T10-4 (ANT1) or T9-1 (ANT1) - Body ground	Always	10 k Ω or higher
T10-15 (ANT2) or T9-5 (ANT2) - Body ground	Always	10 k Ω or higher

NG  **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK



8.	REPLACE TRANSPONDER KEY ECU ASSEMBLY
-----------	---

- (a) Replace the transponder key ECU assembly with a new one  .

NOTICE:

Key ID code registration is necessary when replacing the transponder key ECU assembly, refer to

NEXT

9.	CLEAR DTC
-----------	------------------

(a) Clear the DTCs [INFO](#) .

NEXT

10.	CHECK FOR DTC
------------	----------------------

(a) Perform "DTC Output Confirmation Operation" procedure.

(b) Check for DTCs [INFO](#) .

OK:

DTC B2784 is not output.

Result

RESULT	PROCEED TO
DTC B2784 is not output	A
DTC B2784 is output	B

B **REPLACE TRANSPONDER KEY COIL**

A **END (TRANSPONDER KEY ECU ASSEMBLY WAS DEFECTIVE)**



Last Modified: 11-13-2015	6.6 C	Doc ID: RM000001TCJ04GX
Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): B2793,B2794,B2797,B2798; Transponder Chip Malfunction; 2016 MY Tacoma [08/2015 -]		

DTC	B2793	Transponder Chip Malfunction
------------	--------------	-------------------------------------

DTC	B2794	Unmatched Encryption Code
------------	--------------	----------------------------------

DTC	B2797	Communication Malfunction No. 1
------------	--------------	--

DTC	B2798	Communication Malfunction No. 2
------------	--------------	--

DESCRIPTION

- DTC B2793 is stored when a malfunction is found in the key during key code registration or a key code is not registered normally. Replace the key if key code registration cannot be performed normally and this DTC is output.
- DTC B2794 is stored when a key with an incomplete key code is inserted into the ignition key cylinder.
- DTC B2797 is stored when a key with a BCC malfunction is inserted into the ignition key cylinder.
- DTC B2798 is stored when a key is inserted into the ignition key cylinder but a communication error occurs between the key and transponder key ECU assembly.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA	DTC OUTPUT CONFIRMATION OPERATION
B2793	A transponder chip malfunction (1 trip detection logic*).	• Key • Transponder key coil • Transponder key ECU assembly	Insert the key into the ignition key cylinder, turn the ignition switch from off to ON and wait at least 20 seconds.
B2794	A key with an incomplete key ID code is used to turn the ignition switch to ON (1 trip detection logic*).		
B2797	A key with a BCC malfunction is used to turn the ignition switch to ON (1 trip detection logic*).		
B2798	Key ID code identification cannot be completed within the specified time (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
---	---

VEHICLE CONDITION WHEN MALFUNCTION DETECTED	FAIL-SAFE OPERATION WHEN MALFUNCTION DETECTED
Engine cannot be started	-

Related Data List and Active Test

DTC NO.	DATA LIST AND ACTIVE TEST
B2793	-
B2794	-
B2797	-
B2798	-

INSPECTION PROCEDURE

NOTICE:

- If the transponder key ECU assembly or key is replaced, refer to Registration [INFO](#) .
- After repair, confirm that no DTCs are output by performing "DTC Output Confirmation Operation".

PROCEDURE

1.	CLEAR DTC
-----------	------------------

(a) Clear the DTCs [INFO](#) .

NEXT

2.	CHECK DTC OUTPUT
-----------	-------------------------

(a) Perform "DTC Output Confirmation Operation" procedure.

(b) Check for DTCs [INFO](#) .

HINT:

If DTC B2793, B2794, B2797, or B2798 is stored, clear the DTCs before checking the next key.

OK:

DTC B2793, B2794, B2797 and B2798 are not output.

Result

RESULT	PROCEED TO
DTCs are output for all of the keys	A
DTCs are output for any of the keys	B
DTCs are not output	C

B ► REPLACE KEY THAT DTC IS OUTPUT

C ► USE SIMULATION METHOD TO CHECK

A



3.	CHECK CONNECTION OF CONNECTOR
-----------	--------------------------------------

(a) Check that the connector is properly connected to the transponder key coil.

(b) Check that the engine starts with the key.

OK:

Engine starts normally.

NG ► GO TO STEP 4

OK ► END (CONNECTOR WAS NOT CONNECTED PROPERLY)

4.	REPLACE TRANSPONDER KEY COIL
-----------	-------------------------------------

(a) Clear the DTCs  .

(b) Replace the transponder key coil  .

(c) Check that the engine starts with the key  .

OK:

Engine starts normally.

NG ► REPLACE TRANSPONDER KEY ECU ASSEMBLY

OK ► END (TRANSPONDER KEY COIL WAS DEFECTIVE)



Last Modified: 11-13-2015	6.6 C	Doc ID: RM000002M6X0BGX
Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): B2799,B279986; Engine Immobiliser System Malfunction; 2016 MY Tacoma [08/2015 -]		

DTC	B2799	Engine Immobiliser System Malfunction
------------	--------------	--

DTC	B279986	Engine Immobiliser System Signal (Some Circuit Quantity, Reported via Serial Data) Invalid
------------	----------------	---

DESCRIPTION

This DTC is stored when one of the following occurs: 1) the ECM detects errors in its own communication 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.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA	DTC OUTPUT CONFIRMATION OPERATION
B2799*1	One of the following conditions is met: • Error in communication between ECM and transponder key ECU assembly. • Error in communication lines. • Communication ID is different during communication between ECM and transponder key ECU assembly.	• Wire harness or connector • ECM • Transponder key ECU assembly	• Start the engine and wait 10 seconds. • After disconnecting and reconnecting the cable to the negative (-) battery terminal, turn the ignition switch to ON and wait 10 seconds.
B279986*2	One of the following conditions is met: • Error in communication between ECM and transponder key ECU assembly. • Error in communication lines. • Communication ID is different during communication between ECM and transponder key ECU assembly.	• Wire harness or connector • ECM • Transponder key ECU assembly	• Start the engine and wait 10 seconds. • After disconnecting and reconnecting the cable to the negative (-) battery terminal, turn the ignition switch to ON and wait 10 seconds.

- *1: for 2TR-FE
- *2: for 2GR-FKS

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 NO.	DATA LIST AND ACTIVE TEST
B2799*1	-
B279986*2	-

- *1: for 2TR-FE
- *2: for 2GR-FKS

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- If the transponder key ECU assembly or ECM is replaced, refer to Registration [INFO](#) .
- After repair, confirm that no DTCs are output by performing "DTC Output Confirmation Operation".

HINT:

If the transponder key ECU assembly DTC is output simultaneously, troubleshoot the transponder key ECU assembly DTCs first.

PROCEDURE

1.	CLEAR DTC
----	------------------

- (a) Clear the DTCs [INFO](#) .

NEXT



2.	CHECK FOR DTC
----	---------------

(a) Perform "DTC Output Confirmation Operation" procedure.

(b) Check for DTCs INFO.

OK:

DTC B2799*1 or B279986*2 is not output.

*1: for 2TR-FE

*2: for 2GR-FKS

Result

RESULT	PROCEED TO
DTC B2799 is output*1	A
DTC B279986 is output*2	B
Other DTCs are output	C
DTC B2799*1 or B279986*2 is not output	D

*1: for 2TR-FE

*2: for 2GR-FKS

B  **GO TO STEP 11**

C  **GO TO DIAGNOSTIC TROUBLE CODE CHART**

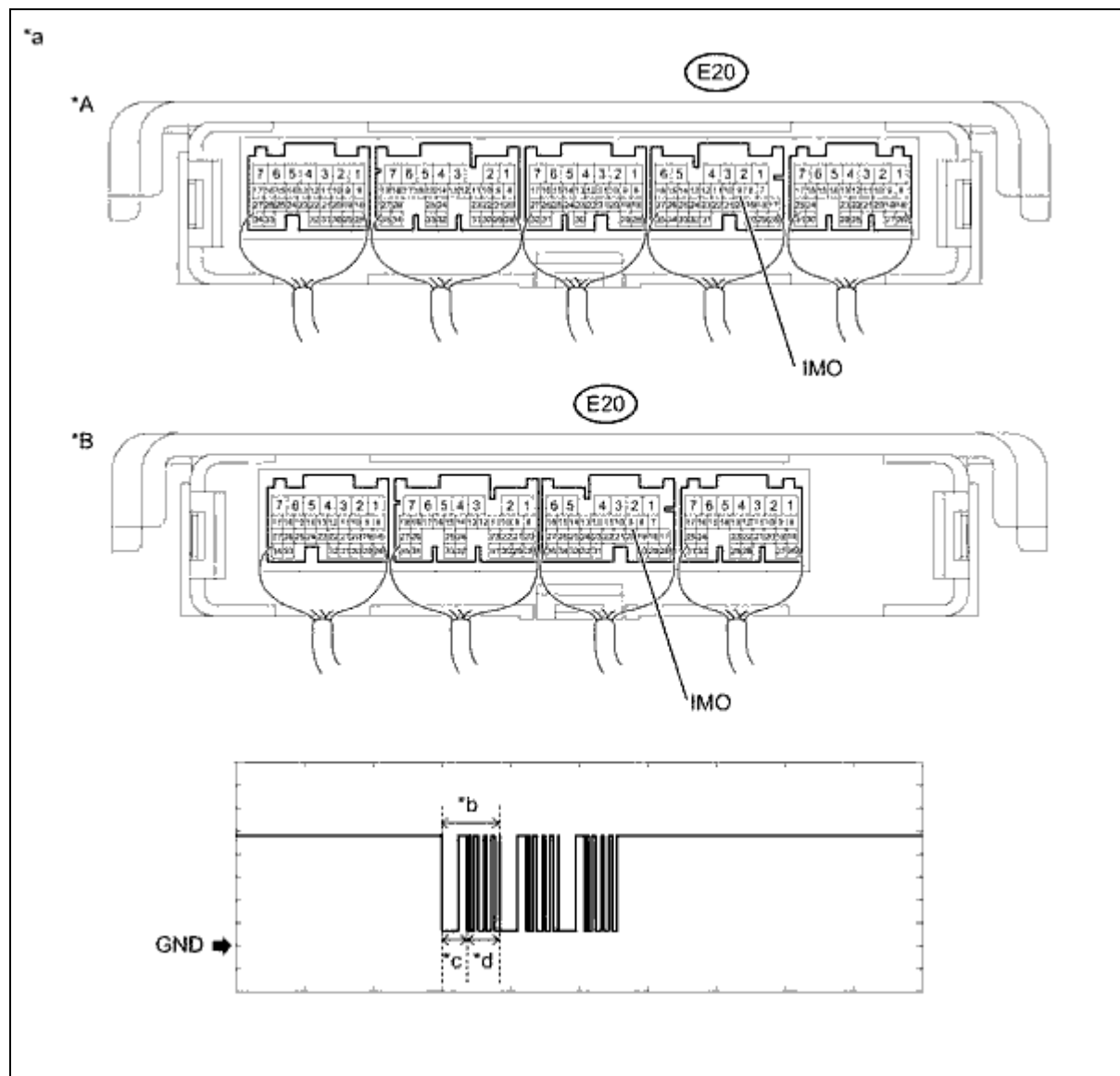
D  **USE SIMULATION METHOD TO CHECK**

A



3.	INSPECT ECM (TERMINAL IMO)
----	----------------------------

(a) Using an oscilloscope, check the waveform.



Text in Illustration

*A	for Automatic Transmission	*B	for Manual Transmission
*a	Component with harness connected (ECM)	*b	Waveform
*c	Approximately 160 ms	*d	Approximately 270 ms

Measurement Condition:

TESTER CONNECTION	CONDITION	TOOL SETTING	SPECIFIED CONDITION
E20-9 (IMO) - Body ground	Within 3 seconds of starter operation and initial combustion, or within 3 seconds of ignition switch first being turned to ON after cable disconnected and reconnected to negative (-) battery terminal	2 V/DIV., 500 ms./DIV.	Pulse generation (See waveform)

OK:

Waveform is similar to that shown in the illustration.

Result

RESULT	PROCEED TO
Normal waveform	A
Terminal IMO stuck low (2.4 V or less)	B
Terminal IMO stuck high (12 V) or abnormal waveform	C

B ► **GO TO STEP 7**

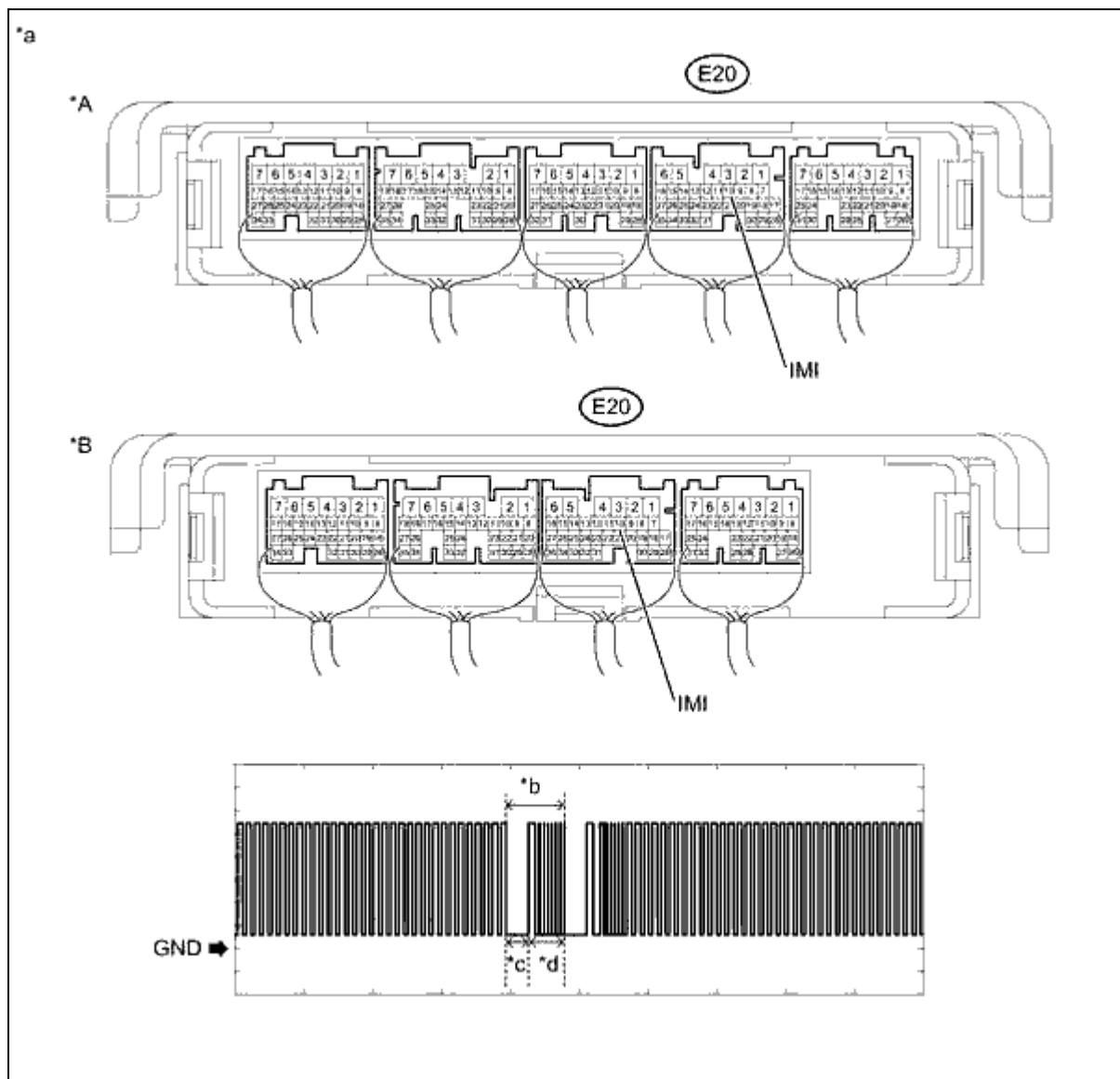
C ► **GO TO STEP 19**

A



4.	INSPECT ECM (TERMINAL IMI)
-----------	-----------------------------------

(a) Using an oscilloscope, check the waveform.



Text in Illustration

*A	for Automatic Transmission	*B	for Manual Transmission
*a	Component with harness connected (ECM)	*b	Waveform
*c	Approximately 160 ms	*d	Approximately 270 ms

Measurement Condition:

TESTER CONNECTION	CONDITION	TOOL SETTING	SPECIFIED CONDITION
E20-10 (IMI) - Body ground	Within 3 seconds of starter operation and initial combustion, or within 3 seconds of ignition switch first being turned to ON after cable disconnected and reconnected to negative (-) battery terminal	2 V/DIV., 500 ms./DIV.	Pulse generation (See waveform)

OK:

Waveform is similar to that shown in the illustration.

NG  GO TO STEP 9

OK


5.

REGISTER ECU COMMUNICATION ID

(a) Register the ECU communication ID  .

NEXT


6.

CHECK WHETHER ENGINE STARTS

- (a) Using a registered door control transmitter assembly, turn the ignition switch to ON.
- (b) Check that the engine starts 5 seconds after the ignition switch was turned to ON.

OK:
Engine starts normally.

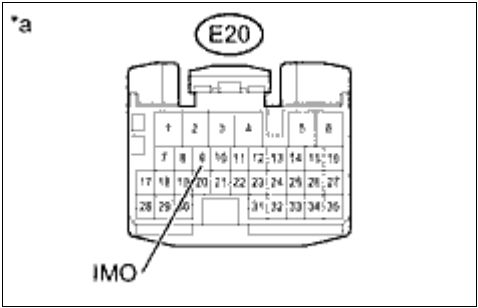
NG  GO TO STEP 19

OK  END (COMMUNICATION ID REGISTRATION WAS DEFECTIVE)

7.

INSPECT ECM (IMO TERMINAL VOLTAGE)

(a) Disconnect the ECM connector.



- (b) Turn the ignition switch to ON.
- (c) Measure the voltage according to the value(s) in the table below.
- Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E20-9 (IMO) - Body ground	Ignition switch turned to ON using registered door control transmitter assembly	Terminal IMO stuck low (2.4 V or less)

Text in Illustration

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

Result

RESULT	PROCEED TO
Terminal IMO stuck low (2.4 V or less)	A
Terminal IMO stuck high (12 V) or abnormal waveform	B

B  **GO TO STEP 19**

A



8.	CHECK HARNESS AND CONNECTOR (TRANSPONDER KEY ECU ASSEMBLY - ECM)
-----------	---

- (a) Disconnect the T10 transponder key ECU assembly connector.
- (b) Disconnect the E20 ECM connector.
- (c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
T10-12 (EFII) - E20-9 (IMO)	Always	Below 1 Ω
T10-12 (EFII) or E20-9 (IMO) - Body ground	Always	10 k Ω or higher

NG  **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK



9.	REPLACE TRANSPONDER KEY ECU ASSEMBLY
-----------	---

(a) Replace the transponder key ECU assembly with a new one **INFO** .

NEXT



10. CHECK WHETHER ENGINE STARTS

(a) Using a registered door control transmitter assembly, turn the ignition switch to ON.

(b) Check that the engine starts 5 seconds after the ignition switch was turned to ON.

OK:

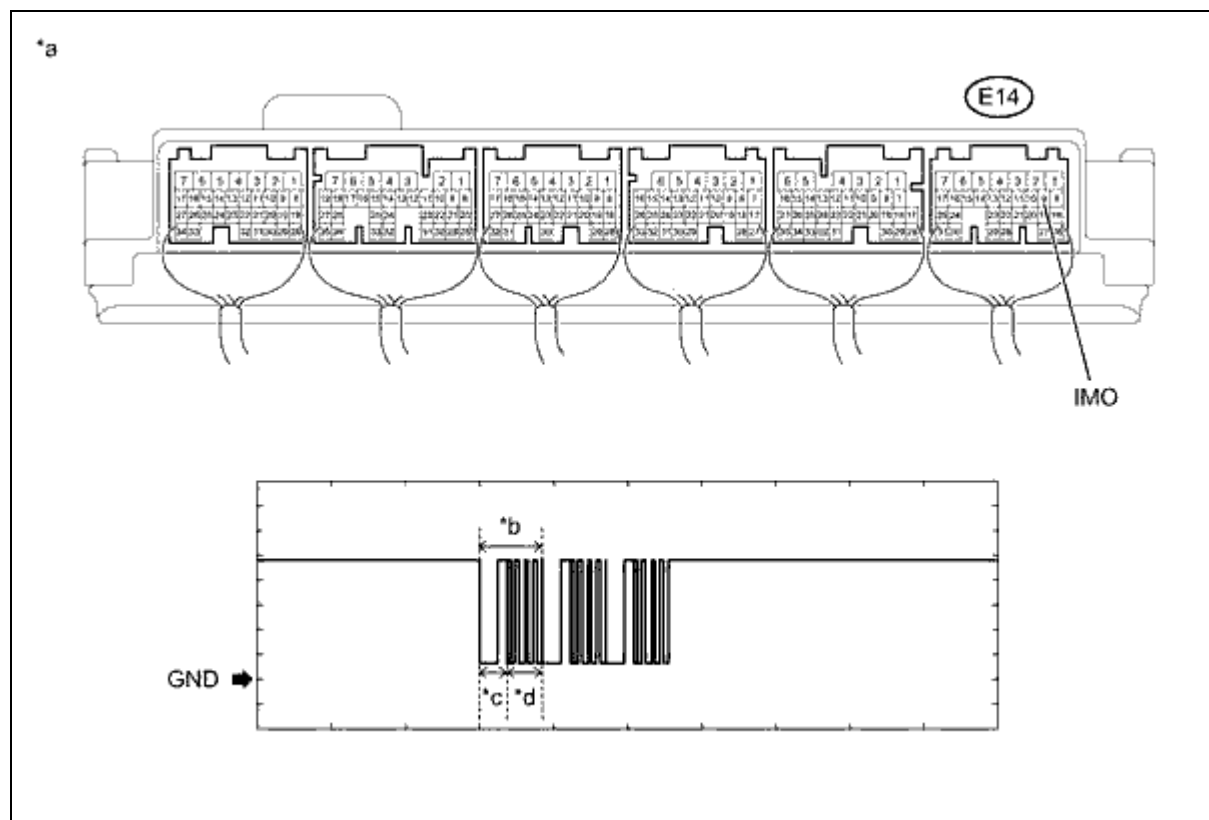
Engine starts normally.

