

2008 Lexus RX 350

2008 ACCESSORIES & EQUIPMENT Windshield/Window Glass - RX 350

2008 ACCESSORIES & EQUIPMENT

Windshield/Window Glass - RX 350

POWER WINDOW CONTROL SYSTEM

PRECAUTION

NOTE: When disconnecting the negative (-) battery cable, initialize the following systems after the cable is reconnected.

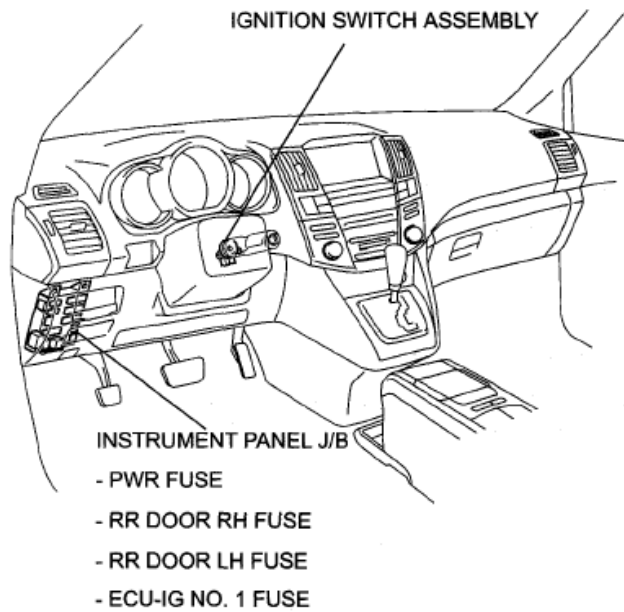
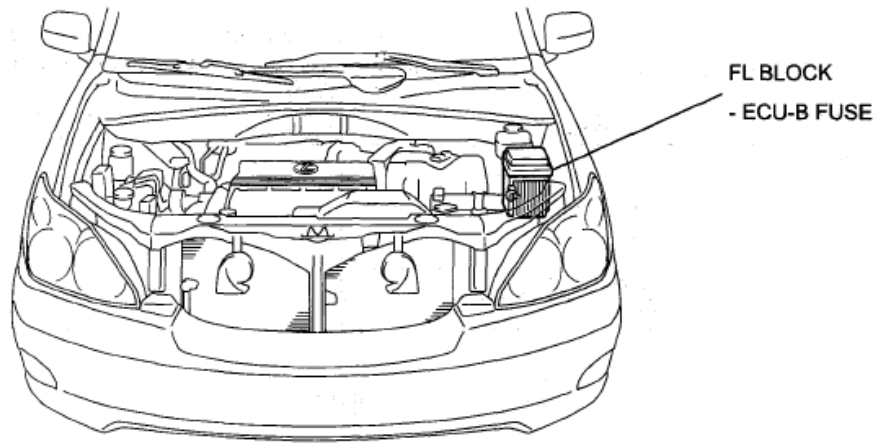
SYSTEM NAME REFERENCE

System Name	Information
Lighting System	<u>INITIALIZATION</u>
Power Door Lock Control System	
Power Window Control System	
Back Door Closer System	
Power Back Door System	
Electrical Back Door Outside Handle System	
Sliding Roof Control (for Multi-panel Moon Roof)	
Sliding Roof Control (for Standard)	

PARTS LOCATION

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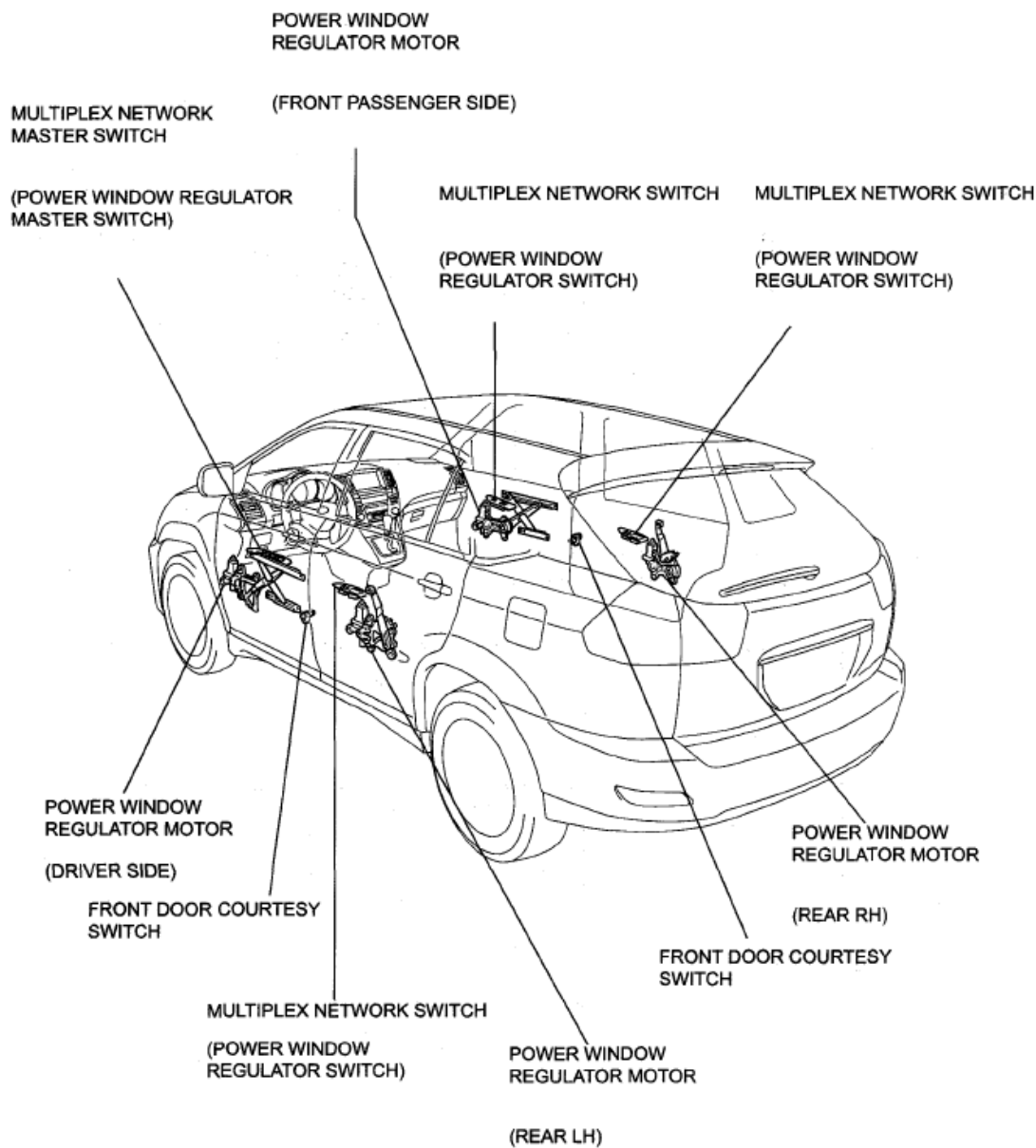
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Fig. 1: Identifying Power Window Control System Replacement Components (1 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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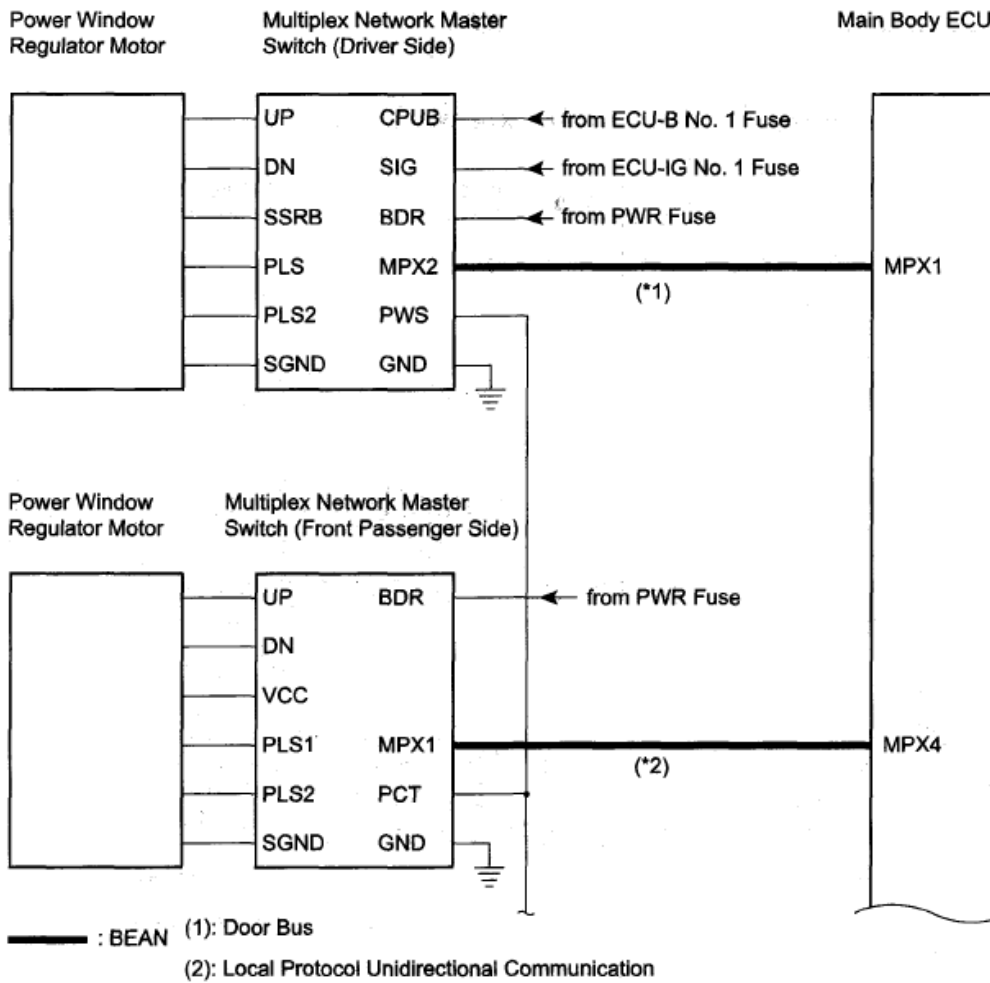
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Fig. 2: Identifying Power Window Control System Replacement Components (2 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

SYSTEM DIAGRAM

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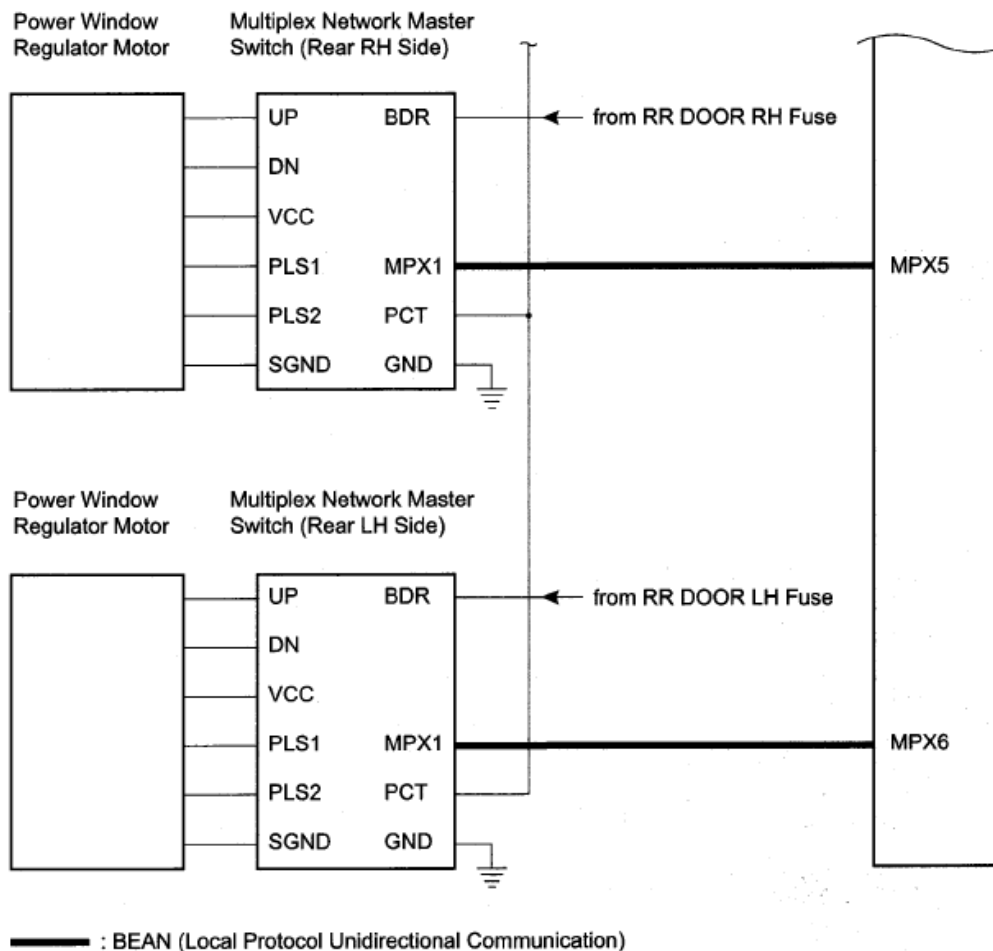
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Fig. 3: Identifying Power Window Control System Diagram (1 Of 2)

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



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Fig. 4: Identifying Power Window Control System Diagram (2 Of 2)

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

SYSTEM DESCRIPTION

1. POWER WINDOW CONTROL SYSTEM DESCRIPTION

- a. The power window control system controls the power window UP/DOWN function by using regulator motors. This system is mainly controlled by the multiplex network master switch built into the driver's door and multiplex network switches built into passenger's doors. Pressing any of these multiplex network switches or the driver side door window switch mounted on the master switch transmits an UP/DOWN signal to the regulator motor for the corresponding power window, which then operates the power window UP/DOWN. Pressing, any switch for the power windows except the driver's power window mounted on the master switch transmits a remote UP/DOWN signal to the main body ECU via the BEAN line. Then the main body ECU transmits this remote signal to the regulator switcher the corresponding power window via the BEAN line and activates the motor to open/close the power window.
- b. The power window control system has the following functions:

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POWER WINDOW CONTROL FUNCTION TABLE

Function	Outline
Manual up-and-down function	Function that causes window to go up while power window switch is being pulled halfway up and to go down while pushed halfway down. Window stops as soon as the switch is released.
All door auto up-and-down function	Function that enables window of all doors to be fully opened or closed by one press of power window switch.
Jam protection function	Function that automatically stops power window and moves it downward if a foreign object gets jammed in door window during auto-up operation.
Remote control function	Function that allows power window master switch to control AUTO and MANUAL up-and-down operations of front passenger door window and rear door windows.
Key-off operation function	Function that makes it possible to operate power window for approx. 45 seconds after ignition switch is turned to ACC or LOCK position, if either front door is not opened.
Key-linked up-and-down function	Function that causes window to go up while driver's door key is turned to lock side for more than 1.5 seconds and to go down while turned to unlock side for more than 1.5 seconds. Window stops as soon as the key is returned to original position.
Transmitter-linked down function	Function that causes window to go down while unlock switch on transmitter is pressed for more than 2.5 seconds. Window stops as soon as the switch is released.
Diagnosis	Function that allows the power window switch to make a diagnosis for failed section when power window switch detects a malfunction in power window system. Power window switch light comes on or blinks to inform driver.
Fail-safe	A fail-safe function to disable a part of power window functions if pulse sensor in power window motor has a malfunction: <ul style="list-style-type: none">• All door auto up-and-down function and remote control function are disabled.• Manual operation is possible by each power window switch.

HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

- Use this procedure to troubleshoot the power window control system.
- The intelligent tester should be used in steps 3 and 5.

1. **VEHICLE BROUGHT TO WORKSHOP**
2. **CUSTOMER PROBLEM ANALYSIS CHECK AND SYMPTOM CHECK**
3. **CHECK COMMUNICATION FUNCTION OF MULTIPLEX COMMUNICATION SYSTEM (BEAN)**

HINT:

See **HOW TO PROCEED WITH TROUBLESHOOTING**

- a. Use the intelligent tester to confirm normal function of the multiplex communication system.
 1. (ECU unconnected, communication line malfunctioning) Without code outputs, proceed to A.
 2. (ECU unconnected, communication line malfunctioning) With code outputs, proceed to B.

B: Go to MULTIPLEX COMMUNICATION SYSTEM

A: Go to next step.

4. **PROBLEM SYMPTOMS TABLE**

HINT:

See **PROBLEM SYMPTOMS TABLE**

5. **OVERALL ANALYSIS AND TROUBLESHOOTING**

- a. Data list/Active test

HINT:

See **DATA LIST/ACTIVE TEST**

- b. Circuit inspection
- c. See **TERMINALS OF ECU**

6. **ADJUST, REPAIR OR REPLACE**

7. **RESET POWER WINDOW MOTOR**

HINT:

See **PROBLEM SYMPTOMS TABLE**

NEXT: END

OPERATION CHECK

1. **CHECK WINDOW LOCK SWITCH**

- a. Check that the front passenger side power window and rear power window operation is disabled when the window lock switch of the multiplex network master switch is pressed.

Standard: Front passenger side power window and rear power window operation is disabled.



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Fig. 5: Identifying Window Lock Switch
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Check that the front passenger side power window and rear power windows can be operated when the window lock switch is pressed again.

Standard: Front passenger side power window and rear power windows can be operated.

2. CHECK MANUAL UP/DOWN FUNCTION

- a. Check that the driver side power window operates as follows:

Standard

DRIVER SIDE POWER WINDOW

Condition	Master Switch	Switch Operation	Power Window
Ignition switch ON	Driver side	Pulled halfway up	UP (Closed)
		Pushed halfway down	DOWN (Open)

- b. Check that the power windows except the driver side power window operates as follows:

Standard

POWER WINDOWS EXCEPT DRIVER SIDE POWER WINDOW

Condition	Master Switch	Switch Operation	Power Window
<ul style="list-style-type: none"> • Ignition switch ON • Window lock switch OFF 	Passenger side	Pulled halfway up	UP (Closed)
		Pushed halfway down	DOWN (Open)
	Rear LH	Pulled halfway up	UP (Closed)
		Pushed halfway down	DOWN (Open)
	Rear RH	Pulled halfway up	UP (Closed)
		Pushed halfway down	DOWN (Open)

3. CHECK AUTO UP/DOWN FUNCTION

- a. Check that the driver side power window operates as follows:

Standard

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DRIVER SIDE POWER WINDOW

Condition	Master Switch	Switch Operation	Power Window
Ignition switch ON	Driver side	Pulled halfway up	UP (Closed)
		Pushed halfway down	DOWN (Open)

- b. Check that the power windows except the driver side power window operate as follows:

Standard

POWER WINDOWS EXCEPT DRIVER SIDE POWER WINDOW

Condition	Master Switch	Switch Operation	Power Window
<ul style="list-style-type: none"> • Ignition switch ON • Window lock switch OFF 	Passenger side	Pulled halfway up	UP (Closed)
		Pushed halfway down	DOWN (Open)
	Rear LH	Pulled halfway up	UP (Closed)
		Pushed halfway down	DOWN (Open)
	Rear RH	Pulled halfway up	UP (Closed)
		Pushed halfway down	DOWN (Open)

4. CHECK REMOTE MANUAL UP/DOWN FUNCTION

- a. Check that the power windows except the driver side power window operate as follows:

Standard

POWER WINDOWS EXCEPT DRIVER SIDE POWER WINDOW

Condition	Master Switch	Switch Operation	Power Window
<ul style="list-style-type: none"> • Ignition switch ON • Window lock switch OFF 	Passenger side	Pulled halfway up	UP (Closed)
		Pushed halfway down	DOWN (Open)
	Rear LH	Pulled halfway up	UP (Closed)
		Pushed halfway down	DOWN (Open)
	Rear RH	Pulled halfway up	UP (Closed)
		Pushed halfway down	DOWN (Open)

5. CHECK REMOTE AUTO UP/DOWN FUNCTION

- a. Check that the power windows except the driver side power window operate as follows:

Standard

POWER WINDOWS EXCEPT DRIVER SIDE POWER WINDOW

Condition	Master Switch	Switch Operation	Power Window
<ul style="list-style-type: none"> • Ignition switch ON 	Passenger side	Pulled halfway up	UP (Closed)
		Pushed halfway down	DOWN (Open)
	Rear LH	Pulled halfway up	UP (Closed)

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<ul style="list-style-type: none"> Window lock switch OFF 		Pushed halfway down	DOWN (Open)
	Rear RH	Pulled halfway up	UP (Closed)
		Pushed halfway down	DOWN (Open)

6. MANUAL UP/DOWN FUNCTION USING DRIVER SIDE DOOR LOCK KEY CYLINDER

- a. Check that all power windows and sliding roof (standard type only) operate as follows, when the key is inserted into the driver side door lock key cylinder:

Standard

DOOR LOCK KEY OPERATION TABLE

Condition	Key Operation	Position/Operation
No key in ignition key cylinder	Turned left (LOCK) for more than 1.5 sec.	Driver and passenger side power windows/UP
	Turned left (LOCK) for more than 2.0 sec.	Rear LH and RH power windows/UP
	Turned left (LOCK) for more than 2.5 sec.	Sliding roof/CLOSE
	Turned right (UNLOCK) for more than 1.5 sec.	Driver and passenger side power windows/DOWN
	Turned right (UNLOCK) for more than 2.0 sec.	Rear LH and RH power windows/DOWN
	Turned right (UNLOCK) for more than 2.5 1 sec.	Sliding roof/OPEN

7. CHECK MANUAL DOWN FUNCTION USING TRANSMITTER

- a. Check that all power windows and sliding roof (standard type only) operate as follows when operating the transmitter:

Standard

TRANSMITTER OPERATION TABLE

Condition	Transmitter Operation	Position/Operation
<ul style="list-style-type: none"> No key in ignition key cylinder Any door unlocked 	UNLOCK switch pressed for more than 1.5 sec.	Driver and passenger side power windows/DOWN
	UNLOCK switch pressed for more than 2.0 sec.	Rear LH and RH power windows/DOWN
	UNLOCK switch pressed for more than 2.5 sec.	Sliding roof/OPEN

HINT:

For a sign for starting operation, the wireless door lock buzzer sounds once (answer-back).

8. CHECK POWER WINDOW OPERATION FUNCTION AFTER IGNITION SWITCH IS TURNED OFF

- a. When both of the following conditions are fulfilled, check that the power windows can be operated even after the ignition switch is turned off.
 1. Within 45 seconds after the ignition switch is turned off.
 2. The front doors are closed.

9. CHECK JAM PROTECTION FUNCTION

HINT:

The jam protection function prevents any part of your body from getting caught by accident between the door frame and the door glass during power window operation.

NOTE: If the power window motor has been reset, raise and lower the door glass several times using MANUAL function before performing the check.

