

ACCESSORIES & EQUIPMENT

Power Back Door System (Diagnostic Codes & Symptom Tests) - Sienna

POWER BACK DOOR SYSTEM

DTC B2222: PBD PULSE SENSOR MALFUNCTION

DESCRIPTION

- A pulse sensor is built into the power back door ECU (power back door motor unit) to detect foreign objects and the back door position. The pulse sensor monitors the operating speed of the back door to detect foreign objects. The pulse sensor is also used to monitor the back door position. If a pulse signal that is out of the normal range is output, the power back door ECU (power back door motor unit) will store DTC B2222.
- If DTC B2222 is stored, the power back door system will be turned off and the back door will be switched to manual operation mode (not electrically controlled).
- In order to restore the power back door system to normal operation mode, first solve the problem indicated by DTC B2222 and then fully close the back door manually (reset operation).

DTC No.	DTC Detection Condition	Trouble Area
B2222	The power back door ECU (Power back door motor unit) does not operate.	Power back door ECU (Power back door motor unit)

INSPECTION PROCEDURE

PROCEDURE

1. CHECK FOR DTC

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

OK

DTC B2222 is not output.

NG --> See step 3

OK --> See step 2

2. **USE SIMULATION METHOD TO CHECK. Refer to ELECTRONIC CIRCUIT INSPECTION PROCEDURE**
3. **REPLACE POWER BACK DOOR ECU (POWER BACK DOOR MOTOR UNIT). Refer to REMOVAL**

DTC B2225: BACK DOOR MOTOR CLUTCH MALFUNCTION

DESCRIPTION

When an electrical malfunction (open or short) is detected in the clutch circuit of the power back door ECU (power back door motor unit) while the power back door is operating, the power back door ECU (power back door motor unit) stores DTC B2225.

DTC No.	DTC Detection Condition	Trouble Area
B2225	Voltage and current malfunction in clutch circuit of the power back door ECU (power back door motor unit).	Power back door ECU (Power back door motor unit)

INSPECTION PROCEDURE

PROCEDURE

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

OK

DTC B2225 is not output.

NG --> See step 3

OK --> See step 2

2. **USE SIMULATION METHOD TO CHECK. Refer to ELECTRONIC CIRCUIT INSPECTION PROCEDURE**
3. **REPLACE POWER BACK DOOR ECU (POWER BACK DOOR MOTOR UNIT). Refer to REMOVAL**

SYMPTOM TESTS

Power Back Door cannot be Operated Using Any Switch

DESCRIPTION

When the power back door cannot be operated using any switch, one of the following may be the cause: 1) initialization of the power back door ECU (power back door motor unit), 2) power back door touch sensor circuit, 3) power slide door main switch circuit, 4) back door closer system, 5) meter/gauge system, 6) main body ECU or 7) power back door ECU (power back door motor unit).

WIRING DIAGRAM

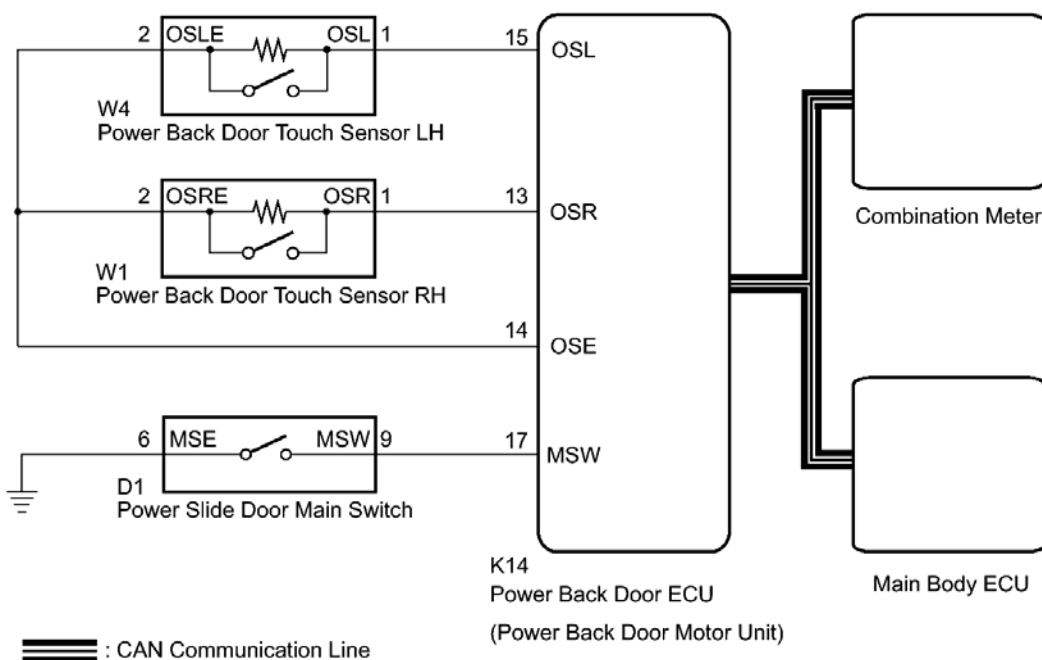


Fig. 1: Power Back Door Circuit - Wiring Diagram
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

WARNING: The power back door system uses a CAN communication system. Inspect the communication function by following How to Proceed with Troubleshooting. Refer to HOW TO PROCEED WITH TROUBLESHOOTING . Troubleshoot the power back door system after confirming that the communication system is functioning properly.

PROCEDURE

1. INITIALIZE POWER BACK DOOR ECU (POWER BACK DOOR MOTOR UNIT)
 - a. Perform the initialization for the power back door ECU (power back door motor unit). Refer to

INITIALIZATION .

NEXT: Go to next step

2. CHECK POWER BACK DOOR SYSTEM

- a. Check the power back door system operation. Refer to **OPERATION CHECK** .

OK

Power back door system operates normally.

NG --> See step 3

OK --> END

3. CHECK BACK DOOR CLOSER SYSTEM

- a. Check back door closer system operation. Refer to **OPERATION CHECK** .

OK

Back door closer system operates normally.

NG --> See step 14

OK: Go to next step

4. CHECK COMBINATION METER ASSEMBLY

- a. Check shift position indicator operation and that the speedometer indicates 0 km/h (0 mph) when the vehicle is stopped with the engine idling.

OK

Combination meter operates normally.

NG --> See step 15

OK: Go to next step

5. CHECK POWER DOOR LOCK OPERATION (BASIC FUNCTION)

- a. Check the power door lock function. Refer to **OPERATION CHECK** .

OK

The power door lock basic function operates normally.

NG --> See step 16

OK: Go to next step

6. CHECK DTC OUTPUT

- a. Check for DTCs. Refer to **DTC CHECK / CLEAR** .

RESULT

Result	Proceed to
DTC is not output	A
B2222 is output	B
B2225 is output	C
B2250 is output	D
B2251 is output	E

B --> See step 17

C --> See step 18

D --> See step 19

E --> See step 20

A: Go to next step

7. READ VALUE USING TECHSTREAM (BACK DOOR OPEN)

- a. Connect the Techstream to the DLC3.
b. Turn the ignition switch to ON.
c. Turn the Techstream on.
d. Enter the following menus: Body Electrical / Main Body / Data List.
e. Check the Data List to determine if the back door lock assembly functions properly.

MAIN BODY (MAIN BODY ECU)

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note

Back Door Open	Back door lock / Permit or Prohibit	Permit: Back door unlocked Prohibit: Back door locked	-
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OK

The back door functions as specified in the normal condition column.

NG --> See step 21

OK: Go to next step

8. READ VALUE USING TECHSTREAM (DOOR LOCK STATUS)

- Connect the Techstream to the DLC3.
- Turn the ignition switch to ON.
- Turn the Techstream on.
- Enter the following menus: Body Electrical / Back Door / Data List.
- Check the Data List to determine if the back door lock assembly functions properly.

BACK DOOR (POWER BACK DOOR ECU)

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Door Lock Status	Back door lock condition signal / LOCK or UNLOCK	LOCK: Back door locked UNLOCK: Back door unlocked	-

OK

The back door functions as specified in the normal condition column.

NG --> See step 13

OK: Go to next step

9. READ VALUE USING TECHSTREAM (PBD TOUCH SENSOR)

- Connect the Techstream to the DLC3.
- Turn the ignition switch to ON.
- Turn the Techstream on.

- d. Enter the following menus: Body Electrical / Back Door / Data List.
- e. Check the Data List to determine if the power back door touch sensor functions properly.

BACK DOOR (POWER BACK DOOR ECU)

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
PBD Touch Sensor (Right)	Power back door touch sensor RH signal / ON, OFF or Open	ON: Power back door touch sensor RH pressed OFF: Power back door touch sensor RH not pressed Open: Power back door touch sensor RH circuit open	-
PBD Touch Sensor (Left)	Power back door touch sensor LH signal / ON, OFF or Open	ON: Power back door touch sensor LH pressed OFF: Power back door touch sensor LH not pressed Open: Power back door touch sensor LH circuit open	-

RESULT

Result	Proceed to
On the Techstream screen, ON or OFF will be displayed accordingly.	A
On the Techstream screen, ON or OFF will not be displayed accordingly or Open is displayed.	B

B --> See step 22

A: Go to next step

10. READ VALUE USING TECHSTREAM (PBD MAIN SW)

- Connect the Techstream to the DLC3.
- Turn the ignition switch to ON.
- Turn the Techstream on.
- Enter the following menus: Body Electrical / Back Door / Data List.
- Check the Data List to determine if the power slide door main switch functions properly.

BACK DOOR (POWER BACK DOOR ECU)

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
PBD Main SW	Power slide door main switch signal / ON or OFF	ON: Power slide door main switch on OFF: Power slide door main switch off	-

OK

The power slide door main switch functions as specified in the normal condition column.

NG --> See step 11

OK --> See step 13

11. INSPECT POWER SLIDE DOOR MAIN SWITCH

- a. Remove the power slide door main switch on the instrument panel. Refer to **REMOVAL**.

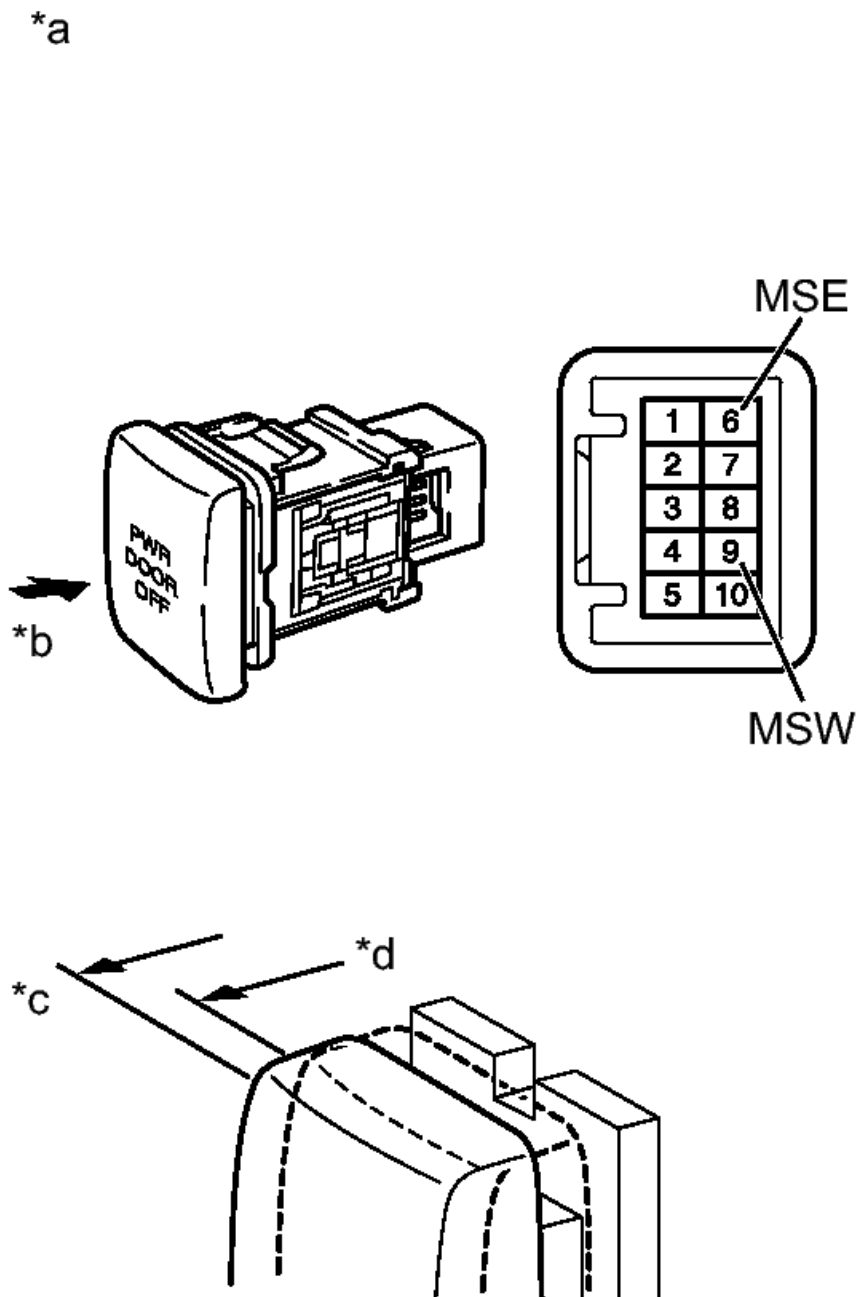


Fig. 2: Inspecting Power Slide Door Main Switch
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard Resistance