NG ► **REPLACE ECM**

OK ► **END (TRANSPONDER KEY ECU ASSEMBLY WAS DEFECTIVE)**

11. INSPECT ECM (TERMINAL IMO)

(a) Using an oscilloscope, check the waveform.



Text in Illustration

*a	Component with harness connected (ECM)	*b	Waveform
*c	Approximately 160 ms	*d	Approximately 270 ms

Measurement Condition:

TESTER CONNECTION	CONDITION	TOOL SETTING	SPECIFIED CONDITION
E14-9 (IMO) - Body ground	Within 3 seconds of starter operation and initial combustion, or within 3 seconds of ignition switch first being turned to ON after cable disconnected and reconnected to negative (-) battery terminal	2 V/DIV., 500 ms./DIV.	Pulse generation (See waveform)

OK:

Waveform is similar to that shown in the illustration.

Result

RESULT	PROCEED TO
Normal waveform	A
Terminal IMO stuck low (2.4 V or less)	B
Terminal IMO stuck high (12 V) or abnormal waveform	C

B ► GO TO STEP 15

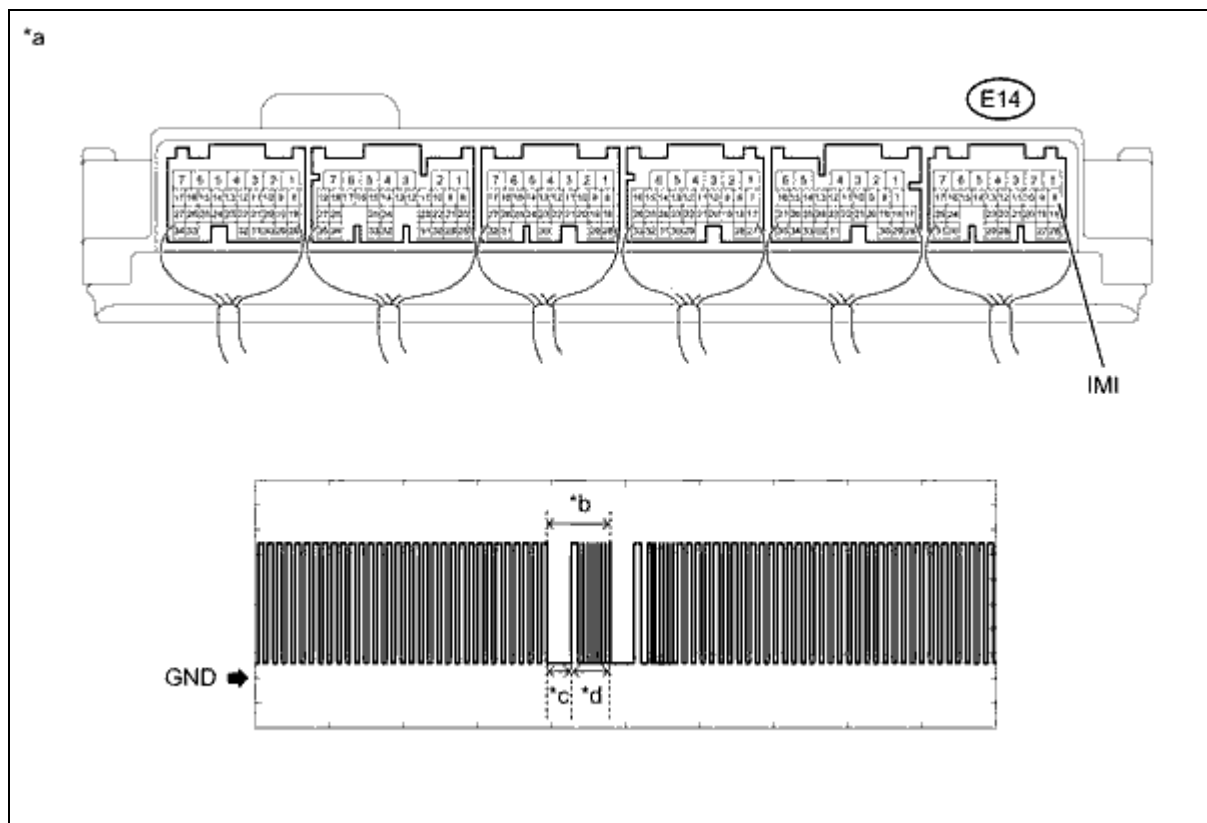
C ► GO TO STEP 19

A



12.	INSPECT ECM (TERMINAL IMI)
------------	-----------------------------------

(a) Using an oscilloscope, check the waveform.



Text in Illustration

*a	Component with harness connected (ECM)	*b	Waveform
*c	Approximately 160 ms	*d	Approximately 270 ms

Measurement Condition:

TESTER CONNECTION	CONDITION	TOOL SETTING	SPECIFIED CONDITION
E14-8 (IMI) - Body ground	Within 3 seconds of starter operation and initial combustion, or within 3 seconds of ignition switch first being turned to ON after cable disconnected and reconnected to negative (-) battery terminal	2 V/DIV., 500 ms./DIV.	Pulse generation (See waveform)

OK:

Waveform is similar to that shown in the illustration.

NG **GO TO STEP 17**

OK

13.	REGISTER ECU COMMUNICATION ID
------------	--------------------------------------

(a) Register the ECU communication ID INFO .

NEXT
▼

14.	CHECK WHETHER ENGINE STARTS
------------	------------------------------------

- (a) Using a registered door control transmitter assembly, turn the ignition switch to ON.
- (b) Check that the engine starts 5 seconds after the ignition switch was turned to ON.

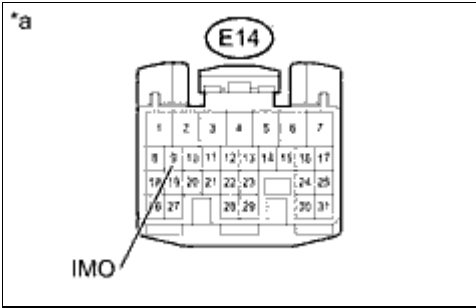
OK:
Engine starts normally.

NG ► **GO TO STEP 19**

OK ► **END (COMMUNICATION ID REGISTRATION WAS DEFECTIVE)**

15.	INSPECT ECM (IMO TERMINAL VOLTAGE)
------------	---

- (a) Disconnect the ECM connector.



- (b) Turn the ignition switch to ON.
- (c) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
E14-9 (IMO) - Body ground	Ignition switch turned to ON using registered door control transmitter assembly	Terminal IMO stuck low (2.4 V or less)

Text in Illustration

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

Result

RESULT	PROCEED TO
Terminal IMO stuck low (2.4 V or less)	A
Terminal IMO stuck high (12 V) or abnormal waveform	B

B ► **GO TO STEP 19**

A

16.	CHECK HARNESS AND CONNECTOR (TRANSPONDER KEY ECU ASSEMBLY - ECM)
------------	---

- (a) Disconnect the T10 transponder key ECU assembly connector.
- (b) Disconnect the E14 ECM connector.
- (c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
T10-12 (EFII) - E14-9 (IMO)	Always	Below 1 Ω
T10-12 (EFII) or E14-9 (IMO) - Body ground	Always	10 k Ω or higher

NG ► **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

17.	REPLACE TRANSPONDER KEY ECU ASSEMBLY
------------	---

- (a) Replace the transponder key ECU assembly with a new one INFO.

NEXT

18.	CHECK WHETHER ENGINE STARTS
------------	------------------------------------

- (a) Using a registered door control transmitter assembly, turn the ignition switch to ON.

(b) Check that the engine starts 5 seconds after the ignition switch was turned to ON.

OK:

Engine starts normally.

NG ► **REPLACE ECM**

OK ► **END (TRANSPONDER KEY ECU ASSEMBLY WAS DEFECTIVE)**

19.	REPLACE ECM
------------	--------------------

(a) Temporarily replace the ECM with a new one  .

NEXT



20.	REGISTER ECU COMMUNICATION ID
------------	--------------------------------------

(a) Register the ECU communication ID  .

NEXT



21.	CHECK WHETHER ENGINE STARTS
------------	------------------------------------

(a) Using a registered door control transmitter assembly, turn the ignition switch to ON.

(b) Check that the engine starts 5 seconds after the ignition switch was turned to ON.

OK:

Engine starts normally.

NG ► **REPLACE TRANSPONDER KEY ECU ASSEMBLY**

OK ► **END (ECM WAS DEFECTIVE)**



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Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): B279A,B279A12; Theft Deterrent System Communication Line High Fixation; 2016 MY Tacoma [08/2015 -]		

DTC	B279A	Theft Deterrent System Communication Line High Fixation
------------	--------------	--

DTC	B279A12	Engine Immobiliser System Circuit Short to Battery
------------	----------------	---

DESCRIPTION

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

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA	DTC OUTPUT CONFIRMATION OPERATION
B279A*1	Communication line (EFIO-IMI) between the ECM and transponder key ECU assembly is stuck high.	• Wire harness or connector • ECM • Transponder key ECU assembly	Turn the ignition switch to ON and wait 6 seconds.
B279A12*2	Communication line (EFIO-IMI) between the ECM and transponder key ECU assembly is stuck high.	• Wire harness or connector • ECM • Transponder key ECU assembly	Turn the ignition switch to ON and wait 6 seconds.

*1: for 2TR-FE

*2: for 2GR-FKS

Vehicle Condition and Fail-safe Operation when Malfunction Detected

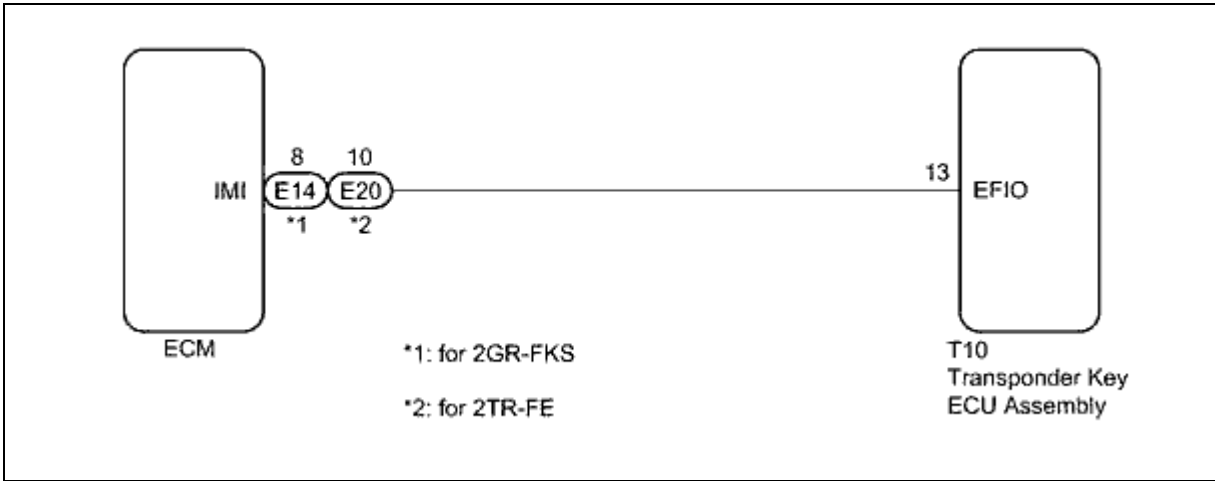
VEHICLE CONDITION WHEN MALFUNCTION DETECTED	FAIL-SAFE OPERATION WHEN MALFUNCTION DETECTED
Engine cannot be started (initial ignition occurs and engine cranks, then ignition stops)	Engine cannot be started

Related Data List and Active Test

DTC NO.	DATA LIST AND ACTIVE TEST
B279A*1	-
B279A12*1	-

- *1: for 2TR-FE
 *2: for 2GR-FKS

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- If the transponder key ECU assembly or ECM is replaced, refer to Registration [INFO](#) .
- After repair, confirm that no DTCs are output by performing "DTC Output Confirmation Operation".

PROCEDURE

1.	CLEAR DTC
----	-----------

(a) Clear the DTCs [INFO](#) .

NEXT



2.	CHECK DTC OUTPUT
----	------------------

(a) Perform "DTC Output Confirmation Operation" procedure.

(b) Check for DTCs [INFO](#) .

Result

RESULT	PROCEED TO
DTC B279A (for 2TR-FE) or B279A12 (for 2GR-FKS) is output	A
DTC B279A (for 2TR-FE) or B279A12 (for 2GR-FKS) is not output	B

B ► USE SIMULATION METHOD TO CHECK**A****3. CHECK CONNECTION OF CONNECTOR**

(a) Check that the connectors are properly connected to the ECM and transponder key ECU assembly.

OK:

Connectors are properly connected.

NG ► CONNECT CONNECTORS PROPERLY**OK****4. CHECK HARNESS AND CONNECTOR (TRANSPONDER KEY ECU ASSEMBLY - ECM)**

(a) Disconnect the T10 transponder key ECU assembly connector.

(b) Disconnect the E14*1 or E20*2 ECM connector.

*1: for 2GR-FKS

*2: for 2TR-FE

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
T10-13 (EFIO) - E14-8 (IMI)*1	Always	Below 1 Ω
T10-13 (EFIO) or E14-8 (IMI) - Body ground*1	Always	10 k Ω or higher
T10-13 (EFIO) - E20-10 (IMI)*2	Always	Below 1 Ω
T10-13 (EFIO) or E20-10 (IMI) - Body ground*2	Always	10 k Ω or higher

*1: for 2GR-FKS

*2: for 2TR-FE

NG ► REPAIR OR REPLACE HARNESS OR CONNECTOR**OK**



5.	REPLACE TRANSPONDER KEY ECU ASSEMBLY
-----------	---

(a) Replace the transponder key ECU assembly with a new one [INFO](#) .

NEXT



6.	CLEAR DTC
-----------	------------------

(a) Clear the DTCs [INFO](#) .

NEXT



7.	CHECK FOR DTC
-----------	----------------------

(a) Perform "DTC Output Confirmation Operation" procedure.

(b) Check for DTCs [INFO](#) .

Result

RESULT	PROCEED TO
DTC B279A (for 2TR-FE) or B279A12 (for 2GR-FKS) is not output	A
DTC B279A is output (for 2TR-FE)	B
DTC B279A12 is output (for 2GR-FKS)	C

B **REPLACE ECM**

C **REPLACE ECM**

A **END (TRANSPONDER KEY ECU ASSEMBLY WAS DEFECTIVE)**



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Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): B279C,B279C95; Theft Deterrent System Presence Detection; 2016 MY Tacoma [08/2015 -]		

DTC	B279C	Theft Deterrent System Presence Detection
------------	--------------	--

DTC	B279C95	Engine Immobiliser System Incorrect Assembly
------------	----------------	---

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	DTC OUTPUT CONFIRMATION OPERATION
B279C*1	An ECM that is incompatible with engine immobiliser system is installed.	ECM	Check for DTCs.
B279C95*2	An ECM that is incompatible with engine immobiliser system is installed.	ECM	Check for DTCs.

*1: for 2TR-FE

*2: for 2GR-FKS

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 NO.	DATA LIST AND ACTIVE TEST
B279C*1	-
B279C95*2	-

*1: for 2TR-FE

*2: for 2GR-FKS

INSPECTION PROCEDURE

NOTICE:

- If the ECM is replaced, refer to Registration [INFO](#) .
- After repair, confirm that no DTCs are output by performing "DTC Output Confirmation Operation".

PROCEDURE

1.	CLEAR DTC
-----------	------------------

(a) Clear the DTCs  .

NEXT



2.	CHECK FOR DTC
-----------	----------------------

(a) Perform "DTC Output Confirmation Operation" procedure.

(b) Check for DTCs  .

OK:

DTC B279C*1 or B279C95*2 is not output.

*1: for 2TR-FE

*2: for 2GR-FKS

Result

RESULT	PROCEED TO
OK	A
NG (for 2TR-FE)	B
NG (for 2GR-FKS)	C

B  **REPLACE ECM**

C  **REPLACE ECM**

A  **USE SIMULATION METHOD TO CHECK**



Last Modified: 11-13-2015	6.6 U	Doc ID: RM000001GVA03ZX
Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): DATA LIST / ACTIVE TEST; 2016 MY Tacoma [08/2015 -]		

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.

- Connect the Techstream to the DLC3.
- Turn the ignition switch to ON.
- Turn the Techstream on.
- Enter the following menus: Body Electrical / Immobiliser / Data List.
- Read the Data List according to the display on the Techstream.

Immobiliser

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
D Door Courtesy SW	Driver door courtesy light switch signal / OFF or ON	OFF: Driver door closed ON: Driver door open	-
Key SW	Unlock warning switch signal / OFF or ON	OFF: No key in ignition key cylinder ON: Key inserted in ignition key cylinder	-
IG SW*2	Ignition switch signal / ON or OFF	ON: Ignition switch ON OFF: Ignition switch ACC or off	-
Immobiliser*2	Engine immobiliser system status determined by transponder key ECU assembly / Set or Unset	Set: Engine immobiliser set (engine start prohibited [no key in ignition key cylinder]) Unset: Engine immobiliser unset (engine start permitted [key inserted in ignition key cylinder])	When the engine immobiliser system does not change to the unset state, this item can be used to determine if the cause is the transponder key ECU assembly.
Response	Key response to signal from transponder key ECU assembly / OK or	OK: Key responds to signal from transponder key ECU assembly	Problems may be caused by the following:

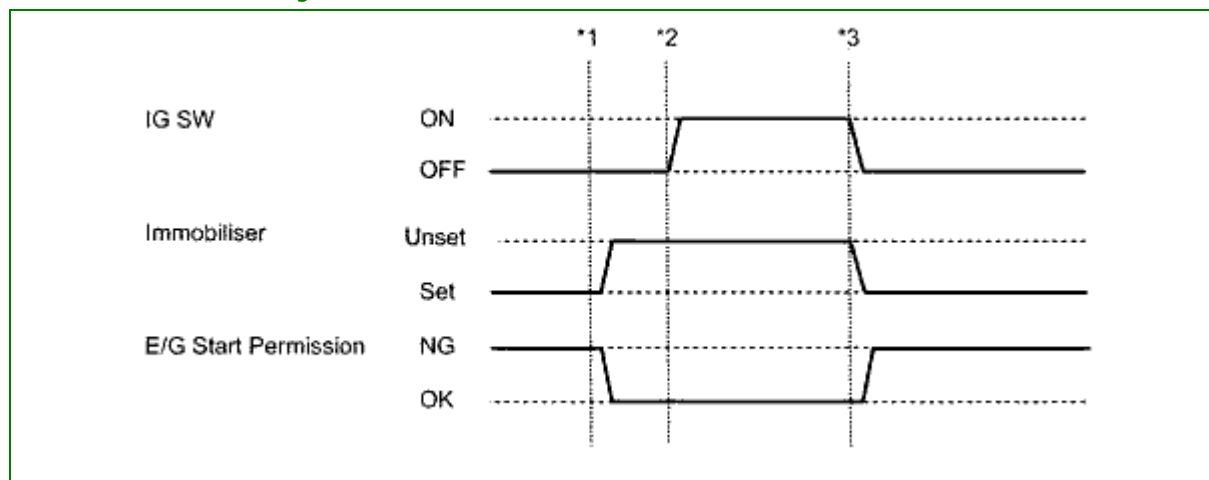
TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
	NG	NG: Key does not respond to signal from transponder key ECU assembly	• A key from a different vehicle is being used. • Malfunctions in the key, transponder key ECU assembly or transponder key coil.
Frame Error	State of data sent from key / OK or NG	OK: No problem with data sent from key NG: Problem with data sent from key	Problems may be caused by the following: • Communication errors due to external electric wave noise. • Malfunctions in the key, transponder key ECU assembly or transponder key coil.
Different Serial Number*1	Vehicle serial number / OK or NG	OK: Signal from transponder chip and vehicle serial number stored in transponder key ECU assembly match NG: Signal from transponder chip and vehicle serial number stored the transponder key ECU assembly do not match	Problems may be caused by the following: • A key from a different vehicle is being used. • Malfunctions in the key, transponder key ECU assembly or transponder key coil.
Different Encrypt Code*1	Code status between transponder chip and transponder key ECU assembly / OK or NG	OK: Codes of transponder chip and transponder key ECU assembly match NG: Codes of transponder chip and transponder key ECU assembly do not match	Problems may be caused by the following: • A key from a different vehicle is being used. • Malfunctions in the key, transponder key ECU assembly or transponder key coil.
Abnormal Status*1	Transponder chip status signal / OK or NG	OK: Transponder chip status signal normal NG: Transponder chip status signal malfunction (malfunction in code computation in key/transponder key ECU assembly)	Problems may be caused by the following: • Communication errors due to external electric wave noise (LF). • Malfunctions in the key, transponder key ECU assembly or transponder key coil.