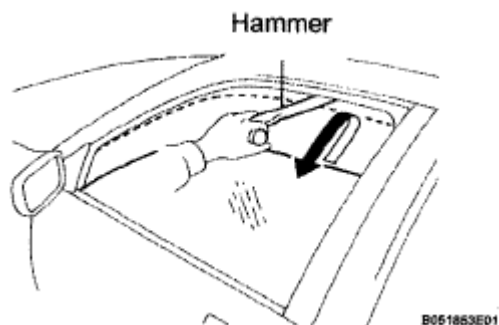


Fig. 6: Checking Jam Protection Function

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

- a. Check that the door glass goes down by approx. 50 mm (1.97 in.) right when something gets caught between the door frame and door glass during power window operation. However, when the opening between the door frame and the door glass is less than 200 mm (7.87 in.), the door glass continues to go down and does not stop until an opening of 200 mm (7.87 in.) is achieved.

Operative conditions:

- AUTO UP
- AUTO UP function after the ignition switch is turned off
- MANUAL UP function after the ignition switch is turned off
- MANUAL UP function using the driver side door lock key cylinder

CUSTOMIZE PARAMETERS

HINT:

The following items can be customized.

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NOTE:

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

POWER WINDOW

TROUBLESHOOTING TABLE - POWER WINDOW

DISPLAY (ITEM)	DEFAULT CONTENTS	CONTENTS	SETTING
UP/DOOR KEY (Door key linked P/W UP)	AVIL	Function that enables all power windows to move up manually, via manual operation, when driver side door key cylinder is held in lock position for 1.5 seconds when ignition switch is off.	NOT/AVIL
DOWN/DOOR KEY (Door key linked P/W DOWN)	AVIL	Function that enables all power windows to move down manually, via manual operation, when driver side door key cylinder is held in unlock position for 1.5 seconds when ignition switch is off.	NOT/AVIL
DOWN/WIRELESS (P/W DOWN w/ transmitter)	AVIL	Function that enables all power windows to move down manually, via manual operation, when unlock switch on transmitter is held for 1.5 seconds when ignition switch is off.	NOT/AVIL
UP/WIRELESS (P/W UP w/ transmitter)	AVIL	Function that enables all power windows to move up manually, via manual operation, when lock switch on transmitter is held for 1.5 seconds when ignition switch is off.	NOT/AVIL

INITIALIZATION

1. RESET (INITIALIZE) POWER WINDOW REGULATOR MOTOR

NOTE:

- Resetting the power window motor (initializing the pulse sensor) is necessary when the battery terminal is disconnected; when the power window regulator master switch, power window regulator switch, wire harness, power window regulator and power window motor are replaced or removed/installed; or when the fuses are replaced. AUTO operation function, jam protection function and remote operation function via the power window regulator master switch do not operate without resetting.

- **Be sure to reset the power window regulator motors using the power window switch on each door because the motors cannot be reset by remote operation using the power window master switch.**
 - **In order to prevent a large amount of current from flowing in the wires, do not simultaneously reset 2 or more power window regulator motors.**
 - **If the power window switch has been continuously operated for a long time, the power window regulator motor will stop so that no additional load will be applied to the motor. Continuing to operate the switch even after the motor has stopped will cause the switch to blink while restricting the AUTO UP/DOWN function and the remote UP/DOWN function. If this happens, reset the motor again after several minutes have passed.**
 - **Whenever disconnecting the battery terminal, reset all the other systems besides the power window control system.**
- a. Turn the ignition switch ON.
 - b. Halfway open the power window by pressing the power window switch.
 - c. Fully pull up the switch until the power window is fully closed and continue to hold the switch for approx. 1 second after the power window is fully closed.
 - d. Check that the AUTO UP/DOWN function operates normally.

If the AUTO UP/DOWN function operates normally, reset operations have been completed at this time. If not normal, follow steps below.

1. Disconnect the negative battery terminal for 10 seconds.
2. Connect the battery terminal.
3. Turn the ignition switch ON.
4. Halfway open the power window by pressing the power window switch.
5. If the AUTO UP/DOWN function operates normally, reset operations have been completed at this time.

If not normal, follow steps below.

6. Turn the ignition switch ON.
7. Halfway open the power window by pressing the power window switch.
8. Fully pull up the switch until the power window is fully closed and continue to hold the switch for approx. 12 seconds after the power window is fully closed.
9. Check that the AUTO UP/DOWN function operates normally.

PROBLEM SYMPTOMS TABLE

POWER WINDOW CONTROL SYSTEM

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POWER WINDOW CONTROL SYSTEM

Symptom	Suspected area	Information
Power window does not operate with multiplex network master switch operation	ECU-B, ECU-IG, PWR fuse	-
	Multiplex network master switch circuit (power source)	<u>POWER WINDOW MASTER SWITCH POWER SOURCE CIRCUIT</u>
	Power window regulator motor circuit	<u>DRIVER SIDE POWER WINDOW MOTOR CIRCUIT</u>
	Multiplex network master switch	-
Power window does not operate with multiplex network switch operation (front passenger side)	PWR fuse	-
	Multiplex network switch circuit (power source)	<u>FRONT PASSENGER SIDE POWER WINDOW SWITCH POWER SOURCE CIRCUIT</u>
	Power window regulator motor circuit (front passenger side)	<u>FRONT PASSENGER SIDE POWER WINDOW MOTOR CIRCUIT</u>
	Multiplex network switch (front passenger side)	-
Power window does not operate with multiplex network switch operation (rear LH side)	PWR fuse	-
	Multiplex network switch circuit (power source)	<u>REAR POWER WINDOW SWITCH LH CIRCUIT</u>
	Power window regulator motor circuit (rear LH side)	<u>REAR POWER WINDOW MOTOR LH CIRCUIT</u>
	Multiplex network switch (rear LH side)	-
Power window does not operate with multiplex network switch operation (rear RH side)	PWR fuse	-
	Multiplex network switch circuit (power source)	<u>REAR POWER WINDOW SWITCH RH CIRCUIT</u>
	Power window regulator motor circuit (rear RH side)	<u>REAR POWER WINDOW MOTOR RH CIRCUIT</u>
	Multiplex network switch (rear RH side)	-
AUTO UP/DOWN function does not operate on driver side	Diagnosis check	<u>DIAGNOSIS SYSTEM</u>
	Power window regulator motor reset	<u>INITIALIZATION</u>
	Multiplex network master switch	-
	Wire harness	-
	Diagnosis check	<u>DIAGNOSIS SYSTEM</u>
	Power window regulator	

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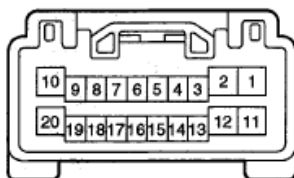
AUTO UP/DOWN function does not operate on any door side except driver side	motor reset	<u>INITIALIZATION</u>
	Multiplex network master switch	-
	Wire harness	-
Remote UP/DOWN function does not operate	DATA LIST/ACTIVE TEST	<u>DATA LIST/ACTIVE TEST</u>
	Multiplex network master switch	<u>TERMINALS OF ECU</u>
	Multiplex network body ECU	-
	Wire harness	-
Power window can be operated after ignition switch is turned off even if operated conditions are not met	Front door courtesy switch	<u>TERMINALS OF ECU</u>
	Wire harness	-
AUTO UP operation does not fully close power window (Jam protection function is activated)	Power window regulator motor reset	<u>INITIALIZATION</u>
	Check & Clean Glass run	-
	Multiplex network master switch	-

TERMINALS OF ECU

1. MULTIPLEX NETWORK MASTER SWITCH

- a. Disconnect the P22 switch connector.

P22



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Fig. 7: Identifying P22 Switch Connector

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

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

Standard resistance

STANDARD RESISTANCE SPECIFICATION TABLE

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
GND (P22-2) - Body	W-B - Body	Ground	Constant	Below 1 ohms

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ground	ground		
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Standard voltage

STANDARD VOLTAGE SPECIFICATION TABLE

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
BDR (P22-10) - GND (P22-2)	G - W-B	+B power supply	Constant	10 to 14 V
CPUB (P22-9) - GND (P22-2)	L - B-W-B	+B power supply	Constant	10 to 14 V
SIG (P22-20) - GND (P22-2)	BR - W-B	Ignition power supply	Ignition switch OFF --> ON	0 V --> 10 to 14 V

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

- c. Reconnect the P22 switch connector and reset the power window motor.
- d. Measure the voltage according to the value(s) in the table below.

Standard voltage

STANDARD VOLTAGE SPECIFICATION TABLE

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
UP (P22-1) - GND (P22-2)	GR - W-B	Power window motor UP output	Ignition switch ON, Driver side power window switch OFF --> UP (Manual operation)	0 V --> 10 to 14 V
UP (P22-1) - GND (P22-2)	GR - W-B	Power window motor UP output	Ignition switch ON, Driver side power window fully open --> Driver side power window switch UP (AUTO operation) --> Driver side power window fully closed	0 V --> 10 to 14 V --> 0 V
DN (P22-11) - GND (P22-2)	B - W-B	Power window motor DOWN output	Ignition switch ON, Driver side power window switch OFF --> DOWN (Manual operation)	10 to 14 V --> 0 V
DN (P22-11) - GND (P22-2)	B - W-B	Power window motor DOWN output	Ignition switch ON, Driver side power window fully closed --> Driver side power window switch DOWN (AUTO operation) --> Driver side power window fully open	10 to 14 V --> 0 V
PWS (P22-6) - GND (P22-2)	O - W-B	Power window lock switch output	Ignition switch ON, Power window lock switch UNLOCK --> LOCK	10 to 14 V --> 0 V
VCC (P22-19) - GND (P22-2)	O - W-B	Power window motor power	Constant	10 to 14 V

2)		source	
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2. CHECK MULTIPLEX NETWORK SWITCH (FRONT PASSENGER SIDE)

P19



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Fig. 8: Identifying Multiplex Network Switch (Front Passenger Side) Connector Terminals
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- a. Disconnect the P19 switch connector.
- b. Measure the voltage and resistance according to the value(s) in the table below.

Standard resistance

STANDARD RESISTANCE SPECIFICATION TABLE

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
GND (P19-7) - Body ground	W-B - Body ground	Ground	Constant	Below 1 ohms

Standard voltage

STANDARD VOLTAGE SPECIFICATION TABLE

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
BDR (P19-12) - GND (P19-7)	G - W-B	+B power supply	Constant	10 to 14 V

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

- c. Reconnect the P19 switch connector and reset power window motor.
- d. Measure the voltage according to the value(s) in the table below.

Standard voltage

STANDARD VOLTAGE SPECIFICATION TABLE

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition

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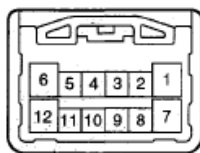
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UP (P19-6) - GND (P19-7)	GR - W-B	Power window motor UP output	Ignition switch ON, Regulator switch OFF --> UP (Manual operation)	0 V --> 10 to 14 V
UP (P19-6) - GND (P19-7)	GR - W-B	Power window motor UP output	Ignition switch ON, Front passenger side power window fully open --> Regulator switch UP (AUTO operation) --> Front passenger side power window fully closed	0 V --> 10 to 14 V --> 0 V
DN (P19-1) - GND (P19-7)	B - W-B	Power window motor DOWN output	Ignition switch ON, Regulator switch OFF --> DOWN (Manual operation)	10 to 14 V --> 0 V
DN (P19-1) - GND (P19-7)	B - W-B	Power window motor DOWN output	Ignition switch ON, Front passenger side power window fully closed --> Regulator switch DOWN (AUTO operation) --> Front passenger side power window fully open	10 to 14 V --> 0 V
PCT (P19-11) - GND (P19-7)	O - W-B	Power window lock switch output	Ignition switch ON, Power window lock switch UNLOCK --> LOCK	10 to 14 V --> 0 V
VCC (P19-5) - SGND (P19-8)	LG - R	Power window motor power source	Constant	10 to 14 V

If the result is not as specified, the multiplex network switch may have a malfunction.

3. CHECK MULTIPLEX NETWORK SWITCH (REAR LH)

P20



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Fig. 9: Identifying Multiplex Network Switch (Rear LH) P20 Switch Connector Terminals
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- a. Disconnect the P20 switch connector.
- b. Measure the voltage and resistance according to the value(s) in the table below.

Standard resistance

STANDARD RESISTANCE SPECIFICATION TABLE

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
GND (P20-7) - Body	W-B - Body	Ground	Constant	Below 1 ohms

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ground	ground			
SEL2 (P20-10) - GND (P20-7)	W-B - W-B	Terminal for identification of rear LH switch	Constant	Below 1 ohms

Standard voltage

STANDARD VOLTAGE SPECIFICATION TABLE

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
BDR (P20-12) - GND (P20-7)	LG - W-B	+B power supply	Constant	10 to 14 V

- c. Reconnect the P20 switch connector and reset the power window motor.
- d. Measure the voltage according to the value(s) in the table below.

Standard voltage

STANDARD VOLTAGE SPECIFICATIONS TABLE

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
UP (P20-6) - GND (P20-7)	V - W-B	Power window motor UP output	Ignition switch ON, Regulator switch OFF --> UP (Manual operation)	0 V --> 10 to 14 V
UP (P20-6) - GND (P20-7)	V - W-B	Power window motor UP output	Ignition switch ON, Rear LH power window fully open --> Regulator switch UP (AUTO operation) --> Rear LH power window fully closed	0 V --> 10 to 14 V --> 0 V
DN (P20-1) - GND (P20-7)	W - W-B	Power window motor DOWN output	Ignition switch ON, Regulator switch OFF --> DOWN (Manual operation)	10 to 14 V --> 0 V
DN (P20-1) - GND (P20-7)	W - W-B	Power window motor DOWN output	Ignition switch ON, Rear LH power window fully closed --> Regulator switch DOWN (AUTO operation) --> Rear LH power window fully open	10 to 14 V --> 0 V
PCT1 (P20-11) - GND (P20-7)	GR - W-B	Power window lock switch output	Ignition switch ON, Power window lock switch UNLOCK --> LOCK	10 to 14 V --> 0 V
VCC (P20-5) - SGND (P20-8)	L - BR	Power window motor power source	Constant	10 to 14 V

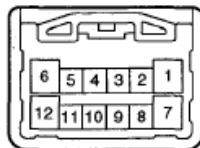
If the result is not as specified, the multiplex network switch may have a malfunction.

4. CHECK MULTIPLEX NETWORK SWITCH (REAR RH)

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P21



Y

9099758E06

Fig. 10: Identifying Multiplex Network Switch (Rear RH) P21 Switch Connector Terminals
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- a. Disconnect the P21 switch connector.
- b. Measure the voltage and resistance according to the value(s) in the table below.

Standard resistance

STANDARD RESISTANCE SPECIFICATION TABLE

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
GND (P21-7) - Body ground	W-B - Body ground	Ground	Constant	Below 1 ohms
SEL1 (P21-9) - GND (P21-7)	W-B - W-B	Terminal for identification of rear RH switch	Constant	Below 1 ohms

Standard voltage

STANDARD VOLTAGE SPECIFICATION TABLE

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
BDR (P21-12) - GND (P21-7)	LG - W-B	+B power supply	Constant	10 to 14 V

- c. Reconnect the P21 switch connector and reset the power window motor.
- d. Measure the voltage according to the value(s) in the table below.

Standard voltage

STANDARD VOLTAGE SPECIFICATION TABLE

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
UP (P21-6) - GND (P21-7)	V - W-B	Power window motor UP output	Ignition switch ON, Regulator switch OFF --> UP (Manual operation)	0 V --> 10 to 14 V
UP (P21-6) - GND (P21-7)	V - W-B	Power window motor UP output	Ignition switch ON, Rear RH power window fully open --> Regulator switch UP (AUTO operation) --> Rear RH	0 V --> 10 to 14 V --> 0 V

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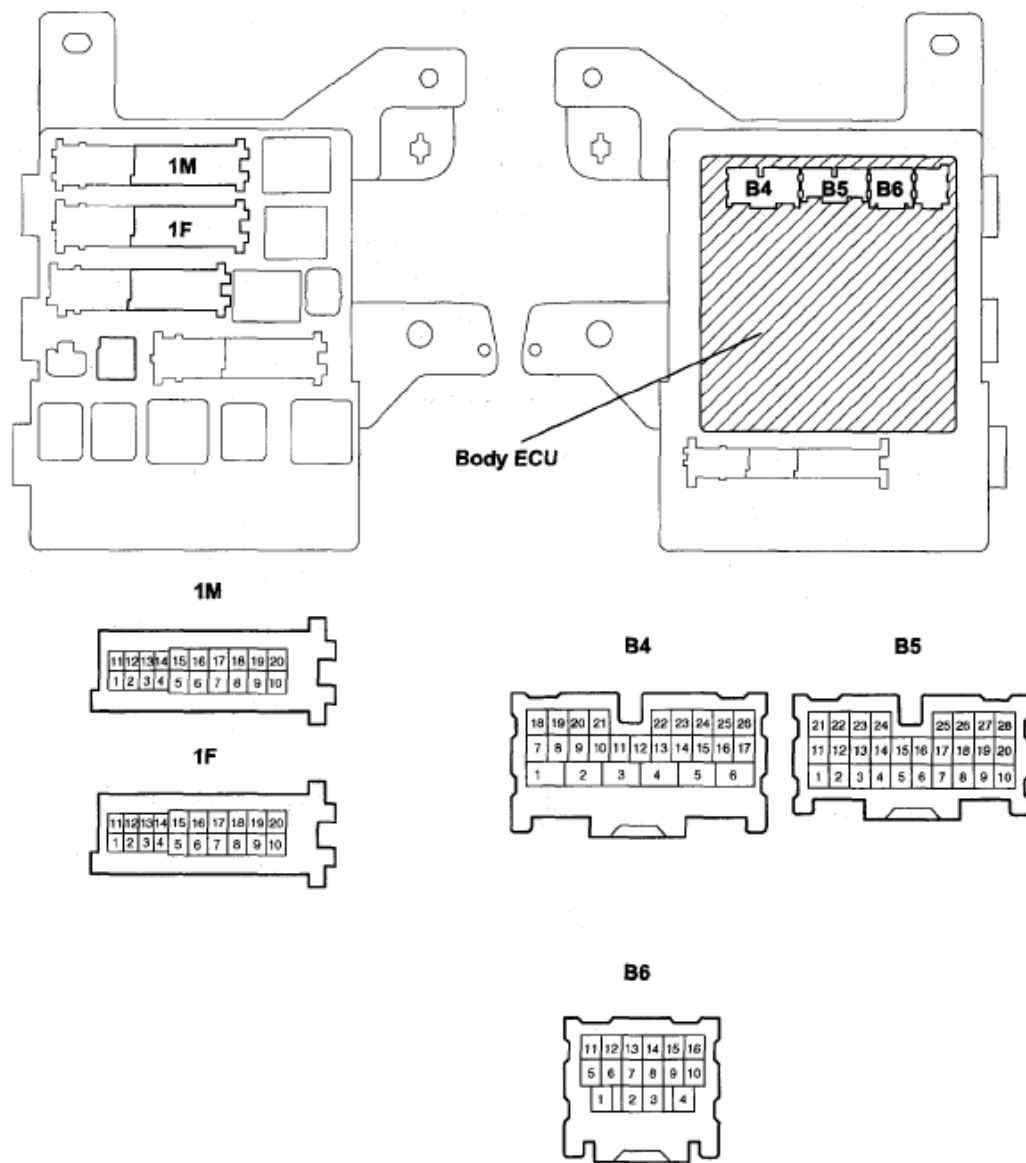
			power window fully closed	
DN (P21-1) - GND (P21-7)	W - W-B	Power window motor DOWN output	Ignition switch ON, Regulator switch OFF --> DOWN (Manual operation)	10 to 14 V --> 0 V
DN (P21-1) - GND (P21-7)	W - W-B	Power window motor DOWN output	Ignition switch ON, Rear RH power window fully closed --> Regulator switch DOWN (AUTO operation) --> Rear RH power window fully open	10 to 14 V --> 0 V
PCT1 (P21-11) - GND (P21-7)	GR - W-B	Power window lock switch output	Ignition switch ON, Power window lock switch UNLOCK --> LOCK	10 to 14 V --> 0 V
VCC (P21-5) - SGND (P21-8)	L - BR	Power window motor power source	Constant	10 to 14 V

If the result is not as specified, the multiplex network switch may have a malfunction.

5. CHECK INSTRUMENT PANEL J/B (BODY ECU)

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B070963E01

Fig. 11: Identifying Instrument Panel J/B (Body ECU) Connector Terminals
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- Disconnect the B4, B5 and B6 ECU connectors.
- Disconnect the 1F and 1M J/B connectors.
- Measure the resistance according to the value(s) in the table below.

Standard resistance

STANDARD RESISTANCE SPECIFICATION TABLE

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Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
KSW (B4-21) - Body ground	B - Body ground	Key unlock warning switch input	No key in ignition key cylinder --> Key inserted	10 kohms or higher --> Below 1 ohms
PCTY (B5-23) - Body ground	L - W-B	Front passenger side courtesy switch input	Passenger side door CLOSED --> OPEN	10 kohms or higher --> Below 1 ohms
DCTY (B6-14) - Body ground	L - Body ground	Driver side courtesy switch input	Driver side door CLOSED --> OPEN	10 kohms or higher --> Below 1 ohms
GND1 (1F-10) - Body ground	W-B - Body ground	Ground	Constant	Below 1 ohms
GND2 (1M-9) - Body ground	W-B - Body ground	Ground	Constant	Below 1 ohms

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

- d. Reconnect the B4, B5 and B6 ECU connectors.
- e. Reconnect the 1M and 1F J/B connectors.
- f. Measure the voltage according to the value(s) in the table below.

Standard voltage

STANDARD VOLTAGE SPECIFICATION TABLE

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
KSW (B4-21) - Body - ground	B - Body ground	Key unlock warning switch input	No key in ignition key cylinder --> Key inserted	10 to 14 V --> 0 V

If the result is not as specified, the instrument panel J/B (body ECU) may have a malfunction.

DIAGNOSIS SYSTEM

1. DESCRIPTION

- a. The power window control system data can be read from the Data Link Connector 3 (DLC3) of the vehicle. When the system seems to be malfunctioning, use the intelligent tester to check for malfunctions and perform repairs.

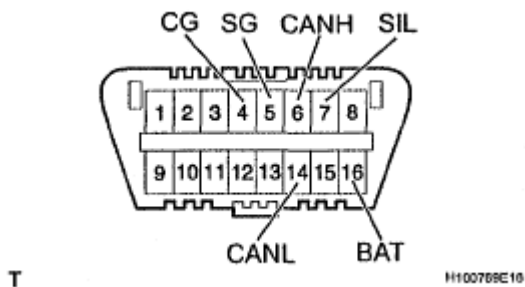


Fig. 12: Identifying DLC3 Connector Terminals
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. CHECK DLC3

- a. The ECU uses ISO 15765-4 communication. The terminal arrangement of the DLC3 complies with SAE J 1962 and matches the ISO 15765-4 format.