Tester Connection	Switch Condition	Specified Condition
6 (MSE) - 9 (MSW)	Free (off)	Below 1 ohms
	Pushed (on)	10 kohms or higher

TEXT IN ILLUSTRATION

*a	Component without harness connected (Power Slide Door Main Switch)
*b	Pushed
*c	Free (off)
*d	Pushed (on)

NG --> See step 23

OK: Go to next step

12. CHECK HARNESS AND CONNECTOR (POWER SLIDE DOOR MAIN SWITCH - POWER BACK DOOR ECU)

- Disconnect the D1 power slide door main switch connector and K14 power back door ECU connector.
- Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Condition	Specified Condition
D1-9 (MSW) - K14-17 (MSW)	Always	Below 1 ohms
D1-6 (MSE) - Body ground	Always	Below 1 ohms

D1-9 (MSW) - Body ground	Always	10 kohms or higher
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NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK --> See step 13

13. **REPLACE POWER BACK DOOR ECU (POWER BACK DOOR MOTOR UNIT). Refer to REMOVAL**
14. **GO TO BACK DOOR CLOSER SYSTEM. Refer to HOW TO PROCEED WITH TROUBLESHOOTING**
15. **GO TO METER/GAUGE SYSTEM. Refer to HOW TO PROCEED WITH TROUBLESHOOTING**
16. **GO TO POWER DOOR LOCK CONTROL SYSTEM. Refer to HOW TO PROCEED WITH TROUBLESHOOTING**
17. **GO TO OTHER FLOW CHART (B2222). Refer to DTC B2222: PBD Pulse Sensor Malfunction**
18. **GO TO OTHER FLOW CHART (B2225). Refer to DTC B2225: Back Door Motor Clutch Malfunction**
19. **GO TO OTHER FLOW CHART (B2250). Refer to DTC B2250: Back Door Closer Operation Malfunction**
20. **GO TO OTHER FLOW CHART (B2251). Refer to DTC B2251: Back Door Closer Switch Malfunction**
21. **REPLACE MAIN BODY ECU. Refer to REMOVAL**
22. **GO TO OTHER FLOW CHART (TOUCH SENSOR CIRCUIT). Refer to Touch Sensor Circuit**
23. **REPLACE POWER SLIDE DOOR MAIN SWITCH. Refer to REMOVAL**

Power Back Door cannot be Opened or Closed Using the Power Back Door Switch

DESCRIPTION

When the power back door cannot be opened or closed using the power back door control switch, one of the following may be malfunctioning: 1) power back door control switch circuit, 2) power back door ECU (power back door motor unit) or 3) main body ECU.

WIRING DIAGRAM

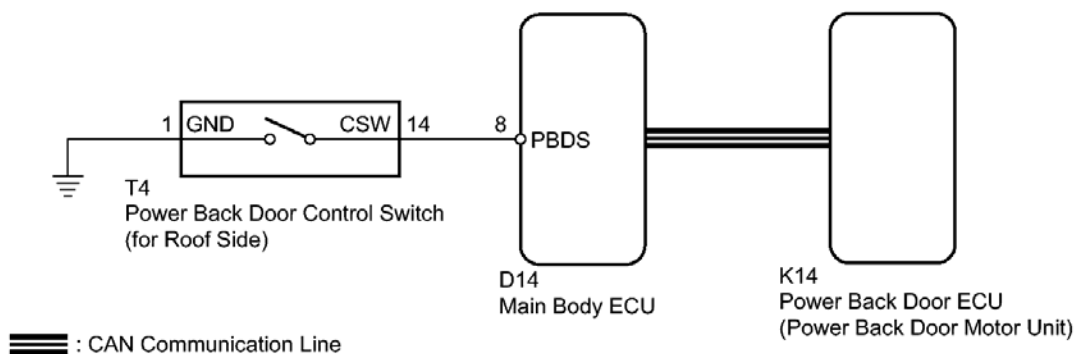


Fig. 3: Power Back Door Control Switch Circuit - Wiring Diagram

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

INSPECTION PROCEDURE

WARNING: The power back door system uses a CAN communication system. Inspect the communication function by following How to Proceed with Troubleshooting. Refer to HOW TO PROCEED WITH TROUBLESHOOTING . Troubleshoot the power back door system after confirming that the communication system is functioning properly.

PROCEDURE

1. READ VALUE USING TECHSTREAM (BACK DOOR OPEN SW)

- Connect the Techstream to the DLC3.
- Turn the ignition switch to ON.
- Turn the Techstream on.
- Enter the following menus: Body Electrical / Main Body / Data List.
- Check the Data List to determine if the power back door control switch functions properly.

MAIN BODY (MAIN BODY ECU)

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Back Door Open SW	Power back door control switch / ON or OFF	ON: Power back door control switch pushed OFF: Power back door control	-

		switch not pushed	
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OK

The power back door control switch functions as specified in the normal condition column.

NG --> See step 5

OK: Go to next step

2. REPLACE POWER BACK DOOR ECU (POWER BACK DOOR MOTOR UNIT)

- a. Replace the power back door ECU (power back door motor unit). Refer to **REMOVAL** .

NEXT: Go to next step

3. INITIALIZE POWER BACK DOOR ECU (POWER BACK DOOR MOTOR UNIT)

- a. Perform the initialization for the power back door ECU (power back door motor unit). Refer to **INITIALIZATION** .

NEXT: Go to next step

4. CHECK POWER BACK DOOR OPERATION

- a. Check that the power back door operates normally. Refer to **OPERATION CHECK** .

OK

Power back door operates normally.

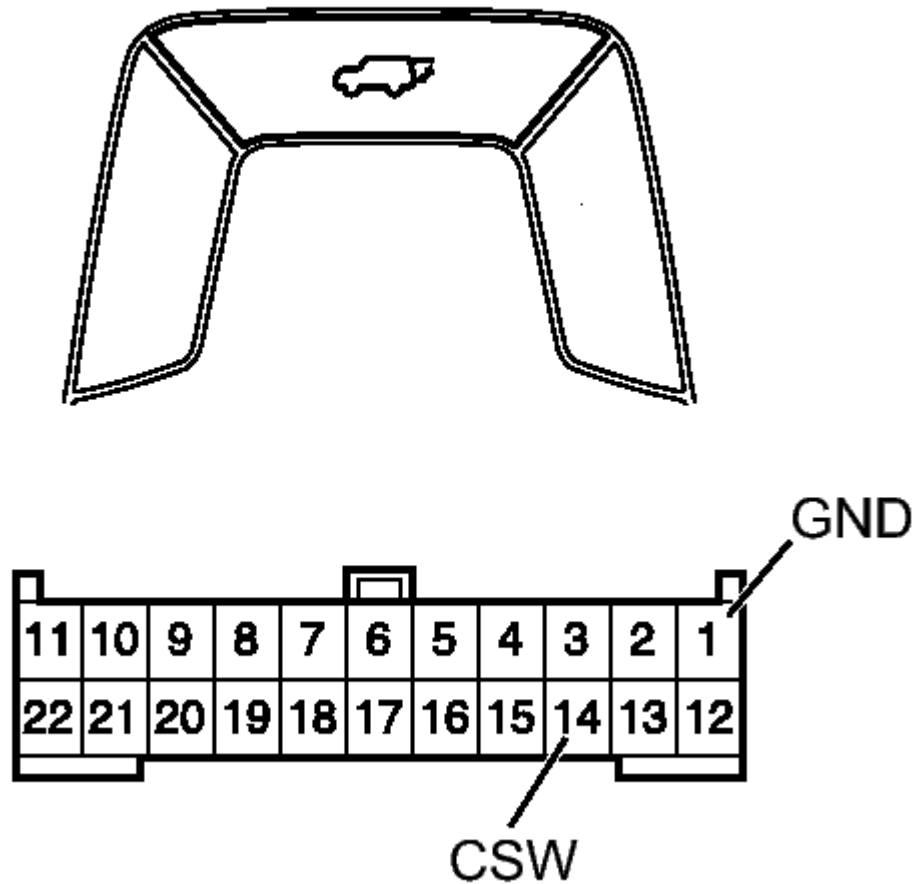
NG --> See step 7

OK --> END (POWER BACK DOOR ECU (POWER BACK DOOR MOTOR UNIT) WAS DEFECTIVE)

5. INSPECT POWER BACK DOOR CONTROL SWITCH

- a. Remove the power back door control switch. Refer to **REMOVAL** .

*a



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Fig. 4: Inspecting Power Back Door Control Switch
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard Resistance

Tester Connection	Switch Position	Specified Condition
	Power back door control switch not pushed	10 kohms or higher

1 (GND) - 14 (CSW)	(off)	Below 1 ohms
	Power back door control switch pushed (on)	

TEXT IN ILLUSTRATION

*a	Component without harness connected (Power Back Door Control Switch)
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NG --> See step 8

OK: Go to next step

6. CHECK HARNESS AND CONNECTOR (POWER BACK DOOR CONTROL SWITCH - MAIN BODY ECU)

- Disconnect the T4 power back door control switch and D14 main body ECU connectors.
- Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Condition	Specified Condition
T4-14 (CSW) - D14-8 (PBDS)	Always	Below 1 ohms
T4-1 (GND) - Body ground	Always	Below 1 ohms
T4-14 (CSW) - Body ground	Always	10 kohms or higher

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK --> See step 7

7. **REPLACE MAIN BODY ECU. Refer to REMOVAL**

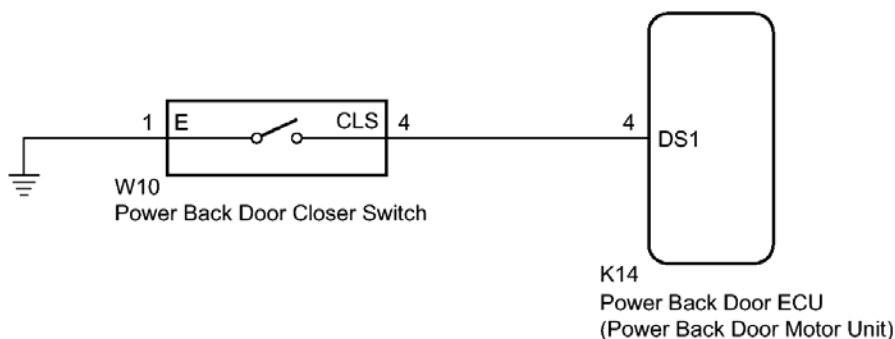
8. **REPLACE POWER BACK DOOR CONTROL SWITCH. Refer to REMOVAL**

Power Back Door cannot be Closed Using the Power Back Door Closer Switch

DESCRIPTION

When the power back door cannot be closed using the power back door closer switch, either of the following may be malfunctioning: 1) power back door closer switch circuit or 2) power back door ECU (power back door motor unit).

WIRING DIAGRAM



H

Fig. 5: Power Back Door Closer Switch Circuit - Wiring Diagram

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

INSPECTION PROCEDURE

PROCEDURE

1. READ VALUE USING TECHSTREAM (PBD CLOSE SW)

- Connect the Techstream to the DLC3.
- Turn the ignition switch to ON.
- Turn the Techstream on.
- Enter the following menus: Body Electrical / Back Door / Data List.
- Check the Data List to determine if the power back door closer switch functions properly.