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Bcc Malfunction*1	Bcc signal status of transponder chip / OK or NG	OK: Bcc signal normal NG: Bcc signal malfunction (malfunction in code computation in key/transponder key ECU assembly)	Problems may be caused by the following: • Communication errors due to external electric wave noise (LF). • Malfunctions in the key, transponder key ECU assembly or transponder key coil.
Sub Key	Not available / Unreg or Reg	-	-
Master Key	Whether master key ID code matches ID code registered in transponder key ECU assembly / Unreg or Reg	Unreg: ID code of master key does not match ID code registered in transponder key ECU assembly Reg: ID code of master key matches ID code registered in transponder key ECU assembly	-
Transponder S-code	Number of registered sub-keys / min.: 0, max.: 15	Number of registered sub-keys	-
Transponder M-code	Number of registered master keys / min.: 0, max.: 15	Number of registered master keys	-
Reg Code Space Full	Key registration code memory space full / No or Yes	Yes: Cannot register any more key codes No: Possible to register more key codes	-
+B	+B judgment / Normal or Break	Normal: Battery power supply normal Break: Battery power supply malfunctioning	-
Antenna Coil Status	Antenna coil condition / Normal or Fail	Normal: Antenna coil normal Fail: Antenna coil malfunctioning	-
EEPROM Status	EEPROM status / OK or NG	OK: Data OK NG: Data error	-
E/G Start Permission*2	Engine start permission / NG or OK	NG: Engine start not permitted OK: Engine start permitted	-

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Immobi ECU Comm Spd	Immobiliser ECU communication speed / Unknown, 50bps, No Res or 200bps	Unknown: ECU communication speed unknown 50bps: ECU communication speed 50 bps No Res: No response regarding ECU communication speed 200bps: ECU communication speed 200 bps	-
The Number of DTCs	Number of DTCs / Min.: 0, Max.: 255	Number of stored DTCs	-

HINT:

- *1: This indicates that there is a problem with the communication format between the key and transponder key ECU assembly. Electric wave interference, key or transponder key ECU assembly malfunctions, the key of another vehicle being used, etc. are possible causes.
- *2: Refer to the following Data List items of an actual vehicle.



*1: Without depressing the brake pedal (for Automatic Transmission) or clutch pedal (for Manual Transmission), insert the key into the ignition key cylinder and turn the ignition switch to ACC.

*2: Without depressing the brake pedal (for Automatic Transmission) or clutch pedal (for Manual Transmission), turn the ignition switch to ON.

*3: Turn the ignition switch off and remove the key from the ignition key cylinder.

(f) Enter the following menus: Powertrain / Engine or Engine and ECT / Data List.

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

Engine (for 2GR-FKS)

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Immobiliser Fuel Cut	Status of immobiliser fuel cut / ON or OFF	-	-

Engine and ECT (for 2TR-FE)

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Immobiliser Fuel Cut	Status of immobiliser fuel cut / ON or OFF	-	-

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.

- Connect the Techstream to the DLC3.
- Turn the ignition switch to ON.
- Turn the Techstream on.
- Enter the following menus: Body Electrical / Immobiliser or Main Body / Active Test.
- Perform the Active Test according to the display on the Techstream.

Immobiliser

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Security Indicator	Security indicator light	ON/OFF	-

Main Body (w/ Theft Deterrent System)

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Security Indicator	Security indicator light	OFF/ON	-



Last Modified: 11-13-2015	6.6 D	Doc ID: RM000001GV70CFX
Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): DIAGNOSIS SYSTEM; 2016 MY Tacoma [08/2015 -]		

DIAGNOSIS SYSTEM

1. DESCRIPTION

- (a) The transponder key ECU assembly controls the engine immobiliser system. The engine immobiliser system data and Diagnostic Trouble Codes (DTCs) can be read through the vehicle Data Link Connector 3 (DLC3).

2. CHECK DLC3

- (a) Check the DLC3  .

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.



Last Modified: 11-13-2015	6.6 S	Doc ID: RM00000292H04YX
Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): DIAGNOSTIC TROUBLE CODE CHART; 2016 MY Tacoma [08/2015 -]		

DIAGNOSTIC TROUBLE CODE CHART

HINT:

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

Transponder Key ECU Assembly

DTC CODE	DETECTION ITEM	SEE PAGE
B2780	Push Switch / Key Unlock Warning Switch Malfunction	INFO
B2784	Antenna Coil Open / Short	INFO
B2793	Transponder Chip Malfunction	INFO
B2794	Unmatched Encryption Code	INFO
B2797	Communication Malfunction No. 1	INFO
B2798	Communication Malfunction No. 2	INFO

HINT:

The DTCs for the engine immobiliser system are specified below. If other codes are output, check the DTC chart for the SFI system.

ECM

DTC CODE	DETECTION ITEM	SEE PAGE
B2799*1	Engine Immobiliser System Malfunction	INFO
B279986*2	Engine Immobiliser System Signal (Some Circuit Quantity, Reported via Serial Data) Invalid	INFO
B279A*1	Theft Deterrent System Communication Line High Fixation	INFO
B279A12*2	Engine Immobiliser System Circuit Short to Battery	INFO
B279C*1	Theft Deterrent System Presence Detection	INFO
B279C95*2	Engine Immobiliser System Incorrect Assembly	INFO

*1: for 2TR-FE

*2: for 2GR-FKS



Last Modified: 11-13-2015	6.6 D	Doc ID: RM000001GV80AQX
Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): DTC CHECK / CLEAR; 2016 MY Tacoma [08/2015 -]		

DTC CHECK / CLEAR

1. CHECK FOR TRANSPONDER KEY ECU ASSEMBLY 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 / Immobiliser / Trouble Codes.
- (e) Check the details of the DTC(s) **INFO** .

2. CHECK FOR ECM DTC (for 2GR-FKS)

- (a) Connect the Techstream to the DLC3.
- (b) Turn the ignition switch to ON.
- (c) Turn the Techstream on.
- (d) Enter the following menus: Powertrain / Engine / Trouble Codes.
- (e) Check the details of the DTC(s) **INFO** for engine immobiliser system, **INFO** for SFI system).

3. CHECK FOR ECM DTC (for 2TR-FE)

- (a) Connect the Techstream to the DLC3.
- (b) Turn the ignition switch to ON.
- (c) Turn the Techstream on.
- (d) Enter the following menus: Powertrain / Engine and ECT / Trouble Codes.
- (e) Check the details of the DTC(s) **INFO** for engine immobiliser system, **INFO** for SFI system).

4. CLEAR TRANSPONDER KEY ECU ASSEMBLY 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 / Immobiliser / Trouble Codes.
- (e) Clear the DTC(s).

5. CLEAR ECM DTC (for 2GR-FKS)

- (a) Connect the Techstream to the DLC3.
- (b) Turn the ignition switch to ON.
- (c) Turn the Techstream on.
- (d) Enter the following menus: Powertrain / Engine / Trouble Codes.
- (e) Clear the DTC(s).

6. CLEAR ECM DTC (for 2TR-FE)

- (a) Connect the Techstream to the DLC3.
- (b) Turn the ignition switch to ON.
- (c) Turn the Techstream on.
- (d) Enter the following menus: Powertrain / Engine and ECT / Trouble Codes.
- (e) Clear the DTC(s).



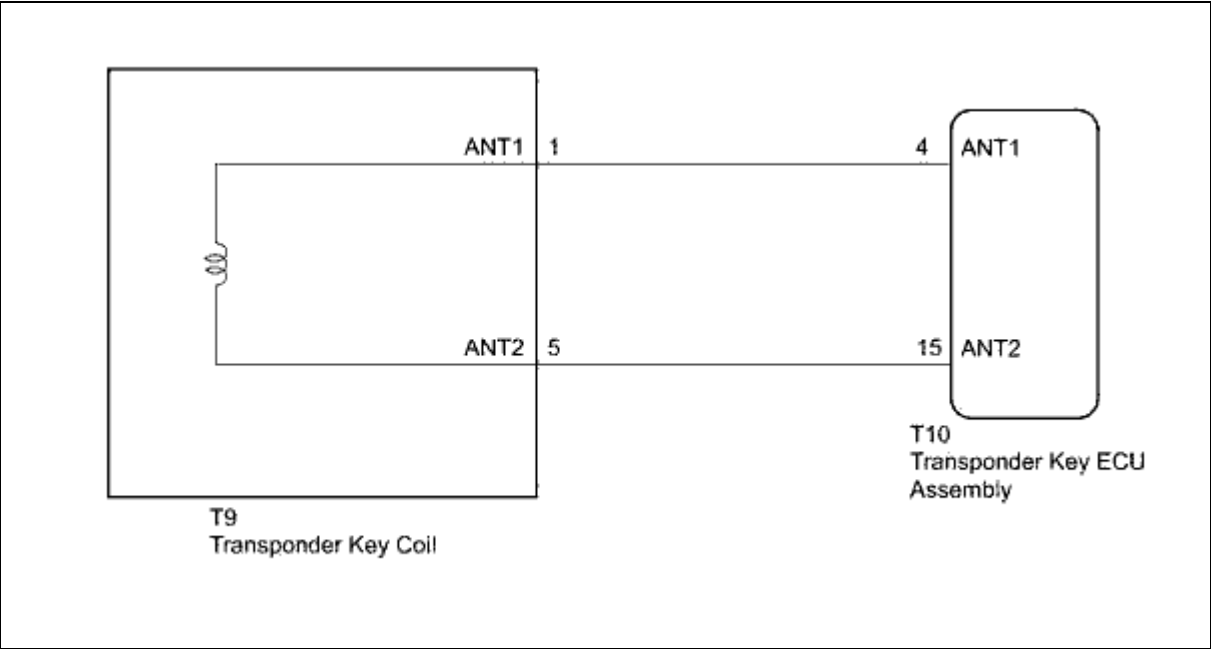
Last Modified: 11-13-2015	6.6 J	Doc ID: RM000005Q4I004X
Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): Engine does not Start because No Initial Combustion; 2016 MY Tacoma [08/2015 -]		

Engine does not Start because No Initial Combustion

DESCRIPTION

- When a key is inserted into the ignition key cylinder, the transponder key coil receives the key ID code and sends it to the transponder key ECU assembly.
- If an error in communication between the transponder key coil and transponder key ECU assembly occurs, this symptom may occur.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:
If the transponder key ECU assembly or key is replaced, refer to Registration [INFO](#) .

PROCEDURE

1.	CLEAR DTC
----	-----------

(a) Clear the DTCs [INFO](#) .

NEXT



2.	CHECK FOR DTC
-----------	----------------------

(a) Check for DTCs  .

Result

RESULT	PROCEED TO
DTCs are not output	A
DTCs are output	B

B  **GO TO DIAGNOSTIC TROUBLE CODE CHART**

A



3.	READ VALUE USING TECHSTREAM (IMMOBILISER FUEL CUT)
-----------	---

- (a) Connect the Techstream to the DLC3.
- (b) Turn the ignition switch to ON.
- (c) Turn the Techstream on.
- (d) Enter the following menus: Powertrain / Engine and ECT or Engine / Data List.
- (e) Read the Data List according to the display on the Techstream.

Engine and ECT (for 2TR-FE)

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Immobiliser Fuel Cut	Status of immobiliser fuel cut / ON or OFF	-	-

Engine (for 2GR-FKS)

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Immobiliser Fuel Cut	Status of immobiliser fuel cut / ON or OFF	-	-

OK:

OFF is displayed after the ignition switch is turned ON.

Result

RESULT	PROCEED TO
--------	------------

RESULT	PROCEED TO
NG	A
OK (for 2TR-FE)	B
OK (for 2GR-FKS)	C

B ► GO TO SFI SYSTEM

C ► GO TO SFI SYSTEM

A



4.	CHECK SECURITY INDICATOR LIGHT OPERATION
-----------	---

(a) Check that the security indicator light turns off when a registered key is inserted into the ignition key cylinder.

OK:

Security indicator light turns off.

Result

RESULT	PROCEED TO
NG	A
OK	B

B ► GO TO OTHER DIAGNOSIS PROCEDURE (Engine does not Start but Initial Combustion Occurs)

A



5.	CHECK SECURITY INDICATOR LIGHT OPERATION
-----------	---

(a) Check that the security indicator light turns off when another registered key is inserted into the ignition key cylinder.

OK:

Security indicator light turns off.

NG ► GO TO STEP 7

OK



6. CHECK WHETHER ENGINE STARTS

- (a) Using another registered key, turn the ignition switch to ON.
- (b) Check that the engine starts 5 seconds after the ignition switch was turned to ON.

OK:

Engine starts normally.

Result

RESULT	PROCEED TO
Engine cannot be started	A
Engine can be started	B

B ► **GO TO STEP 11**

A ► **GO TO OTHER DIAGNOSIS PROCEDURE (Engine does not Start but Initial Combustion Occurs)**

7. REPLACE TRANSPONDER KEY COIL

- (a) Replace the transponder key coil  .

NEXT



8. CHECK WHETHER ENGINE STARTS

- (a) Using another registered key, turn the ignition switch to ON.
- (b) Check that the engine starts 5 seconds after the ignition switch was turned to ON.

OK:

Engine starts normally.

Result

RESULT	PROCEED TO
Engine can be started	A

RESULT	PROCEED TO
Engine cannot be started	B

B ► **GO TO STEP 9**

A ► **END (TRANSPONDER KEY COIL WAS DEFECTIVE)**

9.	REPLACE TRANSPONDER KEY ECU ASSEMBLY
-----------	---

(a) Replace the transponder key ECU assembly with a new one [INFO](#) .

NOTICE:

Key ID code registration is necessary when replacing the transponder key ECU assembly, refer to Registration [INFO](#) .

NEXT



10.	CHECK WHETHER ENGINE STARTS
------------	------------------------------------

(a) Using another registered key, turn the ignition switch to ON.

(b) Check that the engine starts 5 seconds after the ignition switch was turned to ON.

OK:

Engine starts normally.

Result

RESULT	PROCEED TO
Engine can be started	A
Engine cannot be started	B

B ► **GO TO STEP 11**

A ► **END (TRANSPONDER KEY ECU ASSEMBLY WAS DEFECTIVE)**

11.	REPLACE KEY
------------	--------------------

(a) Replace the key.

NOTICE:

Key ID code registration is necessary when replacing the key, refer to Registration [INFO](#) .

NEXT



12.	CHECK WHETHER ENGINE STARTS
------------	------------------------------------

- (a) Using another registered key, turn the ignition switch to ON.
- (b) Check that the engine starts 5 seconds after the ignition switch was turned to ON.

OK:

Engine starts normally.

Result

RESULT	PROCEED TO
Engine can be started	A
Engine cannot be started (for 2TR-FE)	B
Engine cannot be started (for 2GR-FKS)	C

B ► **GO TO SFI SYSTEM**

C ► **GO TO SFI SYSTEM**

A ► **END (KEY WAS DEFECTIVE)**



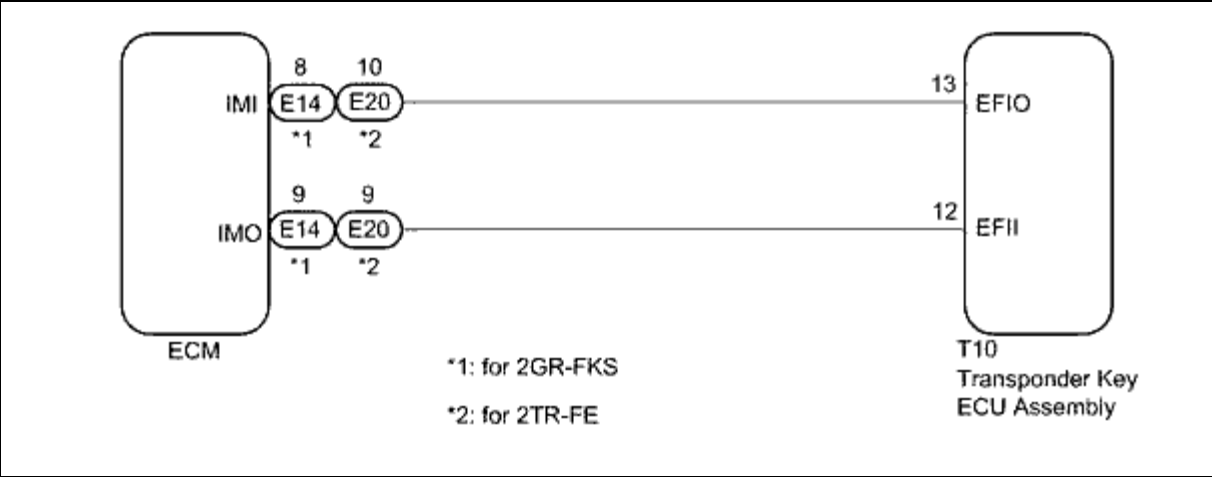
Last Modified: 11-13-2015	6.6 J	Doc ID: RM000005Q4J005X
Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): Engine does not Start but Initial Combustion Occurs; 2016 MY Tacoma [08/2015 -]		

Engine does not Start but Initial Combustion Occurs

DESCRIPTION

If the key ID codes of the key and transponder key ECU assembly match, the engine immobiliser system is unset and the engine start permission signal is sent to the ECM. When the ID codes of the transponder key ECU assembly and ECM match, the engine starts.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

If the transponder key ECU assembly or ECM is replaced, refer to Registration [INFO](#) .

PROCEDURE

1.	CLEAR DTC
----	-----------

(a) Clear the DTCs [INFO](#) .

NEXT



2.	CHECK FOR DTC
----	---------------

(a) Check for DTCs INFO .

Result

RESULT	PROCEED TO
DTCs are not output	A
DTCs are output	B

B  **GO TO DIAGNOSTIC TROUBLE CODE CHART**

A



3.	READ VALUE USING TECHSTREAM (IMMOBILISER FUEL CUT)
-----------	---

(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Turn the Techstream on.

(d) Enter the following menus: Powertrain / Engine and ECT or Engine / Data List.

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

Engine and ECT (for 2TR-FE)

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Immobiliser Fuel Cut	Status of immobiliser fuel cut / ON or OFF	-	-

Engine (for 2GR-FKS)

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Immobiliser Fuel Cut	Status of immobiliser fuel cut / ON or OFF	-	-

OK:

OFF is displayed after the ignition switch is turned ON.

Result

RESULT	PROCEED TO
NG	A
OK (for 2TR-FE)	B
OK (for 2GR-FKS)	C

B  **GO TO SFI SYSTEM**

C ► **GO TO SFI SYSTEM**

A



4.	CHECK WHETHER ENGINE STARTS
-----------	------------------------------------

(a) Using a registered key, turn the ignition switch to ON.

(b) Check that the engine starts 5 seconds after the ignition switch was turned to ON.

OK:

Engine starts normally.