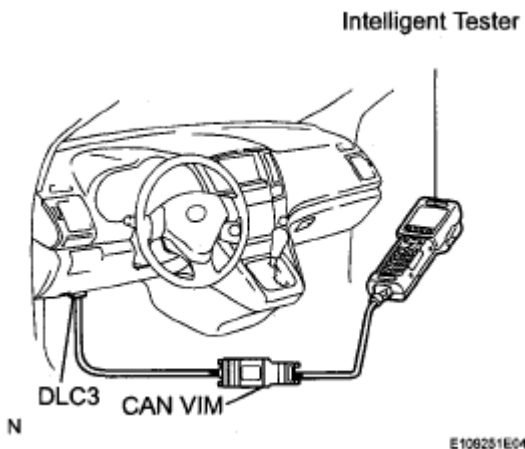


Fig. 13: Connecting Cable Of Intelligent Tester To DLC3
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

CONNECTOR TERMINAL SPECIFIED CONDITION

Symbols (Terminal No.)	Terminal Description	Condition	Specified Condition
SIL (7) - SG (5)	Bus "+" line	During transmission	Pulse generation
CG (4) - Body ground	Chassis ground	Always	Below 1 ohms
SG (5) - Body ground	Signal ground	Always	Below 1 ohms
BAT (16) - Body ground	Battery positive	Always	10 to 14 V
CANH (6) - CANL (14)	CAN bus line	Ignition Switch OFF ⁽¹⁾	54 to 69 ohms
CANH (6) - CG (4)	HIGH-level CAN bus line	Ignition Switch OFF ⁽¹⁾	200 ohms or more
CANL (14) - CG (4)	LOW-level CAN bus line	Ignition Switch OFF ⁽¹⁾	200 ohms or more
CANH (6) - BAT (16)	HIGH-level CAN bus line	Ignition Switch OFF ⁽¹⁾	6 kohms or more
CANL (14) - BAT (16)	LOW-level CAN bus line	Ignition Switch OFF ⁽¹⁾	6 kohms or more

NOTE:

- (1) Before measuring the resistance, leave the vehicle as is for at least 1 minute and do not operate the ignition switch, any other switches or the door.

If the result is not as specified, the DLC3 may have a malfunction. Repair or replace the harness and connector.

HINT:

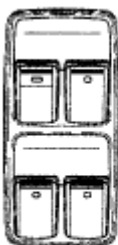
Connect the cable of the intelligent tester to the DLC3, turn the ignition switch on (IG) and attempt to use the tester. If the display indicates that a communication error has occurred, there is a problem either with the vehicle or with the tester.

- If communication is normal when the tester is connected to another vehicle, inspect the DLC3 of the original vehicle.
- If communication is still not possible when the tester is connected to another vehicle, the problem may be in the tester itself. Consult the Service Department listed in the tester's instruction information.

3. CHECK DIAGNOSIS**HINT:**

If there is a malfunction in the pulse sensor, manually operating the power window switch will cause the power window switch light to blink. The light continues to blink for 43 seconds or until the ignition switch is turned off. After 43 seconds, the power window switch light remains on.

- a. Turn the ignition switch on (IG).
- b. Manually operate the power window master switch or power window switch on each door.



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Fig. 14: Identifying Power Window Switch
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Check the blinking pattern of the AUTO light.

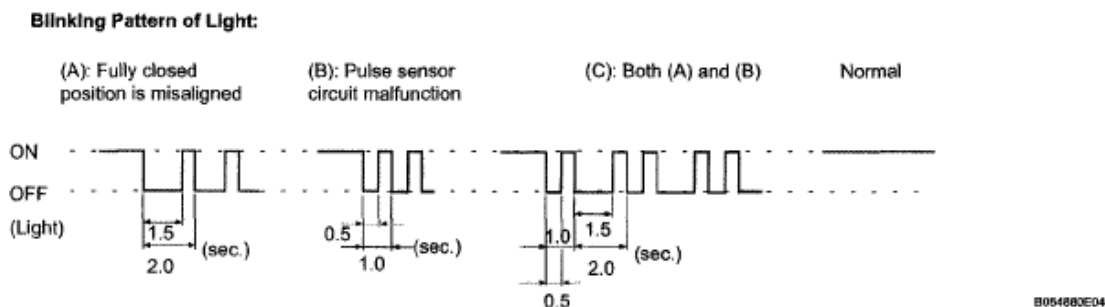


Fig. 15: Identifying AUTO Light - Blinking Pattern
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

1. If pattern (A) is displayed, reset the power window regulator motor.
2. If pattern (B) or (C) is displayed, check the wire harness.
3. If the normal pattern is displayed, replace the power window regulator master switch.

FAIL-SAFE

1. CHECK POWER WINDOW FAIL-SAFE FUNCTION

HINT:

If there is a malfunction in the power window system, some of the power window functions will be disabled.

Driver side power window

DRIVER SIDE POWER WINDOW

Malfunctioning Part	Disabled Function	Operative Function
Pulse sensor circuit in power window motor	<ul style="list-style-type: none"> • AUTO UP/DOWN function • Power window operation function after ignition off 	<ul style="list-style-type: none"> • Manual UP (fully pulled UP position) • Manual DOWN • Remote (AUTO and manual) • Remote function after ignition OFF (AUTO and manual) • MANUAL UP/DOWN function via driver side door lock key cylinder • MANUAL DOWN function via transmitter
	<ul style="list-style-type: none"> • AUTO UP/DOWN function • Remote function (AUTO and manual) 	<ul style="list-style-type: none"> • Manual UP (fully pulled UP

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CPU in power window master switch	<ul style="list-style-type: none"> • MANUAL UP/DOWN function via driver side door lock key cylinder • MANUAL DOWN function via transmitter 	position) <ul style="list-style-type: none"> • Manual DOWN
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Power windows except driver side power window

POWER WINDOWS EXCEPT DRIVER SIDE POWER WINDOW

Malfunctioning Part	Disabled Function	Operative Function
<ul style="list-style-type: none"> • Pulse sensor circuit in power window motor • CPU in power window master switch • Communication between master switch and each power window switch 	<ul style="list-style-type: none"> • AUTO UP/DOWN function • Power window operation function after ignition OFF • MANUAL UP/DOWN function via driver side door lock key cylinder • MANUAL DOWN function via transmitter 	<ul style="list-style-type: none"> • Manual UP (fully pulled UP position) • Manual DOWN

DATA LIST/ACTIVE TEST

1. USING INTELLIGENT TESTER

- a. Connect the intelligent tester to the DLC3.
- b. Monitor the ECU data by following the prompts on the tester screen.

HINT:

The intelligent tester has a "Snapshot" function which records the monitored data. Refer to the intelligent tester operator's information for further details.

2. DATA LIST

HINT:

Using the DATA LIST displayed on the intelligent tester, you can read the value of the switch, sensor, actuator, etc. without parts removal. Reading the DATA LIST as the first step of troubleshooting is one way to shorten the labor time.

- a. Connect the intelligent tester to the DLC3.

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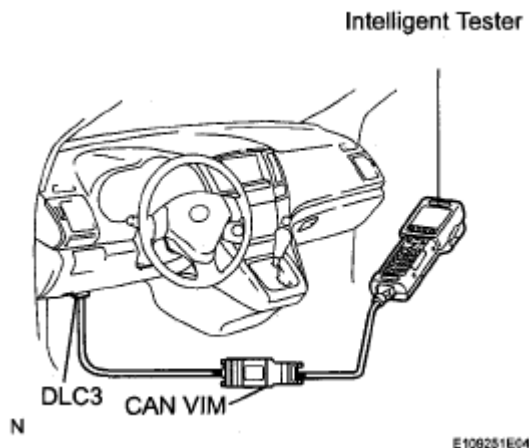


Fig. 16: Connecting Cable Of Intelligent Tester To DLC3
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Turn the ignition switch ON.
- c. Read the DATA LIST according to the display on the tester.

MASTER SW:

DATA LIST - MASTER SW

Item	Measurement Item/Display (Range)	Normal Condition	Diagnostic Note
P/W AUTO SW	Driver door power window auto switch signal/ON or OFF	ON: Driver door power window auto switch operates OFF: Driver door power window auto switch does not operate	-
P P/W AUTO SW	Front passenger door remote power window auto switch signal/ON or OFF	ON: Front passenger door remote power window auto switch operates OFF: Front passenger door remote power window auto switch does not operate	-
RR P/W AUTO SW	Rear RH door remote power window auto switch signal/ON or OFF	ON: Rear RH door remote power window auto switch operates OFF: Rear RH door remote power window auto switch does not operate	-
RL P/W AUTO SW	Rear LH door remote power window auto switch signal/ON or OFF	ON: Rear LH door remote power window auto switch operates OFF: Rear LH door remote power window auto switch does not operate	-
P/W UP SW	Driver door power window manual up switch signal/ON or OFF	ON: Driver door power window manual up switch operates OFF: Driver door power window manual up switch does not operate	-

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P P/W UP SW	Front passenger door remote power window manual up switch signal/ON or OFF	ON: Front passenger door remote power window manual up switch operates OFF: Front passenger door remote power window manual up switch does not operate	-
RR P/W UP SW	Rear RH door remote power window manual up switch signal/ON or OFF	ON: Rear RH door remote power window manual up switch operates OFF: Rear RH door remote power window manual up switch does not operate	-
RL P/W UP SW	Rear LH door remote power window manual up switch signal/ON or OFF	ON: Rear LH door remote power window manual up switch operates OFF: Rear LH door remote power window manual up switch does not operate	-
P/W DOWN SW	Driver door power window manual down switch signal/ON or OFF	ON: Driver door power window manual down switch operates OFF: Driver door power Window manual down switch does not operate	-
P P/W DOWN SW	Front passenger door remote power window manual down switch signal/ON or OFF	ON: Front passenger door remote power window manual down switch operates OFF: Front passenger door remote power window manual down switch does not operate	-
RR P/W DOWN SW	Rear RH door remote power window manual down switch signal/ON or OFF	ON: Rear RH door remote power window manual down switch operates OFF: Rear RH door remote power window manual down switch does not operate	-
RL P/W DOWN SW	Rear LH door remote power window manual down switch signal/ON or OFF	ON: Rear LH door remote power window manual down switch operates OFF: Rear LH door remote power window manual down switch does not operate	-
P/W LOCK SW	Power window lock switch signal/ ON or OFF	ON: Power window lock switch in LOCK position OFF: Power window lock switch in UNLOCK position	-
GLASS POS-1/4	Door glass position (Fully closed - 1/4 open) signal/OK or CAUTION	OK: Power window is going UP by manual operation CAUTION: CAUTION may be displayed even when no resistance is applied in	-

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		each position. In this case, there must be a foreign object stuck in that position	
GLASS POS-2/4	Door glass position (1/4 open - 2/4 open) signal/OK or CAUTION	OK: Power window is going UP by manual operation CAUTION: CAUTION may be displayed even when no resistance is applied in each position. In this case, there must be a foreign object stuck in that position	-
GLASS POS-3/4	Door glass position (2/4 open - 3/4 open) signal/OK or CAUTION	OK: Power window is going UP by manual operation CAUTION: CAUTION may be displayed even when no resistance is applied in each position. In this case, there must be a foreign object stuck in that position	-
GLASS POS-OPEN	Door glass position (3/4 open - Fully open) signal/OK or CAUTION	OK: Power window is going UP by manual operation CAUTION: CAUTION may be displayed even when no resistance is applied in each position. In this case, there must be a foreign object stuck in that position	-
DOOR KEY PW UP	Door key-linked power window UP signal/AVAIL or NOT AVL	AVAIL: Door key-linked power window UP is unavailable NOT AVL: Door key-linked power window UP is unavailable	-
DOOR KEY PW DOWN	Door key-linked power window DOWN signal/AVAIL or NOT AVL	AVAIL: Door key-linked power window DOWN is unavailable NOT AVL: Door key-linked power window DOWN is unavailable	-
UP/WIRELESS	Power window UP w/ transmitter signal/AVAIL or NOT AVL	AVAIL: Power window UP w/ transmitter is unavailable NOT AVL: Power window UP w/ transmitter is unavailable	-

BODY:

DATA LIST - BODY

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Item	Measurement Item/Display (Range)	Normal Condition	Diagnostic Note
IG SW	Ignition switch signal/ON or OFF	ON: Key is in ON or START position OFF: Key is in OFF or ACC position	-
D DOR CTY SW	Driver side door courtesy switch signal/or OFF	ON: Driver side door is open OFF: Driver side door is closed	-
P DOR CYT SW	Front passenger side door courtesy switch signal/ON or OFF	ON: Front passenger side door is open OFF: Front passenger side door is closed	-

3. ACTIVE TEST

HINT:

Performing the ACTIVE TEST using the intelligent tester allows you to operate the relay, VSV, actuator, etc. without parts removal. Performing the ACTIVE TEST as the first step of troubleshooting is one way to shorten the labor time. It is possible to display the DATA LIST during the ACTIVE TEST.

- Connect the intelligent tester to the DLC3.
- Turn the ignition switch ON.
- Perform the ACTIVE TEST according to the display on the tester.

MASTER SW

ACTIVE TEST - MASTER SW

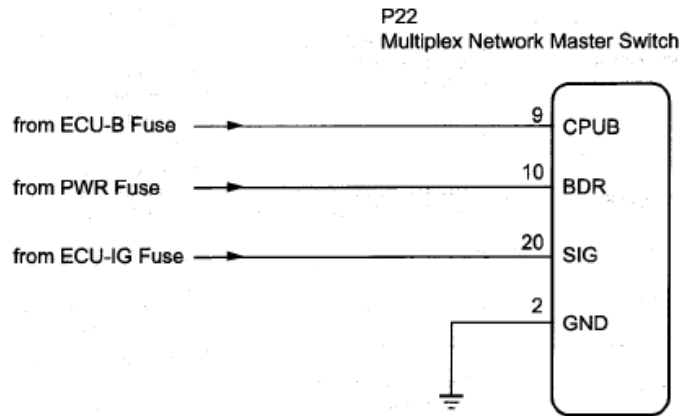
Item	Test Detail	Diagnostic Note
P/W UP/DOWN	Operates power window UP/DOWN	-

POWER WINDOW MASTER SWITCH POWER SOURCE CIRCUIT

DESCRIPTION

This circuit supplies power to operate the multiplex network master switch.

WIRING DIAGRAM



C

B11208E14

Fig. 17: Identifying Power Window Master Switch Power Source Circuit Wiring Diagram
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

1. **CHECK WIRE HARNESS (MULTIPLEX NETWORK MASTER SWITCH - BATTERY AND BODY GROUND)**
 - a. Disconnect the P22 connector.

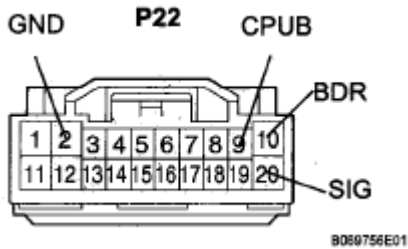


Fig. 18: Identifying P22 Connector Terminals
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard voltage

STANDARD VOLTAGE SPECIFICATION TABLE

Tester Connection	Condition	Specified Condition
P22-9 (CPUB) - Body ground	Always	10 to 14 V
P22-10 (BDR) - Body ground	Always	10 to 14 V
P22-20 (SIG) - Body ground	Ignition switch ON	10 to 14 V

Standard resistance

STANDARD RESISTANCE SPECIFICATION TABLE

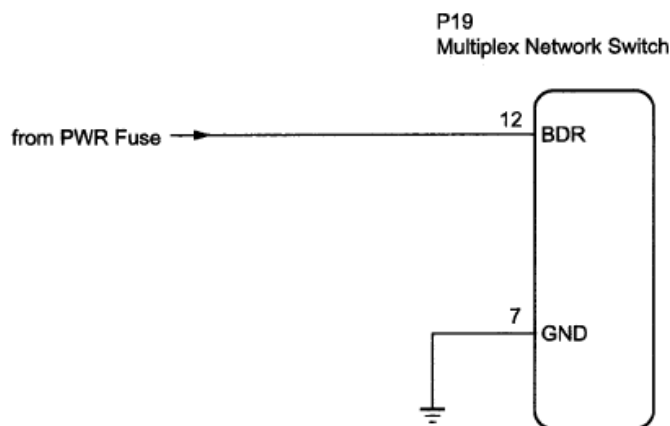
Tester Connection	Condition	Specified Condition
P22-2 (GND) - Body ground	Always	Below 1 ohms

NG: REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

FRONT PASSENGER SIDE POWER WINDOW SWITCH POWER SOURCE CIRCUIT**DESCRIPTION**

This circuit supplies power to operate the multiplex network switch.

WIRING DIAGRAM

c

B111209E01

Fig. 19: Identifying Front Passenger Side Power Window Switch Power Source Circuit Wiring Diagram
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

1. **CHECK WIRE HARNESS (MULTIPLEX NETWORK SWITCH)**
 - a. Disconnect the P19 connector.

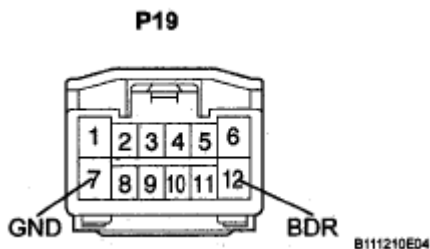


Fig. 20: Identifying P19 Connector Terminals
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard voltage

STANDARD VOLTAGE SPECIFICATION TABLE

Tester Connection	Condition	Specified Condition
P19-12 (BDR) - Body ground	Always	10 to 14 V

Standard resistance

STANDARD RESISTANCE SPECIFICATION TABLE

Tester Connection	Condition	Specified Condition
P19-7 (GND) - Body ground	Always	Below 1 ohms

NG: REPAIR OR REPLACE HARNESS OR CONNECTOR

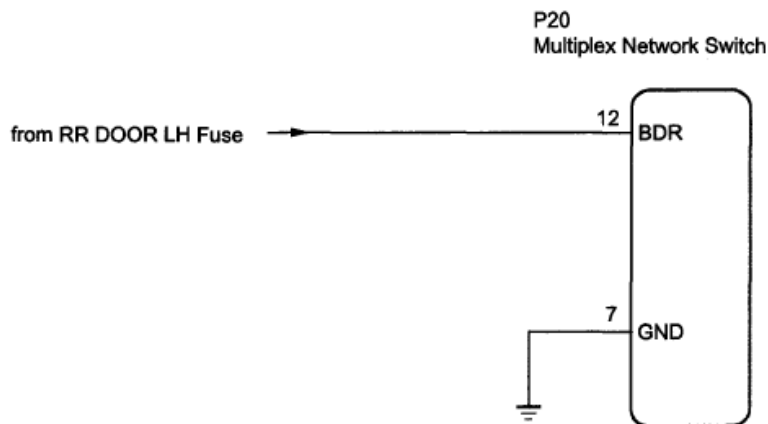
OK: PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

REAR POWER WINDOW SWITCH LH CIRCUIT

DESCRIPTION

This circuit supplies power to operate the multiplex network switch.

WIRING DIAGRAM



C

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Fig. 21: Identifying Rear Power Window Switch LH Circuit Wiring Diagram
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

1. **CHECK WIRE HARNESS (MULTIPLEX NETWORK SWITCH - BATTERY AND BODY GROUND)**
 - a. Disconnect the P20 connector.

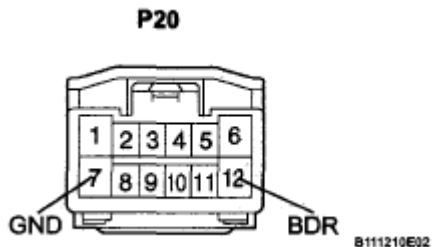


Fig. 22: Identifying P20 Connector Terminals
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard voltage

STANDARD VOLTAGE SPECIFICATION TABLE

Tester Connection	Condition	Specified Condition
P20-12 (BDR) - Body ground	Always	10 to 14 V

Standard resistance

STANDARD RESISTANCE SPECIFICATION TABLE

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Tester Connection	Condition	Specified Condition
P20-7 (GND) - Body ground	Always	Below 1 ohms

NG: REPAIR OR REPLACE HARNESS OR CONNECTOR

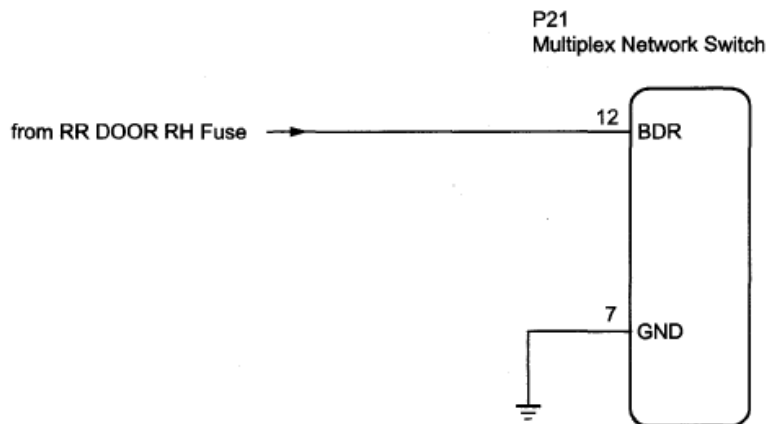
OK: PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

REAR POWER WINDOW SWITCH RH CIRCUIT

DESCRIPTION

This circuit supplies power to operate the multiplex network switch.

WIRING DIAGRAM



C

B111209E22

Fig. 23: Identifying Rear Power Window Switch RH Circuit Wiring Diagram
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

1. **CHECK WIRE HARNESS (MULTIPLEX NETWORK SWITCH - BATTERY AND BODY GROUND)**
 - a. Disconnect the P21 connector.
 - b. Measure the voltage and resistance according to the value(s) in the table below.

Standard voltage

STANDARD VOLTAGE SPECIFICATION TABLE

Tester Connection	Condition	Specified Condition

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P21-12 (BDR) - Body ground	Always	10 to 14 V
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Standard resistance

STANDARD RESISTANCE SPECIFICATION

Tester Connection	Condition	Specified Condition
P21-7 (GND) - Body ground	Always	Below 1 ohms

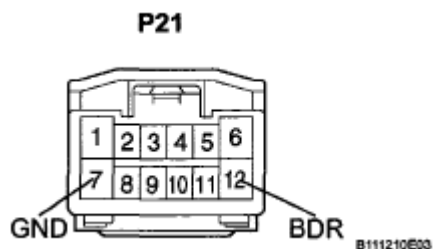


Fig. 24: Identifying P21 Connector Terminals

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

NG: REPAIR OR REPLACE HARNESS OR CONNECTOR

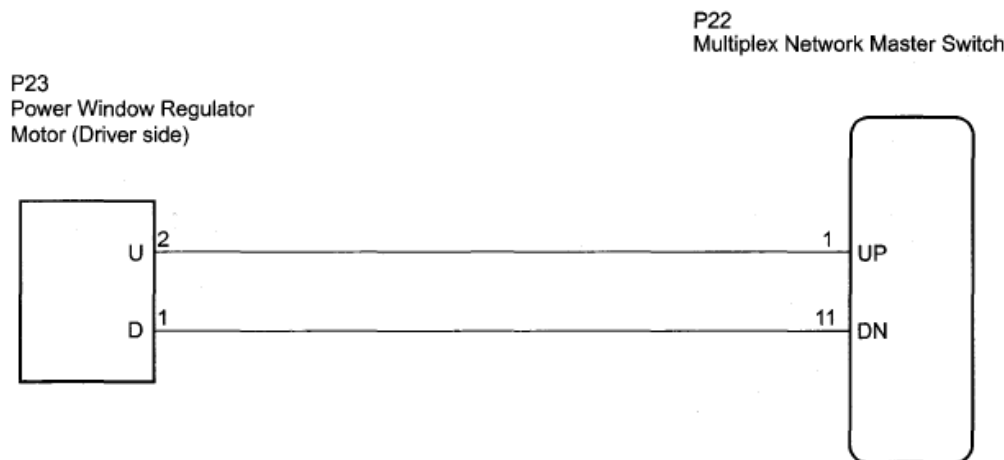
OK: PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

DRIVER SIDE POWER WINDOW MOTOR CIRCUIT

DESCRIPTION

This circuit transmits signals from the multiplex network master switch to the power window regulator motor.