BACK DOOR (POWER BACK DOOR ECU)

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
		ON: Power	

PBD Close SW	Power back door closer switch signal / ON or OFF	back door closer switch on OFF: Power back door closer switch off	-
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OK

The power back door closer switch functions as specified in the normal condition column.

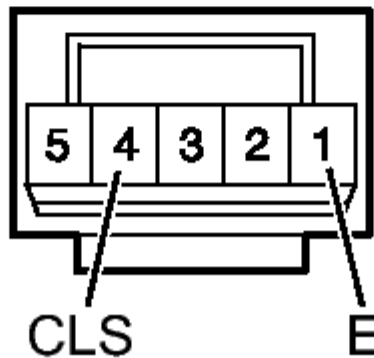
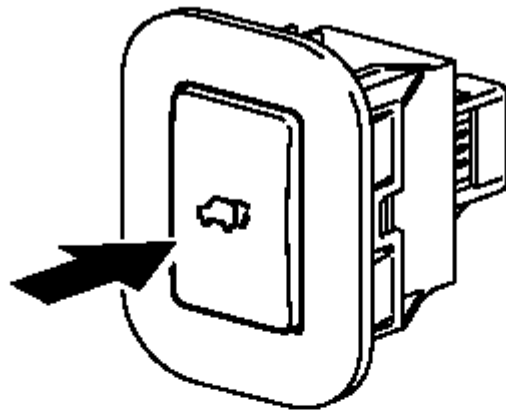
NG --> **See step 2**

OK --> **See step 5**

2. INSPECT POWER BACK DOOR CLOSER SWITCH

- a. Remove the power back door closer switch. Refer to **REMOVAL** .

*a



Y

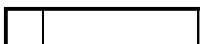
Fig. 6: Inspecting Power Back Door Closer Switch
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard Resistance

Tester Connection	Switch Condition	Specified Condition
4 (CLS) - 1 (E)	Pushed (on)	Below 1 ohms
	Free (off)	10 kohms or higher

TEXT IN ILLUSTRATION



*a	Component without harness connected (Power Back Door Closer Switch)
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NG --> See step 6

OK: Go to next step

3. CHECK HARNESS AND CONNECTOR (POWER BACK DOOR CLOSER SWITCH - POWER BACK DOOR ECU)

- Disconnect the W10 power back door closer switch and K14 power back door ECU connectors.
- Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Condition	Specified Condition
W10-4 (CLS) - K14-4 (DS1)	Always	Below 1 ohms
W10-1 (E) - Body ground	Always	Below 1 ohms
W10-4 (CLS) - Body ground	Always	10 kohms or higher

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK --> See step 4

- REPLACE POWER BACK DOOR ECU (POWER BACK DOOR MOTOR UNIT). Refer to REMOVAL**
- REPLACE POWER BACK DOOR ECU (POWER BACK DOOR MOTOR UNIT). Refer to REMOVAL**
- REPLACE POWER BACK DOOR CLOSER SWITCH. Refer to REMOVAL**

Power Back Door Warning System does not Operate

When the power back door warning system does not operate, one of the following may be malfunctioning: 1) power back door warning buzzer circuit, 2) wireless door lock control system or 3) power back door ECU.

W9
Power Back Door Warning Buzzer

D9
Flasher Relay

D13
Main Body ECU

K14
Power Back Door ECU
(Power Back Door Motor Unit)

HAZ

HAZ

BZR-

BZR+

26

8

3

1

2

Ground symbol

Legend: : CAN Communication Line

INSPECTION PROCEDURE

- The power back door warning function can be customized. Make sure the function is on. Refer to CUSTOMIZE PARAMETERS .
- The power back door system uses a CAN communication system. Inspect the communication function by following How to Proceed with Troubleshooting. Refer to HOW TO PROCEED WITH TROUBLESHOOTING . Troubleshoot the power back door system after confirming that the communication system is functioning properly.

1. CHECK OPERATION

- a. Check power back door system operation.

Result	Proceed to
Power back	

door warning buzzer does not operate	A
Hazard warning light does not come on	B
Power back door warning buzzer in the power back door ECU does not operate	C

B --> See step 5

C --> See step 9

A: Go to next step

2. **PERFORM ACTIVE TEST USING TECHSTREAM (PBD BUZZER)**

- Connect the Techstream to the DLC3.
- Turn the ignition switch to ON.
- Turn the Techstream on.
- Enter the following menus: Body Electrical / Back Door / Active Test.
- Using the Techstream, perform the Active Test to generate a control command, and check that the power back door warning buzzer sounds.

BACK DOOR (POWER BACK DOOR ECU)

Tester Display	Test Part	Control Range	Diagnostic Note
	Power		

PBD Buzzer	back door warning buzzer sound	ON / OFF	-
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OK

Buzzer sounds normally.

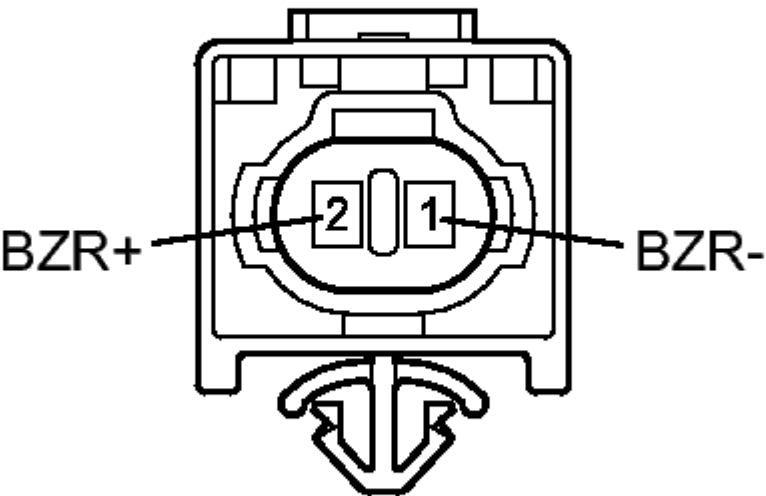
NG --> See step 3

OK --> See step 11

3. INSPECT POWER BACK DOOR WARNING BUZZER

- a. Remove the power back door warning buzzer. Refer to **REMOVAL** .

*a



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Fig. 8: Inspecting Power Back Door Warning Buzzer
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard Resistance

Tester Connection	Condition	Specified Condition
2 (BZR+) - 1 (BZR-)	Always	950 to 1050 ohms

TEXT IN ILLUSTRATION

	Component
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*a	without harness connected (Power Back Door Warning Buzzer)
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NG --> See step 10

OK: Go to next step

4. CHECK HARNESS AND CONNECTOR (POWER BACK DOOR WARNING BUZZER - POWER BACK DOOR ECU)

- Disconnect the W9 power back door warning buzzer connector and K14 power back door ECU connector.
- Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Condition	Specified Condition
W9-2 (BZR+) - K14-26 (BZR+)	Always	Below 1 ohms
W9-1 (BZR-) - Body ground	Always	Below 1 ohms
W9-2 (BZR+) - Body ground	Always	10 kohms or higher

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK --> See step 11

5. CHECK WIRELESS DOOR LOCK CONTROL SYSTEM (HAZARD ANSWER-BACK FUNCTION)

- Check wireless door lock operation.

RESULT

Result	Proceed to

Hazard answer- back function operates normally	A
Hazard answer- back function does not operate	B

B --> See step 12

A: Go to next step

6. REPLACE POWER BACK DOOR ECU (POWER BACK DOOR MOTOR UNIT)

- a. Replace the power back door ECU (power back door motor unit). Refer to **REMOVAL** .

NEXT: Go to next step

7. CHECK POWER BACK DOOR OPERATION

- a. Check that the power back door hazard warning lights operate normally. Refer to **OPERATION CHECK** .

OK

The power back door hazard warning lights operate normally.

NG --> See step 8

OK --> END (POWER BACK DOOR ECU (POWER BACK DOOR MOTOR UNIT) WAS DEFECTIVE)

8. **REPLACE MAIN BODY ECU. Refer to REMOVAL**
9. **REPLACE POWER BACK DOOR ECU (POWER BACK DOOR MOTOR UNIT). Refer to REMOVAL**
10. **REPLACE POWER BACK DOOR WARNING BUZZER. Refer to REMOVAL**
11. **REPLACE POWER BACK DOOR ECU (POWER BACK DOOR MOTOR UNIT). Refer to REMOVAL**
12. **GO TO WIRELESS DOOR LOCK CONTROL SYSTEM (NO ANSWER-BACK). Refer to PROBLEM SYMPTOMS TABLE**

Jam Protection Function Activates During Power Back Door Operation

DESCRIPTION

When the jam protection function activates during power back door operation, one of the following may be the cause: 1) improper fit of back door or a foreign object is stuck in the back door, 2) malfunctioning power back door touch sensor circuit or 3) malfunctioning power back door ECU (power back door motor unit).

WIRING DIAGRAM

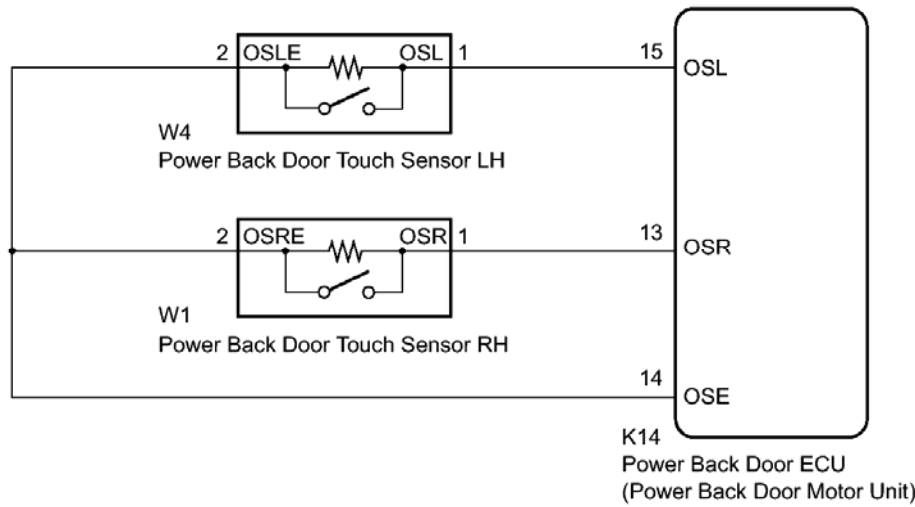


Fig. 9: Power Back Door Touch Sensor Circuit - Wiring Diagram
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

PROCEDURE

1. CHECK BACK DOOR LOCK FUNCTION

- Check if there are any foreign objects interfering with back door operation.

OK

There are no foreign objects.

NG --> REMOVE FOREIGN OBJECT

OK: Go to next step

2. CHECK BACK DOOR

- Check back door operation.
 - Turn the power slide door main switch off.
 - Open/close the back door by hand.

OK

The back door fully opens and closes smoothly.

NG --> See step 6

OK: Go to next step

3. READ VALUE USING TECHSTREAM (PBD TOUCH SENSOR)

- Connect the Techstream to the DLC3.
- Turn the ignition switch to ON.
- Turn the Techstream on.
- Enter the following menus: Body Electrical / Back Door / Data List.
- Check the Data List to determine if the power back door touch sensor functions properly.

BACK DOOR (POWER BACK DOOR ECU)

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
PBD Touch Sensor (Right)	Power back door touch sensor RH signal / ON, OFF or Open	ON: Power back door touch sensor RH pressed OFF: Power back door touch sensor RH not pressed Open: Power back door touch sensor RH circuit open	-
		ON: Power back door touch sensor LH pressed OFF: Power	

PBD Touch Sensor (Left)	Power back door touch sensor LH signal / ON, OFF or Open	back door touch sensor LH not pressed Open: Power back door touch sensor LH circuit open	-
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RESULT

Result	Proceed to
On the Techstream screen, ON or OFF will be displayed accordingly.	A
On the Techstream screen, ON or OFF will not be displayed accordingly or Open is displayed.	B

B --> See step 5

A --> See step 4

4. **REPLACE POWER BACK DOOR ECU (POWER BACK DOOR MOTOR UNIT). Refer to REMOVAL**
5. **GO TO OTHER FLOW CHART (TOUCH SENSOR CIRCUIT). Refer to Touch Sensor Circuit**
6. **ADJUST BACK DOOR. Refer to ADJUSTMENT**

CIRCUIT TESTS

Touch Sensor Circuit

DESCRIPTION

When the power back door ECU (power back door motor unit) receives a jam signal from the touch sensor while the power back door is operating, the ECU reverses the back door operation and opens the door.