Result

RESULT	PROCEED TO
NG (for 2TR-FE)	A
NG (for 2GR-FKS)	B
OK	C

B ► **GO TO STEP 15**

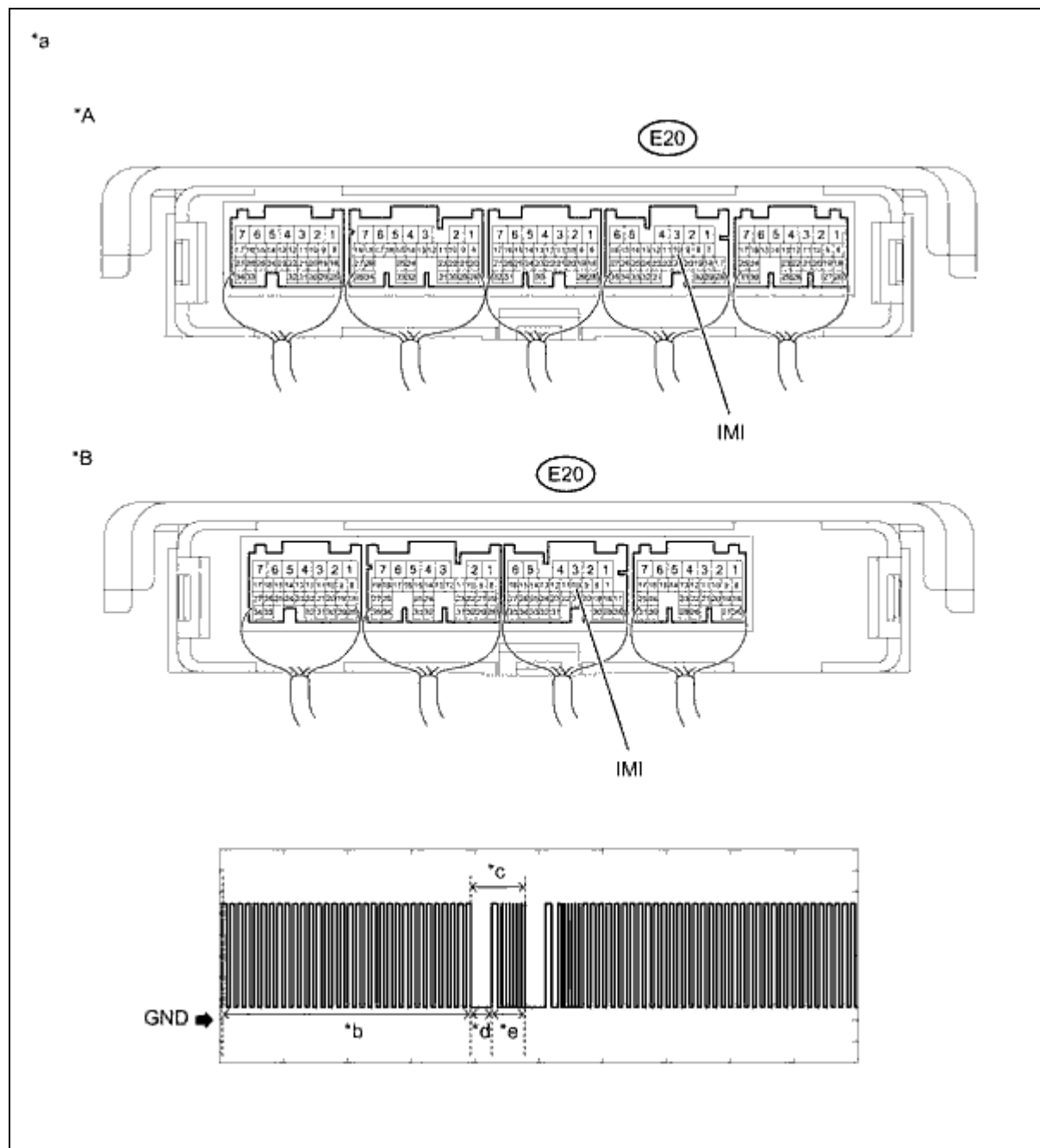
C ► **USE SIMULATION METHOD TO CHECK**

A



5.	CHECK ECM (TERMINAL IMI)
-----------	---------------------------------

(a) Using an oscilloscope, check the waveform.



Text in Illustration

*A	for Automatic Transmission	*B	for Manual Transmission
*a	Component with harness connected (ECM)	*b	Waveform 1
*c	Waveform 2	*d	Approximately 160 ms
*e	Approximately 270 ms	-	-

Measurement Condition:

TESTER CONNECTION	CONDITION	TOOL SETTING	SPECIFIED CONDITION
E20-10 (IMI) -	Within 3 seconds of starter operation and initial combustion, or	2 V/DIV.,	Pulse

TESTER CONNECTION	CONDITION	TOOL SETTING	SPECIFIED CONDITION
Body ground	within 3 seconds of ignition switch first being turned to ON after cable disconnected and reconnected to negative (-) battery terminal	500 ms./DIV.	generation (See waveform)

Result

RESULT	PROCEED TO
Normal waveform	A
Waveform 1 not output, or has abnormal wavelength or shape	B
Waveform 2 not output, or has abnormal wavelength or shape	C

B ► **GO TO STEP 12**

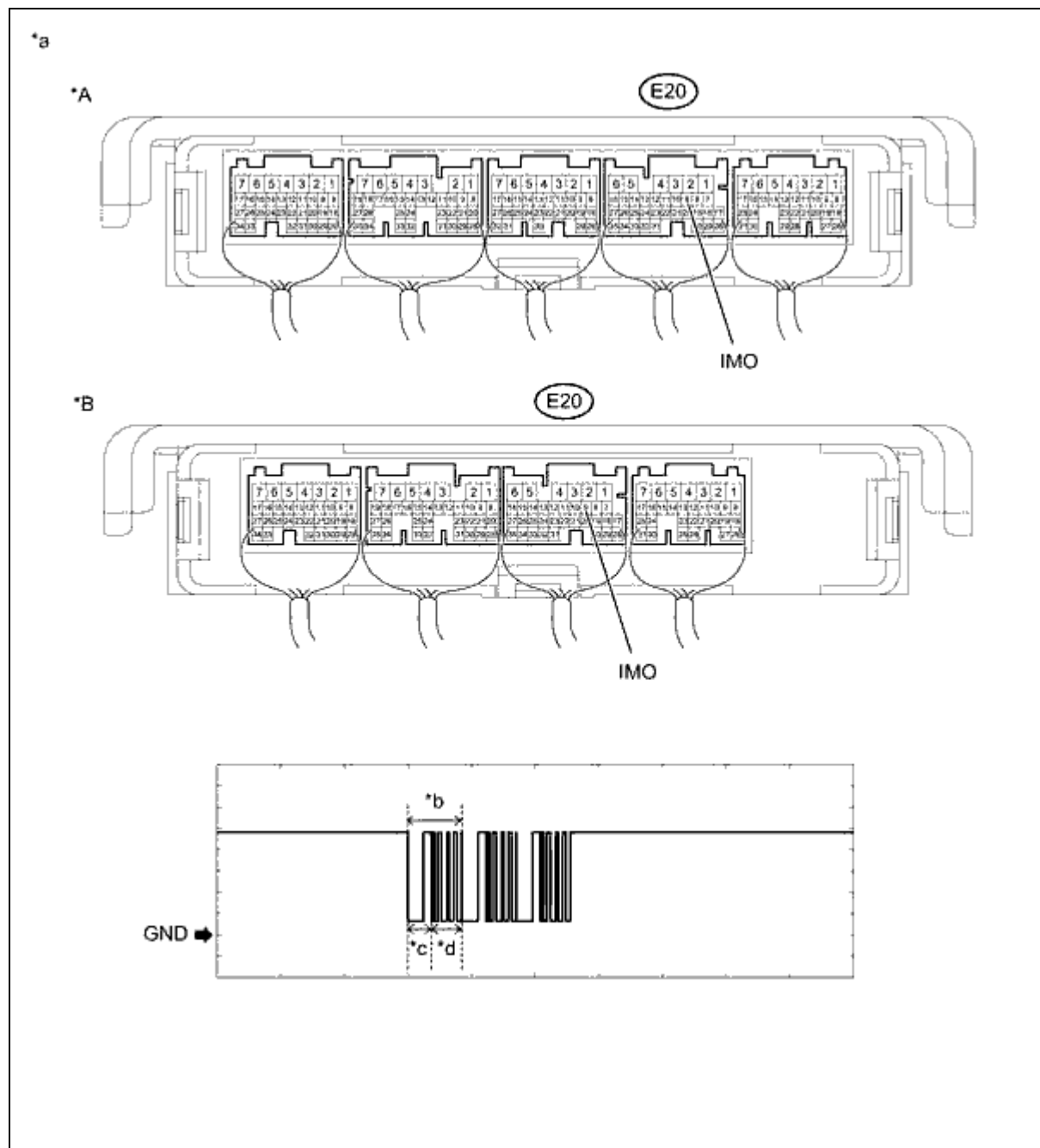
C ► **GO TO STEP 13**

A



6.	CHECK ECM (TERMINAL IMO)
-----------	---------------------------------

(a) Using an oscilloscope, check the waveform.



Text in Illustration

*A	for Automatic Transmission	*B	for Manual Transmission
*a	Component with harness connected (ECM)	*b	Waveform
*c	Approximately 160 ms	*d	Approximately 270 ms

Measurement Condition:

TESTER CONNECTION	CONDITION	TOOL SETTING	SPECIFIED CONDITION
E20-9 (IMO) - Body ground	Within 3 seconds of starter operation and initial combustion, or within 3 seconds of ignition switch first being turned to ON	2 V/DIV., 500	Pulse generation

TESTER CONNECTION	CONDITION	TOOL SETTING	SPECIFIED CONDITION
	after cable disconnected and reconnected to negative (-) battery terminal	ms./DIV.	(See waveform)

Result

RESULT	PROCEED TO
Normal waveform	A
Waveform not output, or has abnormal wavelength or shape	B

B ► **GO TO STEP 9**

A



7.	REGISTER ECU COMMUNICATION ID
-----------	--------------------------------------

(a) Register the communication ID between the transponder key ECU assembly and ECM  .

NEXT



8.	CHECK WHETHER ENGINE STARTS
-----------	------------------------------------

(a) Using a registered key, turn the ignition switch to ON.

(b) Check that the engine starts 5 seconds after the ignition switch was turned to ON.

OK:

Engine starts normally.

NG ► **GO TO STEP 13**

OK ► **END (REGISTERED COMMUNICATION ID WAS DEFECTIVE)**

9.	REPLACE ECM
-----------	--------------------

(a) Temporarily replace the ECM with a new one  .

NEXT



10.	REGISTER ECU COMMUNICATION ID
-----	-------------------------------

(a) Register the ECU communication ID  .

NEXT



11.	CHECK WHETHER ENGINE STARTS
-----	-----------------------------

- (a) Using a registered key, turn the ignition switch to ON.
- (b) Check that the engine starts 5 seconds after the ignition switch was turned to ON.

OK:

Engine starts normally.

NG  **GO TO SFI SYSTEM**

OK  **END (ECM WAS DEFECTIVE)**

12.	CHECK HARNESS AND CONNECTOR (TRANSPONDER KEY ECU ASSEMBLY - ECM)
-----	--

- (a) Disconnect the T10 transponder key ECU assembly connector.
- (b) Disconnect the E20 ECM connector.
- (c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
T10-13 (EFIO) - E20-10 (IMI)	Always	Below 1 Ω
T10-13 (EFIO) or E20-10 (IMI) - Body ground	Always	10 k Ω or higher

NG  **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK



13.	REPLACE TRANSPONDER KEY ECU ASSEMBLY
------------	---

(a) Replace the transponder key ECU assembly with a new one  .

NOTICE:

Key ID code registration is necessary when replacing the transponder key ECU assembly, refer to Registration  .

NEXT



14.	CHECK WHETHER ENGINE STARTS
------------	------------------------------------

(a) Using a registered key, turn the ignition switch to ON.

(b) Check that the engine starts 5 seconds after the ignition switch was turned to ON.

OK:

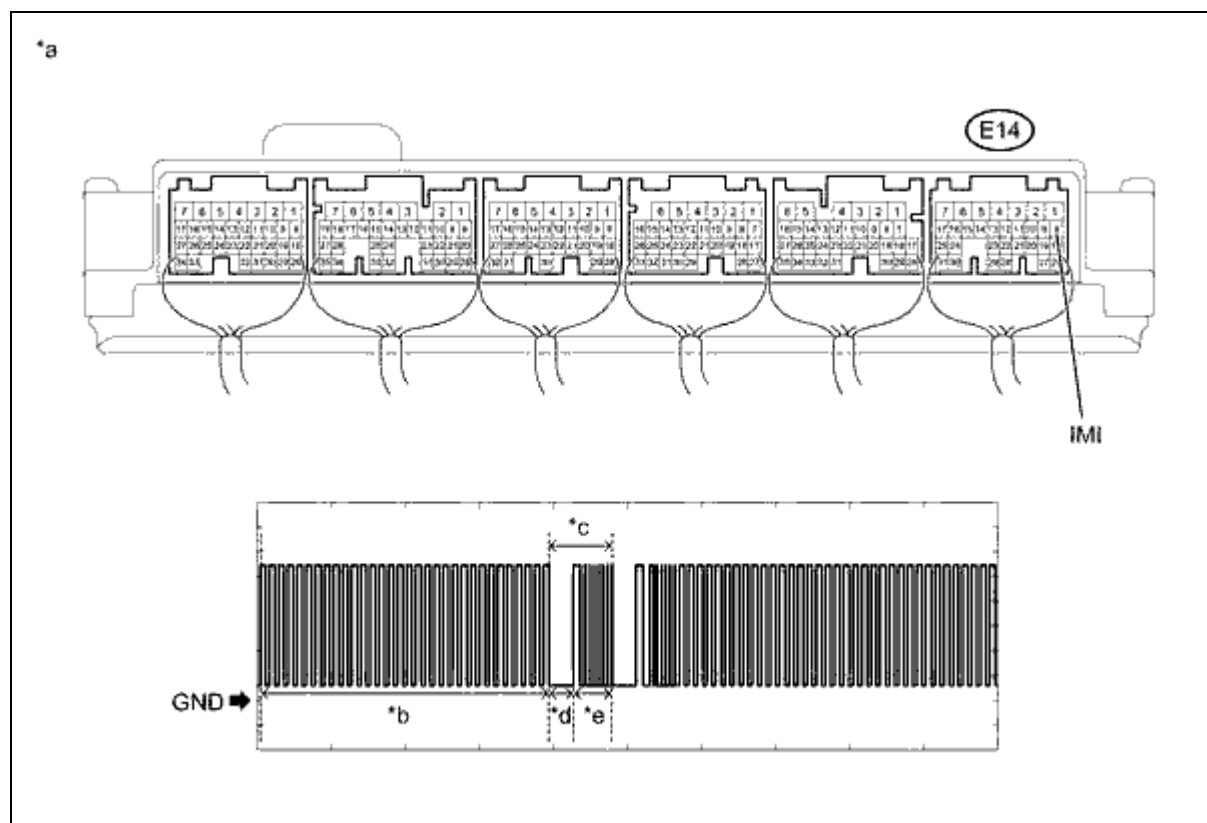
Engine starts normally.

NG  **GO TO SFI SYSTEM**

OK  **END (TRANSPONDER KEY ECU ASSEMBLY WAS DEFECTIVE)**

15.	CHECK ECM (TERMINAL IMI)
------------	---------------------------------

(a) Using an oscilloscope, check the waveform.



Text in Illustration

*a	Component with harness connected (ECM)	*b	Waveform 1
*c	Waveform 2	*d	Approximately 160 ms
*e	Approximately 270 ms	-	-

Measurement Condition:

TESTER CONNECTION	CONDITION	TOOL SETTING	SPECIFIED CONDITION
E14-8 (IMI) - Body ground	Within 3 seconds of starter operation and initial combustion, or within 3 seconds of ignition switch first being turned to ON after cable disconnected and reconnected to negative (-) battery terminal	2 V/DIV., 500 ms./DIV.	Pulse generation (See waveform)

Result

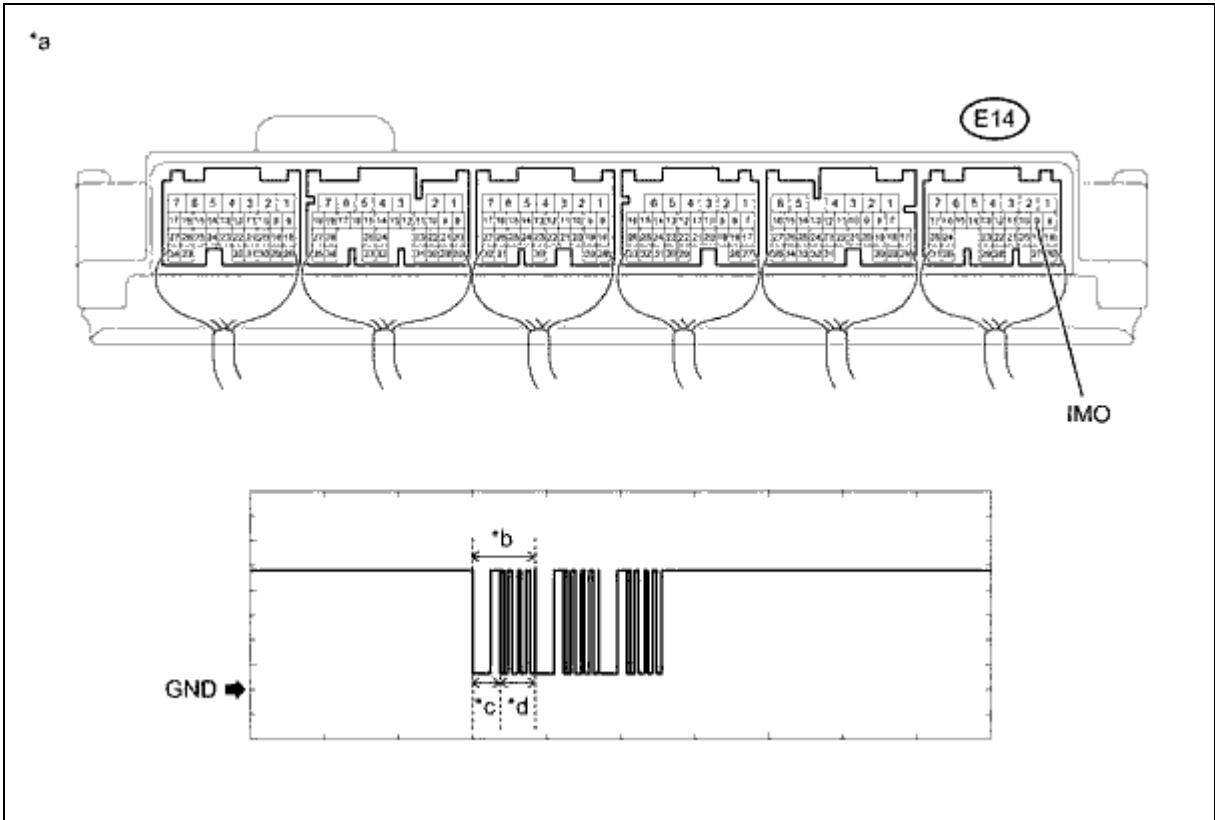
RESULT	PROCEED TO
Normal waveform	A
Waveform 1 not output, or has abnormal wavelength or shape	B
Waveform 2 not output, or has abnormal wavelength or shape	C

A



16. CHECK ECM (TERMINAL IMO)

(a) Using an oscilloscope, check the waveform.



Text in Illustration

*a	Component with harness connected (ECM)	*b	Waveform
*c	Approximately 160 ms	*d	Approximately 270 ms

Measurement Condition:

TESTER CONNECTION	CONDITION	TOOL SETTING	SPECIFIED CONDITION
E14-9 (IMO) - Body ground	Within 3 seconds of starter operation and initial combustion, or within 3 seconds of ignition switch first being turned to ON after cable disconnected and reconnected to negative (-) battery terminal	2 V/DIV., 500 ms./DIV.	Pulse generation (See waveform)

Result

RESULT	PROCEED TO
Normal waveform	A
Waveform not output, or has abnormal wavelength or shape	B

B ► GO TO STEP 19

A



17.	REGISTER ECU COMMUNICATION ID
------------	--------------------------------------

(a) Register the communication ID between the transponder key ECU assembly and ECM  .

NEXT



18.	CHECK WHETHER ENGINE STARTS
------------	------------------------------------

(a) Using a registered key, turn the ignition switch to ON.

(b) Check that the engine starts 5 seconds after the ignition switch was turned to ON.

OK:

Engine starts normally.

NG ► GO TO STEP 23

OK ► END (REGISTERED COMMUNICATION ID WAS DEFECTIVE)

19.	REPLACE ECM
------------	--------------------

(a) Temporarily replace the ECM with a new one  .

NEXT



20. REGISTER ECU COMMUNICATION ID

(a) Register the ECU communication ID  .

NEXT



21. CHECK WHETHER ENGINE STARTS

- (a) Using a registered key, turn the ignition switch to ON.
- (b) Check that the engine starts 5 seconds after the ignition switch was turned to ON.

OK:

Engine starts normally.

NG  **GO TO SFI SYSTEM**

OK  **END (ECM WAS DEFECTIVE)**

22. CHECK HARNESS AND CONNECTOR (TRANSPONDER KEY ECU ASSEMBLY - ECM)

- (a) Disconnect the T10 transponder key ECU assembly connector.
- (b) Disconnect the E14 ECM connector.
- (c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
T10-13 (EFIO) - E14-10 (IMI)	Always	Below 1 Ω
T10-13 (EFIO) or E14-10 (IMI) - Body ground	Always	10 k Ω or higher

NG  **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK



23. REPLACE TRANSPONDER KEY ECU ASSEMBLY

(a) Replace the transponder key ECU assembly with a new one  .

NOTICE:

Key ID code registration is necessary when replacing the transponder key ECU assembly, refer to Registration  .

NEXT



24.	CHECK WHETHER ENGINE STARTS
------------	------------------------------------

(a) Using a registered key, turn the ignition switch to ON.

(b) Check that the engine starts 5 seconds after the ignition switch was turned to ON.

OK:

Engine starts normally.

NG  **GO TO SFI SYSTEM**

OK  **END (TRANSPONDER KEY ECU ASSEMBLY WAS DEFECTIVE)**



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Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): HOW TO PROCEED WITH TROUBLESHOOTING; 2016 MY Tacoma [08/2015 -]		

HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

Use the following procedure to troubleshoot the engine immobiliser system.

*: Use the Techstream.

1.	VEHICLE BROUGHT TO WORKSHOP
-----------	------------------------------------

NEXT



2.	CUSTOMER PROBLEM ANALYSIS
-----------	----------------------------------

HINT:

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

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

NEXT



3.	INSPECT BATTERY VOLTAGE
-----------	--------------------------------

(a) Measure the battery voltage.