WIRING DIAGRAM



C

B11211E01

Fig. 25: Identifying Driver Side Power Window Motor Circuit Wiring Diagram
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

1. INSPECT POWER WINDOW REGULATOR MOTOR

- a. Remove the power window motor.

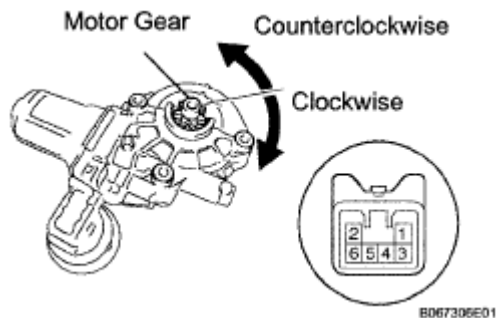


Fig. 26: Identifying Power Window Regulator Motor
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Apply battery voltage to the motor connector according to the table below.

NOTE: Do not apply battery to any terminals except terminals 1 and 2.

Standard

VOLTAGE SPECIFICATION TABLE

Measurement Condition	Specified Condition
Battery positive (+) --> Terminal 1 (D)	

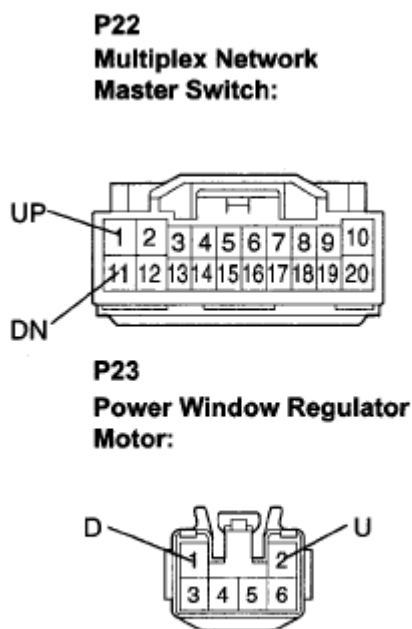
Battery negative (-) --> Terminal 2 (U)	Motor gear rotates clockwise
Battery positive (+) --> Terminal 2 (U)	Motor gear rotates counterclockwise
Battery negative (-) --> Terminal 1 (D)	

NG: REPLACE POWER WINDOW REGULATOR MOTOR

OK: Go to next step.

2. CHECK WIRE HARNESS (WINDOW REGULATOR MOTOR - MULTIPLEX NETWORK MASTER SWITCH)

- a. Disconnect the P22 and P23 connectors.



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Fig. 27: Identifying Window Regulator Motor & Multiplex Network Master Switch Connector Terminal

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

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

Standard resistance

STANDARD VOLTAGE SPECIFICATION TABLE

Tester Connection	Condition	Specified Condition
P22-1 (UP) - P23-2 (U)	Always	Below 1 ohms
P22-11 (DN) - P23-1 (D)	Always	Below 1 ohms
P22-1 (UP) - Body ground	Always	10 kohms or higher

P22-11 (DN) - Body ground	Always	10 kohms or higher
---------------------------	--------	--------------------

NG: REPAIR OR REPLACE HARNESS OR CONNECTOR

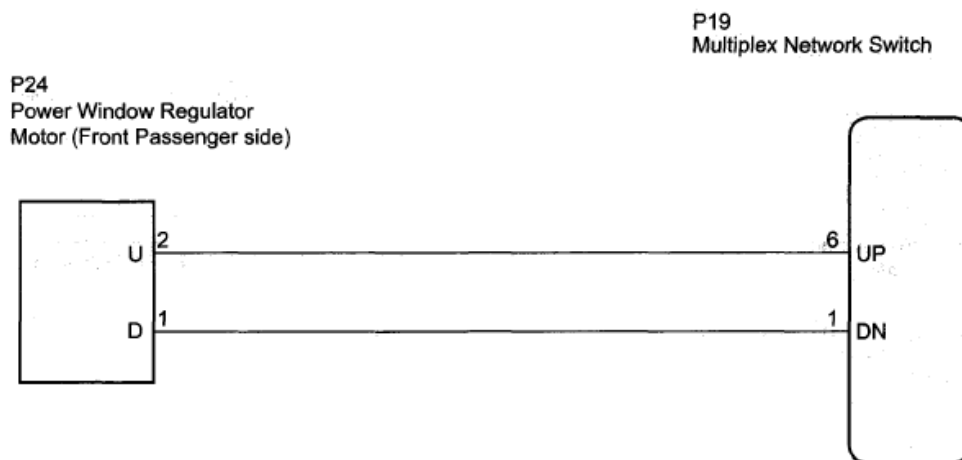
OK: PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

FRONT PASSENGER SIDE POWER WINDOW MOTOR CIRCUIT

DESCRIPTION

This circuit transmits signals from the multiplex network switch to the power window regulator motor.

WIRING DIAGRAM



C

B111211E02

Fig. 28: Identifying Front Passenger Side Power Window Motor Circuit Wiring Diagram
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

1. **INSPECT POWER WINDOW REGULATOR MOTOR**
 - a. Remove the power window motor.

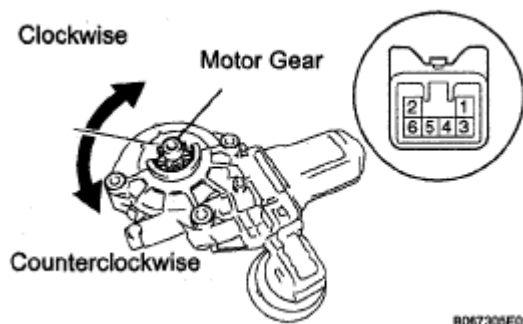


Fig. 29: Identifying Power Window Regulator Motor Operation
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Apply battery voltage to the motor connector according to the table below.

NOTE: Do not apply battery to any terminals except terminals 1 and 2.

Standard

VOLTAGE SPECIFICATION TABLE

Measurement Condition	Specified Condition
Battery positive (+) --> Terminal 1 (D) Battery negative (-) --> Terminal 2 (U)	Motor gear rotates counterclockwise
Battery positive (+) --> Terminal 2 (U) Battery negative (-) --> Terminal 1 (D)	Motor gear rotates clockwise

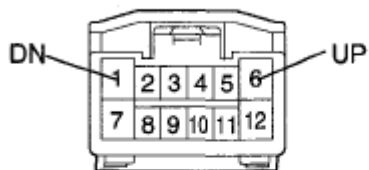
NG: REPLACE POWER WINDOW REGULATOR MOTOR

OK: Go to next step.

2. CHECK WIRE HARNESS (WINDOW REGULATOR MOTOR - MULTIPLEX NETWORK SWITCH)

- a. Disconnect the P19 and P24 connectors.

**P19
Multiplex Network Switch:**



**P24
Power Window Regulator
Motor:**



B062056E08

Fig. 30: Identifying P19 & P24 Connector Terminals
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard resistance

STANDARD VOLTAGE SPECIFICATION TABLE

Tester Connection	Condition	Specified Condition
P19-1 (DN) - P24-1 (D)	Always	Below 1 ohms
P19-6 (UP) - P24-2 (U)	Always	Below 1 ohms
P19-1 (DN) - Body ground	Always	10 kohms or higher
P19-6 (UP) - Body ground	Always	10 kohms or higher

NG: REPAIR OR REPLACE HARNESS OR CONNECTOR

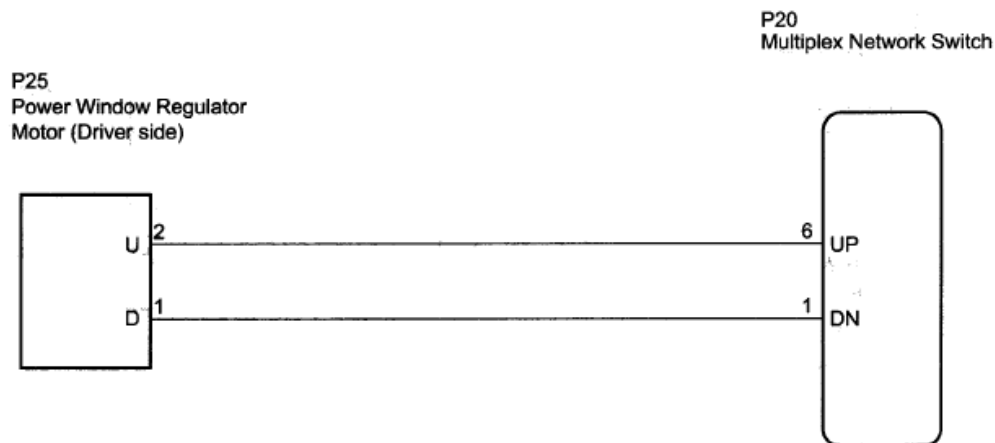
OK: PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

REAR POWER WINDOW MOTOR LH CIRCUIT

DESCRIPTION

This circuit transmits signals from the multiplex network switch to the power window regulator motor.

WIRING DIAGRAM



c

B11121E03

Fig. 31: Identifying Rear Power Window Motor LH Circuit Wiring Diagram
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

1. INSPECT POWER WINDOW REGULATOR MOTOR

- a. Remove the power window motor.

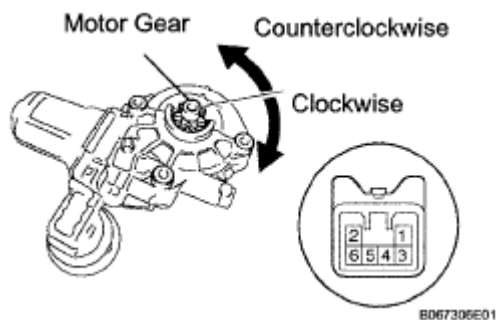


Fig. 32: Checking Operation Of Power Window Motor
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Apply battery voltage to the motor connector according to the table below.

NOTE: Do not apply battery to any terminals except terminals 1 and 2.

Standard

VOLTAGE SPECIFICATION TABLE

Measurement Condition	Specified Condition
Battery positive (+) --> Terminal 1 (D)	

Battery negative (-) --> Terminal 2 (U)	Motor gear rotates clockwise
Battery positive (+) --> Terminal 2 (U)	Motor gear rotates counterclockwise
Battery negative (-) --> Terminal 1 (D)	

NG: REPLACE POWER WINDOW REGULATOR MOTOR

OK: Go to next step.

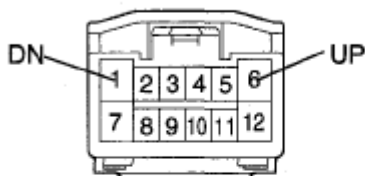
2. **CHECK WIRE HARNESS (WINDOW REGULATOR MOTOR - MULTIPLEX NETWORK SWITCH)**
 - a. Disconnect the P20 and P25 connectors.
 - b. Measure the resistance according to the value(s) in the table below.

Standard resistance

STANDARD RESISTANCE SPECIFICATION TABLE

Tester Connection	Condition	Specified Condition
P20-1 (DN) - P25-1 (D)	Always	Below 1 ohms
P20-6 (UP) - P25-2 (U)	Always	Below 1 ohms
P20-1 (DN) - Body ground	Always	10 kohms or higher
P20-6 (UP) - Body ground	Always	10 kohms or higher

**P20
Multiplex Network Switch:**



**P25
Power Window Regulator
Motor:**



8062056E04

Fig. 33: Identifying P20 & P25 Connector Terminals
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NG: REPAIR OR REPLACE HARNESS OR CONNECTOR

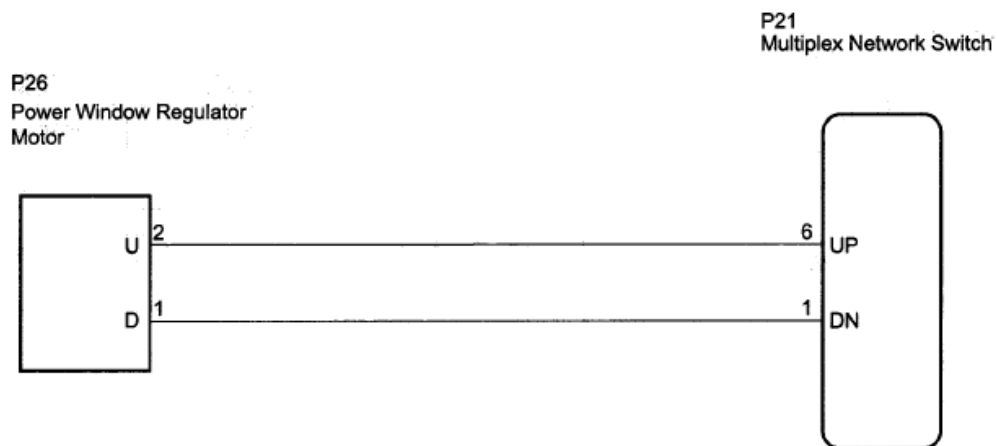
OK: PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

REAR POWER WINDOW MOTOR RH CIRCUIT

DESCRIPTION

This circuit transmits signals from the multiplex network switch to the power window regulator motor.

WIRING DIAGRAM



c

B11121E04

Fig. 34: Identifying Rear Power Window Motor RH Circuit Wiring Diagram
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

1. INSPECT POWER WINDOW REGULATOR MOTOR

- a. Remove the power window motor.
- b. Apply battery voltage to the motor connector according to the table below.

NOTE: Do not apply battery to any terminals except terminals 1 and 2.

Standard

VOLTAGE SPECIFICATION TABLE

Measurement Condition	Specified Condition
Battery positive (+) --> Terminal 1 (D) Battery negative (-) --> Terminal 2 (U)	Motor gear rotates counterclockwise
Battery positive (+) --> Terminal 2 (U)	Motor gear rotates clockwise

Battery negative (-) --> Terminal 1 (D)

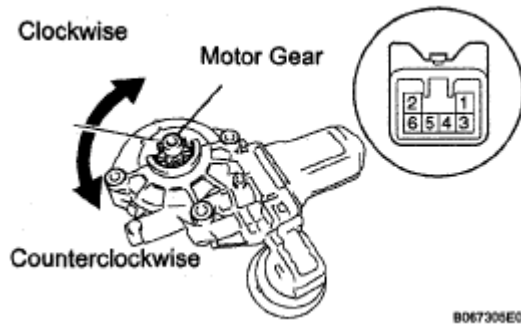


Fig. 35: Identifying Power Window Regulator Motor Operation
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NG: REPLACE POWER WINDOW REGULATOR MOTOR

OK: Go to next step.

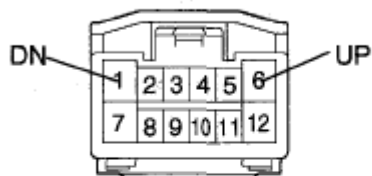
2. **CHECK WIRE HARNESS (WINDOW REGULATOR MOTOR - MULTIPLEX NETWORK SWITCH)**
 - a. Disconnect the P21 and P26 connectors.
 - b. Measure the resistance according to the value(s) in the table below.

Standard resistance

STANDARD RESISTANCE SPECIFICATION TABLE

Tester Connection	Condition	Specified Condition
P21-1 (DN) - P26-1 (D)	Always	Below 1 ohms
P21-6 (UP) - P26-2 (U)	Always	Below 1 ohms
P21-1 (DN) - Body ground	Always	10 kohms or higher
P21-6 (UP) - Body ground	Always	10 kohms or higher

**P21
Multiplex Network Switch:**



**P26
Power Window Regulator
Motor:**



8052058E03

Fig. 36: Identifying P21 & P26 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

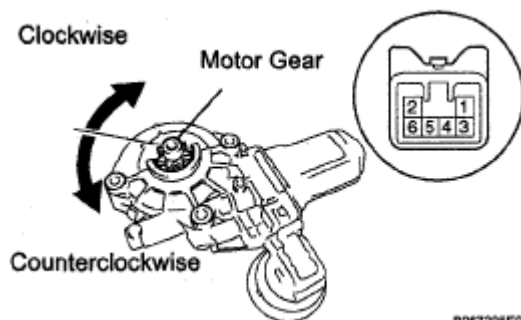
NG: REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

POWER WINDOW REGULATOR MOTOR

INSPECTION

1. **INSPECT POWER WINDOW REGULATOR MOTOR (FRONT RH)**
 - a. Remove the power window regulator motor.



8067308E01

Fig. 37: Checking Power Window Regulator Motor Operation (Front RH)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Apply battery voltage to the motor connector according to the table below.

NOTE: Do not apply battery to any terminals except terminals 1 and 2.

Standard

VOLTAGE SPECIFICATION TABLE

Measurement Condition	Specified Condition
Battery positive (+) --> Terminal 1 (D) Battery negative (-) --> Terminal 2 (U)	Motor gear rotates clockwise
Battery positive (+) --> Terminal 2 (U) Battery negative (-) --> Terminal 1 (D)	Motor gear rotates counterclockwise

2. INSPECT POWER WINDOW REGULATOR MOTOR (FRONT LH)

- a. Remove the power window regulator motor.

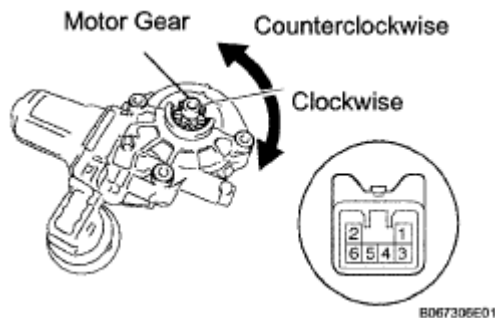


Fig. 38: Checking Operation Of Power Window Motor (FRONT LH)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Apply battery voltage to the motor connector according to the table below.

NOTE: Do not apply battery to any terminals except terminals 1 and 2.

Standard

VOLTAGE SPECIFICATION TABLE

Measurement Condition	Specified Condition
Battery positive (+) --> Terminal 1 (D) Battery negative (-) --> Terminal 2 (U)	Motor gear rotates counterclockwise
Battery positive (+) --> Terminal 2 (U) Battery negative (-) --> Terminal 1 (D)	Motor gear rotates clockwise

3. INSPECT POWER WINDOW REGULATOR MOTOR (REAR RH)

- a. Remove the power window regulator motor.

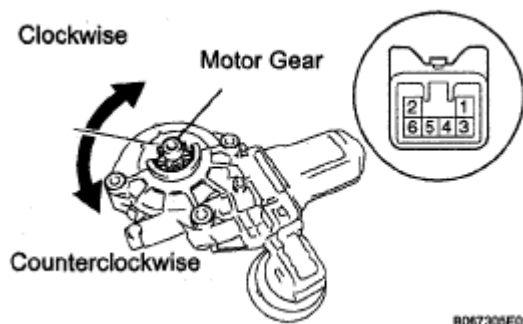


Fig. 39: Identifying Power Window Regulator Motor Operation (Rear RH)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Apply battery voltage to the motor connector according to the table below.

NOTE: Do not apply battery to any terminals except terminals 1 and 2.

Standard

VOLTAGE SPECIFICATION TABLE

Measurement Condition	Specified Condition
Battery positive (+) --> Terminal 1 (D)	Motor gear rotates clockwise
Battery negative (-) --> Terminal 2 (U)	
Battery positive (+) --> Terminal 2 (U)	Motor gear rotates counterclockwise
Battery negative (-) --> Terminal 1 (D)	

4. INSPECT POWER WINDOW REGULATOR MOTOR (REAR LH)

- a. Remove the power window regulator motor.

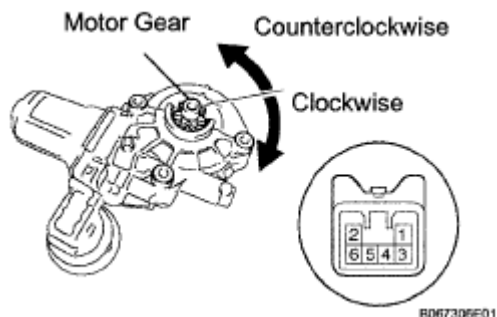


Fig. 40: Checking Power Window Regulator Motor Operation (Rear LH)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Apply battery voltage to the motor connector according to the table below.

NOTE: Do not apply battery to any terminals except terminals 1 and 2.