WIRING DIAGRAM

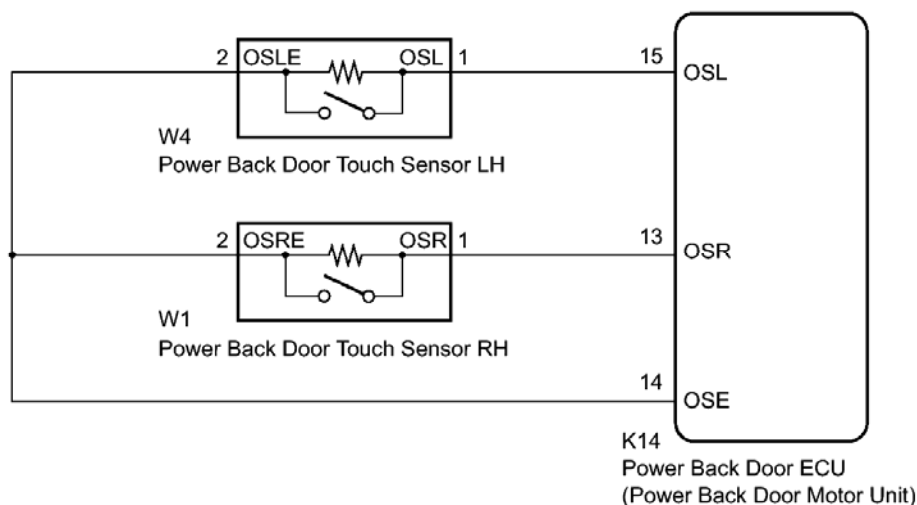


Fig. 10: Touch Sensor Circuit - Wiring Diagram
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

PROCEDURE

1. **READ VALUE USING TECHSTREAM (PBD TOUCH SENSOR)**
 - 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 / Back Door / Data List.
 - e. Check the Data List for proper functioning of the power back door touch sensor.

BACK DOOR (POWER BACK DOOR ECU)

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
		ON: Power back door touch sensor RH pressed OFF:	

PBD Touch Sensor (Right)	Power back door touch sensor RH signal / ON, OFF or Open	Power back door touch sensor RH not pressed Open: Power back door touch sensor RH circuit open	-
PBD Touch Sensor (Left)	Power back door touch sensor LH signal / ON, OFF or Open	ON: Power back door touch sensor LH pressed OFF: Power back door touch sensor LH not pressed Open: Power back door touch sensor LH circuit open	-

RESULT

Result	Proceed to
ON and OFF function is normal	A
ON and OFF function is not normal, or Open	B

is displayed for LH touch sensor	
ON and OFF function is not normal, or Open is displayed for RH touch sensor	C

B --> See step 2

C --> See step 5

A --> END

2. CHECK POWER BACK DOOR TOUCH SENSOR LH (POWER BACK DOOR TOUCH SENSOR LH - BODY GROUND)

- a. Disconnect the W4 power back door touch sensor LH connector.

***a**

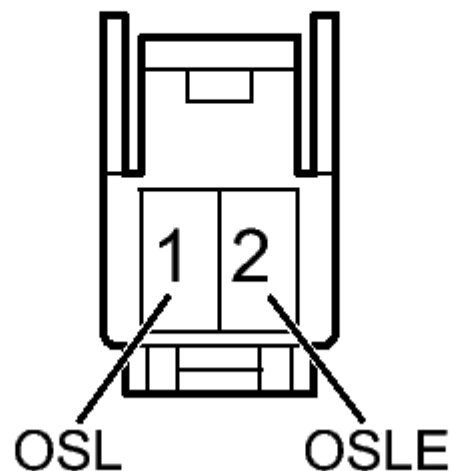


Fig. 11: Checking Power Back Door Touch Sensor LH (Power Back Door Touch Sensor LH - Body Ground)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard Resistance

Tester Connection	Condition	Specified Condition
1 (OSL) - Body ground	Always	10 kohms or higher
2 (OSLE) - Body ground	Always	10 kohms or higher

TEXT IN ILLUSTRATION

*a	Component without harness connected (Power Back Door Touch Sensor LH)
----	---

HINT:

Perform this inspection with the touch sensor installed on the vehicle.

NG --> See step 10

OK: Go to next step

3. INSPECT POWER BACK DOOR TOUCH SENSOR LH

- a. Remove the power back door touch sensor LH. Refer to **REMOVAL** .

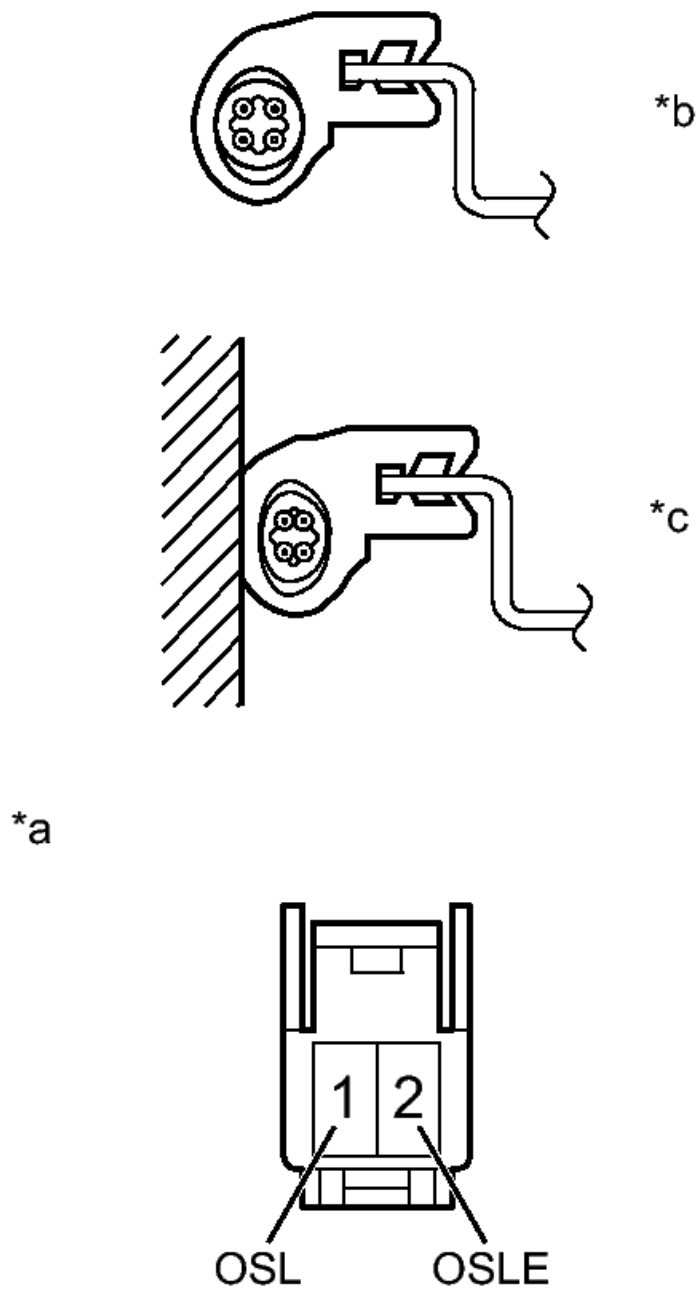


Fig. 12: Inspecting Power Back Door Touch Sensor LH
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard Resistance

Tester Connection	Condition	Specified Condition
1 (OSL) - 2 (OSLE)	Not pressed	950 to 1050 ohms
	Pressed	Below 100 ohms

TEXT IN ILLUSTRATION

*a	Component without harness connected (Power Back Door Touch Sensor LH)
*b	Not Pressed
*c	Pressed

NG --> See step 10

OK: Go to next step

4. CHECK HARNESS AND CONNECTOR (TOUCH SENSOR LH - POWER BACK DOOR ECU AND BODY GROUND)

- Disconnect the W4 power back door touch sensor LH connector and K14 power back door ECU connector.
- Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Condition	Specified Condition
W4-1 (OSL) - K14-15 (OSL)	Always	Below 1 ohms
W4-2 (OSLE) - K14-14 (OSE)	Always	Below 1 ohms

W4-1 (OSL) - Body ground	Always	10 kohms or higher
-----------------------------------	--------	-----------------------

NG --> **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK --> **See step 9**

5. **CHECK POWER BACK DOOR TOUCH SENSOR RH (POWER BACK DOOR TOUCH SENSOR RH - BODY GROUND)**

- a. Disconnect the W1 power back door touch sensor RH connector.

***a**

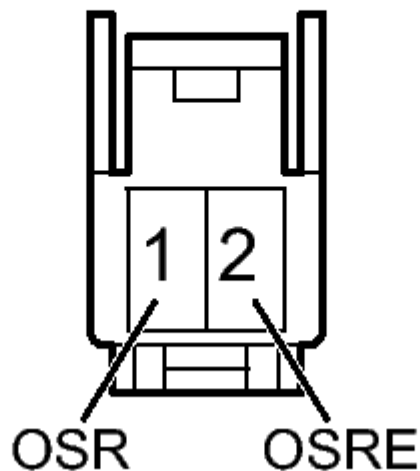


Fig. 13: Checking Power Back Door Touch Sensor RH (power Back Door Touch Sensor RH - Body Ground)

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

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

Standard Resistance

Tester Connection	Condition	Specified Condition
1 (OSR) - Body ground	Always	10 kohms or higher

2 (OSRE) - Body ground	Always	10 kohms or higher
------------------------------	--------	-----------------------

TEXT IN ILLUSTRATION

*a	Component without harness connected (Power Back Door Touch Sensor RH)
----	---

HINT:

Perform this inspection with the touch sensor installed on the vehicle.

NG --> See step 8

OK: Go to next step

6. INSPECT POWER BACK DOOR TOUCH SENSOR RH

- a. Remove the power back door touch sensor RH. Refer to **REMOVAL** .

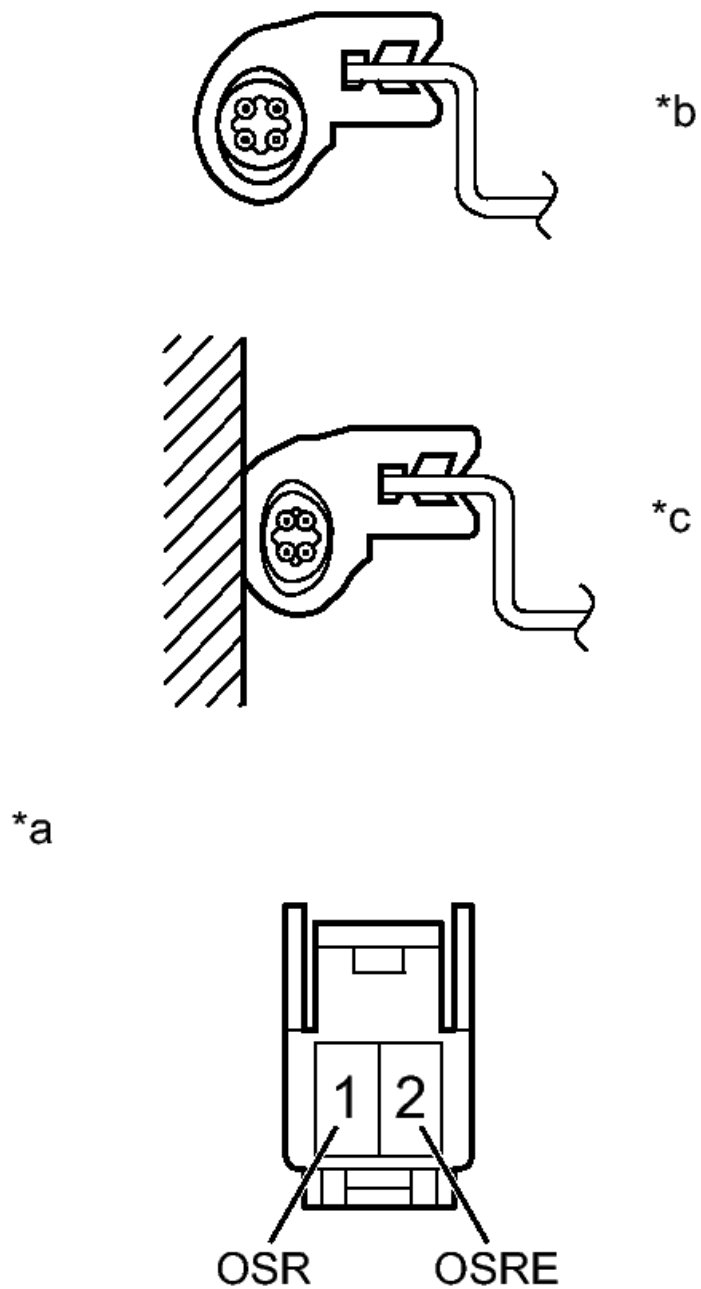


Fig. 14: Inspecting Power Back Door Touch Sensor RH
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard Resistance