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 DTCs (ENGINE IMMOBILISER SYSTEM)*
----	---

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

(b) Clear the DTCs  .

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

Result

RESULT	PROCEED TO
No DTCs are output	A
Engine immobiliser system DTC is output	B

B  **GO TO DIAGNOSTIC TROUBLE CODE CHART**

A



6.	CHECK FOR DTCs (SFI SYSTEM)*
----	------------------------------

(a) Clear the DTCs  .

(b) Recheck for DTCs.

HINT:

The DTCs for the engine immobiliser system are specified below. If other DTCs are output, check the DTC chart for the SFI system.

Result

--

RESULT	PROCEED TO
No DTCs are output	A
Engine immobiliser system DTC is output (DTC B2799, B279A or B279C)	B
SFI system DTC is output (except DTC B2799, B279A and B279C) (for 2TR-FE)	C
SFI system DTC is output (except DTC B279986, B279A12 and B279C95) (for 2GR-FKS)	D

B ► **GO TO DIAGNOSTIC TROUBLE CODE CHART**

C ► **GO TO SFI SYSTEM**

D ► **GO TO SFI SYSTEM**

A
▼

7.	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

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Key SW	Unlock warning switch signal/ON or OFF	ON: Key in ignition key cylinder OFF: No key in ignition key cylinder	-

OK:

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

NG ► **GO TO DTC B2780**

OK
▼

8.	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 10

A



9.	OVERALL ANALYSIS AND TROUBLESHOOTING*
-----------	--

(a) Data List / Active Test [INFO](#)

(b) Terminals of ECU [INFO](#)

NEXT



10.	REPAIR OR REPLACE
------------	--------------------------

NEXT



11.	CONFIRMATION TEST
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NEXT  **END**



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Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): Key Cannot be Registered; 2016 MY Tacoma [08/2015 -]		

Key Cannot be Registered

DESCRIPTION

A maximum of 5 master key ID codes can be registered.

WIRING DIAGRAM

Refer to "B2780" [INFO](#)

INSPECTION PROCEDURE

NOTICE:

If the transponder key ECU assembly is replaced, refer to Registration [INFO](#) .

PROCEDURE

1.	CHECK REGISTRATION MODE
-----------	--------------------------------

(a) Check that the system enters registration mode [INFO](#) .

OK:

System enters registration mode.

NG  **GO TO STEP 5**

OK



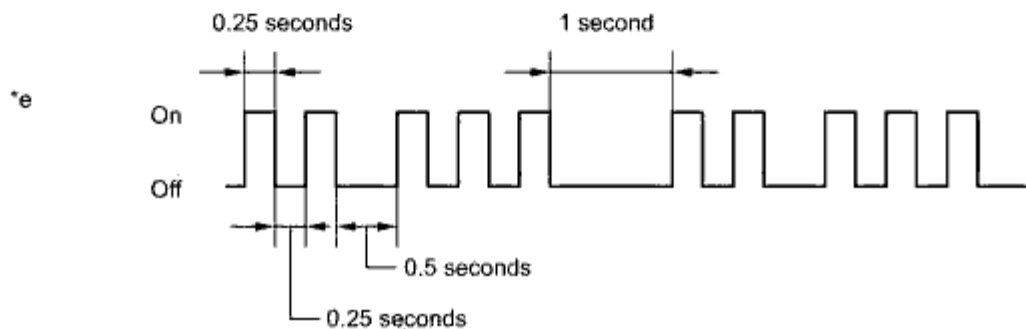
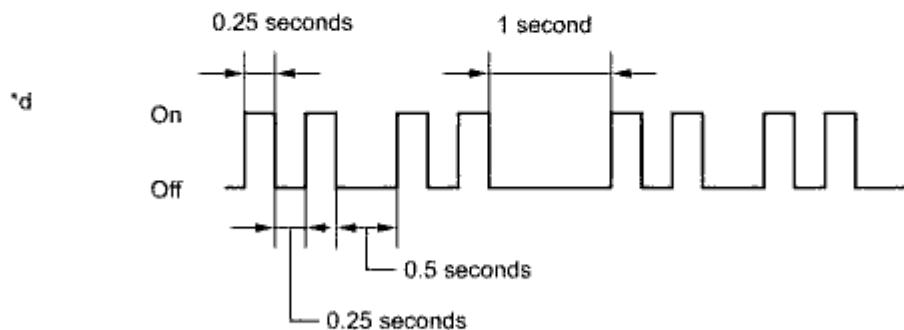
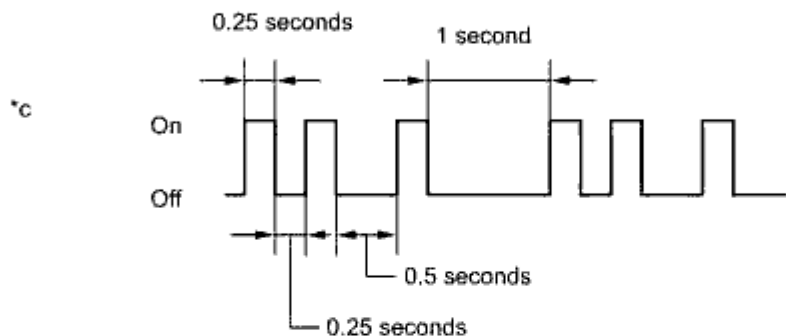
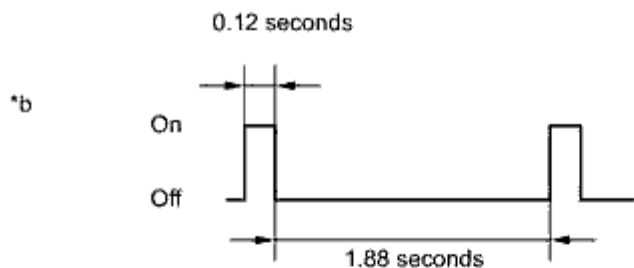
2.	CHECK SECURITY INDICATOR LIGHT OPERATION
-----------	---

(a) In registration mode, insert the key into the ignition key cylinder and check the security indicator light.

HINT:

If the new key ID code registration fails, code 2-1 will be output through the security 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 ID codes exceeds the maximum limit, code 2-3 will be output through the security indicator light. The output details are shown in the following illustration.

*a



N

*a	Security Indicator Light	*b	Normal (Immobiliser system is operating normally)
*c	Code 2-1	*d	Code 2-2
*e	Code 2-3	-	-

Result

RESULT	PROCEED TO
--------	------------

RESULT	PROCEED TO
Code 2-2 is output	A
Code 2-1 or Code 2-3 is output	B

B ► **GO TO STEP 3**

A ► **END (REGISTERED KEY WAS USED)**

3.	READ VALUE USING TECHSTREAM (TRANSPONDER S-CODE, TRANSPONDER M-CODE)
-----------	---

- (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

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Transponder S-code	Number of registered sub- keys/min. 0, max. 15	Number of registered sub-keys	-
Transponder M-code	Number of registered master keys/min. 0, max. 15	Number of registered master keys	-

Result

RESULT	PROCEED TO
Values are other than above	A
0 is displayed for "Transponder M-code" and 3 is displayed for "Transponder S-code"	B
5 is displayed for "Transponder M-code" and 3 is displayed for "Transponder S-code"	C

B ► **KEY REGISTRATION (MASTER KEY)**

C ► **MAXIMUM NUMBER OF KEYS ALREADY REGISTERED**

A
▼

4. KEY REGISTRATION

(a) Refer to the table below to determine if additional Keys can be registered.

NUMBER OF DOOR CONTROL TRANSMITTER ASSEMBLIES REGISTERED MASTER	PROCEED TO
0	New key ID code registration
1 to 7	Additional key ID code registration

(b) Check if an additional key can be registered.

OK:

Additional key can be registered.

NG ► REPLACE TRANSPONDER KEY ECU ASSEMBLY

OK ► END (KEY MALFUNCTION)

5. INSPECT UNLOCK WARNING SWITCH ASSEMBLY

(a) Remove the unlock warning switch assembly  .

(b) Inspection the unlock warning switch assembly  .

NG ► REPLACE UNLOCK WARNING SWITCH ASSEMBLY

OK



6. CHECK HARNESS AND CONNECTOR (TRANSPONDER KEY ECU ASSEMBLY - UNLOCK WARNING SWITCH ASSEMBLY - BODY GROUND)

(a) Disconnect the T10 transponder key ECU assembly connector.

(b) Disconnect the U1 unlock warning switch assembly connector.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
T10-3 (KSW) - U1-1	Always	Below 1 Ω
T10-3 (KSW) or U1-1 - Body ground	Always	10 k Ω or higher

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
U1-2 - Body ground	Always	Below 1 Ω

NG ► REPAIR OR REPLACE HARNESS OR CONNECTOR

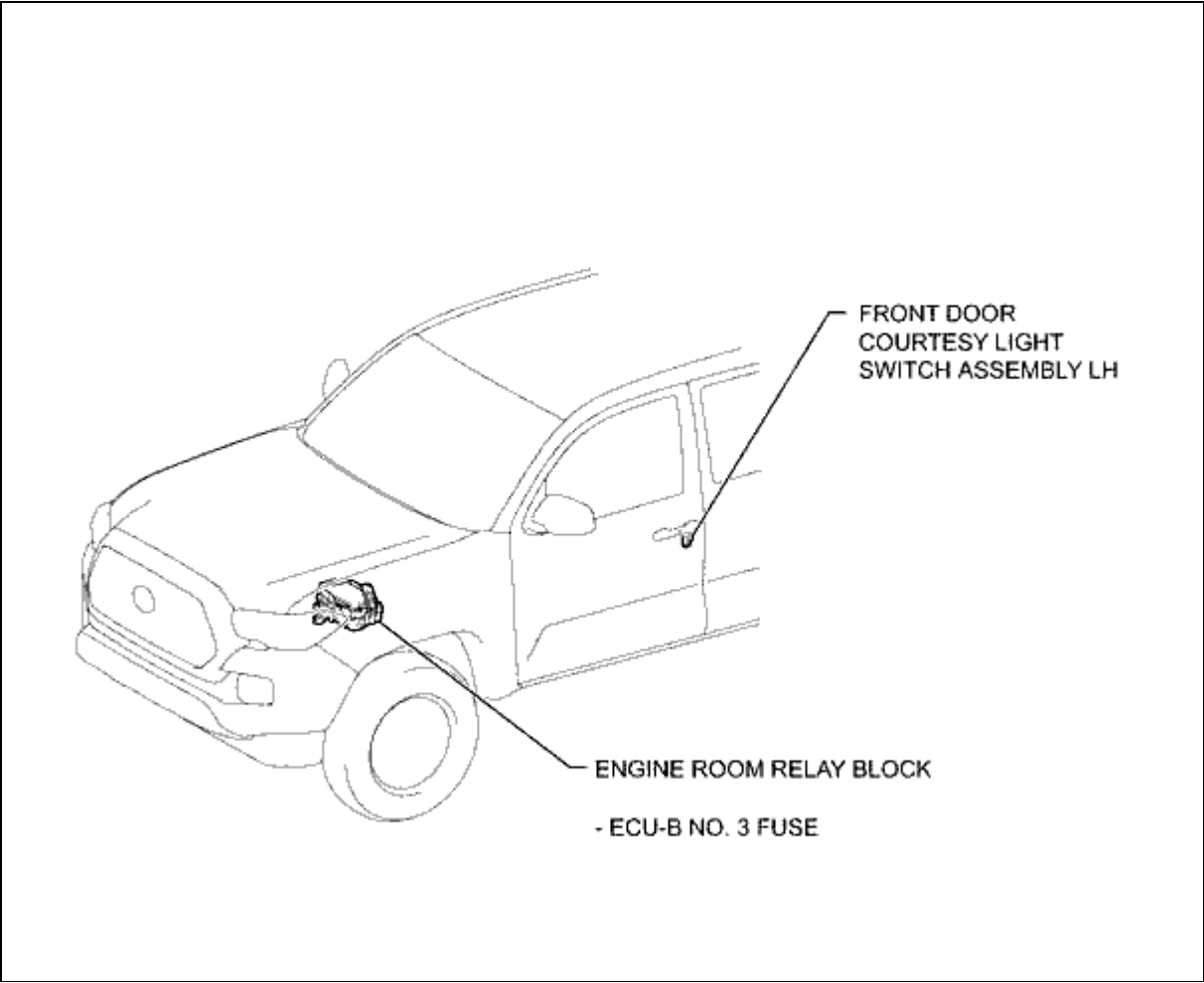
OK ► REPLACE TRANSPONDER KEY ECU ASSEMBLY



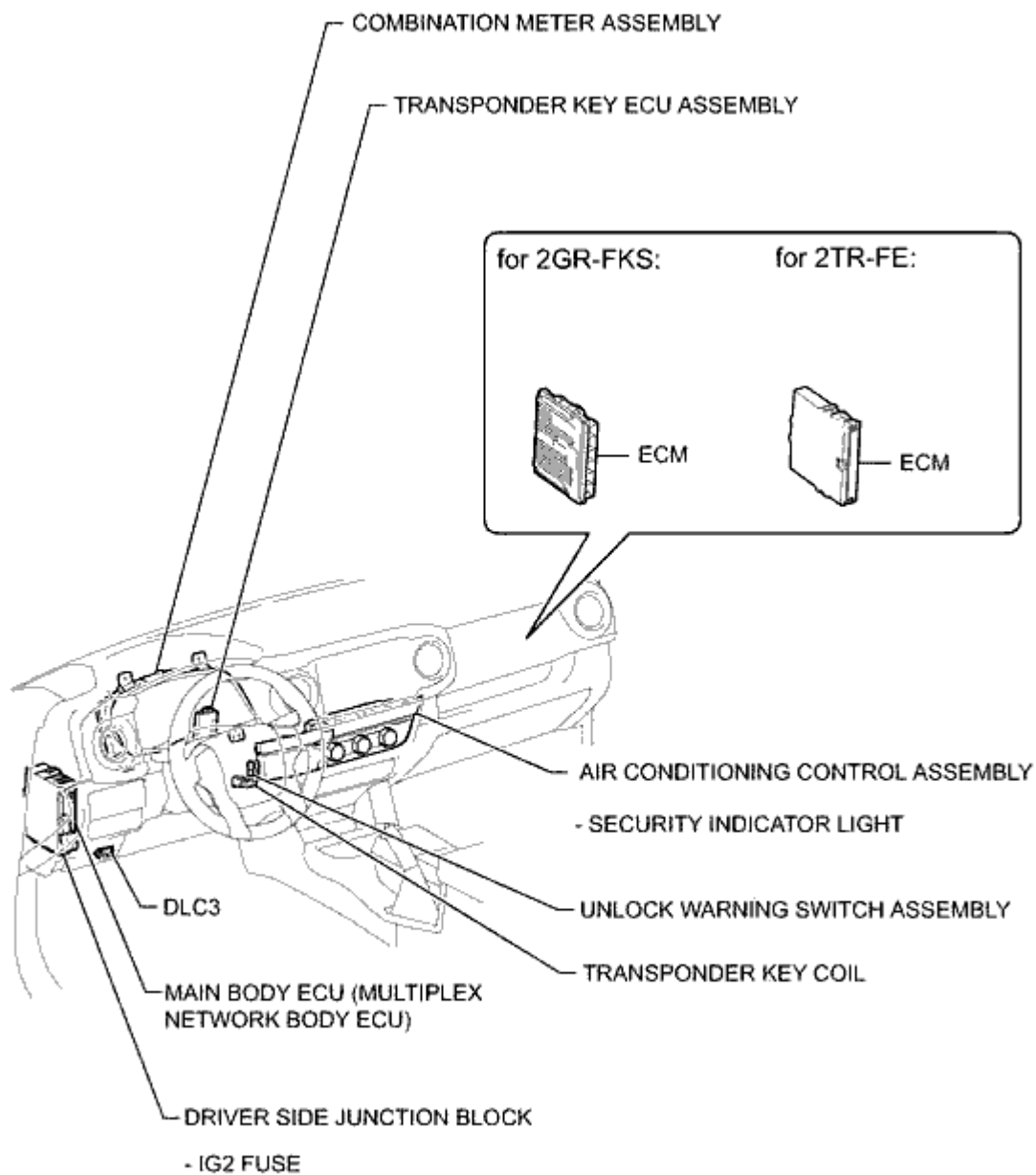
Last Modified: 11-13-2015	6.6 R	Doc ID: RM00000289L03AX
Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): PARTS LOCATION; 2016 MY Tacoma [08/2015 -]		

PARTS LOCATION

ILLUSTRATION



ILLUSTRATION



Last Modified: 11-13-2015	6.6 L	Doc ID: RM000001R4A04AX
Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): PRECAUTION; 2016 MY Tacoma [08/2015 -]		

PRECAUTION

1. PRECAUTIONS WHEN USING TECHSTREAM

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

Connect the Techstream to the DLC3 while the ignition 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 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.

3. PRECAUTION FOR REGISTRATION

- (a) If replacing any of the following parts, refer to the registration procedures  .

NOTICE:

Any keys or ECUs for which registration has been performed cannot be reused.

- (1) Key
- (2) Transponder key ECU assembly
- (3) ECM



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Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): PROBLEM SYMPTOMS TABLE; 2016 MY Tacoma [08/2015 -]		

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 (w/o Smart Key System)

SYMPTOM	SUSPECTED AREA	SEE PAGE
Engine does not start because no initial combustion occurs	Proceed to "Engine does not Start because No Initial Combustion"	INFO
Engine does not start but initial combustion occurs	Proceed to "Engine does not Start but Initial Combustion Occurs"	INFO
Security indicator light does not blink	Proceed to "Security Indicator Light Does not Blink"	INFO
Key Cannot be registered	Proceed to "Key Cannot be Registered"	INFO



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Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): REGISTRATION; 2016 MY Tacoma [08/2015 -]		

REGISTRATION

1. DESCRIPTION OF CODE REGISTRATION

(a) w/ Wireless Door Lock Control System:

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 (w/o Smart Key System) [INFO](#) .

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

HINT:

- The following procedures require the use of the Techstream:
 - New key code registration
 - Additional key code registration
 - Key code erasure
- A maximum of 5 key codes can be registered.

CUSTOMER REQUEST/CONDITION	REGISTRATION PROCEDURE CONDITION	PROCEDURE	REFER TO
Registering additional key	Customer must bring at least 1 key.	1. Register additional keys as necessary (additional key code registration).	PROCEDURE "B"
- Replacing a key - Making a lost key unusable HINT: After key code erasure, any remaining keys that are not registered at this time cannot be used. Therefore, after key code erasure, register all remaining keys.	Customer must bring at least 1 key.	1. Using remaining key, clear all registered keys except one (key code erasure).	PROCEDURE "C"
		2. Register additional keys as necessary (additional key code registration).	PROCEDURE "B"
All keys are lost	-	1. Reset all keys (all keys ID erasure (key code reset)).	PROCEDURE "D"
		2. Register all keys new key ID registration.	PROCEDURE "A"

3. PART REPLACEMENT AND KEY REGISTRATION PROCEDURES

(a) The following table shows ECU replacement and key registration procedures for cases in which an ECU has been determined to be malfunctioning during troubleshooting of the engine immobiliser system.

HINT:

- The following procedures require the use of the Techstream:
 - New key code registration
 - Additional key code registration
 - Key code erasure
- A maximum of 5 key codes can be registered.