2008 Lexus RX 350

2008 ACCESSORIES & EQUIPMENT Windshield/Window Glass - RX 350

Standard

VOLTAGE SPECIFICATION TABLE

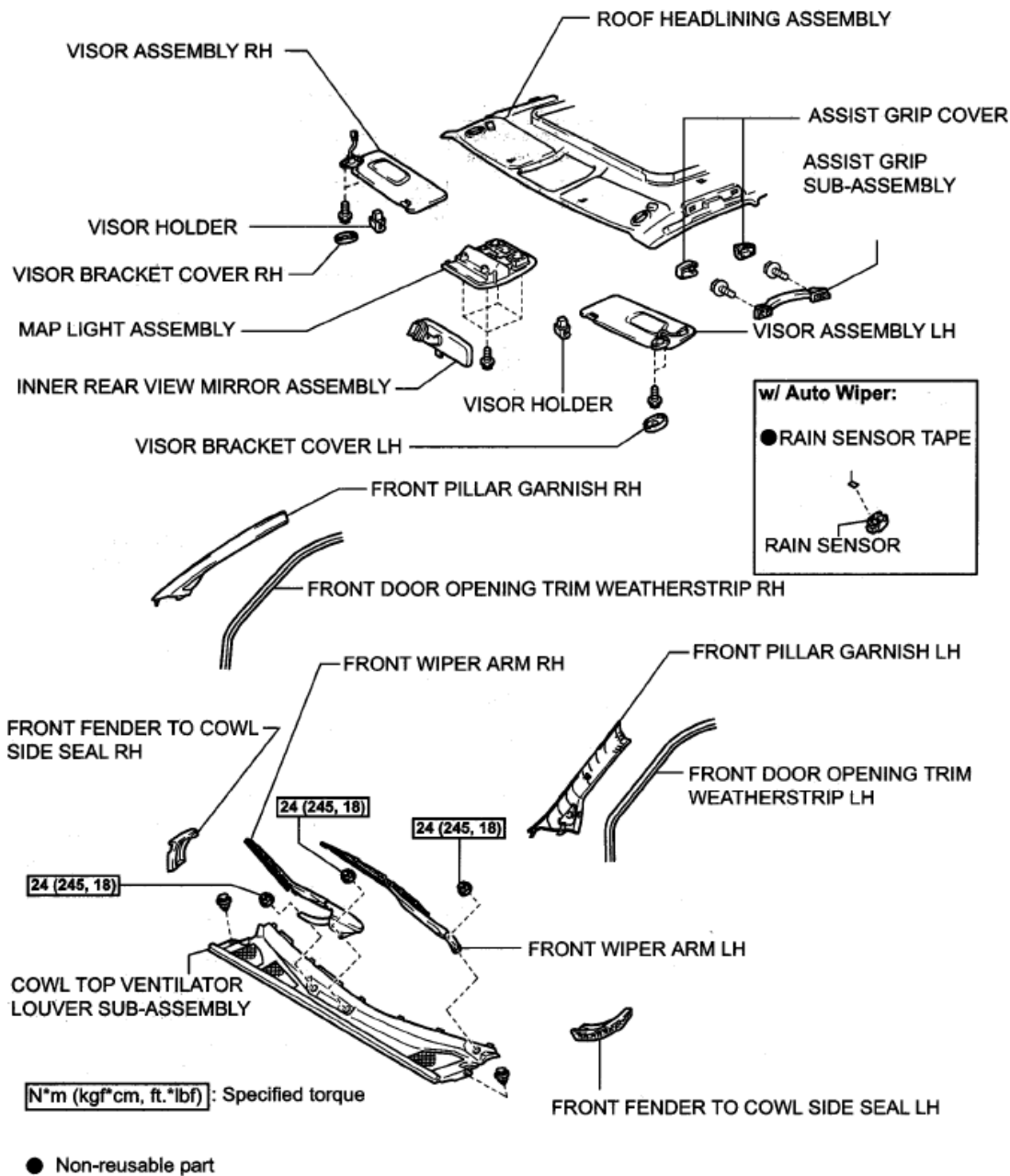
Measurement Condition	Specified Condition
Battery positive (+) --> Terminal 1 (D) Battery negative (-) --> Terminal 2 (U)	Motor gear rotates counterclockwise
Battery positive (+) --> Terminal 2 (U) Battery negative (-) --> Terminal 1 (D)	Motor gear rotates clockwise

WINDSHIELD GLASS

COMPONENTS

2008 Lexus RX 350

2008 ACCESSORIES & EQUIPMENT Windshield/Window Glass - RX 350



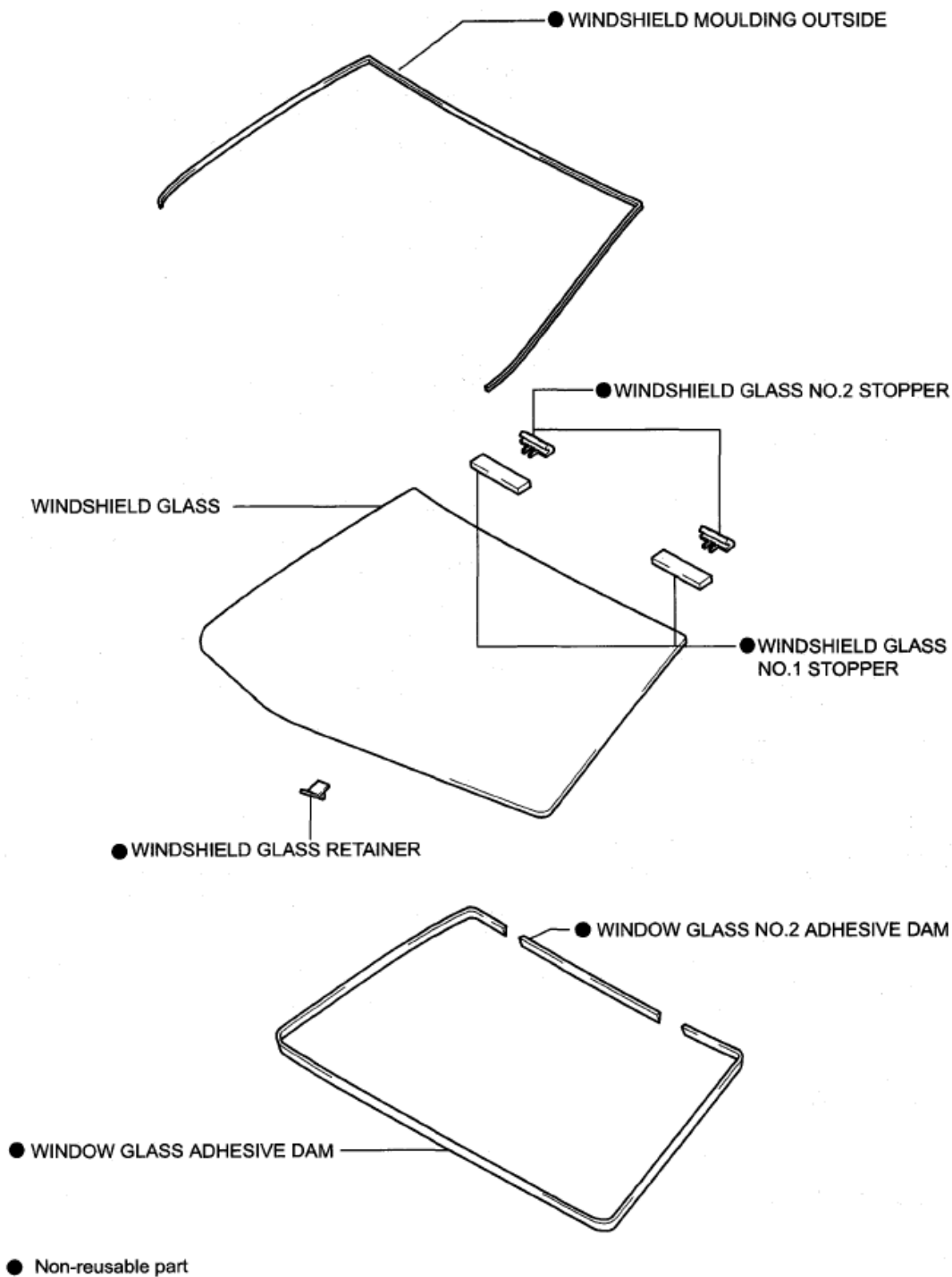
P

B106925E02

Fig. 41: Identifying Windshield Glass Replacement Components With Torque Specifications (1 Of 2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2008 Lexus RX 350

2008 ACCESSORIES & EQUIPMENT Windshield/Window Glass - RX 350



B10692RE01

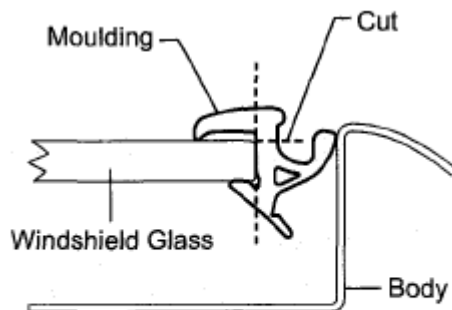
Fig. 42: Identifying Windshield Glass Replacement Components (2 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

CAUTION: Wait at least 90 seconds after disconnecting the cable from the negative (-) battery terminal to prevent airbag and seat belt pretensioner activation (See PRECAUTION).

2. REMOVE FRONT WIPER ARM LH (See REMOVAL)
3. REMOVE FRONT WIPER ARM RH (See REMOVAL)
4. REMOVE FRONT FENDER TO COWL SIDE SEAL LH
5. REMOVE FRONT FENDER TO COWL SIDE SEAL RH
6. REMOVE COWL TOP VENTILATOR LOUVER SUB-ASSEMBLY (See REMOVAL)
7. REMOVE INNER REAR VIEW MIRROR ASSEMBLY (See REMOVAL)
8. REMOVE FRONT DOOR OPENING TRIM WEATHERSTRIP LH
9. REMOVE FRONT DOOR OPENING TRIM WEATHERSTRIP RH
10. REMOVE FRONT PILLAR GARNISH LH (See REMOVAL)
11. REMOVE FRONT PILLAR GARNISH RH
12. REMOVE MAP LIGHT ASSEMBLY (See REMOVAL)
13. REMOVE VISOR ASSEMBLY LH (See REMOVAL)
14. REMOVE VISOR ASSEMBLY RH
15. REMOVE VISOR HOLDER (See REMOVAL)
16. REMOVE ASSIST GRIP SUB-ASSEMBLY (See REMOVAL)
17. REMOVE ROOF HEADLINING ASSEMBLY (See REMOVAL)
18. REMOVE RAIN SENSOR (w/ Auto Wiper) (See REMOVAL)
19. REMOVE WINDSHIELD MOLDING OUTSIDE
 - a. Using a knife, cut off the molding.



B11142BE01

Fig. 43: Cutting Off Molding Using Knife
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: Do not damage the vehicle body with the knife.

- b. Remove the remaining molding from the vehicle body.

HINT:

When removing, make a partial cut, then pull and remove it by hand.

- c. Disconnect the connector (w/ Deicer).

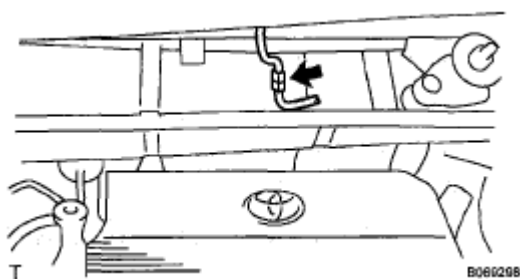


Fig. 44: Identifying Connector

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

20. REMOVE WINDSHIELD GLASS

- a. Pass a piano wire between the vehicle body and glass from the interior.

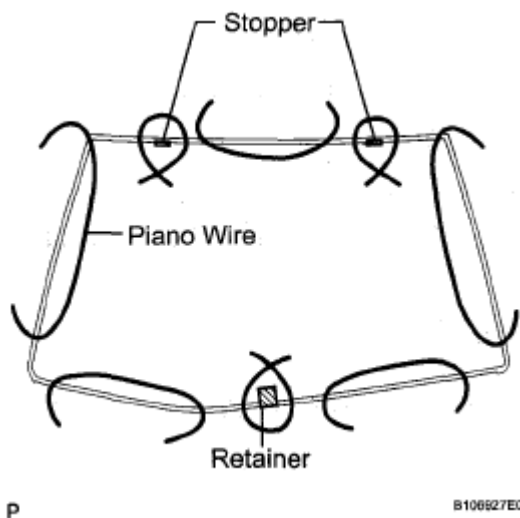
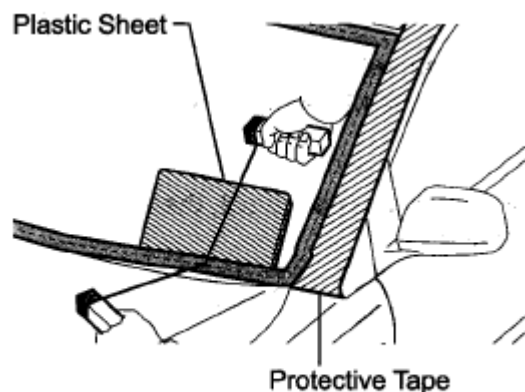


Fig. 45: Passing Piano Wire Between Vehicle Body & Glass From Interior

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

- b. Tie both wire ends to wooden blocks or similar objects.



P

B106928E01

Fig. 46: Tying Both Wire Ends To Wooden Blocks
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE:

- When separating the glass, take care not to damage the paint and the interior and exterior ornaments.
- To prevent the safety pad from being scratched when removing the glass, place a plastic sheet between the piano wire and safety pad.

HINT:

Apply protective tape to the outer surface to prevent the surface from being scratched.

- c. Cut off the adhesive by pulling the piano wire around the glass.
- d. Disengage the stoppers.
- e. Using a suction cup, remove the glass.

NOTE:

Leave as much adhesive on the vehicle body as possible when removing the glass.

21. REMOVE WINDSHIELD GLASS RETAINER

- a. Remove the windshield glass retainer.

22. REMOVE WINDSHIELD GLASS NO.2 STOPPER

- a. Using a scraper, remove the windshield glass No.2 stoppers.

23. REMOVE WINDSHIELD GLASS NO.1 STOPPER

- a. Remove the windshield glass Not stoppers.

24. CLEAN WINDSHIELD GLASS

- a. Using a scraper, remove the damaged stoppers, dam and adhesive sticking to the glass.
- b. Clean the outer circumference of the glass with a non-residue solvent.

NOTE:

- Do not touch the glass surface after cleaning it.
- Be careful not to damage the glass.
- Even if using anew glass, clean the glass with a non-residue solvent.

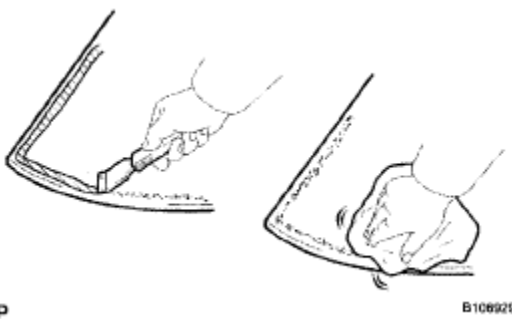


Fig. 47: Cleaning Windshield Glass
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSTALLATION

1. INSTALL WINDSHIELD GLASS NO.1 STOPPER

- a. Install 2 new stoppers to the vehicle body.

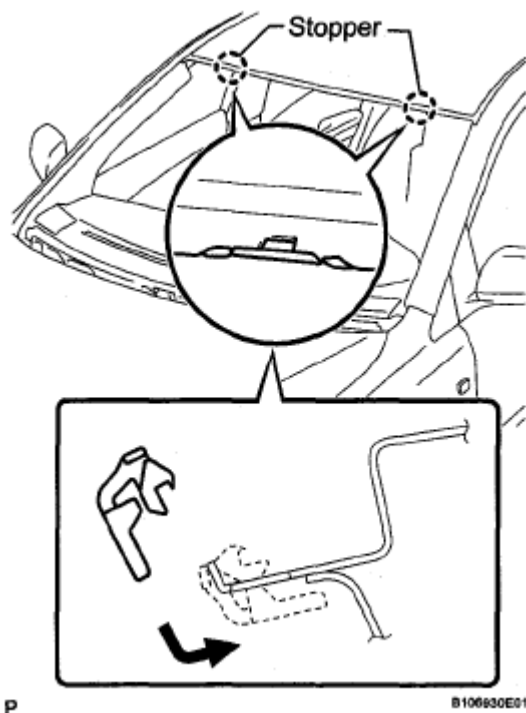


Fig. 48: Identifying Windshield Glass No.1 Stoppers
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. INSTALL WINDSHIELD GLASS NO. 2 STOPPER

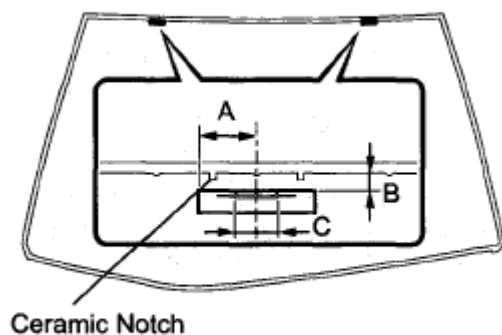
- a. Coat the installation part of the stopper with Primer G.

NOTE:

- Allow the primer coating to dry for 3 minutes or more.
- Do not keep any of the opened Primer G for later use.
- Do not apply too much primer.

- b. Install 2 new windshield glass stoppers onto the glass.

Backside:



P

B106031E01

Fig. 49: Identifying Windshield Glass No. 2 Stopper
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard dimension

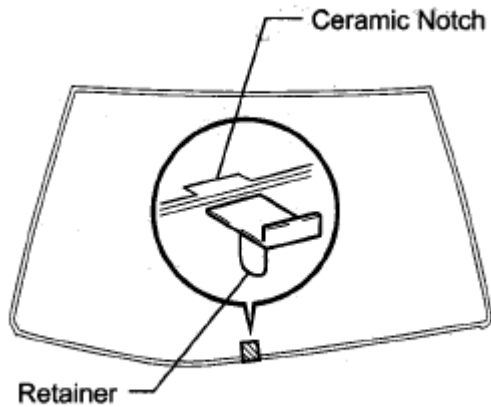
WINDSHIELD DIMENSION TABLE

Area	Dimension
A	40.0 mm (1.575 in.)
B	9.0 mm (0.354 in.)
C	15.0 mm (0.591 in.)

3. INSTALL WINDSHIELD GLASS RETAINER

- a. Install a new windshield glass retainer to the glass.

Backside:



P

B106032E01

Fig. 50: Identifying Windshield Glass Retainer
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

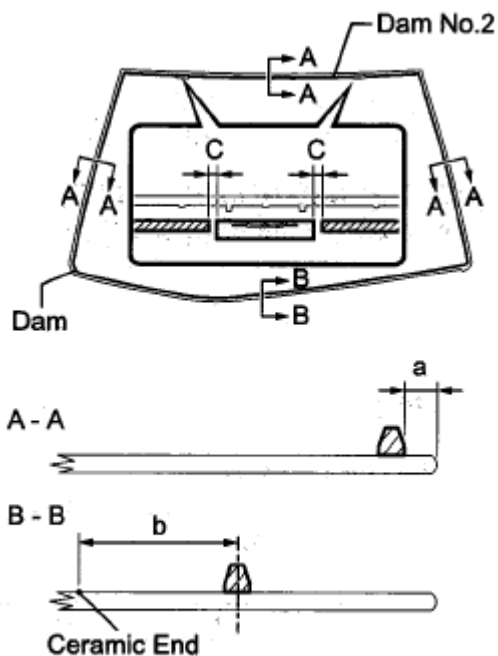
4. INSTALL WINDOW GLASS ADHESIVE DAM

- a. Coat the installation part of the dam with Primer G.

NOTE:

- Allow the primer, coating to dry for 3 minutes or more.
- Do not apply too much primer.

- b. Install a new dam, applying double-sided tape all the way around the glass except where the dam is installed.



P

B106935E01

Fig. 51: Identifying Window Glass Dimension Area
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard dimension

WINDSHIELD DIMENSION

Area	Dimension
a	9.5 mm (0.374 in.)
b	50.0 mm (1.969 in.)
c	8.0 mm (0.315 in.)

5. INSTALL WINDOW GLASS NO.2 ADHESIVE DAM

6. INSTALL WINDSHIELD GLASS

- a. Clean and shape the contact surface of the vehicle body.
 - 1. Using a knife, cut away any rough adhesive on the contact surface of the vehicle body to ensure the appropriate surface shape.

NOTE: Be careful not to damage the vehicle body.

HINT:

Leave as much adhesive on the vehicle body as possible.

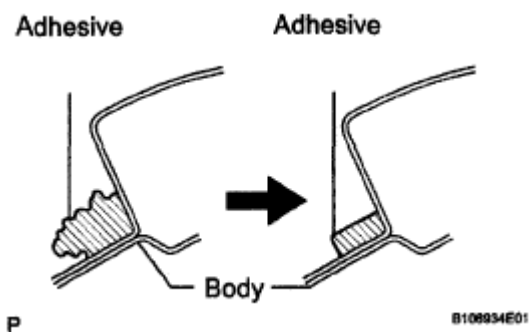


Fig. 52: Identifying Area For Applying Adhesive
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Clean the contact surface of the vehicle body with a piece of shop rag saturated with cleaner.

HINT:

Even if all the adhesive has been removed, clean the vehicle body.

- b. Position the glass.

1. Using a suction cup, place the glass in the correct position.
2. Check that the whole contact surface of the glass rim is perfectly even.
3. Place reference marks between the glass and vehicle body.

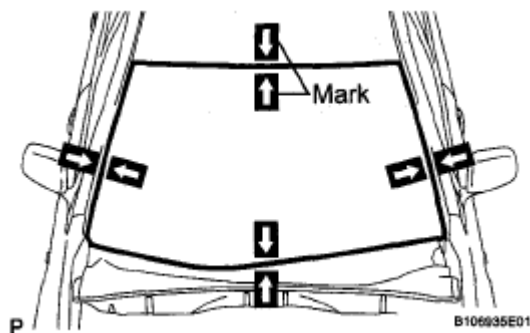


Fig. 53: Placing Reference Marks Between Glass & Vehicle Body
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: Check that the stoppers are attached to the vehicle body correctly.

HINT:

When reusing the glass, check and correct the reference mark positions.

4. Remove the glass.

- c. Using a brush, coat the exposed part of the vehicle body on the vehicle side with Primer M.

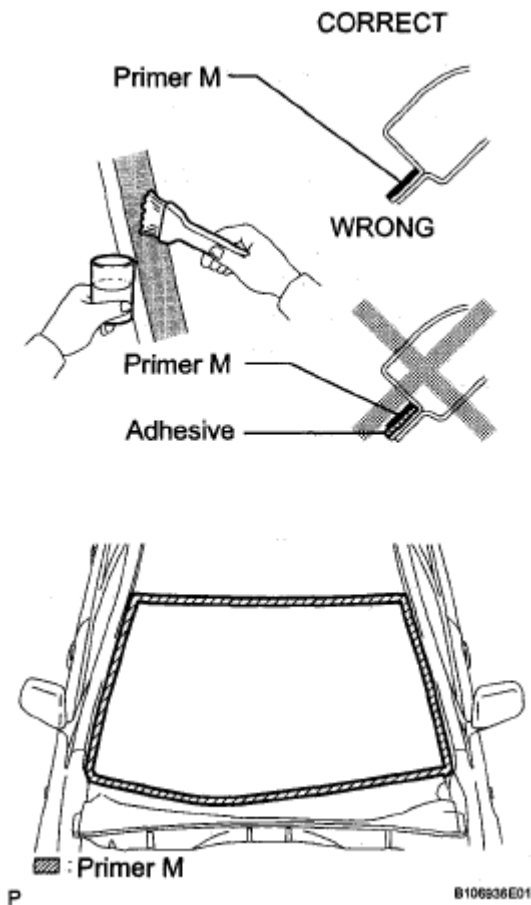


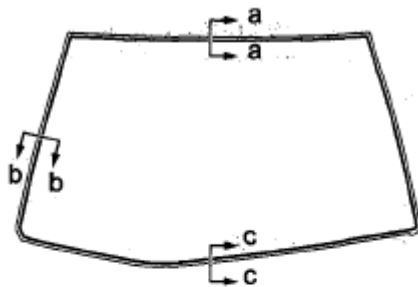
Fig. 54: Coating Exposed Part Of Vehicle Body On Vehicle Side With Primer M
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE:

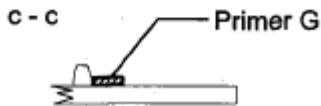
- Allow the primer coating to dry for 3 minutes or more.
- Do not coat the adhesive with Primer M.
- Do not keep any of the opened Primer M for later use.

- d. Using a brush or sponge, coat the edge of the glass and the contact surface with Primer G.

Backside:



a - a



P

B106837E01

Fig. 55: Coating Edge Of Glass & Contact Surface With Primer G
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE:

- Allow the primer coating to dry for 3 minutes or more.
- Do not keep any of the opened Primer G for later use.

HINT:

If an area other than that specified is coated by accident, wipe off the primer with a clean shop rag before it dries.

- e. Apply adhesive (Adhesive: TOYOTA genuine windshield glass adhesive or equivalent).
 1. Cut off the tip of the cartridge nozzle.

HINT:

After cutting off the tip, use all adhesive within the time described in the table below.