Tester Connection	Condition	Specified Condition
1 (OSR) - 2 (OSRE)	Not pressed	950 to 1050 ohms
1 (OSR) - 2 (OSRE)	Pressed	Below 100 ohms

TEXT IN ILLUSTRATION

*a	Component without harness connected (Power Back Door Touch Sensor RH)
*b	Not Pressed
*c	Pressed

NG --> See step 8

OK: Go to next step

7. CHECK HARNESS AND CONNECTOR (TOUCH SENSOR RH - POWER BACK DOOR ECU AND BODY GROUND)

- Disconnect the W1 power back door touch sensor RH connector and K14 power back door ECU connector.
- Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Condition	Specified Condition
W1-1 (OSR) - K14-13 (OSR)	Always	Below 1 ohms
W1-2 (OSRE) - K14-14	Always	Below 1 ohms

(OSE)		
W1-1 (OSR) - Body ground	Always	10 kohms or higher

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK --> See step 9

- 8. REPLACE POWER BACK DOOR TOUCH SENSOR RH. Refer to REMOVAL**
- 9. REPLACE POWER BACK DOOR ECU (POWER BACK DOOR MOTOR UNIT). Refer to REMOVAL**
- 10. REPLACE POWER BACK DOOR TOUCH SENSOR LH. Refer to REMOVAL**

ACCESSORIES & EQUIPMENT

Power Back Door System (Diagnostics - Introduction) - Sienna

POWER BACK DOOR SYSTEM

PRECAUTION

PRECAUTION

1. IGNITION SWITCH EXPRESSIONS

- a. The type of ignition switch used on this model differs according to the specifications of the vehicle. The expressions listed in the table below are used in this information.

Expression	Ignition Switch (Position)	Engine Switch (Condition)
Ignition switch off	LOCK	Off
Ignition switch ACC	ACC	On (ACC)
Ignition switch ON	ON	On (IG)
Engine start	START	Start

PARTS LOCATION

ILLUSTRATION

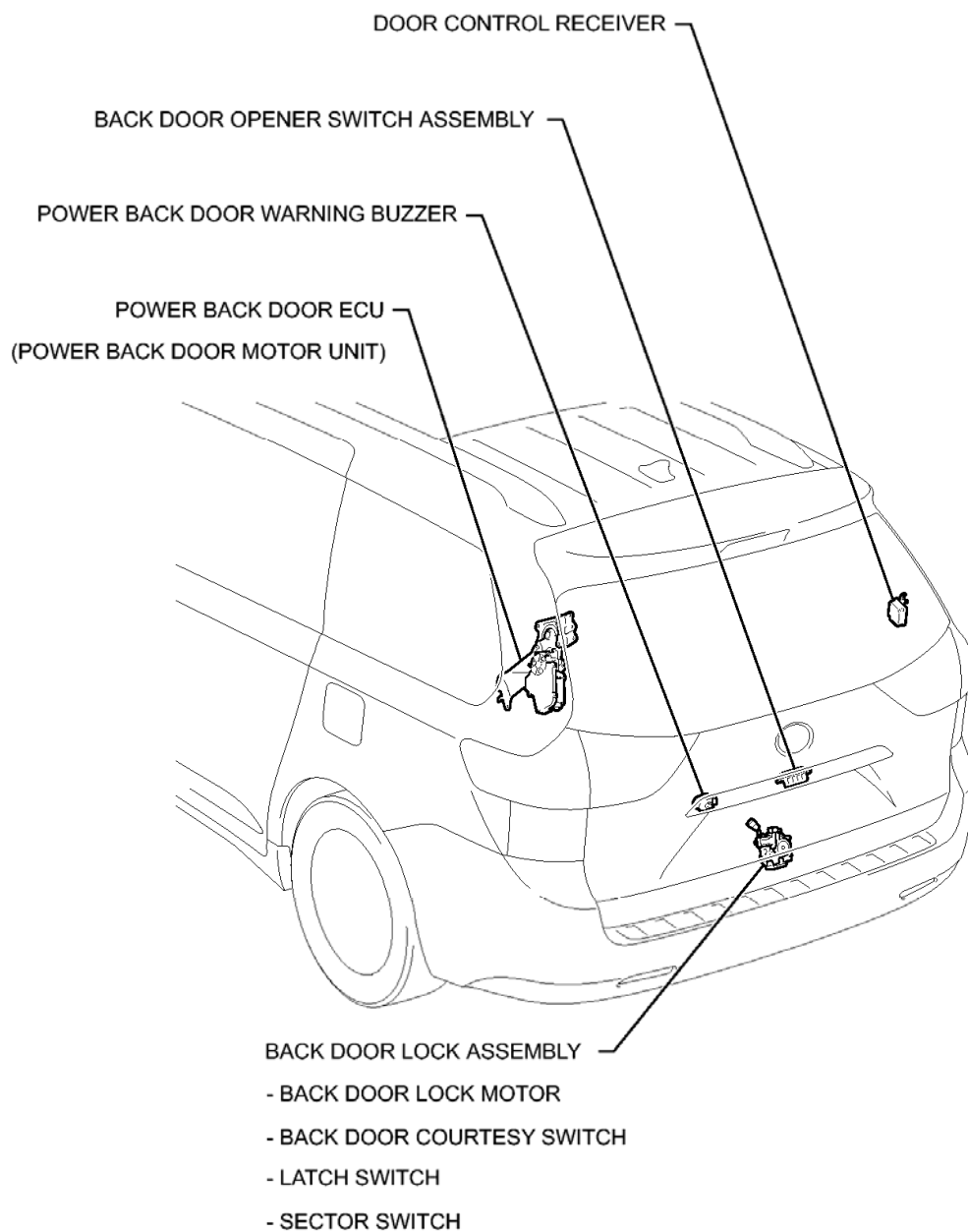
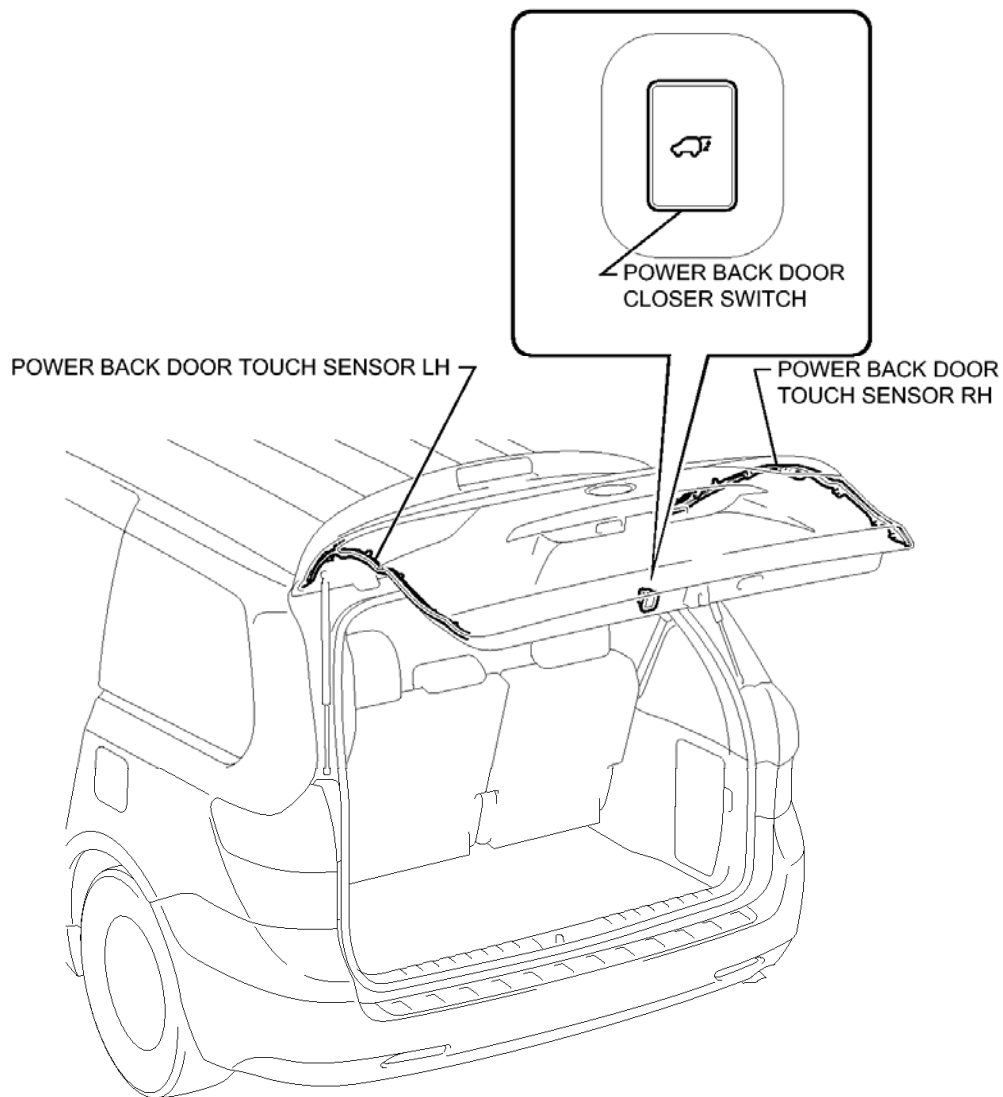


Fig. 1: Power Back Door System Components Location (1 Of 3)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ILLUSTRATION



P

Fig. 2: Power Back Door System Components Location (2 Of 3)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ILLUSTRATION

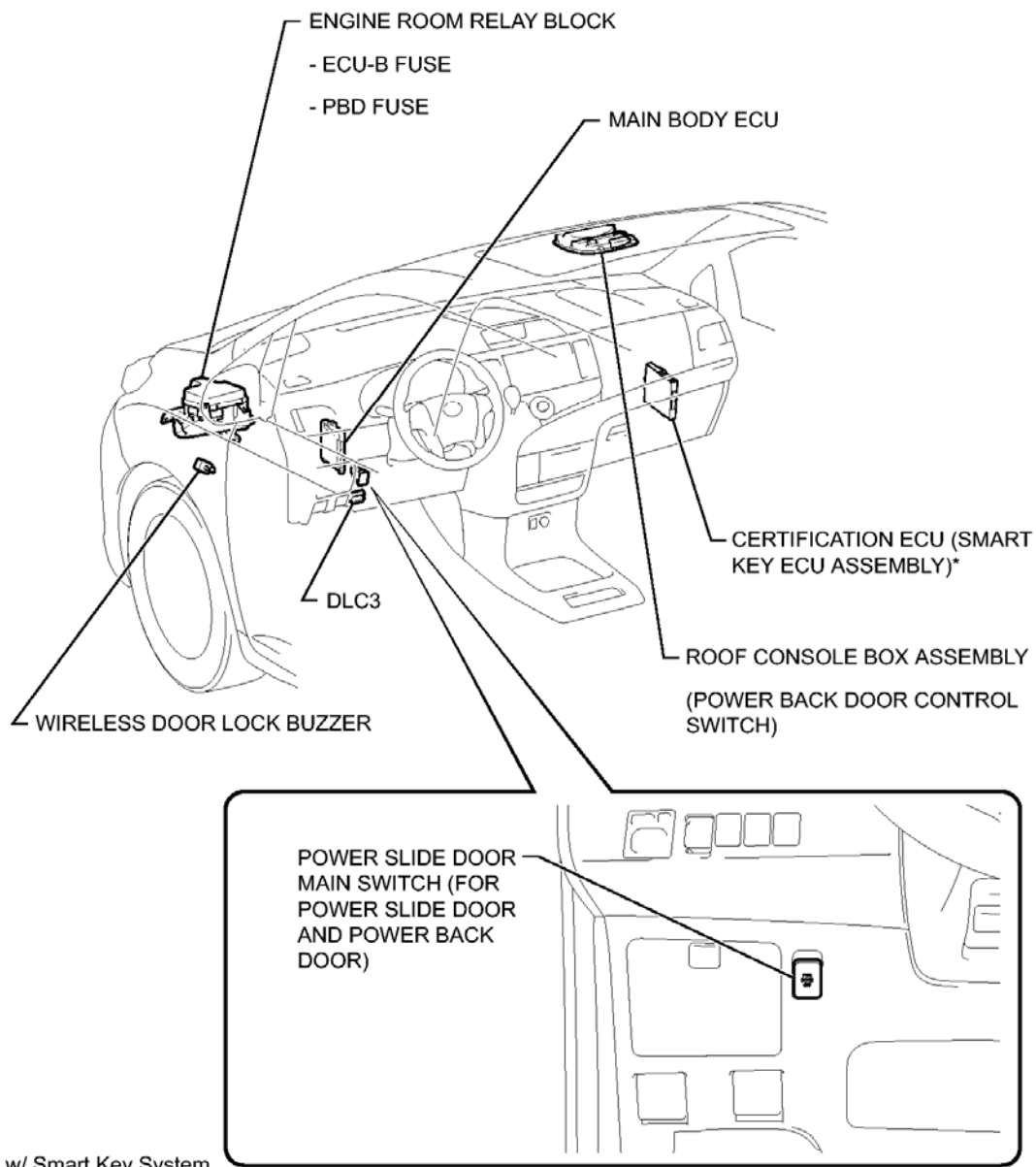


Fig. 3: Power Back Door System Components Location (3 Of 3)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