MALFUNCTIONING ECU	PROCEDURE	REFER TO
Transponder key ECU assembly	1. Replace transponder key ECU assembly.	
	2. Register all keys.	PROCEDURE "A"
	3. Register ECU communication ID.	PROCEDURE "E"
ECM	1. Replace ECM. (for 2TR-FE)	
	2. Replace ECM. (for 2GR-FKS)	
	3. Register ECU communication ID.	PROCEDURE "F"
Transponder key ECU assembly and ECM	1. Replace transponder key ECU assembly.	
	2. Replace ECM. (for 2TR-FE)	
	3. Replace ECM. (for 2GR-FKS)	
	4. Register all keys.	PROCEDURE "A"
	5. Register ECU communication ID.	PROCEDURE "F"

4. KEY REGISTRATION (PROCEDURE "A")

(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 2 key codes for 2 master keys can be registered. The master keys 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)

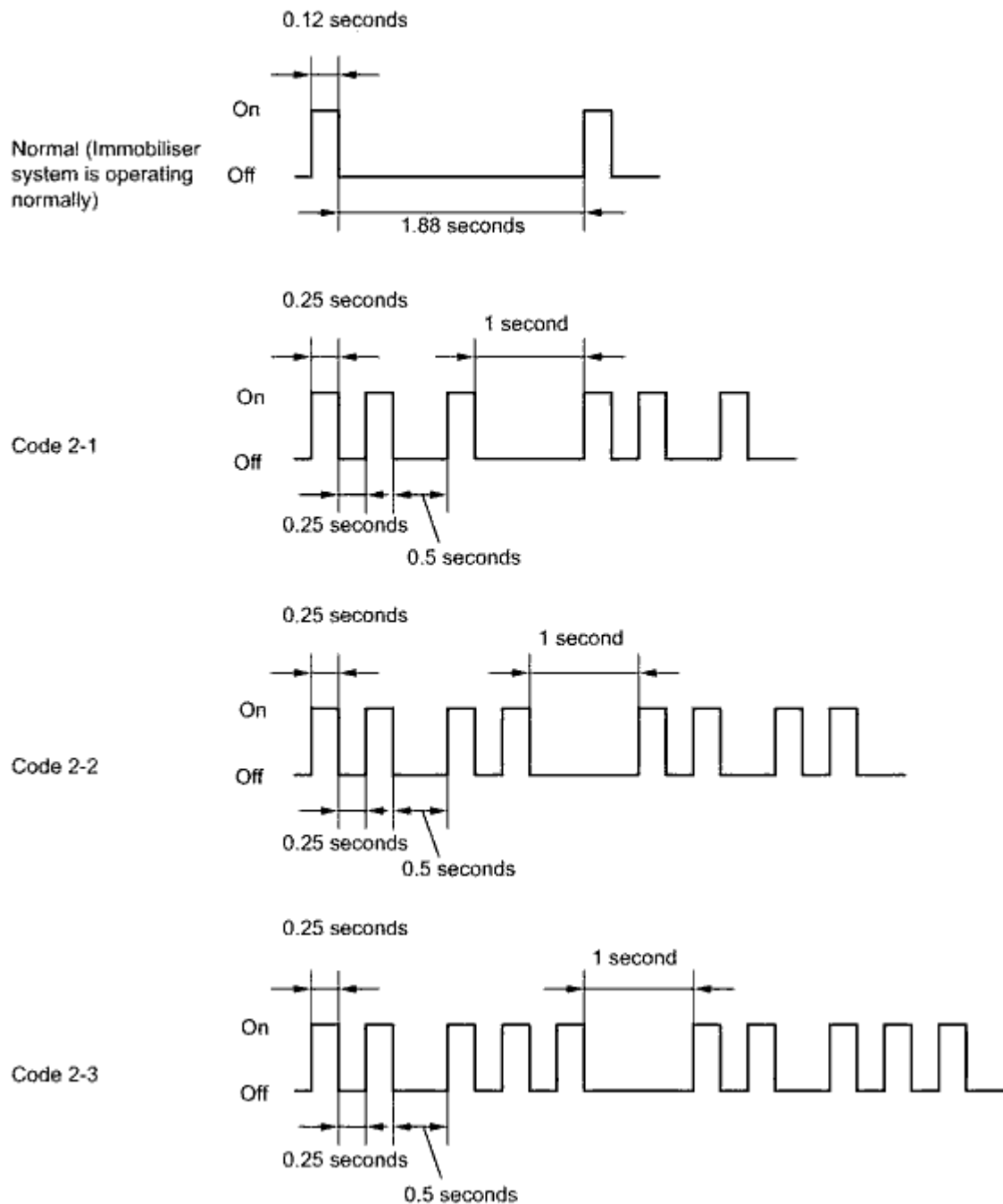
PROCEDURE	SECURITY INDICATOR LIGHT CONDITION
1. Start	Blinking HINT: Until first key is inserted
2. Insert the master key into the ignition key cylinder.	On
3. Techstream operation Enter the following menus: Body Electrical / Immobiliser / Utility / Key Registration HINT: After completing the above operation, proceed to the next step in	Off for 1 second and then on

PROCEDURE	SECURITY INDICATOR LIGHT CONDITION
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 for 0.5 seconds and then off
6. Remove the key.	Blinking
7. End	

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.

Security Indicator Light:



N

(b) End automatic key code registration mode:

Automatic key code registration mode can be forced to end when at least 1 key code (immobiliser code) has been registered as the master key.

HINT:

Follow the instruction on the Techstream screen to end new key code registration mode.

5. KEY REGISTRATION (PROCEDURE "B")

(a) Additional registration (Procedure "B"):

HINT:

- A maximum of 5 master 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 is possible with the new master key 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 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 previous registered master key into the ignition key cylinder and turn the ignition switch to ON.	-	Off
3. Techstream operation Enter the following menus: Body Electrical / Immobiliser / Utility / Key Registration HINT: After completing the above operation, proceed to the next step in accordance with the prompts on the Techstream screen.	Within 120 seconds	On
4. Remove the master key.	Within 20 seconds HINT: After the Techstream instruction	On
5. Insert the key to be registered in the ignition key cylinder.	Within 10 seconds	Blinking
6. Wait for 60 seconds after the key is registered. HINT: The security indicator light goes off.	-	Off
7. Remove the key.	-	Blinking
8. End		

HINT:

- A brief outline of a key code registration procedure 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 a previous 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".

6. KEY REGISTRATION (PROCEDURE "C")

(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 previous registered master key in the ignition key cylinder and turn the ignition switch to ON.	-	Off
3. Techstream operation Enter the following menus: Body Electrical / Immobiliser / Utility / Transponder Code Erasure HINT: After completing the above operation, proceed to the next step in accordance with the prompts on the Techstream screen.	Within 120 seconds	On for 1 second and then off
4. Remove the master key.	Within 10 seconds HINT: After the Techstream instruction	Blinking
5. End		

HINT:

- A brief outline of a key code registration procedure 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.

7. KEY REGISTRATION (PROCEDURE "D")

(a) All key code erasure (Procedure "D"):

HINT:

- To perform this procedure, at least 1 key should be registered to the transponder key ECU assembly.

- This procedure can be performed using either a registered or unregistered key.

All Key Code Erasure

PROCEDURE	TIME TO COMPLETE OPERATION	SECURITY INDICATOR LIGHT CONDITION
1. Start	-	Blinking
2. Insert the previous registered master key or unregistered key into ignition key cylinder and turn the ignition switch to ON.	Within 10 min.	On or off
3. Using TIS, confirm that user and vehicle match.		
4. Techstream operation Enter the following menus: Body Electrical / Immobiliser / Utility / Immobiliser Code Reset HINT: After completing the above operation, proceed to the next step in accordance with the prompts on the Techstream screen.	Within 15 min.	On for 1 second and then off
5. Completion of erasure of all key codes is displayed.	Within 10 seconds HINT: After the Techstream instruction	On
6. End		

HINT:

- A brief outline of a key code registration procedure 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.

8. KEY REGISTRATION (PROCEDURE "E")

(a) ECU communication ID registration (Procedure "E"):

NOTICE:

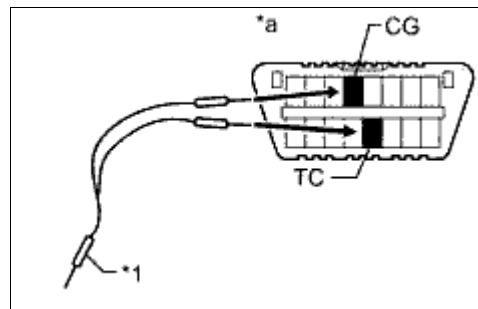
- When the transponder key ECU assembly is replaced, the ECU communication ID of the ECM must be registered into the transponder key ECU assembly to match their ECU communication IDs.
- The engine cannot be started unless the ECU communication IDs match.
- Do not turn the ignition switch from ON to off 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 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 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

Text in Illustration

*1	SST
*a	DLC3



(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.

9. KEY REGISTRATION (PROCEDURE "F")

(a) ECU communication ID registration (Procedure "F"):

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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Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): SYSTEM DESCRIPTION; 2016 MY Tacoma [08/2015 -]		

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 assembly that stores the key ID codes of authorized ignition keys. If an attempt is made to start the engine using an unauthorized key, the transponder key ECU assembly 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 ECU assembly	- When a key is inserted into the ignition key cylinder, the transponder key ECU assembly checks if the key ID code received from the transponder key coil and registered key ID code match. - When the engine is started, the transponder key ECU assembly checks if the engine ID codes stored in the ECM and transponder key ECU assembly match.
Transponder key coil	When a key is inserted into the ignition key cylinder, the transponder key amplifier receives the key ID code from the transponder chip in the key grip and outputs it to the transponder key ECU assembly.
ECM	The ECM receives key ID code verification results from the transponder key ECU assembly. The ECM also verifies the ECUs. Then judgment of whether to immobilise the engine is made.
Unlock warning switch assembly	The unlock warning switch assembly detects if the key is in the ignition key cylinder and outputs the result to the transponder key ECU assembly.
Security indicator light (air conditioning control assembly)	Depending on the operation of the transponder key ECU assembly, the security indicator light comes on or starts blinking.

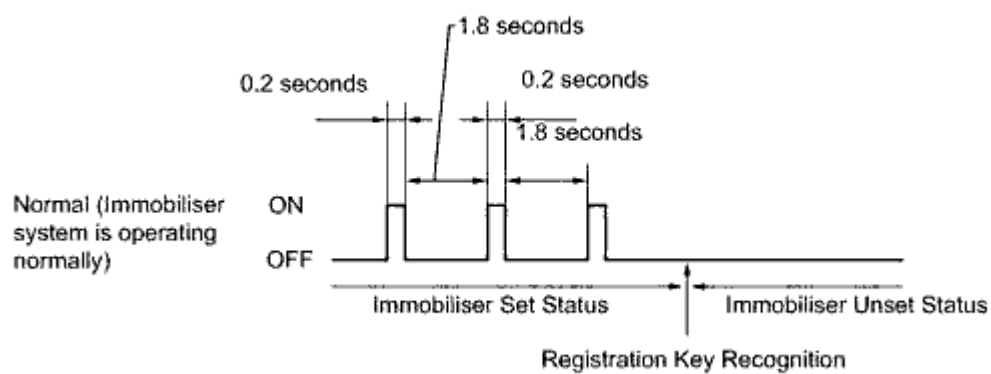
3. SYSTEM FUNCTION

- (a) When the transponder key ECU assembly detects that the unlock warning switch assembly is on, the transponder key ECU assembly applies current to the transponder key coil and produces a magnetic field around the antenna coil. A transponder chip in the key grip outputs a key ID code signal using electromotive force generated by the magnetic field. The transponder key coil receives the signal and sends it to the transponder key ECU assembly. The transponder key ECU assembly checks if the key ID code received from the transponder key coil matches the registered key ID code.

When the engine is started, the ECM communicates with the transponder key ECU assembly and checks the key verification result. In addition, the ECM checks if the engine ID codes stored in the transponder key ECU assembly and ECM match. If they do not match, the ECM prohibits engine start.

- (b) The security indicator light blinking pattern is as shown below (when changing from the immobiliser set status to the unset status):

Theft Warning Indicator Light:

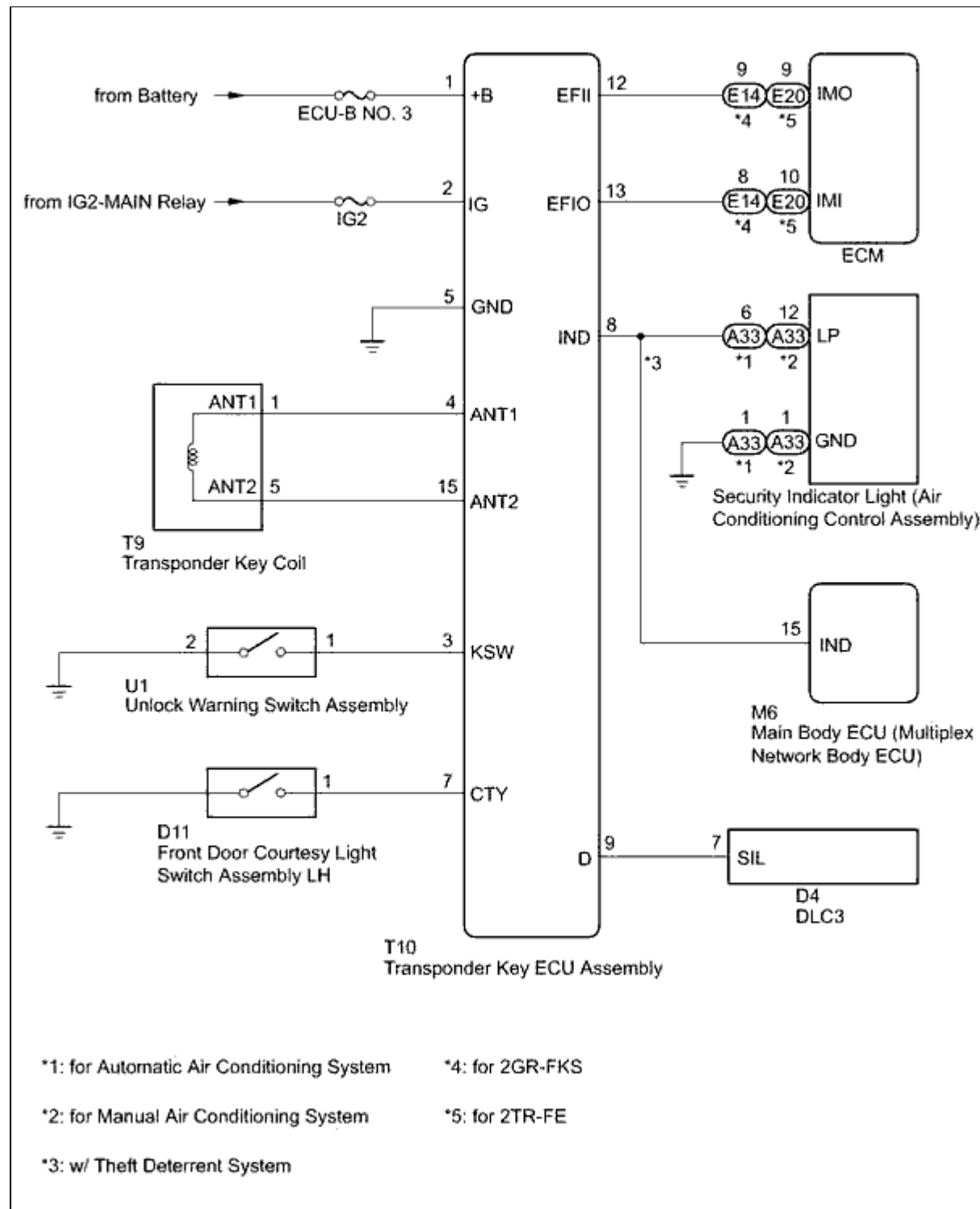


N



Last Modified: 11-13-2015	6.6 U	Doc ID: RM0000014IP047X
Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): SYSTEM DIAGRAM; 2016 MY Tacoma [08/2015 -]		

SYSTEM DIAGRAM



Last Modified: 11-13-2015	6.6 J	Doc ID: RM000000W120DLX
Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): Security Indicator Light Does not Blink; 2016 MY Tacoma [08/2015 -]		

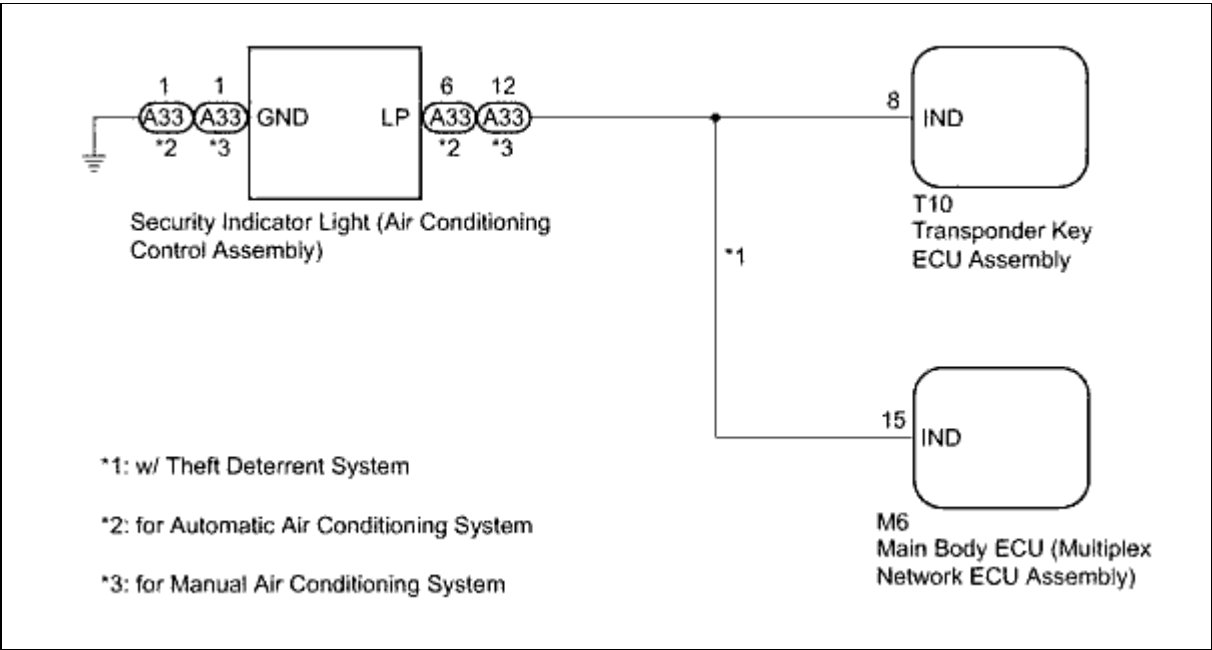
Security Indicator Light Does not Blink

DESCRIPTION

- The transponder key ECU assembly blinks the security indicator light when the immobiliser is set (no key is in the ignition key cylinder).
- w/ Theft Deterrent System:

The main body ECU (multiplex network body ECU) blinks the security indicator light when the theft deterrent system is in the arming preparation state or alarm sounding state.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

If the transponder key ECU assembly is replaced, refer to Registration [INFO](#) .

PROCEDURE

1.	SYSTEM CHECK
----	--------------

(a) Check the vehicle specification.

Result

RESULT	PROCEED TO
w/o Theft Deterrent System	A
w/ Theft Deterrent System	B

B ► **GO TO STEP 5**

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) Enter the following menus: Body Electrical / Immobiliser / Active Test.
- (e) Perform the Active Test according to the display on the Techstream.

Immobiliser

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Security Indicator	Security indicator light	ON/OFF	-

OK:

The security indicator light operates normally by using the Active Test.

NG ► **GO TO STEP 3**

OK ► **REPLACE TRANSPONDER KEY ECU ASSEMBLY**

3.	CHECK HARNESS AND CONNECTOR (AIR CONDITIONING CONTROL ASSEMBLY - TRANSPONDER KEY ECU ASSEMBLY)
-----------	---

- (a) Disconnect the A33 security indicator light (air conditioning control assembly) connector.
- (b) Disconnect the T10 transponder key ECU assembly connector.
- (c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
T10-8 (IND) - A33-6 (LP)*1	Always	Below 1 Ω

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
T10-8 (IND) or A33-6 (LP) - Body ground*1	Always	10 kΩ or higher
A33-1 (GND) - Body ground	Always	Below 1 Ω
T10-8 (IND) - A33-12 (LP)*2	Always	Below 1 Ω
T10-8 (IND) or A33-12 (LP) - Body ground*2	Always	10 kΩ or higher

*1: for Automatic Air Conditioning System

*2: for Manual Air Conditioning System

NG  **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK



4.	CHECK TRANSPONDER KEY ECU ASSEMBLY
-----------	---

(a) Reconnect the T10 transponder key ECU assembly connector.

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

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A33-6 (LP) - Body ground*1	No key in ignition key cylinder (engine immobiliser system set)	Pulse generation
A33-6 (LP) - Body ground*1	Key in ignition key cylinder (engine immobiliser system unset)	Below 1 V
A33-12 (LP) - Body ground*2	No key in ignition key cylinder (engine immobiliser system set)	Pulse generation
A33-12 (LP) - Body ground*2	Key in ignition key cylinder (engine immobiliser system unset)	Below 1 V

*1: for Automatic Air Conditioning System

*2: for Manual Air Conditioning System

Result

RESULT	PROCEED TO
OK (for Automatic Air Conditioning System)	A
OK (for Manual Air Conditioning System)	B
NG	C

B ▶ REPLACE SECURITY INDICATOR LIGHT (AIR
CONDITIONING CONTROL ASSEMBLY)

C ▶ REPLACE TRANSPONDER KEY ECU ASSEMBLY

A ▶ REPLACE SECURITY INDICATOR LIGHT (AIR
CONDITIONING CONTROL ASSEMBLY)

5. PERFORM ACTIVE TEST USING TECHSTREAM (SECURITY INDICATOR LIGHT)

- (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 or Main Body / Active Test.
- (e) Perform the Active Test according to the display on the Techstream.

Immobiliser

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Security Indicator	Security indicator light	ON/OFF	-

Main Body

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Security Indicator	Security indicator light	OFF/ON	-

Result

RESULT	PROCEED TO
Security indicator light operation is normal when performing the "Main Body" and "Immobiliser" Active Test	A
- Security indicator light operation is not normal when performing the "Immobiliser" Active Test - Security indicator light operation is normal when performing the "Main Body" Active Test	B
- Security indicator light operation is normal when performing the "Immobiliser" Active Test - Security indicator light operation is not normal when performing the "Main Body" Active Test	C

RESULT	PROCEED TO
Security indicator light operation is not normal when performing the "Main Body" and "Immobiliser" Active Test	D

B ► GO TO STEP 7

C ► GO TO STEP 8

D ► GO TO STEP 9

A

6.	CHECK SECURITY INDICATOR LIGHT OPERATION
-----------	---

(a) When the immobiliser is set, check that the security indicator light blinks.*1

OK:

The security indicator light blinks normally.