Tackfree time

TEMPERATURE SPECIFICATION TABLE

Temperature	Tackfree Time
35°C (95°F)	15 minutes
20°C (68°F)	1 hour 40 minutes
5°C (41°F)	8 hours

2. Load the sealer gun with the cartridge.
3. Coat the glass with adhesive.

Backside:

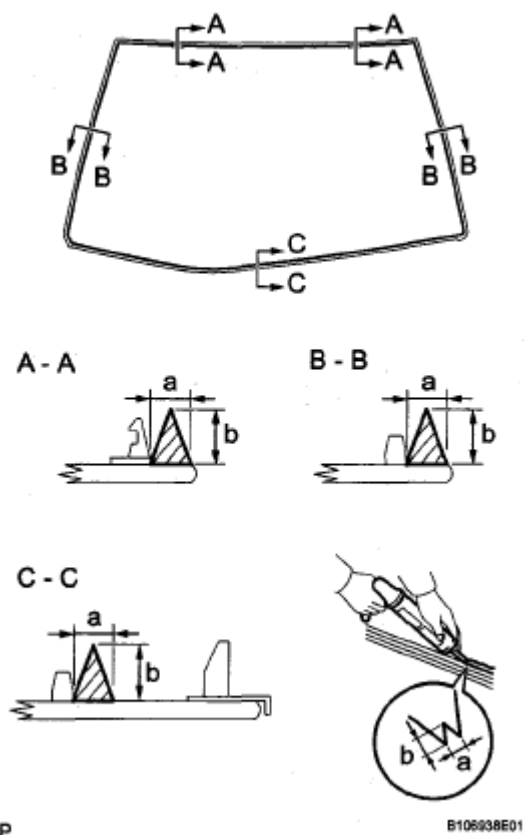


Fig. 56: Coating Glass With Adhesive
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard dimension

ADHESIVE DIMENSION

Area	Dimension
a	8.0 mm (0.315 in.)
b	12.0 mm (0.472 in.)

f. Install the glass.

1. Using a suction cup, position the glass so that the reference marks are aligned, and press it in gently along the rim.

NOTE:

- Allow the primer coating to dry for 3 minutes or more.
- Check that the stoppers are attached to the vehicle body correctly.
- Check the clearance between the vehicle body and glass.

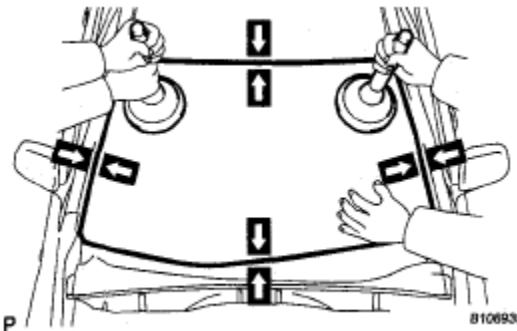


Fig. 57: Identifying Glass Installation Position
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Lightly press the front surface of the glass to ensure a close fit.
3. Using a scraper, remove any excess or protruding adhesive.

NOTE: Take care not to drive the vehicle for the time described in the table below.

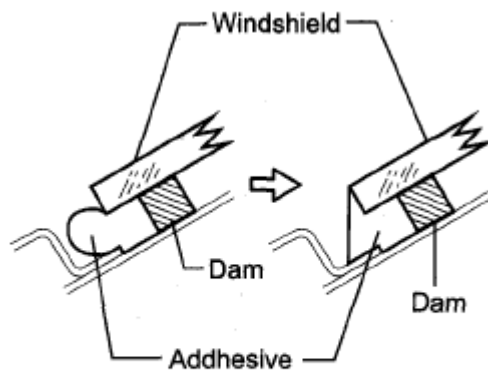
Minimum time

TEMPERATURE SPECIFICATION TABLE

Temperature	Minimum time prior to driving vehicle
35°C (95°F)	1 hour 30 minutes
20°C (68°F)	5 hours
5°C (41°F)	24 hours

HINT:

Apply adhesive onto the glass rim.



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Fig. 58: Removing Adhesive

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

7. INSTALL WINDSHIELD MOLDING OUTSIDE

- a. Using a brush or sponge, coat the edge of the glass and the contact surface with Primer G.

NOTE:

- Allow the primer coating to dry for 3 minutes or more.
- Do not coat the adhesive with Primer G.
- Do not keep any of the opened Primer G for later use.

- b. Install the windshield molding.

8. CHECK FOR LEAKS AND REPAIR

- a. Conduct a leak test after the adhesive has completely hardened.
- b. Seal any leaks with auto glass sealer.

9. INSTALL RAIN SENSOR (w/ Auto Wiper) (See INSTALLATION)**10. INSTALL ROOF HEADLINING ASSEMBLY (See INSTALLATION)****11. INSTALL ASSIST GRIP SUB-ASSEMBLY****12. INSTALL VISOR HOLDER****13. INSTALL VISOR ASSEMBLY LH****14. INSTALL VISOR ASSEMBLY RH****15. INSTALL MAP LIGHT ASSEMBLY****16. INSTALL FRONT PILLAR GARNISH LH****17. INSTALL FRONT PILLAR GARNISH RH****18. INSTALL FRONT DOOR OPENING TRIM WEATHERSTRIP LH****19. INSTALL FRONT DOOR OPENING TRIM WEATHERSTRIP RH****20. INSTALL INNER REAR VIEW MIRROR ASSEMBLY (See INSTALLATION)****21. INSTALL COWL TOP VENTILATOR LOUVER SUB-ASSEMBLY**

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22. **INSTALL FRONT FENDER TO COWL SIDE SEAL LH**
23. **INSTALL FRONT FENDER TO COWL SIDE SEAL RH**
24. **INSTALL FRONT WIPER ARM LH (See INSTALLATION)**
25. **INSTALL FRONT WIPER ARM RH (See INSTALLATION)**
26. **CONNECT CABLE TO NEGATIVE BATTERY TERMINAL**
27. **PERFORM INITIALIZATION**

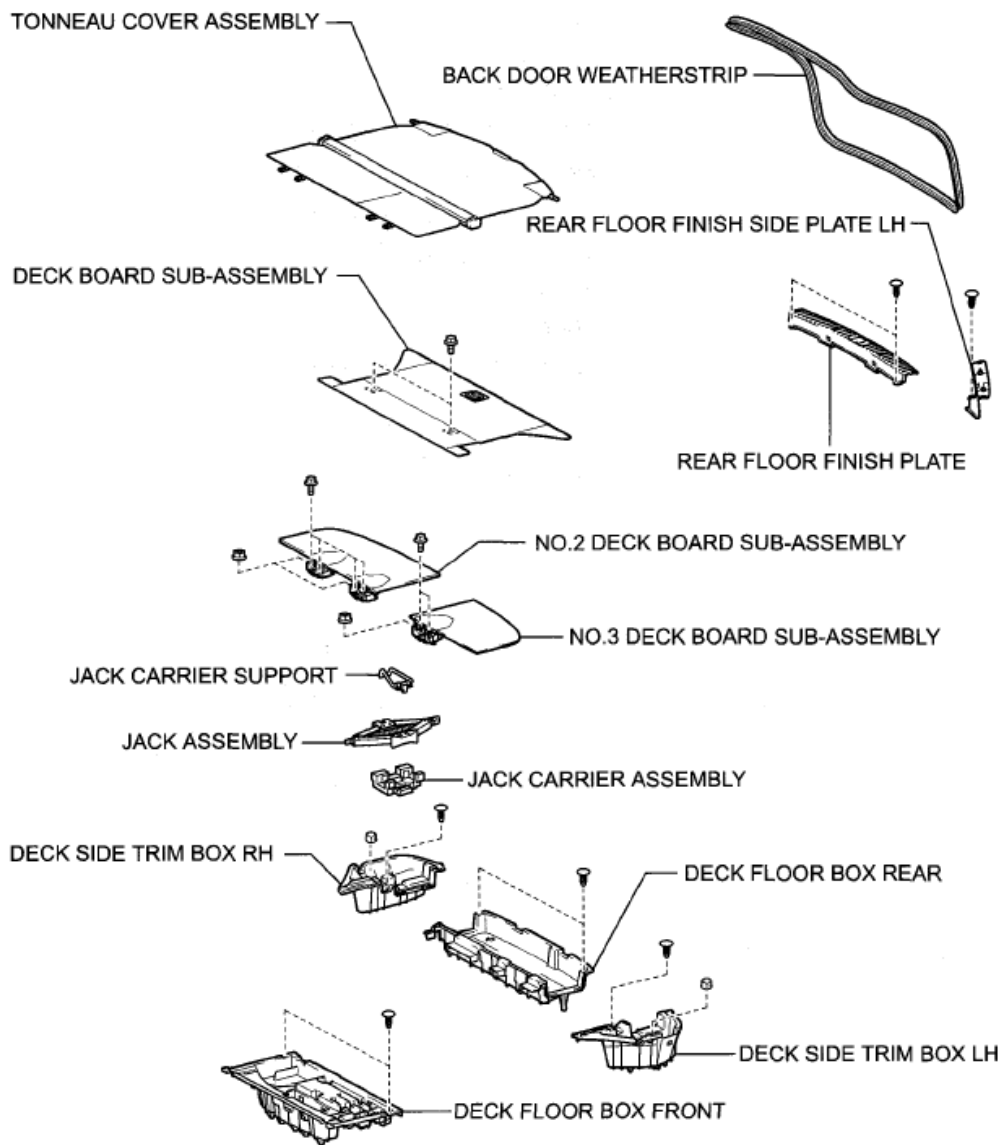
NOTE: Some systems need initialization when disconnecting the cable from the negative (-) battery terminal (See INITIALIZATION).

REAR QUARTER WINDOW GLASS

COMPONENTS

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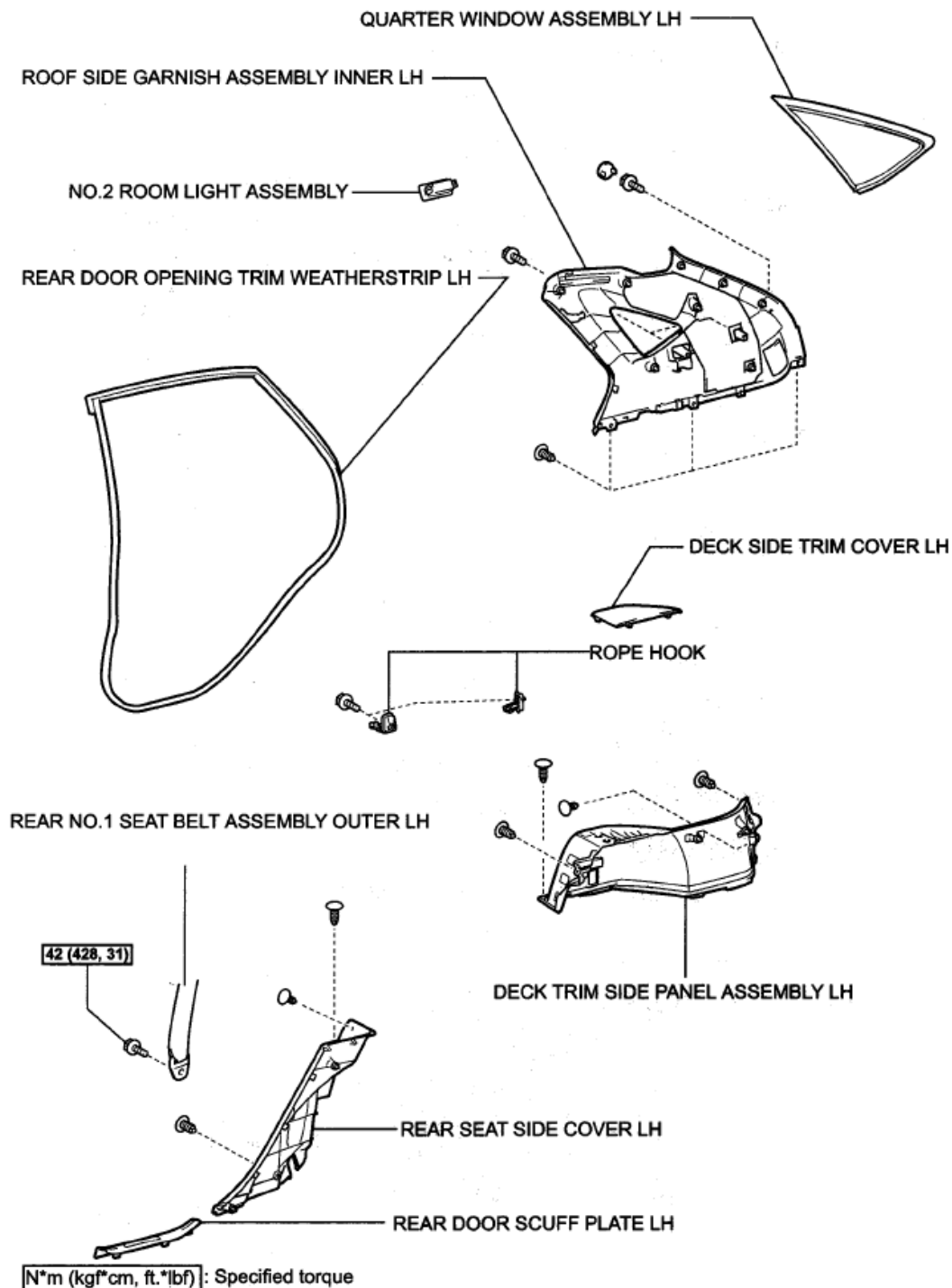
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Fig. 59: Identifying Rear Quarter Window Glass Replacement Components (1 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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Fig. 60: Identifying Rear Quarter Window Glass Replacement Components With Torque Specification (2 Of 2)

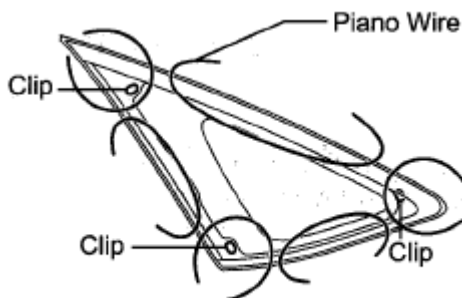
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

CAUTION: Wait at least 90 seconds after disconnecting the cable from the negative (-) battery terminal to prevent airbag and seat belt pretensioner activation (See PRECAUTION).

2. REMOVE REAR DOOR SCUFF PLATE LH (See REMOVAL)
3. REMOVE REAR DOOR OPENING TRIM WEATHERSTRIP LH
4. REMOVE DECK BOARD SUB-ASSEMBLY (See REMOVAL)
5. REMOVE TONNEAU COVER ASSEMBLY
6. REMOVE DECK FLOOR BOX FRONT (See REMOVAL)
7. REMOVE DECK FLOOR BOX REAR (See REMOVAL)
8. REMOVE NO.2 DECK BOARD SUB-ASSEMBLY (See REMOVAL)
9. REMOVE NO.3 DECK BOARD SUB-ASSEMBLY (See REMOVAL)
10. REMOVE BACK DOOR WEATHERSTRIP
11. REMOVE JACK CARRIER ASSEMBLY
12. REMOVE DECK SIDE TRIM BOX RH
13. REMOVE DECK SIDE TRIM BOX LH (See REMOVAL)
14. REMOVE REAR FLOOR FINISH PLATE (See REMOVAL)
15. REMOVE REAR FLOOR FINISH SIDE PLATE LH (See REMOVAL)
16. REMOVE DECK SIDE TRIM COVER LH (See REMOVAL)
17. SEPARATE REAR NO.1 SEAT BELT ASSEMBLY OUTER LH
18. REMOVE REAR SEAT SIDE COVER LH (See REMOVAL)
19. REMOVE ROPE HOOK (See REMOVAL)
20. REMOVE DECK TRIM SIDE PANEL ASSEMBLY LH (See REMOVAL)
21. REMOVE NO.2 ROOM LIGHT ASSEMBLY (See REMOVAL)
22. REMOVE ROOF SIDE GARNISH ASSEMBLY INNER LH (See REMOVAL)
23. REMOVE QUARTER WINDOW ASSEMBLY LH
 - a. Pass a piano wire between the vehicle body and glass from the interior.



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Fig. 61: Passing Piano Wire Between Vehicle Body & Glass From Interior

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

- b. Tie both wire ends to wooden blocks or similar objects.

NOTE: When separating the glass, take care not to damage the paint and the interior and exterior ornaments.

HINT:

Apply protective tape to the outer surface to prevent the surface from being scratched.

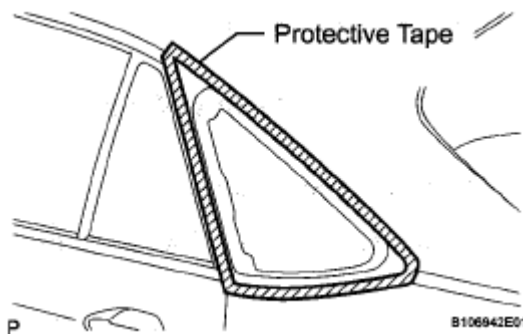


Fig. 62: Applying Protective Tape To Quarter Window Assembly LH
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Cut off the adhesive by pulling the piano wire around the glass.
d. Using a suction cup, remove the glass.

NOTE: Leave as much adhesive on the vehicle body as possible when removing the glass.

24. CLEAN QUARTER WINDOW ASSEMBLY LH

- a. Clean the outer circumference of the glass with a non-residue solvent.

NOTE:

- Do not touch the glass surface after cleaning it.
- Be careful not to damage the glass.

INSTALLATION

1. INSTALL QUARTER WINDOW ASSEMBLY LH

- a. Clean and shape the contact surface of the vehicle body.
1. Using a knife, cut away any rough adhesive on the contact surface of the vehicle body to ensure the appropriate surface shape.

HINT:

Leave as much adhesive on the vehicle body as possible.

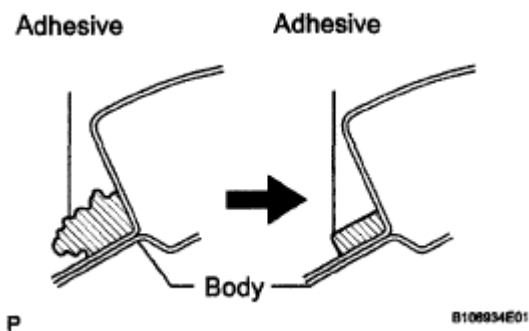


Fig. 63: Identifying Area For Applying Adhesive
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Clean the contact surface of the vehicle body with a piece of shop rag saturated with cleaner.

HINT:

Even if all the adhesive has been removed, clean the vehicle body.

- b. Using a brush, coat the exposed part of the vehicle body with Primer M.

NOTE:

- Allow the primer coating to dry for 3 minutes or more.
- Do not coat the adhesive with Primer M.
- Do not keep any of the opened Primer M for later use.

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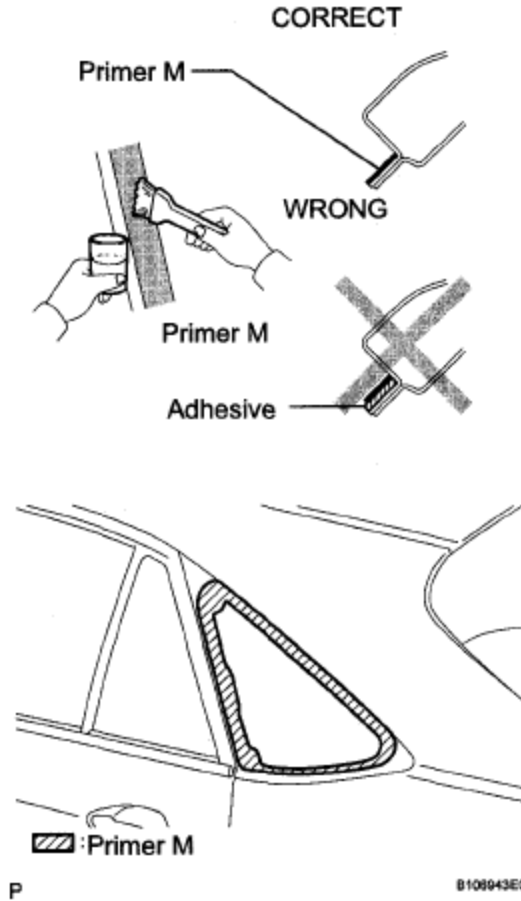
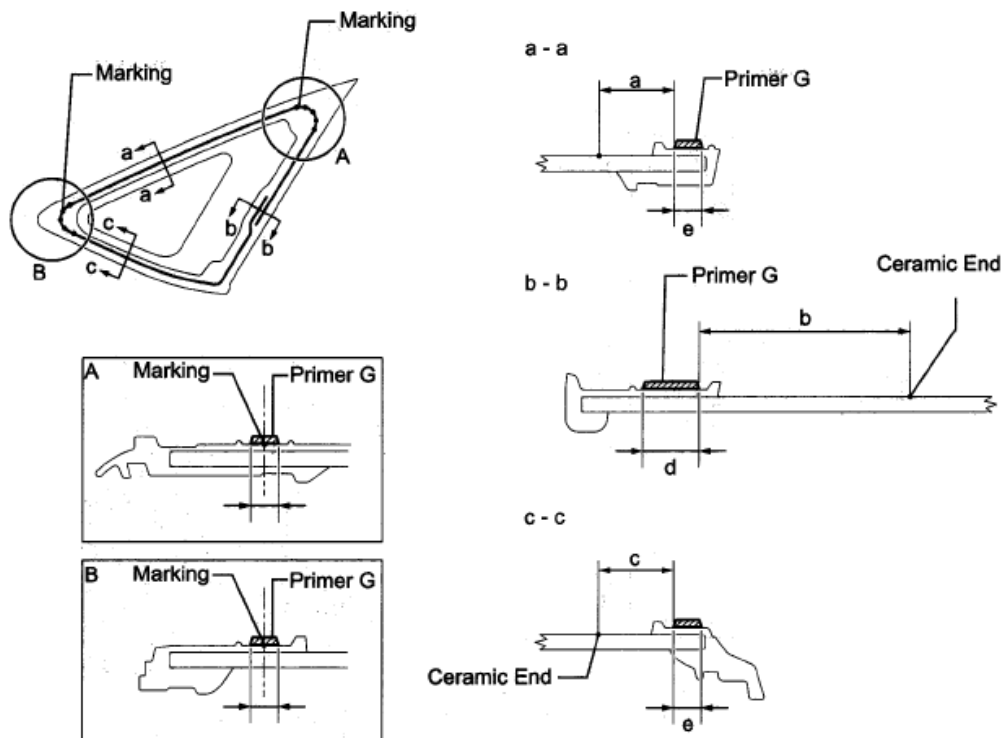


Fig. 64: Coating Exposed Part Of Vehicle Body With Primer M
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Using a brush or sponge, coat the edge of the glass and the contact surface with Primer G.

Backside:



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Fig. 65: Coating Edge Of Glass & Contact Surface With Primer G
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE:

- Allow the primer coating to dry for 3 minutes or more.
- Do not keep any of the opened Primer G for later use.

Standard dimension

STANDARD DIMENSION

Area	Dimension
a	9.0 mm (0.354 in.)
b	52.0 mm (2.047 in.)
c	17.0 mm (0.669 in.)
d	12.0 mm (0.472 in.)
e	6.0 mm (0.236 in.)

HINT:

If an area other than that specified is coated by accident, wipe off the primer with a clean shop rag

before it dries.