SYSTEM DIAGRAM

SYSTEM DIAGRAM

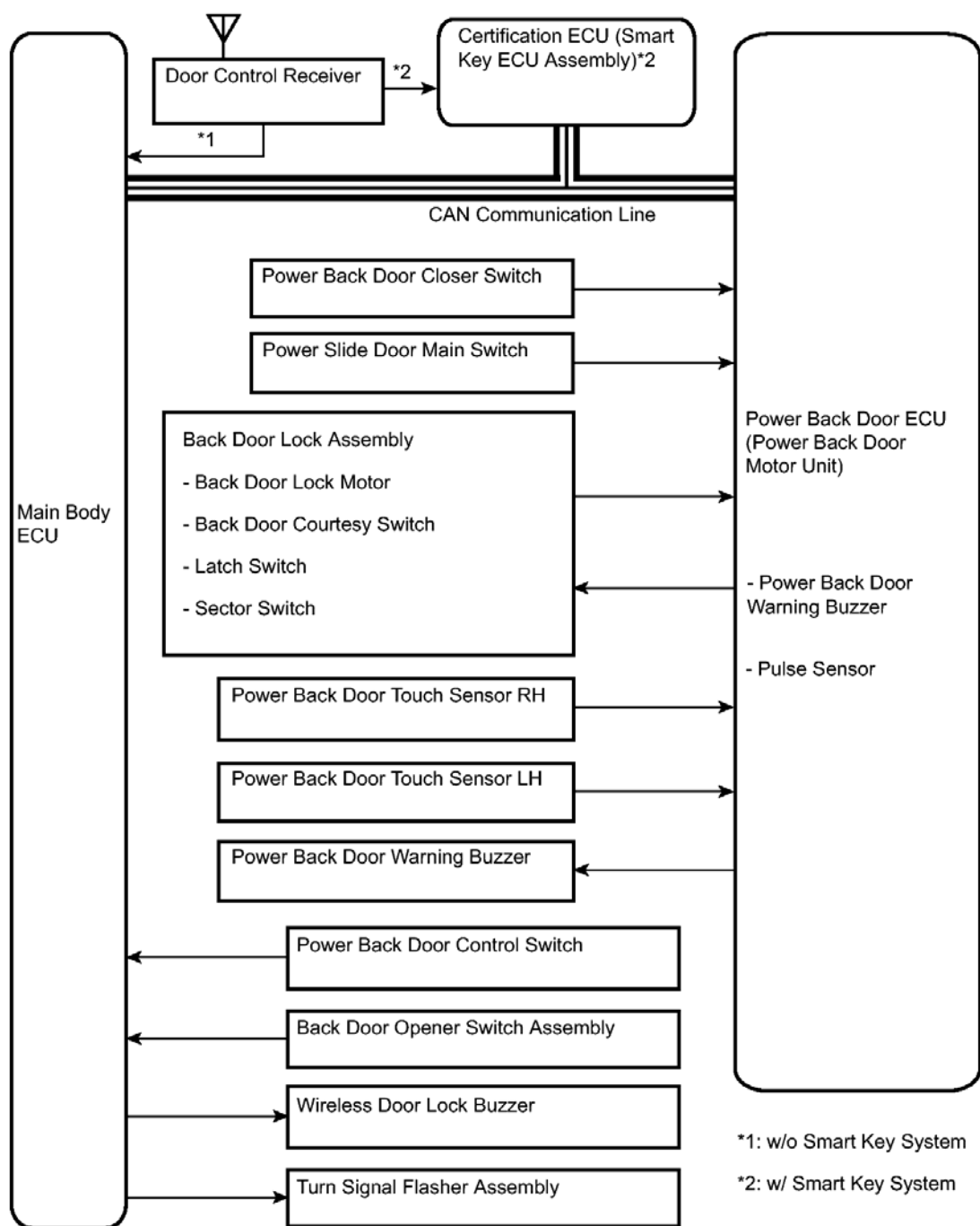


Fig. 4: Power Back Door System Diagram
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

COMMUNICATION TABLE

Sender	Receiver	Signal	Line
		- Power back door control switch signal - Back door unlock detection switch	

Main body ECU	Power back door ECU (Power back door motor unit)	signal • Vehicle speed signal • Electrical transmitter switch signal • Shift position switch signal	CAN
Power back door ECU (Power back door motor unit)	Main body ECU	• Hazard warning light signal • Back door courtesy switch signal	CAN
Certification ECU (Smart key ECU assembly)	Main body ECU	• Transmitter switch signal • Back door opener switch signal	CAN

SYSTEM DESCRIPTION

SYSTEM DESCRIPTION

1. POWER BACK DOOR SYSTEM DESCRIPTION

- a. The power back door system controls the power back door by automatically opening and closing the power back door with a motor.
 1. The power back door system operates only when the necessary conditions are satisfied.
 2. The power back door ECU records the back door positions in the power back door ECU.

If the battery, PBD fuse or power back door ECU (power back door motor unit) is removed and then reinstalled, the power back door ECU loses the memory of the door positions.

In such cases, initialization of the power back door system is necessary. Refer to the **INITIALIZATION** information.

3. "OPEN/CLOSE" request signals for the back door are received by the power back door ECU.

Then, the power back door ECU controls the back door opening/closing operation by sending commands to the back door lock assembly and back door motor unit.

4. The power back door system has various request signals: "OPEN/CLOSE" request signal from the transmitter switch, "OPEN/CLOSE" request signal from the power back door control switch, "CLOSE" request signal from the power back door closer switch, and "OFF" request signal from the back door main switch.
5. The power back door system sets off an alarm (using a buzzer) and hazard warning lights when the power back door starts operating.
6. The power back door reverses the direction that the power back door is operating if any switch is pressed during operation.
7. A pulse sensor and a touch sensor are used to prevent anything from being caught in the door while the power back door is closing (jam protection function).
8. The power back door system stops motor operation and switches to the manual operation mode when the jam protection function is activated repeatedly more than the specified number of times.

9. The power back door system slows the back door down when the back door approaches the fully opened position or fully closed position in order to reduce the impact against the vehicle body.

b. Function of main components:

Component	Function
Power back door warning buzzer	• Sounds for 0.8 seconds when the power back door closer switch, power back door control switch or transmitter switch is pressed. • Sounds intermittently while the power back door is operating.*1 • Sounds twice for 0.1 seconds to notify that the direction of door movement will reverse after being triggered by activation of the jam protection function. • Sounds for 2 seconds when the back door opener switch assembly is pressed

	while the power back door is operating.
Hazard warning lights	Flash twice to notify that the power back door will start operating when an OPEN/CLOSE request signal is input from a switch while the back door is in the closed or fully open position.
Power slide door main switch	• The power back door system does not operate when the switch is off. • The power back door system operates when the switch is on.
Transmitter switch	• Pressing the switch causes the power back door to open/close. • Pressing the switch again during operation reverses the direction of door movement.
Power back door control switch	Transmits a power back door OPEN/CLOSE request signal to the power back

	door ECU via the main body ECU.
Power back door closer switch	Transmits a power back door CLOSE signal to the power back door ECU.

*1: This function is set through the customize function, it is off by default.

HOW TO PROCEED WITH TROUBLESHOOTING

HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

- Use the following procedures to troubleshoot the power back door system.
- *: Use the Techstream.

1. VEHICLE BROUGHT TO WORKSHOP

NEXT: Go to next step

2. CUSTOMER PROBLEM ANALYSIS

HINT:

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

What	Vehicle model, system name
When	Date, time, occurrence frequency
Where	Road conditions
Under	Running conditions, driving

what conditions?	conditions, weather conditions
How did it happen?	Problem symptoms

NEXT: Go to next step

3. INSPECT 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: Go to next step

4. CHECK COMMUNICATION FUNCTION OF CAN COMMUNICATION SYSTEM*

- 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. Refer to DIAGNOSTIC TROUBLE CODE CHART

A: Go to next step

5. CHECK FOR DTC*

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

RESULT

	Proceed
--	---------

Result	to
DTC is not output	A
DTC is output	B

B --> GO TO DIAGNOSTIC TROUBLE CODE CHART. Refer to DIAGNOSTIC TROUBLE CODE CHART

A: Go to next step

6. PROBLEM SYMPTOMS TABLE

- Refer to PROBLEM SYMPTOMS TABLE.

RESULT

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

B --> Go to step 8

A: Go to next step

7. OVERALL ANALYSIS AND TROUBLESHOOTING*

- Operation check. Refer to OPERATION CHECK
- Terminals of ECU. Refer to TERMINALS OF ECU
- Data List / Active Test. Refer to DATA LIST / ACTIVE TEST

NEXT: Go to next step

8. ADJUST, REPAIR OR REPLACE

NEXT: Go to next step

9. CONFIRMATION TEST

NEXT --> END

OPERATION CHECK

OPERATION CHECK

1. CHECK BASIC OPERATION

- a. Conditions necessary for the power back door to open:
 - The power slide door main switch is on.
 - The back door is unlocked (except wireless one motion function).
 - The vehicle speed is 3 km/h (2 mph) or less.
 - The shift lever is in P (this can be determined only when the ignition switch is ON).
 - The power back door touch sensor circuit is not open.
- b. Conditions necessary for the power back door to close:
 - The power slide door main switch is on.
 - The power back door touch sensor circuit is not open.
 - The vehicle speed is 3 km/h (2 mph) or less.
- c. Check the opening operation.
 1. With the back door fully closed, push the power back door control switch and check that the buzzer sounds for 0.8 seconds, the hazard warning lights flash twice and the back door starts opening.
 2. With the back door fully closed, push the transmitter switch and check that the buzzer sounds for 0.8 seconds, the hazard warning lights flash twice and the back door starts opening.
- d. Check the closing operation.
 1. With the back door fully open, push the power back door control switch and check that the buzzer sounds for 0.8 seconds, the hazard warning lights flash twice and the back door starts closing.
 2. With the back door fully open, push the transmitter switch and check that the buzzer sounds for 0.8 seconds, the hazard warning lights flash twice and the back door starts closing.
 3. With the back door fully open, push the power back door closer switch and check that the buzzer sounds for 0.8 seconds, the hazard warning lights flash twice and the back door starts closing.
- e. Check the wireless one motion operation.
 1. With all doors locked, push the transmitter switch and check that the buzzer sounds for 0.8 seconds, the hazard warning lights flash twice and the back door starts opening.
- f. Check the operation when another input is detected during the opening or closing operation.
 1. During a power back door opening operation, push the power back door control switch, transmitter switch or power back door closer switch again, and check that the buzzer sounds for 0.2 seconds, the back door reverses and the back door starts closing.
 2. During a power back door closing operation, push the power back door control switch,

transmitter switch or power back door closer switch again, and check that the buzzer sounds for 0.2 seconds, the back door reverses and the door starts opening.