(b) When the theft deterrent system is in the arming preparation state, check that the security indicator light on **INFO** .*2

OK:

The security indicator light is on normally.

Result

RESULT	PROCEED TO
Both *1 and *2 are OK	A
*1 is NG (*2 is OK)	B
*2 is NG (*1 is OK)	C
Both *1 and *2 are NG (for Automatic Air Conditioning System)	D
Both *1 and *2 are NG (for Manual Air Conditioning System)	E

B ► REPLACE TRANSPONDER KEY ECU ASSEMBLY

C ► REPLACE MAIN BODY ECU (MULTIPLEX NETWORK BODY ECU)

D ► REPLACE SECURITY INDICATOR LIGHT (AIR CONDITIONING CONTROL ASSEMBLY)

E ► **REPLACE SECURITY INDICATOR LIGHT (AIR CONDITIONING CONTROL ASSEMBLY)**

A ► **USE SIMULATION METHOD TO CHECK**

7.

CHECK HARNESS AND CONNECTOR (AIR CONDITIONING CONTROL ASSEMBLY - TRANSPONDER KEY ECU ASSEMBLY)

- (a) Disconnect the A33 security indicator light (air conditioning control assembly) connector.
- (b) Disconnect the T10 transponder key ECU assembly connector.
- (c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
T10-8 (IND) - A33-6 (LP)*1	Always	Below 1 Ω
T10-8 (IND) or A33-6 (LP) - Body ground*1	Always	10 k Ω or higher
T10-8 (IND) - A33-12 (LP)*2	Always	Below 1 Ω
T10-8 (IND) or A33-12 (LP) - Body ground*2	Always	10 k Ω or higher

*1: for Automatic Air Conditioning System

*2: for Manual Air Conditioning System

NG ► **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ► **REPLACE TRANSPONDER KEY ECU ASSEMBLY**

8.

CHECK HARNESS AND CONNECTOR (AIR CONDITIONING CONTROL ASSEMBLY - MAIN BODY ECU (MULTIPLEX NETWORK BODY ECU))

- (a) Disconnect the A33 security indicator light (air conditioning control assembly) connector.
- (b) Disconnect the M6 main body ECU (multiplex network body ECU) connector.
- (c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
M6-15 (IND) - A33-6 (LP)*1	Always	Below 1 Ω
M6-15 (IND) or A33-6 (LP) - Body ground*1	Always	10 k Ω or higher
M6-15 (IND) - A33-12 (LP)*2	Always	Below 1 Ω
M6-15 (IND) or A33-12 (LP) - Body ground*2	Always	10 k Ω or higher

*1: for Automatic Air Conditioning System

*2: for Manual Air Conditioning System

NG  **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK  **REPLACE MAIN BODY ECU (MULTIPLEX NETWORK BODY ECU)**

9.

CHECK HARNESS AND CONNECTOR (AIR CONDITIONING CONTROL ASSEMBLY - MAIN BODY ECU (MULTIPLEX NETWORK BODY ECU) OR TRANSPONDER KEY ECU ASSEMBLY)

- (a) Disconnect the A33 security indicator light (air conditioning control assembly) connector.
- (b) Disconnect the T10 transponder key ECU assembly connector.
- (c) Disconnect the M6 main body ECU (multiplex network body ECU) connector.
- (d) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
T10-8 (IND) - A33-6 (LP)*1	Always	Below 1 Ω
M6-15 (IND) - A33-6 (LP)*1	Always	Below 1 Ω
A33-1 (GND) - Body ground	Always	Below 1 Ω
T10-8 (IND) or A33-6 (LP) - Body ground*1	Always	10 k Ω or higher
M6-15 (IND) or A33-6 (LP) - Body ground*1	Always	10 k Ω or higher
T10-8 (IND) - A33-12 (LP)*2	Always	Below 1 Ω
M6-15 (IND) - A33-12 (LP)*2	Always	Below 1 Ω
T10-8 (IND) or A33-12 (LP) - Body ground*2	Always	10 k Ω or higher
M6-15 (IND) or A33-12 (LP) - Body ground*2	Always	10 k Ω or higher

*1: for Automatic Air Conditioning System

*2: for Manual Air Conditioning System

NG  **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK



10.

REPLACE SECURITY INDICATOR LIGHT (AIR CONDITIONING CONTROL ASSEMBLY)

- (a) Temporarily replace the security indicator light (air conditioning control assembly) with a new or

known good one .*1

(b) Temporarily replace the security indicator light (air conditioning control assembly) with a new or known good one .*2

(c) When the immobiliser is set or theft deterrent system is in the arming preparation state, check that the security indicator light blinks.

*1: for Automatic Air Conditioning System

*2: for Manual Air Conditioning System

OK:

Security indicator light blinks.

NG  **GO TO STEP 11**

OK  **END (SECURITY INDICATOR LIGHT (AIR
CONDITIONING CONTROL ASSEMBLY) WAS
DEFECTIVE)**

11.	REPLACE TRANSPONDER KEY ECU ASSEMBLY
------------	---

(a) Replace the transponder key ECU assembly with a new one .

(b) When the immobiliser is set or theft deterrent system is in the arming preparation state, check that the security indicator light blinks.

OK:

Security indicator light blinks.

NG  **REPLACE MAIN BODY ECU (MULTIPLEX NETWORK
BODY ECU)**

OK  **END (TRANSPONDER KEY ECU ASSEMBLY WAS
DEFECTIVE)**

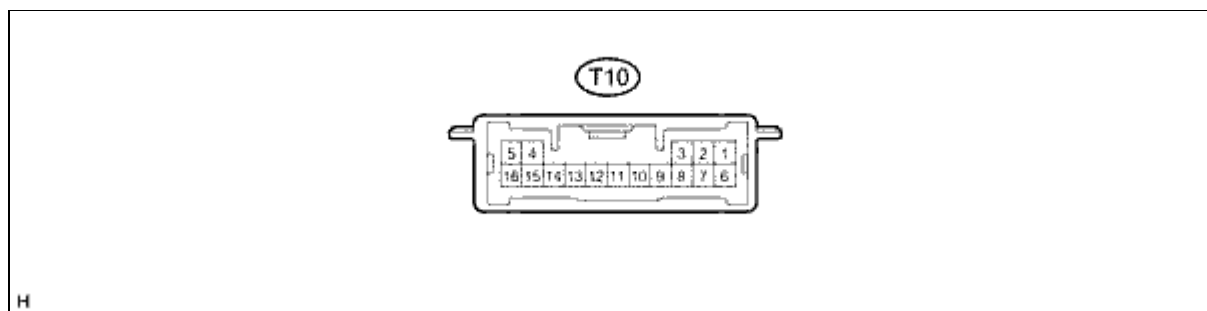


Last Modified: 11-13-2015	6.6 U	Doc ID: RM000001GUS04EX
Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: ENGINE IMMOBILISER SYSTEM (w/o Smart Key System): TERMINALS OF ECU; 2016 MY Tacoma [08/2015 -]		

TERMINALS OF ECU

1. CHECK TRANSPONDER KEY ECU ASSEMBLY

(a) Disconnect the T10 transponder key ECU assembly connector.



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

HINT:

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

TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
T10-1 (+B) - T10-5 (GND)	R - W-B	Battery	Always	11 to 14 V
T10-2 (IG) - T10-5 (GND)	B - W-B	Ignition switch signal	Ignition switch off	Below 1 V
			Ignition switch ON	11 to 14 V
T10-3 (KSW) - T10-5 (GND)	LG - W-B	Unlock warning switch signal	No key in ignition key cylinder	10 k Ω or higher
			Key in ignition key cylinder	Below 1 Ω
T10-5 (GND) - 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 T10 transponder key ECU assembly connector.

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

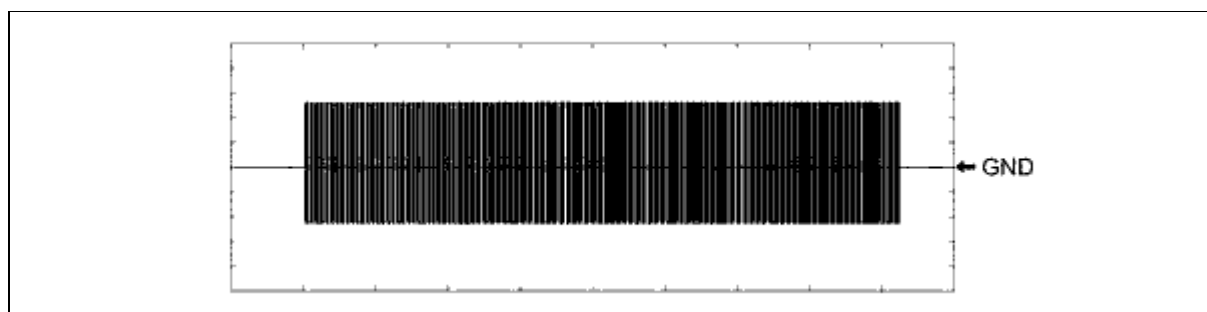
TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
T10-8 (IND) - T10-5 (GND)	V - W-B	Security indicator signal	No key in ignition key cylinder, or 20 seconds elapsed after turning ignition switch to ACC or off (engine immobiliser system set)	Pulse generation

TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
T10-9 (D) - T10-5 (GND)	W - W-B	DLC3 communication	Key in ignition key cylinder (engine immobiliser system unset)	Below 1 V
			Without communication	Below 1 V
T10-4 (ANT1) - T10-5 (GND)	GR - W-B	Transponder key coil power source	During communication	Pulse generation
			No key in ignition key cylinder	4 to 6 V
T10-15 (ANT2) - T10-5 (GND)	P - W-B	Transponder key coil power source	Within 3 seconds of inserting key into ignition key cylinder	Pulse generation (See waveform 1)
			No key in ignition key cylinder	4 to 6 V
T10-12 (EFII) - T10-5 (GND)	Y - W-B	Transponder key coil communication signal	Within 3 seconds of inserting key into ignition key cylinder	Pulse generation (See waveform 2)
			No key in ignition key cylinder	4 to 6 V
T10-13 (EFIO) - T10-5 (GND)	SB - W-B	ECM output signal	Within 3 seconds of starter operation and initial combustion, or within 3 seconds of ignition switch first being turned to ON after cable disconnected and reconnected to negative (-) battery terminal	Pulse generation (See waveform 3)
			Ignition switch off	Below 1 V
T10-13 (EFIO) - T10-5 (GND)	SB - W-B	ECM output signal	Within 3 seconds of starter operation and initial combustion, or within 3 seconds of ignition switch first being turned to ON after cable disconnected and reconnected to negative (-) battery terminal	Pulse generation (See waveform 4)
			Ignition switch off	Below 1 V

If the result is not as specified, the transponder key ECU assembly may be malfunctioning.

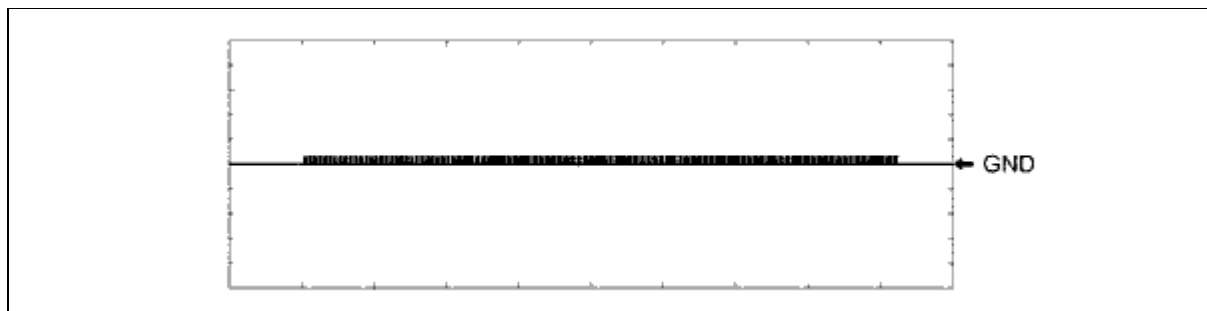
(e) Using an oscilloscope, check the waveform.

(1) Waveform 1 (Reference)



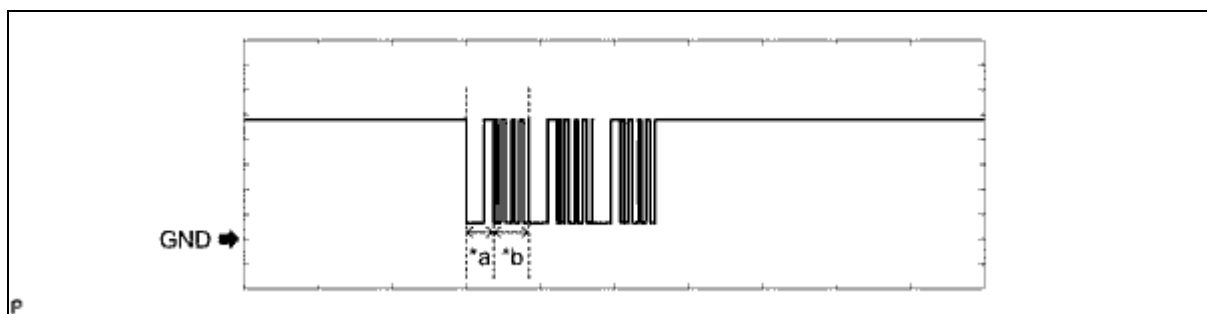
Tester Connection	T10-4 (ANT1) - T10-5 (GND)
Tool Setting	2 V/DIV, 500 ms./DIV.
Condition	Within 3 seconds of inserting key into ignition key cylinder

(2) Waveform 2 (Reference)



Tester Connection	T10-15 (ANT2) - T10-5 (GND)
Tool Setting	2 V/DIV., 500 ms./DIV.
Condition	Within 3 seconds of inserting key into ignition key cylinder

(3) Waveform 3 (Reference)

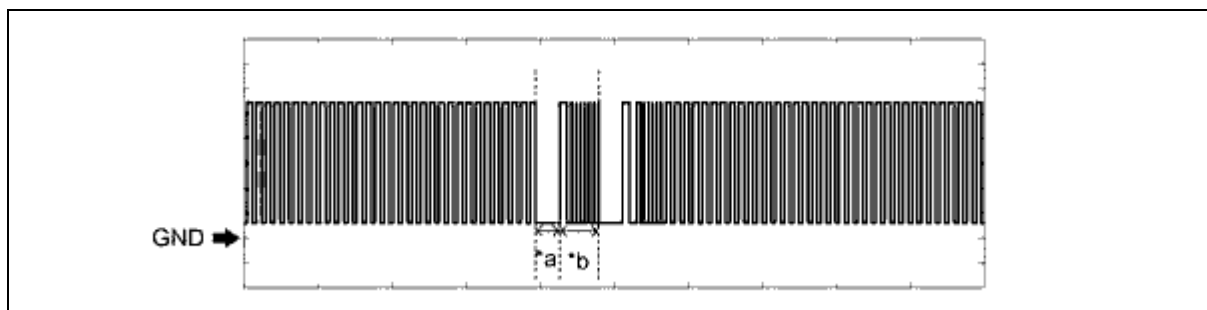


Text in Illustration

*a	Approximately 160 ms	*b	Approximately 270 ms
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Tester Connection	T10-12 (EFII) - T10-5 (GND)
Tool Setting	2 V/DIV., 500 ms./DIV.
Condition	Within 3 seconds of starter operation and initial combustion, or within 3 seconds of ignition switch first being turned to ON after cable disconnected and reconnected to negative (-) battery terminal

(4) Waveform 4 (Reference)

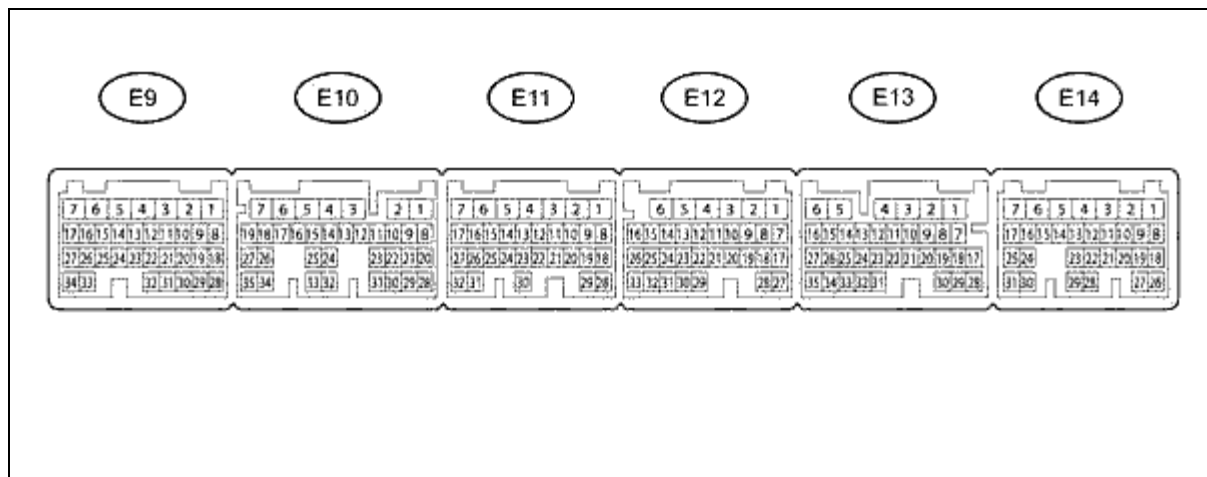


Text in Illustration

*a	Approximately 160 ms	*b	Approximately 270 ms
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Tester Connection	T10-13 (EFIO) - T10-5 (GND)
Tool Setting	2 V/DIV., 500 ms./DIV.
Condition	Within 3 seconds of starter operation and initial combustion, or within 3 seconds of ignition switch first being turned to ON after cable disconnected and reconnected to negative (-) battery terminal

2. CHECK ECM (for 2GR-FKS)



HINT:

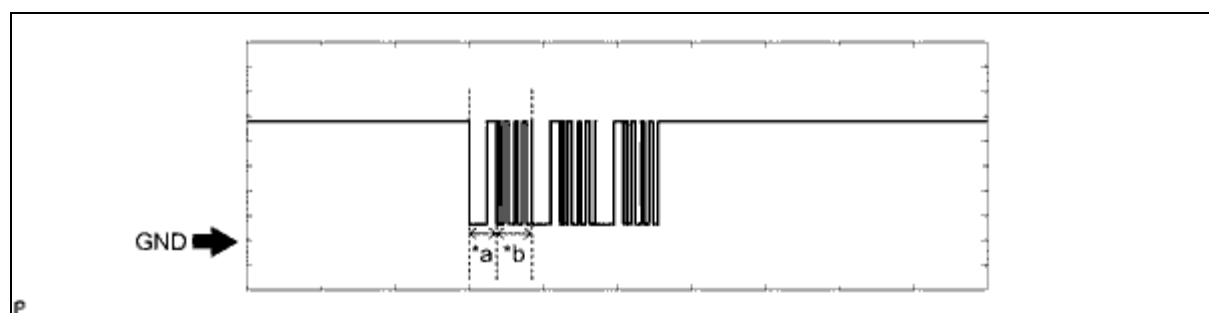
The standard voltage between each pair of ECM terminals is shown in the table below. The appropriate conditions for checking each pair of terminals are also indicated. The result of checks should be compared with the standard voltage for that pair of terminals, displayed in the "Specified Condition" column. The illustration above can be used as a reference to identify the ECM terminal locations.

TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
E11-1 (E1) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
E14-2 (BATT) - E11-1 (E1)	L - W-B	+B power supply	Always	11 to 14 V
E14-4 (+B2) - E11-1 (E1)	B - W-B	+B power supply	Ignition switch ON	11 to 14 V
E14-3 (+B) - E11-1 (E1)	B - W-B	+B power supply	Ignition switch ON	11 to 14 V
E14-9 (IMO) - E11-1 (E1)	Y - W-B	Transponder key ECU assembly communication input	Ignition switch off	11 to 14 V
E14-9 (IMO) - E11-1 (E1)	Y - W-B	Transponder key ECU assembly communication input	Within 3 seconds of starter operation and initial combustion, or within 3 seconds of ignition switch first being turned to ON after cable disconnected and reconnected to	Pulse generation (See

TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
			negative (-) battery terminal	waveform 1)
E14-8 (IMI) - E11-1 (E1)	SB - W-B	Transponder key ECU assembly communication output	Ignition switch off	Below 1 V
E14-8 (IMI) - E11-1 (E1)	SB - W-B	Transponder key ECU assembly communication output	Within 3 seconds of starter operation and initial combustion, or within 3 seconds of ignition switch first being turned to ON after cable disconnected and reconnected to negative (-) battery terminal	Pulse generation (See waveform 2)

(a) Inspect using an oscilloscope.