- d. Apply adhesive (Adhesive: TOYOTA genuine windshield glass adhesive or equivalent).
 1. Cut off the tip of the cartridge nozzle.

HINT:

After cutting off the tip, use all adhesive within the time described in the table below.

Tackfree time

TEMPERATURE SPECIFICATION TABLE

Temperature	Tackfree Time
35°C (95°F)	15 minutes
20°C (68°F)	1 hour 40 minutes
5°C (41°F)	8 hours

2. Load the sealer gun with the cartridge.
3. Coat the glass with adhesive.

Backside:

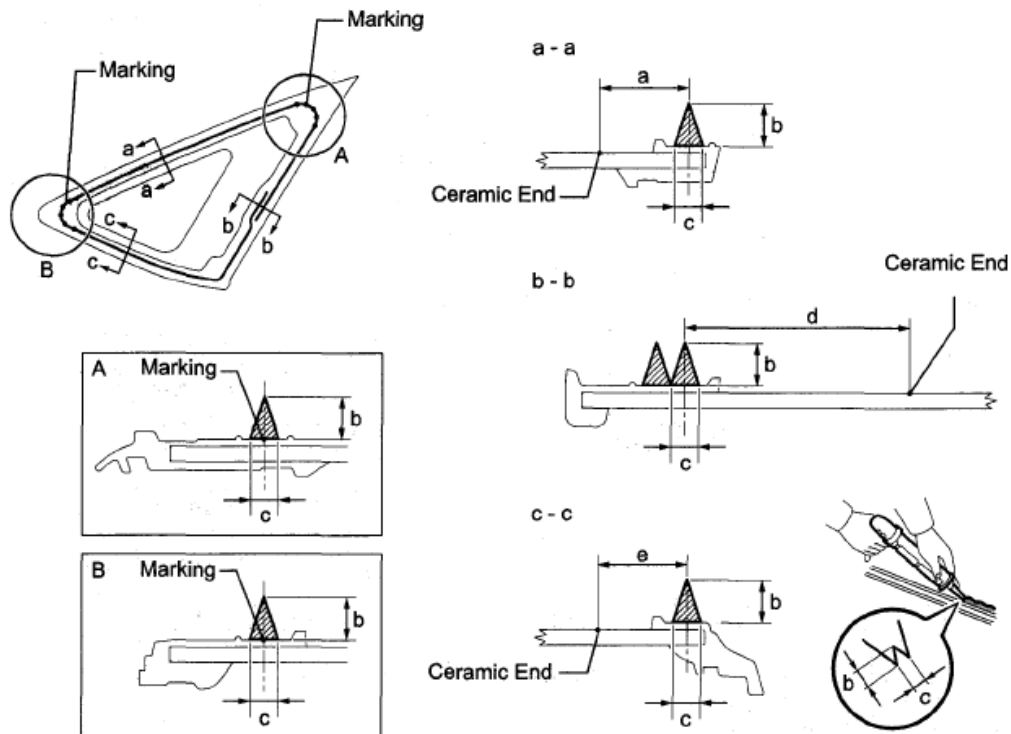


Fig. 66: Identifying Dimension For Coating Glass With Adhesive
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard dimension

ADHESIVE STANDARD DIMENSION

Area	Dimension
a	12.0 mm (0.472 in.)
b	8.0 mm (0.315 in.)
c	6.0 mm (0.236 in.)
d	550 mm (21.654 in.)
e	20 mm (0.787 in.)

- e. Install the glass to the vehicle body.
1. Hold the glass in place securely with tape or equivalent to the vehicle body until the adhesive has hardened.

NOTE:

- Allow the primer coating to dry for 3 minutes or more.
- Check that the clips are attached to the vehicle body correctly.
- Check the clearance between the vehicle body and glass.

2. Lightly press the front surface of the glass to ensure a close fit.
3. Using a scraper, remove any excess or protruding adhesive.

NOTE:

Take care not to drive the vehicle for the time described in the table below.

Minimum time

TEMPERATURE SPECIFICATION TABLE

Temperature	Minimum time prior to driving vehicle
35°C (96°F)	1 hour 30 minutes
20°C (68°F)	5 hours
5°C (41°F)	24 hours

2. CHECK FOR LEAKS AND REPAIR

- a. Conduct a leak test after the adhesive has completely hardened.
- b. Seal any leaks with auto glass sealer.

3. INSTALL ROOF SIDE GARNISH ASSEMBLY INNER LH

4. INSTALL ROOM LIGHT ASSEMBLY NO.2

5. INSTALL DECK TRIM SIDE PANEL ASSEMBLY LH

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6. **INSTALL ROPE HOOK**
7. **INSTALL REAR SEAT SIDE COVER LH**
8. **INSTALL REAR NO.1 SEAT BELT ASSEMBLY OUTER LH**
9. **INSTALL DECK SIDE TRIM COVER LH**
10. **INSTALL REAR FLOOR FINISH SIDE PLATE LH**
11. **INSTALL REAR FLOOR FINISH PLATE**
12. **INSTALL DECK SIDE TRIM BOX LH**
13. **INSTALL DECK SIDE TRIM BOX RH**
14. **INSTALL JACK CARRIER ASSY**
15. **INSTALL BACK DOOR WEATHERSTRIP**
16. **INSTALL NO.2 DECK BOARD SUB-ASSEMBLY**
17. **INSTALL NO.3 DECK BOARD SUB-ASSEMBLY**
18. **INSTALL DECK FLOOR BOX REAR**
19. **INSTALL DECK FLOOR BOX FRONT**
20. **INSTALL TONNEAU COVER ASSEMBLY**
21. **INSTALL DECK BOARD SUB-ASSEMBLY**
22. **INSTALL REAR DOOR OPENING TRIM WEATHERSTRIP LH**
23. **INSTALL REAR DOOR SCUFF PLATE LH**
24. **CONNECT CABLE TO NEGATIVE BATTERY TERMINAL**
25. **PERFORM INITIALIZATION**

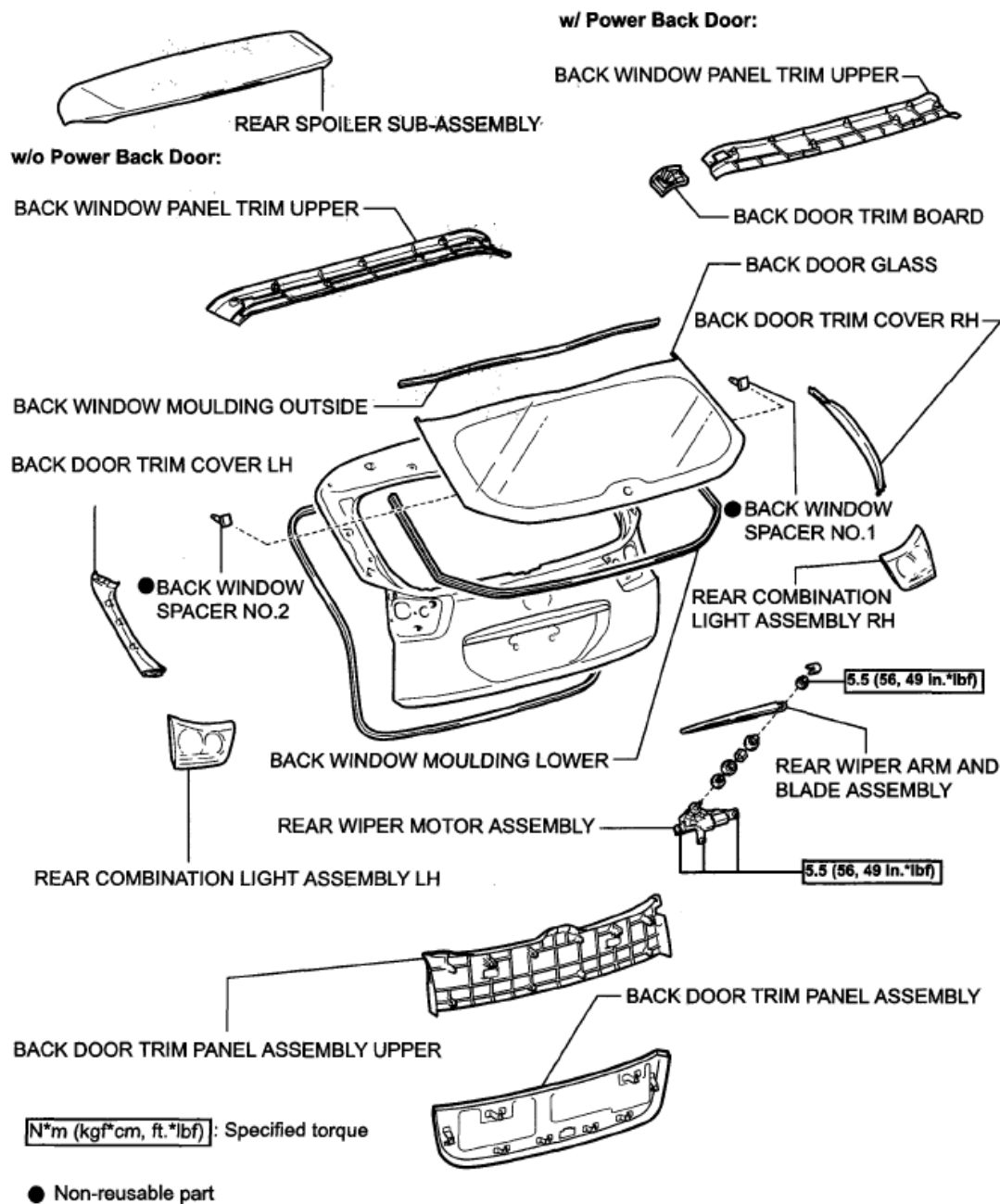
NOTE: Some systems need initialization when disconnecting the cable from the negative (-) battery terminal (See INITIALIZATION).

BACK DOOR GLASS

COMPONENTS

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Fig. 67: Identifying Back Door Glass Replacement Components With Torque Specifications
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

CAUTION: Wait at least 90 seconds after disconnecting the cable from the

negative (-) battery terminal to prevent airbag and seat belt pretensioner activation (See PRECAUTION).

2. REMOVE REAR WIPER ARM AND BLADE ASSEMBLY (See REMOVAL)
3. REMOVE BACK DOOR TRIM BOARD (w/ Power Back Door)
4. REMOVE BACK WINDOW PANEL TRIM UPPER (w/ Power Back Door)
5. REMOVE BACK WINDOW PANEL TRIM UPPER (w/o Power Back Door)
6. REMOVE BACK DOOR TRIM PANEL ASSEMBLY UPPER
7. REMOVE BACK DOOR TRIM PANEL ASSEMBLY
8. REMOVE BACK DOOR TRIM COVER RH
9. REMOVE BACK DOOR TRIM COVER LH
10. REMOVE REAR SPOILER SUB-ASSEMBLY
11. REMOVE REAR WIPER MOTOR ASSEMBLY (See REMOVAL)
12. REMOVE REAR COMBINATION LIGHT ASSEMBLY LH (See REMOVAL)
13. REMOVE REAR COMBINATION LIGHT ASSEMBLY RH
14. REMOVE BACK DOOR GLASS
 - a. Disconnect the connector.
 - b. Pass a piano wire between the vehicle body and glass from the interior.

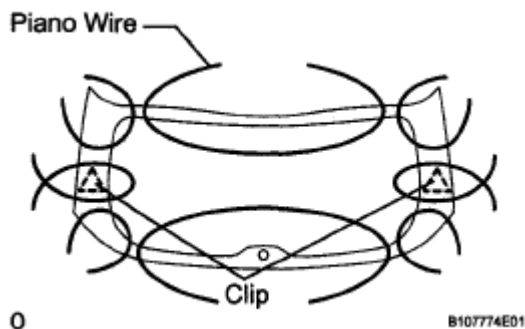


Fig. 68: Passing Piano Wire Between Vehicle Body & Glass From Interior
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Tie both wire ends to wooden blocks or similar objects.

NOTE: When separating the glass, take care not to damage the paint and interior and exterior ornaments.

HINT:

Apply protective tape to the outer surface to prevent the surface from being scratched.

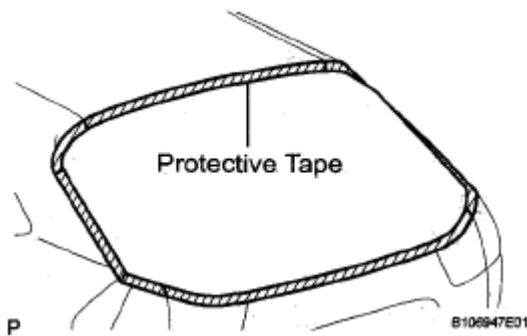


Fig. 69: Applying Protective Tape To Back Door Glass
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Cut off the adhesive by pulling the piano wire around the glass.

NOTE: If the back door glass will be reused, be careful not to damage the clip attached to the glass when you cut off the adhesive.

- e. Using a suction cup, remove the glass.

NOTE: Leave as much adhesive on the vehicle body as possible when removing the glass.

15. CLEAN BACK DOOR GLASS

- a. Using a scraper, remove the damaged stoppers, dam and adhesive sticking to the glass.
 b. Clean the outer circumference of the glass with a non-residue solvent.

NOTE:

- Do not touch the glass surface after cleaning it.
- Be careful not to damage the glass.
- Even if using a new glass, clean the glass with a non-residue solvent.

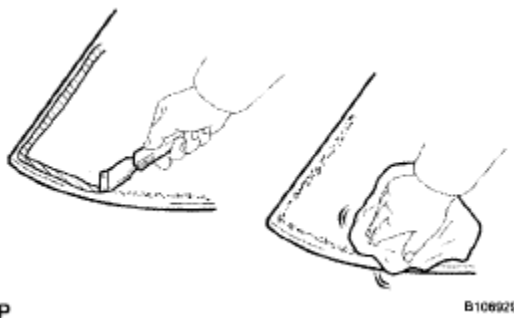


Fig. 70: Cleaning Back Door Glass
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSTALLATION

1. INSTALL BACK DOOR GLASS

- a. Clean and shape the contact surface of the vehicle body.
 1. Using a knife, cut away any rough adhesive on the contact surface of the vehicle body to ensure the appropriate surface shape.

HINT:

Leave as much adhesive on the vehicle body as possible.

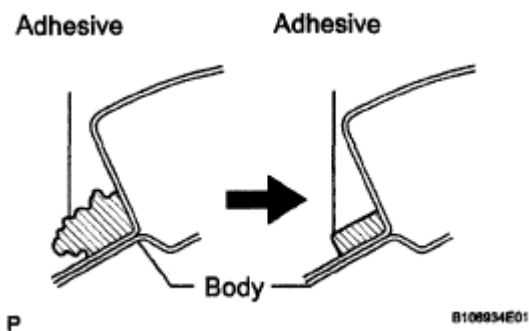


Fig. 71: Identifying Area For Applying Adhesive
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Clean the contact surface of the vehicle body with a piece of shop rag saturated with cleaner.

HINT:

Even if all the adhesive has been removed, clean the vehicle body.

- b. Using a brush, coat the exposed part of the vehicle body with Primer M.

NOTE:

- Allow the primer coating to dry for 3 minutes or more.
- Do not coat the adhesive with Primer M.
- Do not keep any of the opened Primer M for later use.

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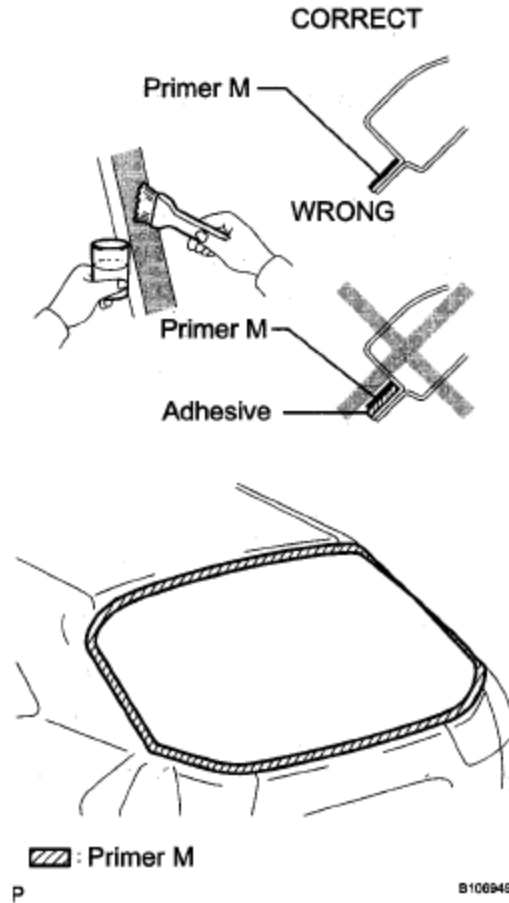
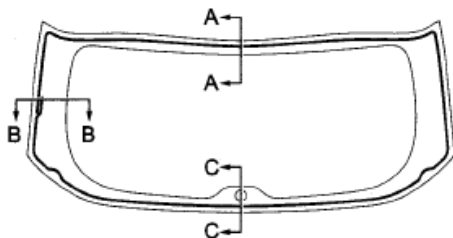


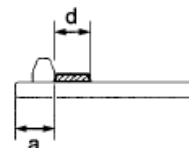
Fig. 72: Coating Edge Of Glass & Contact Surface With Primer M
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Using a brush or sponge, coat the edge of the glass and the contact surface with Primer G.

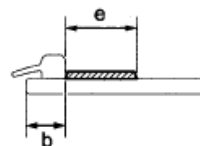
Backside:



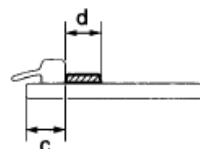
A - A



B - B



C - C



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Fig. 73: Coating Edge Of Glass & Contact Surface With Primer G
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE:

- Allow the primer coating to dry for 3 minutes or more.
- Do not keep any of the opened Primer G for later use.

Standard dimension

STANDARD DIMENSION

Area	Dimension
a	8.0 mm (0.315 in.)
b	9.2 mm (0.362 in.)
c	9.2 mm (0.362 in.)
d	8.0 mm (0.315 in.)
e	16.0 mm (0.630 in.)

HINT:

If an area other than that specified is coated by accident, wipe off the primer with a clean shop rag before it dries.

- d. Apply adhesive (Adhesive: TOYOTA genuine windshield glass adhesive or equivalent).
 1. Cut off the tip of the cartridge nozzle.

HINT:

After cutting off the tip, use all adhesive within the time described in the table below.

2. Load the sealer gun with the cartridge.

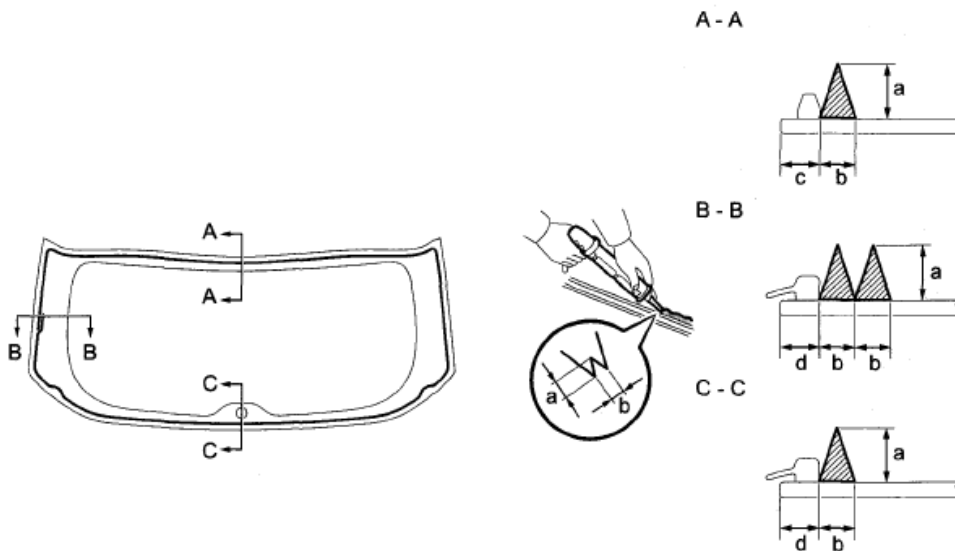
Tackfree time

TEMPERATURE SPECIFICATION TABLE

Temperature	Tackfree Time
35°C (95°F)	15 minutes
20°C (68°F)	1 hour 40 minutes
5°C (41°F)	8 hours

3. Coat the glass with adhesive as shown in the illustration.

Backside:



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Fig. 74: Identifying Dimension For Coating Glass With Adhesive
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard dimension

STANDARD DIMENSION

Area	Dimension
a	12.0 mm (0.472 in.)

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b	8.0 mm (0.315 in.)
c	8.0 mm (0.315 in.)
d	9.2 mm (0.362 in.)

e. Install the glass to the vehicle body.

1. Hold the back window glass in place securely with tape or equivalent to the vehicle body until the adhesive has hardened.

NOTE:

- Allow the primer coating to dry for 3 minutes or more.
- Check that the clips are attached to the vehicle body correctly.
- Check the clearance between the vehicle body and glass.

2. Lightly press the front surface of the glass to ensure a close fit.
3. Using a scraper, remove any excess or protruding adhesive.

NOTE:

Take care not to drive the vehicle for the time described in the table below.

Minimum time

TEMPERATURE SPECIFICATION TABLE

Temperature	Minimum time prior to driving vehicle
35°C (95°F)	1 hour 30 minutes
20°C (68°F)	5 hours
5°C (41°F)	24 hours

2. INSTALL BACK WINDOW MOLDING OUTSIDE

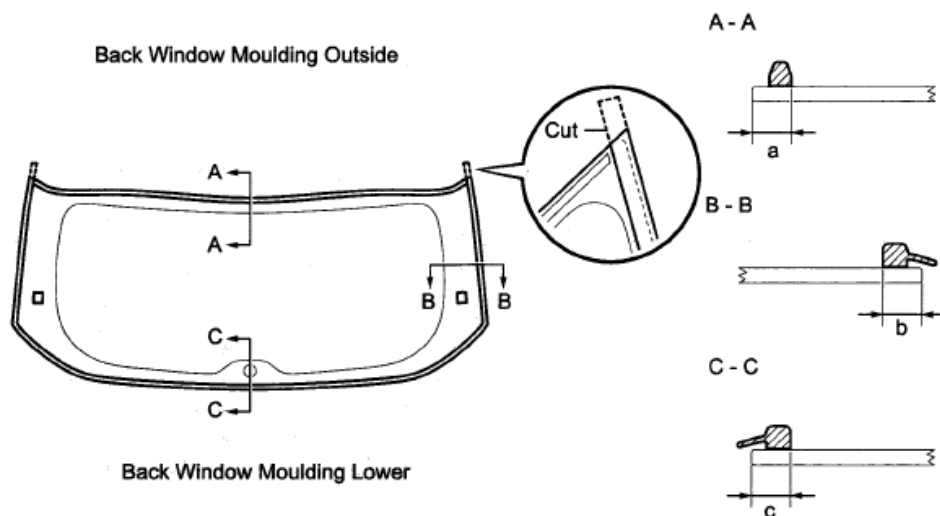
- a. Coat the installation part of the moldings with Primer G.

NOTE:

- Allow the primer coating to dry for 3 minutes or more.
- Do not apply too much primer.