3. During a power back door opening or closing operation, push the back door opener switch assembly, and check that the buzzer sounds for 2 seconds and the back door reverses and moves to fully open or closed position.

2. CHECK JAM PROTECTION FUNCTION

HINT:

- The back door motor unit detects changes in the operating speed of the back door while the power back door is moving. If a change in the operating speed is out of the normal range, it will be judged that foreign objects are in the path of the power back door and the operation will reverse.
 - When the power back door touch sensors built into both sides of the back door are compressed, it is judged that foreign objects are in the path of the power back door and the operation will reverse.
 - The power back door touch sensors operate only while the back door is closing. They do not operate while the back door is opening.
- a. Check the jam protection function (the touch sensors) while the power back door is closing.

WARNING: Do not check this function using a part of your body such as your hand. Also, pay thorough attention that nothing gets caught by accident in this process.

1. Fully open the back door.
 2. Press a switch to close the power back door.
 3. While the back door is closing, press a touch sensor using the handle of a hammer or equivalent.
 4. Check that the buzzer sounds twice for 0.1 seconds and the jam protection function is immediately activated and the power back door reverses and moves to the fully open position.
- b. Check the jam protection function (the pulse sensor in the back door motor unit) while the power back door is closing.

WARNING: Do not check this function using a part of your body such as your hand. Also, pay thorough attention that nothing gets caught by accident in this process.

1. Fully open the back door.
 2. Press a switch to close the power back door.
 3. While the back door is closing, insert a tire or equivalent between the back door panel and vehicle body, in order to interrupt the closing operation.
 4. Check that the buzzer sounds twice for 0.1 seconds and the jam protection function is immediately activated and the power back door reverses and moves to the fully open position.
- c. Check the jam protection function while the power back door is opening.

WARNING: Pay thorough attention that your body or your clothes, etc. do not get caught in the door by accident in this process.

1. Fully close the back door.
 2. Press a switch to open the power back door.
 3. While the back door is opening, use your hands to press on the outside surface of the back door panel so that the operating speed decreases.
 4. Check that the buzzer sounds twice for 0.1 seconds and the jam protection function is immediately activated and the power back door reverses and moves to the fully closed position.
- d. Check operation of the power back door when the jam protection function is consecutively activated.
1. Check that power back door operation is canceled and switched to manual operation mode (not electrically controlled) when the jam protection function has been activated 2 or more consecutive times and the most recent activation occurred during closing.

CUSTOMIZE PARAMETERS

CUSTOMIZE PARAMETERS

HINT:

The following items can be customized.

NOTE:

- After confirming whether the items requested by the customer are applicable or not for customization, perform customizing operations.
- Be sure to record the current settings before customization.
- When troubleshooting, make sure that the item in question is not set to "OFF" as a result of customization (Example: For the condition, "the wireless function does not operate", first check that the wireless function is not set to "OFF", then perform troubleshooting).

1. CUSTOMIZE

- a. Connect the Techstream to the DLC3.
- b. Turn the ignition switch to ON.
- c. Turn the Techstream on.
- d. Enter the following menus: Customize Setting / PSD & PBD operation.
- e. Select the setting by referring to the table below.

PSD AND PBD OPERATION

Tester Display	Default	Content	Setting
		Function	

PBD SW Operation	0.8 s	that turns the power back door closer switch on when a switch is pushed once or held down for 0.8 seconds.	0.8 s or 0.0 s
PBD Buzzer*1	OFF	Function that makes the power back door buzzer sound when the power back door is operating.	OFF or ON
Door Unlock with 1 Motion	Back Door	Function that selects the door or doors to unlock when the back door is locked and the transmitter switch is pushed to operate the power back door.	Back Door or ALL DOORS
One Motion with Unlock	0.8 s	Function that operates the power back door by pushing the	OFF, 2 Op or 0.8 s

Door		transmitter switch regardless of the door lock condition.	
------	--	--	--

*:The warning buzzer that sounds when the power back door is operating cannot be customized (even if this function is set to "OFF", the buzzer will still sound).

INITIALIZATION

INITIALIZATION

1. RESET BACK DOOR CLOSE POSITION

NOTE: Perform initialization of the power back door system (power back door ECU initialization) if one of the following is performed:

- a. The cable is disconnected from the negative (-) battery terminal.
- b. A wire harness of the power back door system is disconnected and reconnected.
- c. The power back door ECU (back door motor unit) is replaced or removed and reinstalled.
- d. The ECU-B and PBD fuses are replaced or removed and reinstalled.

If initialization is not performed, the power back door system will not operate.

- a. When the back door is open and the cable is disconnected and reconnected to the negative (-) battery terminal, fully close the back door by hand to initialize the power back door system.

HINT:

- Initialization is not necessary if the cable is disconnected and reconnected to the negative (-) battery terminal while the back door is closed.
- The power back door ECU controls the locked or unlocked state of the back door based on its memory. If the power for the power back door ECU is disconnected and reconnected, the back door will need to be unlocked before it can be operated.
- If the power back door system does not operate and/or the back door does not open, disconnect the cable from the negative (-) battery terminal. Then wait 10 seconds, reconnect the cable and perform initialization of the power back door system again.

PROBLEM SYMPTOMS TABLE

PROBLEM SYMPTOMS TABLE

- Use the table below to help determine the cause of problem symptoms. If multiple suspected areas are listed, the potential causes of the symptoms are listed in order of probability in the "Suspected Area" column of the table. Check each symptom by checking the suspected areas in the order they are listed. Replace parts as necessary.
- Inspect the fuses and relays related to this system before inspecting the suspected areas below.

POWER BACK DOOR SYSTEM

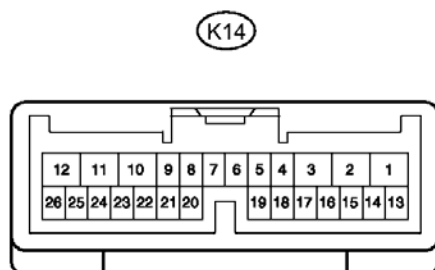
Symptom	Suspected Area	See
Power Back Door cannot be Operated Using Any Switch	Back door closer system	Refer to <u>Power Back Door cannot be Operated Using Any Switch</u>
	Initialize power back door ECU (Power back door motor unit)	-
	Meter/gauge system	-
	Main body ECU	-
	Touch sensor circuit	-
	Power slide door main switch circuit	-
	Power back door ECU (Power back door motor unit)	-
	Wire harness or connector	-
Power Back Door cannot be Opened or Closed Using the Power Back Door Switch	Power back door control switch	Refer to <u>Power Back Door cannot be Opened or Closed Using the Power Back Door Switch</u>
	Power back door ECU (Power back door motor unit)	-
	Main body ECU	-
	Wire harness or connector	-
Power Back Door cannot be Closed Using the Power Back Door Closer Switch	Power back door closer switch	Refer to <u>Power Back Door cannot be Closed Using the Power Back Door Closer Switch</u>
	Power back door ECU (Power back door motor unit)	-
	Wire harness or connector	-
Jam Protection Function Activates During Power Back Door Operation	Fitting condition of back door	Refer to <u>Jam Protection Function Activates During Power Back Door Operation</u>
	Touch sensor circuit	-
	Power back door ECU (Power back door motor unit)	-
	Wire harness or connector	-
	Power back door warning buzzer	Refer to <u>Power Back Door Warning System does not</u>

Power Back Door Warning System does not Operate		<u>Operate</u>
	Hazard warning light circuit	-
	Power back door ECU (Power back door motor unit)	-
	Wire harness or connector	-
Only Wireless Control Function is Inoperative (w/ Smart Key System)	Proceed to: All Door Entry Lock/Unlock Functions and Wireless Functions do not Operate.	-
Only Wireless Control Function is Inoperative (w/o Smart Key System)	Proceed to: Only Wireless Control Function is Inoperative	-

TERMINALS OF ECU

TERMINALS OF ECU

1. CHECK POWER BACK DOOR ECU (POWER BACK DOOR MOTOR UNIT)



T

Fig. 5: Power Back Door ECU Connector Terminal Identification

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

- Disconnect the K14 power back door ECU connector.
- Measure the voltage and resistance according to the value(s) in the table below.

HINT:

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

Terminal No. (Symbol)	Wiring Color	Terminal Description	Condition	Specified Condition
K14-10 (ECUB) -	SB - Body	Battery power	Always	11 to 14 V

Body ground	ground	supply		
K14-12 (B) - Body ground	B - Body ground	Battery power supply	Always	11 to 14 V
K14-8 (IG) - Body ground	L - Body ground	IG power supply	Ignition switch ON	11 to 14 V
			Ignition switch off	Below 1 V
K14-17 (MSW) - Body ground	L - Body ground	Power slide door main switch signal	Power slide door main switch not pushed	Below 1 ohms
			Power slide door main switch pushed	10 kohms or higher
K14-4 (DS1) - Body ground	V - Body ground	Power back door closer switch signal	Power back door closer switch on	Below 1 ohms
			Power back door closer switch off	10 kohms or higher
K14-15 (OSL) - K14-14 (OSE)	B - P	Power back door touch sensor LH signal	Power back door touch sensor LH not pressed	950 to 1050 ohms
			Power back door touch sensor LH pressed	Below 100 ohms
K14-13 (OSR) - K14-14	Y - P	Power back door touch sensor RH	Power back door touch sensor RH not pressed	950 to 1050 ohms

(OSE)		signal	Power back door touch sensor RH pressed	Below 100 ohms
K14-11 (GND) - Body ground	W-B - Body ground	Ground	Always	Below 1 ohms
K14-6 (CANH) - Body ground	BR - Body ground	CAN	Always	200 ohms or higher
K14-5 (CANL) - Body ground	W - Body ground	CAN	Always	200 ohms or higher

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

- c. Reconnect the K14 power back door ECU connector.
- d. Initialize the power back door system. Refer to **INITIALIZATION**.
- e. Measure the voltage according to the value(s) in the table below.

Terminal No. (Symbol)	Wiring Color	Terminal Description	Condition	Specified Condition
K14-17 (MSW) - Body ground	L - Body ground	Power slide door main switch signal	Power slide door main switch not pushed	Below 1 V
			Power slide door main switch pushed	Pulse generation
K14-26 (BZR+) - Body ground	G - Body ground	Power back door warning buzzer signal input	Back door warning buzzer sounding	Pulse generation
			Back door warning buzzer stopped	Below 1 V
			Back door	

K14-2 (DC+) - K14-1 (DC-)	W - G	Power back door lock motor signal	lock motor operating	11 to 14 V
			Back door lock motor stopped	Below 1 V
K14-4 (DS1) - Body ground	V - Body ground	Power back door closer switch signal	Power back door closer switch on	Below 1 V
			Power back door closer switch off	Pulse generation
K14-15 (OSL) - K14-14 (OSE)	B - P	Power back door touch sensor LH signal	Power back door touch sensor LH not pressed	4 to 6 V
			Power back door touch sensor LH pressed	Below 1 V
K14-13 (OSR) - K14-14 (OSE)	Y - P	Power back door touch sensor RH signal	Power back door touch sensor RH not pressed	4 to 6 V
			Power back door touch sensor RH pressed	Below 1 V