(1) Waveform 1 (Reference)

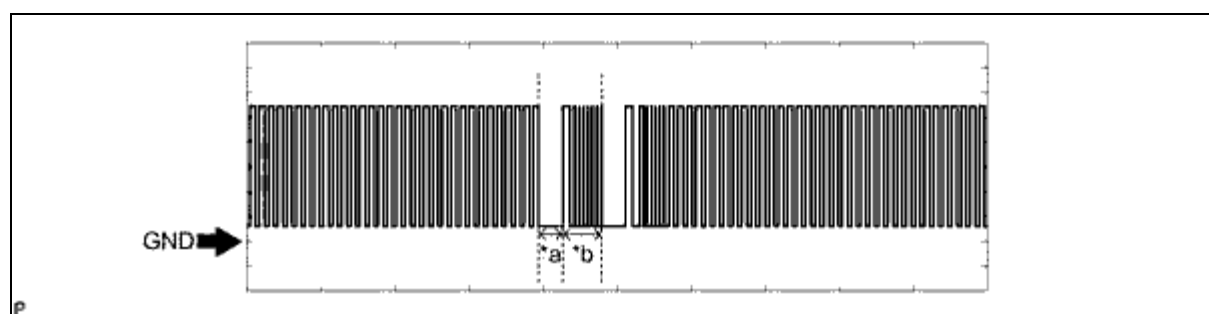


Text in Illustration

*a	Approximately 160 ms	*b	Approximately 270 ms
----	----------------------	----	----------------------

Tester Connection	E14-9 (IMO) - E11-1 (E1)
Tool Setting	2 V/DIV., 500 ms./DIV.
Condition	Within 3 seconds of starter operation and initial combustion, or within 3 seconds of ignition switch first being turned to ON after cable disconnected and reconnected to negative (-) battery terminal

(2) Waveform 2 (Reference)

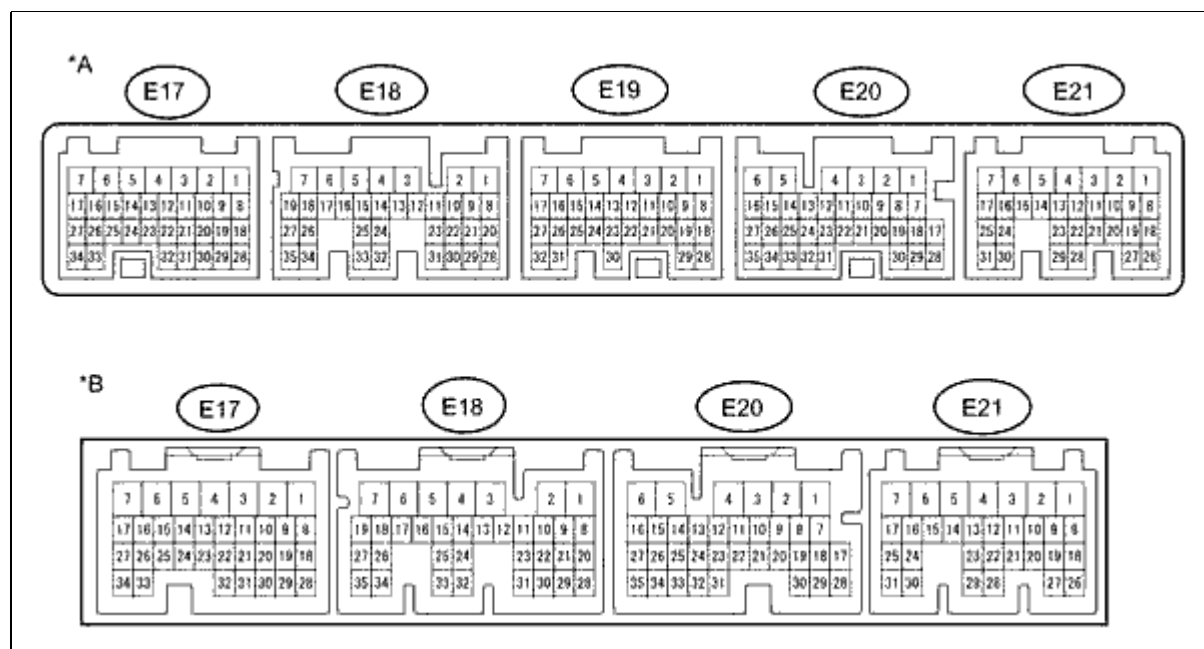


Text in Illustration

*a	Approximately 160 ms	*b	Approximately 270 ms
----	----------------------	----	----------------------

Tester Connection	E14-8 (IMI) - E11-1 (E1)
Tool Setting	2 V/DIV., 500 ms./DIV.
Condition	Within 3 seconds of starter operation and initial combustion, or within 3 seconds of ignition switch first being turned to ON after cable disconnected and reconnected to negative (-) battery terminal

3. CHECK ECM (for 2TR-FE)



Text in Illustration

*A	for Automatic Transmission	*B	for Manual Transmission
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HINT:

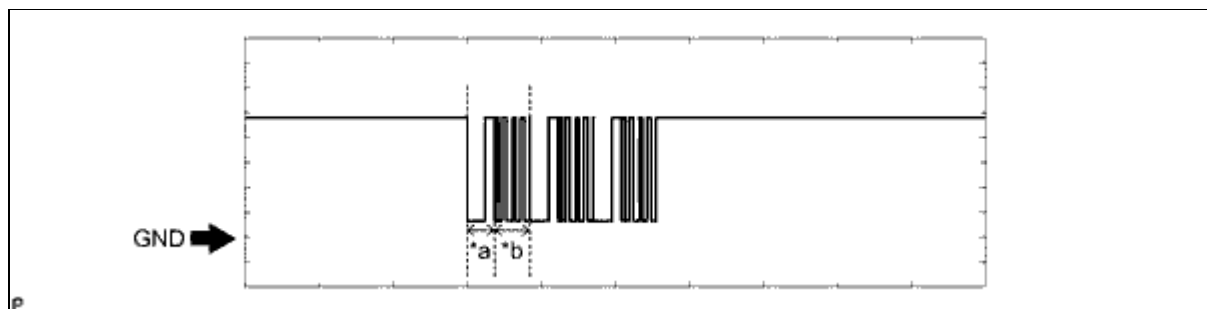
The standard voltage between each pair of ECM terminals is shown in the table below. The appropriate conditions for checking each pair of terminals are also indicated. The result of checks should be compared with the standard voltage for that pair of terminals, displayed in the "Specified Condition" column. The illustration above can be used as a reference to identify the ECM terminal locations.

TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
E17-3 (E1) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
E21-3 (BATT) - E17-3 (E1)	L - W-B	+B power supply	Always	11 to 14 V
E21-2 (+B2) - E17-3 (E1)	B - W-B	+B power supply	Ignition switch ON	11 to 14 V
E21-1 (+B) - E17-3 (E1)	B - W-B	+B power supply	Ignition switch ON	11 to 14 V

TESTER CONNECTION	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
E20-9 (IMO) - E17-3 (E1)	Y - W-B	Transponder key ECU assembly communication input	Ignition switch off	11 to 14 V
E20-9 (IMO) - E17-3 (E1)	Y - W-B	Transponder key ECU assembly communication input	Within 3 seconds of starter operation and initial combustion, or within 3 seconds of ignition switch first being turned to ON after cable disconnected and reconnected to negative (-) battery terminal	Pulse generation (See waveform 1)
E20-10 (IMI) - E17-3 (E1)	SB - W-B	Transponder key ECU assembly communication output	Ignition switch off	Below 1 V
E20-10 (IMI) - E17-3 (E1)	SB - W-B	Transponder key ECU assembly communication output	Within 3 seconds of starter operation and initial combustion, or within 3 seconds of ignition switch first being turned to ON after cable disconnected and reconnected to negative (-) battery terminal	Pulse generation (See waveform 2)

(a) Inspect using an oscilloscope.

(1) Waveform 1 (Reference)

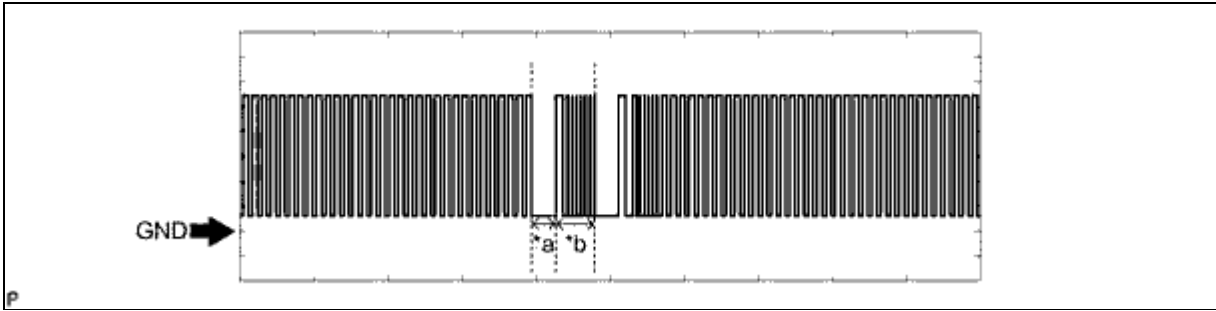


Text in Illustration

*a	Approximately 160 ms	*b	Approximately 270 ms
----	----------------------	----	----------------------

Tester Connection	E20-9 (IMO) - E17-3 (E1)
Tool Setting	2 V/DIV., 500 ms./DIV.
Condition	Within 3 seconds of starter operation and initial combustion, or within 3 seconds of ignition switch first being turned to ON after cable disconnected and reconnected to negative (-) battery terminal

(2) Waveform 2 (Reference)



Text in Illustration

*a	Approximately 160 ms	*b	Approximately 270 ms
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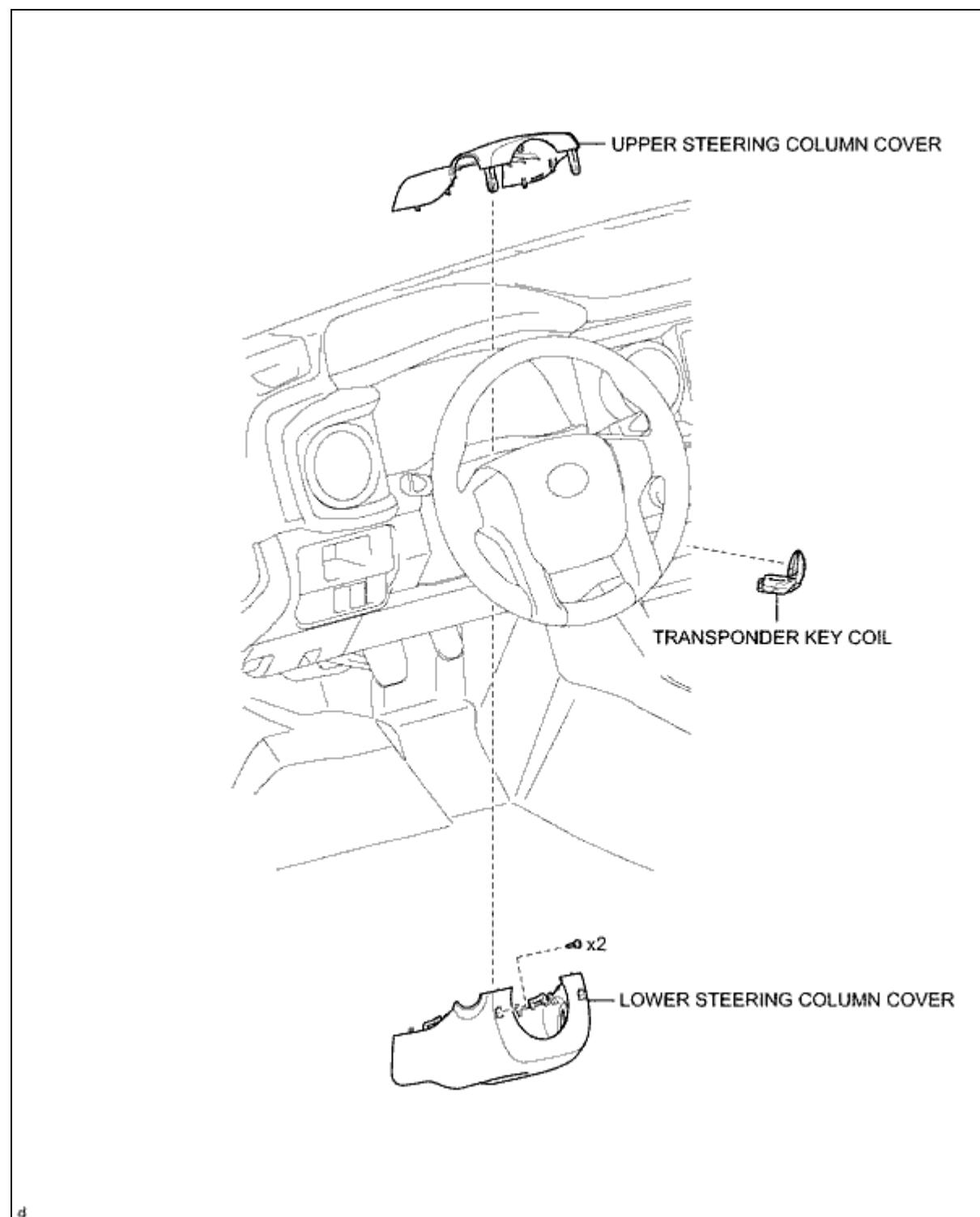
Tester Connection	E20-10 (IMI) - E17-3 (E1)
Tool Setting	2 V/DIV., 500 ms./DIV.
Condition	Within 3 seconds of starter operation and initial combustion, or within 3 seconds of ignition switch first being turned to ON after cable disconnected and reconnected to negative (-) battery terminal



Last Modified: 11-13-2015	6.6 K	Doc ID: RM000002W3A00VX
Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: TRANSPONDER KEY AMPLIFIER: COMPONENTS; 2016 MY Tacoma [08/2015 -]		

COMPONENTS

ILLUSTRATION



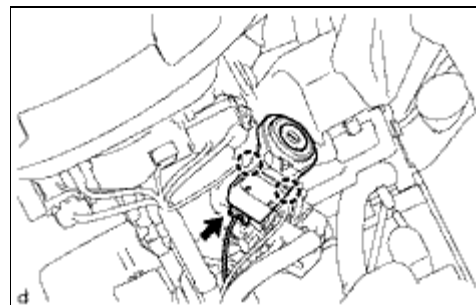


Last Modified: 11-13-2015	6.6 A	Doc ID: RM000002W39010X
Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: TRANSPONDER KEY AMPLIFIER: INSTALLATION; 2016 MY Tacoma [08/2015 -]		

INSTALLATION

1. INSTALL TRANSPONDER KEY COIL

(a) Engage the 2 claws to install the transponder key coil.



(b) Connect the connector.

2. INSTALL UPPER STEERING COLUMN COVER [INFO](#)

3. INSTALL LOWER STEERING COLUMN COVER [INFO](#)



Last Modified: 11-13-2015	6.6 A	Doc ID: RM000002W3B010X
Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: TRANSPONDER KEY AMPLIFIER: REMOVAL; 2016 MY Tacoma [08/2015 -]		

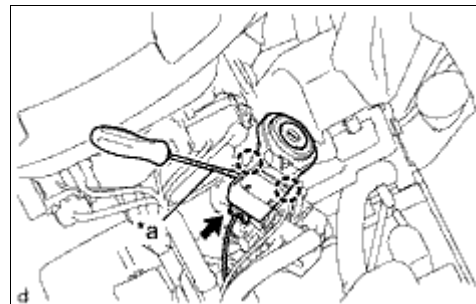
REMOVAL

1. REMOVE LOWER STEERING COLUMN COVER INFO

2. REMOVE UPPER STEERING COLUMN COVER INFO

3. REMOVE TRANSPONDER KEY COIL

(a) Disconnect the connector.



(b) Using a screwdriver with its tip wrapped in protective tape, disengage the 2 claws to remove the transponder key coil.

Text in Illustration

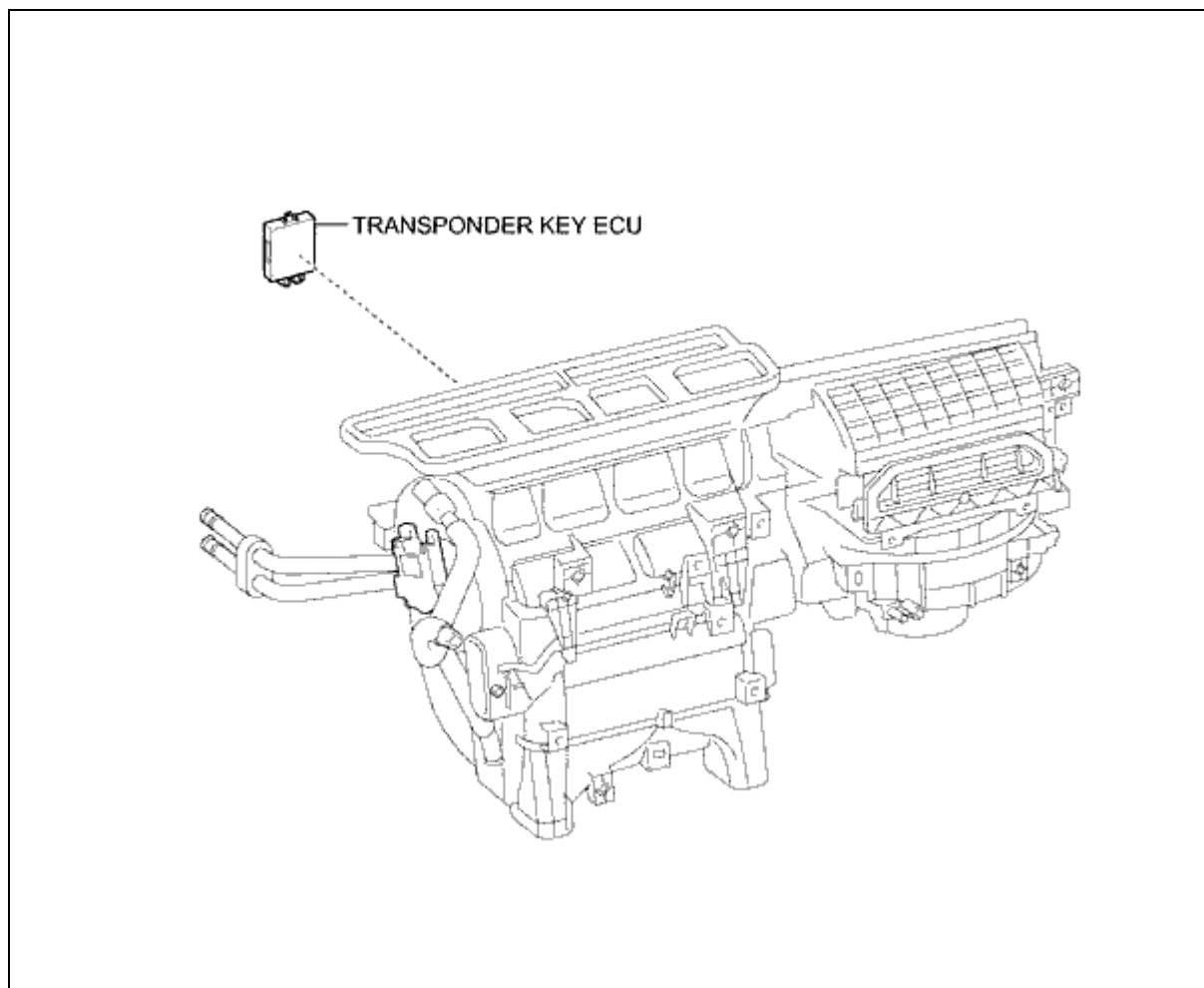
*a	Protective Tape
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Model Year Start: 2016	Model: Tacoma	Prod Date Range: [08/2015 -]
Title: ENGINE IMMOBILISER: TRANSPONDER KEY ECU: COMPONENTS; 2016 MY Tacoma [08/2015 -]		

COMPONENTS

ILLUSTRATION

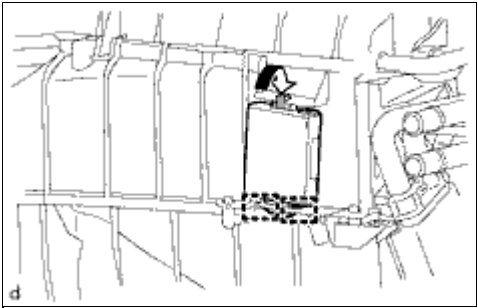


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Title: ENGINE IMMOBILISER: TRANSPONDER KEY ECU: INSTALLATION; 2016 MY Tacoma [08/2015 -]		

INSTALLATION

1. INSTALL TRANSPONDER KEY ECU

- (a) Engage the 2 guides to move the transponder key ECU in the direction of the arrow to install the transponder key ECU.



2. INSTALL AIR CONDITIONING UNIT ASSEMBLY

INFO



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Title: ENGINE IMMOBILISER: TRANSPONDER KEY ECU: REMOVAL; 2016 MY Tacoma [08/2015 -]		

REMOVAL

1. REMOVE AIR CONDITIONING UNIT ASSEMBLY

INFO

2. REMOVE TRANSPONDER KEY ECU

- (a) Move the transponder key ECU in the direction of the arrow to disengage the 2 guides to remove the transponder key ECU.