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

2. CHECK MAIN BODY ECU AND INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY

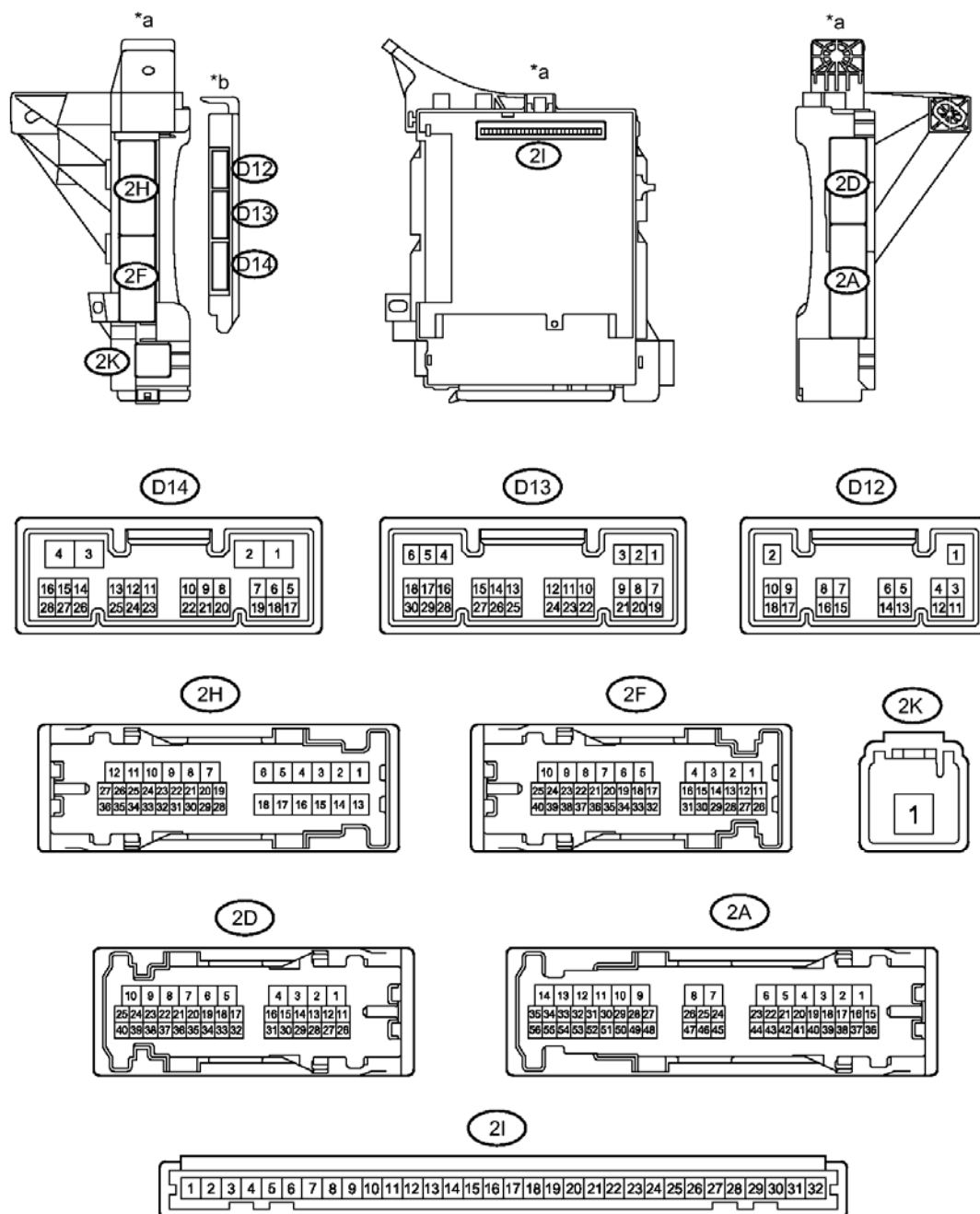


Fig. 6: ECU Connector Terminal Identification - Main Body ECU & I/P Junction Block
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

Component without harness connected	Component without harness
--	---------------------------------

*a	(Instrument Panel Junction Block Assembly)	*b	connected (Main Body ECU)
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- Disconnect the D13, D14 and main body ECU.
- 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.

Terminal No. (Symbol)	Wiring Color	Terminal Description	Condition	Specified Condition
D13-23 (BDSU) - Body ground	L - Body ground	Back door opener switch signal	Back door opener switch on	Below 1 ohms
			Back door opener switch off	10 kohms or higher
D14-8 (PBDS) - Body ground	R - Body ground	Power back door control switch signal	Power back door control switch on	Below 1 ohms
			Power back door control switch off	10 kohms or higher
2I-30 (BECU) - Body ground	-	Battery power supply	Always	11 to 14 V
2I-31 (ALTB) - Body ground	-	Battery power supply	Always	11 to 14 V
2I-11 (GND1) - Body ground	-	Ground	Always	Below 1 ohms
D14-3 (GND2) - Body ground	W-B - Body ground	Ground	Always	Below 1 ohms

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

- c. Reconnect the D13, D14 and main body ECU.
- d. Measure the voltage according to the value(s) in the table below.

Terminal No. (Symbol)	Wiring Color	Terminal Description	Condition	Specified Condition
D13-23 (BDSU) - Body ground	L - Body ground	Back door opener switch signal	Back door opener switch on	Below 1 V
			Back door opener switch off	Pulse generation
D14-8 (PBDS) - Body ground	R - Body ground	Power back door control switch signal	Power back door control switch on	Below 1 V
			Power back door control switch off	Pulse generation

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

3. CHECK CERTIFICATION ECU (SMART KEY ECU ASSEMBLY)

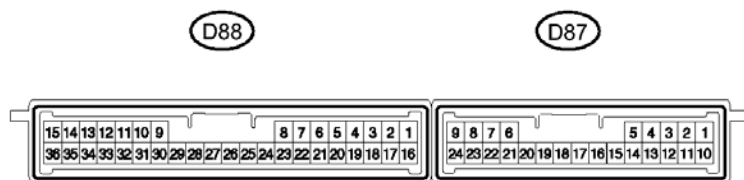


Fig. 7: Certification ECU Connector Terminal Identification
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- a. Disconnect the D88 certification ECU connector.
- b. Measure the resistance according to the value(s) in the table below.

HINT:

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

Terminal				
----------	--	--	--	--

No. (Symbol)	Wiring color	Terminal Description	Condition	Specified Condition
D88-22 (TSW5) - Body ground	L - Body Ground	Back door opener switch signal	Back door opener switch on	Below 1 ohms
			Back door opener switch off	10 kohms or higher

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

- c. Reconnect the D88 certification ECU connector.
- d. Measure the voltage according to the value(s) in the table below.

Terminal No. (Symbol)	Wiring color	Terminal Description	Condition	Specified Condition
D88-22 (TSW5) - Body ground	L - Body Ground	Back door opener switch signal	Back door opener switch on	Below 1 V
			Back door opener switch off	Pulse generation

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

DIAGNOSIS SYSTEM

DIAGNOSIS SYSTEM

1. DESCRIPTION

- a. The power back door ECU (power back door motor unit) controls the power back door system functions. Power back door system data and Diagnostic Trouble Code (DTC) can be read through the Data Link Connector 3 (DLC3).

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

2. CHECK DLC3

- a. Check the DLC3. Refer to **GENERAL INFORMATION** .

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.

DTC CHECK / CLEAR

DTC CHECK / CLEAR

1. CHECK DTC

- a. Connect the Techstream to the DLC3.
- b. Turn the ignition switch to ON.
- c. Turn the Techstream on.
- d. Read the DTCs by following the directions on the Techstream screen.

HINT:

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

2. CLEAR DTC

- a. Connect the Techstream to the DLC3.
- b. Turn the ignition switch to ON.
- c. Turn the Techstream on.
- d. Clear the DTCs by following the directions on the Techstream screen.

HINT:

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

DATA LIST / ACTIVE TEST

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.

NOTE: In the table below, the values listed under "Normal Condition" are reference values. Do not depend solely on these reference values when deciding whether a part is faulty or not.

- a. Connect the Techstream to the DLC3.
- b. Turn the ignition switch to ON.
- c. Turn the Techstream on.
- d. Enter the following menus: Body Electrical / Back Door or Main Body / Data List.
- e. According to the display on the Techstream, read the Data List.

BACK DOOR (POWER BACK DOOR ECU)

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Door Lock Status	Back door lock condition signal / LOCK or UNLOCK	LOCK: Back door locked UNLOCK: Back door unlocked	-
Half Latch SW	Half-latch switch signal / ON or OFF	ON: Back door lock motor open-latched or over-latched OFF: Back door lock motor full-latched or half-latched	-
Closer Position SW	Closer position switch signal / ON or OFF	ON: Back door lock center gear in center position OFF: Back door lock center gear out of center position	-
Courtesy SW	Back door courtesy switch signal / ON or OFF	ON: Back door open OFF: Back door closed	-
		ON: Power back door touch sensor RH	

PBD Touch Sensor (Right)	Power back door touch sensor RH signal / ON, OFF or Open	pressed OFF: Power back door touch sensor RH not pressed Open: Power back door touch sensor RH circuit open	-
PBD Touch Sensor (Left)	Power back door touch sensor LH signal / ON, OFF or Open	ON: Power back door touch sensor LH pressed OFF: Power back door touch sensor LH not pressed Open: Power back door touch sensor LH circuit open	-
PBD Main SW	Power slide door main switch signal / ON or OFF	ON: Power slide door main switch on OFF: Power slide door main switch off	-
PBD Close SW	Power back door closer switch signal / ON or OFF	ON: Power back door closer switch on OFF: Power back door closer switch off	-
IG SW	Ignition switch / ON or OFF	ON: Ignition switch ON OFF: Ignition	-

		switch off	
Door Position (3/4 - Open)	Load signal detected during back door closing operation (3/4 - open) / CAUTION or OK	CAUTION: Load detected between back door 3/4 and fully open position during back door closing operation OK: No load detected between back door 3/4 and fully open position during back door closing operation	-
Door Position (2/4 - 3/4)	Load signal detected during back door closing operation (2/4 - 3/4) / CAUTION or OK	CAUTION: Load detected between back door 2/4 and 3/4 open position during back door closing operation OK: No load detected between back door 2/4 and 3/4 open position during back door closing	-

		operation	
Door Position (1/4 - 2/4)	Load signal detected during back door closing operation (1/4 - 2/4) / CAUTION or OK	CAUTION: Load detected between back door 1/4 and 2/4 open position during back door closing operation OK: No load detected between back door 1/4 and 2/4 open position during back door closing operation	-
Door Position (close - 1/4)	Load signal detected during back door closing operation (close - 1/4) / CAUTION or OK	CAUTION: Load detected between back door fully closed and 1/4 open position during back door closing operation OK: No load detected between back door fully closed and 1/4 open position during back	-

		door closing operation	
PBD SW Operation	Power back door switch operation condition signal / ON or 0.8 s	Current customize setting displayed	-
PBD Buzz In Use*1	Power back door warning buzzer operation condition signal / ON or OFF	Current customize setting displayed	-
Door Unlock with 1 Motion	Door or doors to be unlocked when back door locked and power back door operated by pressing transmitter switch / Back Door or ALL DOORS	Current customize setting displayed	-
One Motion with Unlock Door	Transmitter switch operation condition signal / OFF, 2 Op, 0.8s or (Not Use)	Current customize setting displayed	-

*1: The warning buzzer that sounds when the power back door is operating cannot be customized (even if this function set to "OFF", the buzzer will still sounds).

MAIN BODY (MAIN BODY ECU)

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Back Door Courtesy	Back door courtesy switch signal /	ON: Back door courtesy switch on OFF:	-

SW	ON or OFF	Back door courtesy switch off	
Back Door Open	Back door lock / Permit or Prohibit	Permit: Back door unlocked Prohibit: Back door locked	-
Back Door Open SW	Power back door control switch / ON or OFF	ON: Power back door control switch pushed OFF: Power back door control switch not pushed	-
Back Door Open Handle SW	Back door opener switch signal / ON or OFF	ON: Back door opener switch on OFF: Back door opener switch off	-

2. ACTIVE TEST

HINT:

Using the Techstream to perform Active Test 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 / Back Door / Active Test.
- According to the display on the Techstream, perform the Active Test.

BACK DOOR (POWER BACK DOOR ECU)

Tester Display	Test Part	Control Range	Diagnostic Note
Latch Release	Latch release operation	ON / OFF	-
PBD Motor	Power back door motor	Forward / Reverse / OFF	-
PBD Clutch	Power back door motor clutch	ON / OFF	-
PBD Buzzer	Power back door warning buzzer sound	ON / OFF	-

DIAGNOSTIC TROUBLE CODE CHART**DIAGNOSTIC TROUBLE CODE CHART****HINT:**

If a trouble code is displayed during the DTC check, inspect the trouble areas listed below for that code. For details of the code, refer to the following information below.

POWER BACK DOOR SYSTEM

DTC Code	Detection Item	Trouble Area	See
B2222	PBD Pulse Sensor Malfunction	Power back door ECU (Power back door motor unit)	Refer to <u>DTC B2222: PBD Pulse Sensor Malfunction</u>
B2225	Back Door Motor Clutch Malfunction	Power back door ECU (Power back door motor unit)	Refer to <u>DTC B2225: Back Door Motor Clutch Malfunction</u>