- b. Install a new moldings, applying double-sided tape all the way around the glass except where the moldings is installed.

Backside:



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Fig. 75: Coating Installation Part Of Moldings With Primer
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard dimension

STANDARD DIMENSION

Area	Dimension
a	8.0 mm (0.315 in.)
b	9.2 mm (0.362 in.)
c	9.2 mm (0.362 in.)

- c. Connect the connector.
3. **INSTALL BACK WINDOW MOLDING LOWER**
4. **CHECK FOR LEAKS AND REPAIR**
 - a. Conduct a leak test after the adhesive has completely hardened.
 - b. Seal any leaks with auto glass sealer.
5. **INSTALL REAR COMBINATION LIGHT ASSEMBLY LH** (See **INSTALLATION**)
6. **INSTALL REAR COMBINATION LIGHT ASSEMBLY RH**
7. **INSTALL REAR WIPER MOTOR ASSEMBLY** (See **INSTALLATION**)
8. **INSTALL REAR SPOILER SUB-ASSEMBLY** (See **INSTALLATION**)
9. **INSTALL BACK DOOR TRIM COVER LH**
10. **INSTALL BACK DOOR TRIM COVER RH**

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11. **INSTALL BACK DOOR TRIM PANEL ASSEMBLY**
12. **INSTALL BACK DOOR TRIM PANEL ASSEMBLY UPPER**
13. **INSTALL BACK WINDOW PANEL TRIM UPPER (w/o Power Back Door)**
14. **INSTALL BACK WINDOW PANEL TRIM UPPER (w/ Power Back Door)**
15. **INSTALL BACK DOOR TRIM BOARD (w/ Power Back Door)**
16. **INSTALL REAR WIPER ARM AND BLADE ASSEMBLY (See INSTALLATION)**
17. **CONNECT CABLE TO NEGATIVE BATTERY TERMINAL**
18. **PERFORM INITIALIZATION**

NOTE: Some systems need initialization when disconnecting the cable from the negative (-) battery terminal (See INITIALIZATION).

WINDOW DEFOGGER SYSTEM

PRECAUTION

NOTE: When disconnecting the negative (-) battery cable, initialize the following systems after the cable is reconnected.

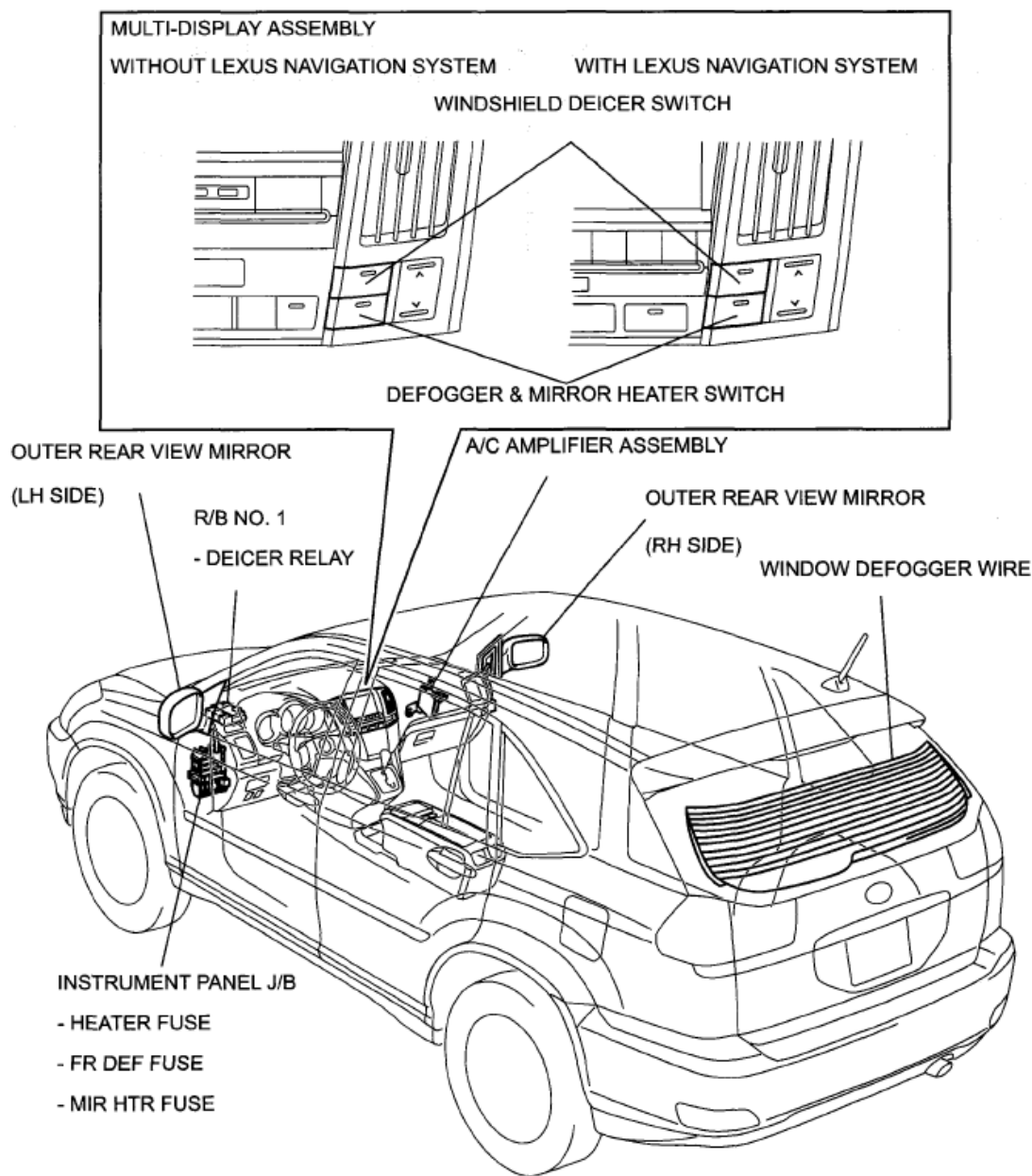
SYSTEM NAME REFERENCE

System Name	See Procedure
Lighting System	<u>INITIALIZATION</u>
Power Door Lock Control System	
Power Window Control System	
Back Door Closer System	
Power Back Door System	
Electrical Back Door Outside Handle System	
Sliding Roof System (for Multi-panel Moon Roof)	
Sliding Roof System (for Standard)	

PARTS LOCATION

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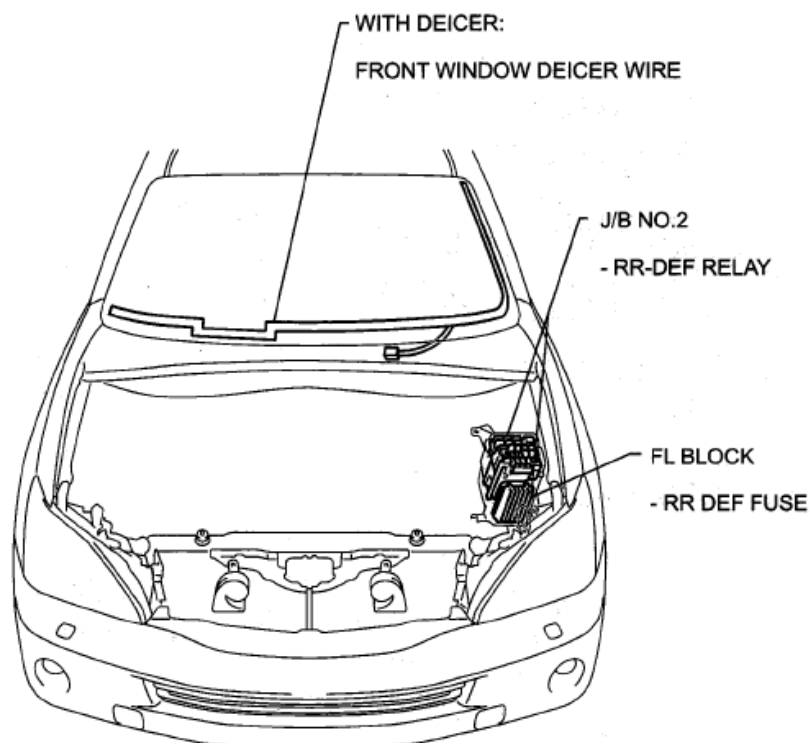
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Fig. 76: Identifying Window Defogger System Replacement Components (1 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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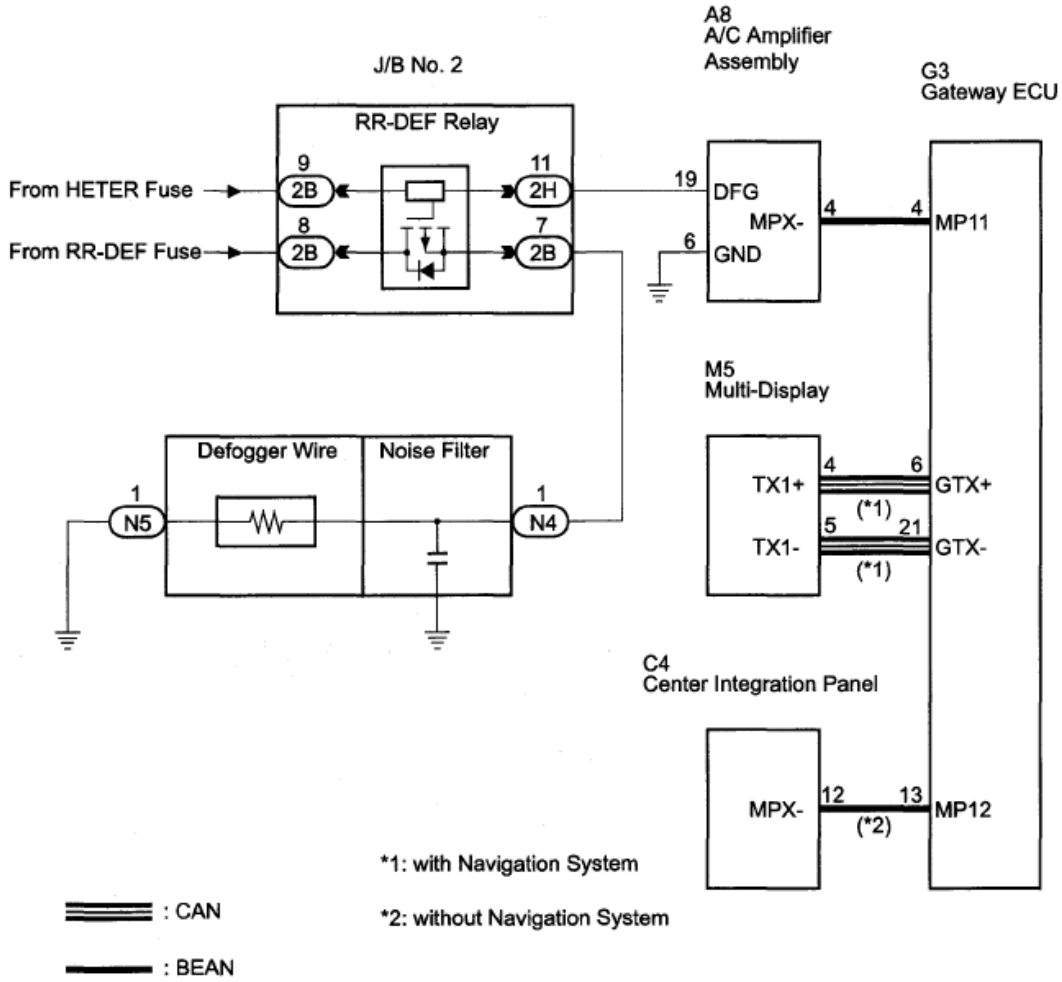
Fig. 77: Identifying Window Defogger System Replacement Components (2 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

SYSTEM DIAGRAM

2008 Lexus RX 350

2008 ACCESSORIES & EQUIPMENT Windshield/Window Glass - RX 350

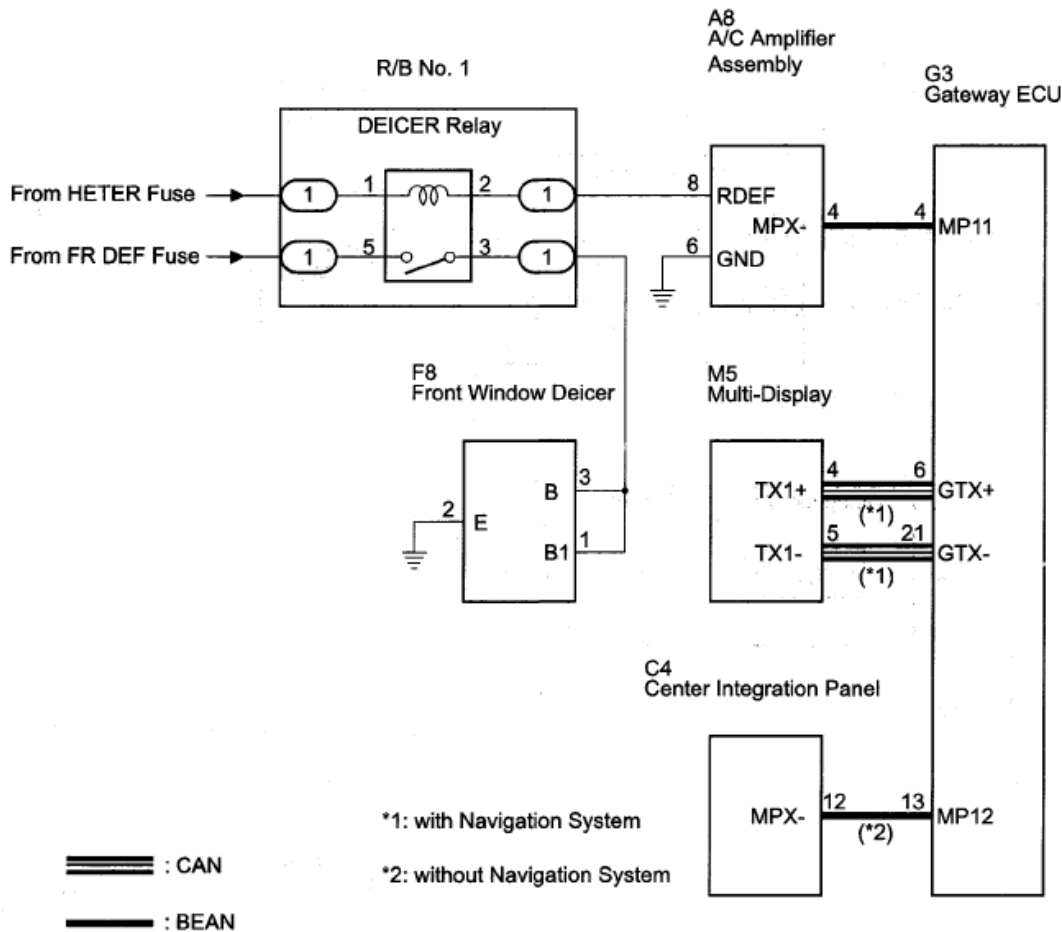
Rear Window Defogger:



B140708E01

Fig. 78: Identifying Window Defogger System Diagram (1 Of 2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Front Window Deicer:



H

B140710E01

Fig. 79: Identifying Window Defogger System Diagram (2 Of 2)

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

SYSTEM DESCRIPTION

1. GENERAL

The defogger system's thin heater wires are attached to the inside of the rear window and defog the window surface quickly. The indicator light illuminates while the system is operating. The system automatically turns off after approximately 15 minutes.

HINT:

The rear window defogger is linked with the mirror defogger.

2. FUNCTION OF MAIN COMPONENT

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FUNCTION OF MAIN COMPONENT

Component	Outline
RR DEF Relay	Receives rear defogger activation request signals from A/C amplifier assembly (A/C ECU) and supplies power to rear window defogger.
Rear Window Defogger	Receives power from RR DEF relay and heats defogger wire.
with Deicer Relay	Receives front deicer activation request signals from A/C amplifier assembly (A/C ECU) and supplies power to front window deicer.
with Deicer Front Window Deicer	Receives power from DEICER relay and heats deicer wire.

3. DESCRIPTION

COMPONENT FUNCTION

Function	Outline
Defogs the rear window surface	<ul style="list-style-type: none">• Receives rear defogger activation request signals from A/C amplifier assembly (A/C ECU) and supplies power to rear window defogger.• Receives power from RR DEF relay and heats defogger wire.
Defogs the front window surface	<ul style="list-style-type: none">• Receives front deicer activation request signals from A/C amplifier assembly (A/C ECU) and supplies power to front window deicer.• Receives power from DEICER relay and heats deicer wire.

HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

- Use the procedure to troubleshoot the defogger system.
- The intelligent tester should be used in steps 4 and 6.

1. VEHICLE BROUGHT TO WORKSHOP

2. INSPECT BATTERY VOLTAGE

Standard voltage: 11 to 14 V

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

3. PROBLEM SYMPTOMS TABLE

Result

RESULT REFERENCE

Result	Proceed to
Fault is not listed in problem symptoms table	A
Fault is listed in problem symptoms table	B

B: Go to step 6

A: Go to next step.

4. OVERALL ANALYSIS AND TROUBLESHOOTING

- a. See TERMINALS OF ECU
- b. See DATA LIST/ACTIVE TEST
- c. See ON-VEHICLE INSPECTION
- d. See ON-VEHICLE INSPECTION

5. REPAIR OR REPLACE

6. CONFIRMATION TEST

NEXT: END

PROBLEM SYMPTOMS TABLE

WINDOW DEFOGGER SYSTEM

WINDOW DEFOGGER SYSTEM

Symptom	Suspected area	Information
with Deicer: Front window deicer does not operate (Indicator ON)	FR DEF fuse	<u>PARTS LOCATION</u>
	HEATER fuse	<u>PARTS LOCATION</u>
	DEICER relay	<u>PARTS LOCATION</u>
	Front window deicer wire	<u>WINDOW DEFOGGER WIRE</u>
	Wire harness	-
with Deicer: Front window deicer does not operate (Indicator OFF)	FR DEF fuse	<u>PARTS LOCATION</u>
	HEATER fuse	<u>PARTS LOCATION</u>
	DEICER relay	<u>PARTS LOCATION</u>
	Front window deicer wire	<u>WINDOW DEFOGGER WIRE</u>
	Multi-display assembly	<u>CENTER CLUSTER INTEGRATION SWITCH</u>
	Wire harness	-
Rear window defogger does not operate (Indicator ON)	RR DEF M-fuse	<u>PARTS LOCATION</u>
	HEATER fuse	<u>PARTS LOCATION</u>
	RR-DEF relay	<u>PARTS LOCATION</u>
	Rear window defogger wire	<u>WINDOW DEFOGGER WIRE</u>
	Wire harness	-
	RR DEF M-fuse	<u>PARTS LOCATION</u>
	HEATER fuse	<u>PARTS LOCATION</u>

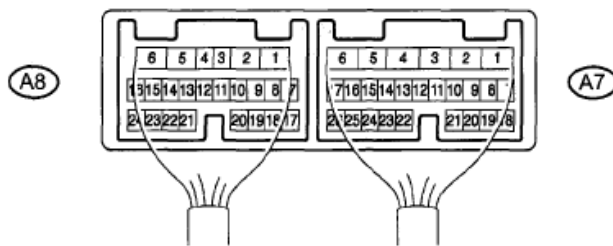
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Rear window defogger does not operate (Indicator OFF)	RR-DEF relay	<u>PARTS LOCATION</u>
	Multi-display assembly	<u>CENTER CLUSTER INTEGRATION SWITCH</u>
	Rear window defogger wire	<u>WINDOW DEFOGGER WIRE</u>
	Wire harness	-

TERMINALS OF ECU

1. CHECK AIR CONDITIONING AMPLIFIER ASSEMBLY



c

1036314E03

Fig. 80: Identifying Air Conditioning Amplifier Assembly ECU Connector Terminals
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- a. Measure the voltage and resistance of each terminal of the connectors.

CONNECTOR TERMINAL VOLTAGE SPECIFICATION

Symbols (Terminal No)	Wire Color	Terminal Description	Condition	Specified Condition
A8-8 (FDEF) - A8-6 (GND)	B - W-B	Front Deicer Signal	Engine switch on (IG) Front deicer switch ON	Below 1 V
A8-8 (FDEF) - A8-6 (GND)	B - W-B	Front Deicer Signal	Engine switch on (IG) Front deicer switch OFF	10 to 14 V
A8-19 (DFG) - A8-6 (GND)	G - W-B	Rear Defogger Signal	Engine switch on (IG) Rear defogger switch OFF	10 to 14 V
A8-19 (DFG) - A8-6 (GND)	G - W-B	Rear Defogger Signal	Engine switch on (IG) Rear defogger switch ON	Below 1 V
A8-6 (GND) - Body ground	W-B - Body ground	Ground	Always	Below 1 ohms

DIAGNOSIS SYSTEM

1. DESCRIPTION

- a. The defogger system data can be read from the Data Link Connector 3 (DLC3) of the vehicle. When the system seems to be malfunctioning, use the intelligent tester to check for malfunctions and perform repairs.

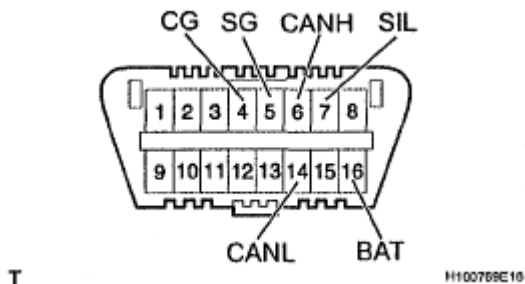


Fig. 81: Identifying DLC3 Connector Terminals
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. CHECK DLC3

- a. The ECU uses ISO 15765-4 communication. The terminal arrangement of the DLC3 complies with SAE J 1962 and matches the ISO 15765-4 format.

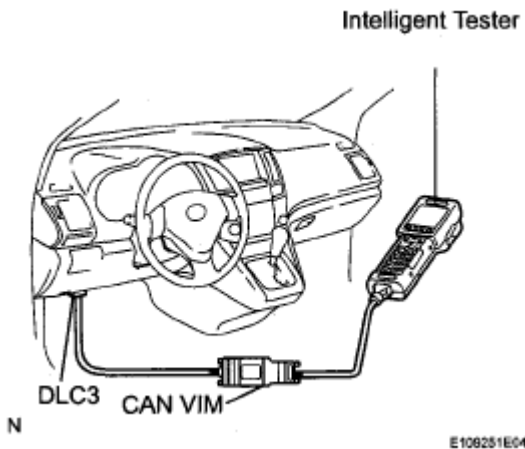


Fig. 82: Connecting Cable Of Intelligent Tester To DLC3
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

CONNECTOR TERMINAL RESISTANCE SPECIFICATION

Symbols (Terminal No.)	Terminal Description	Condition	Specified Condition
SIL (7) - SG (5)	Bus "+" line	During transmission	Pulse generation
CG (4) - Body ground	Chassis ground	Always	Below 1 ohms
SG (5) - Body ground	Signal ground	Always	Below 1 ohms

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BAT (16) - Body ground	Battery positive	Always	10 to 14 V
CANH (6) - CANL (14)	CAN bus line	Ignition Switch OFF ⁽¹⁾	54 to 69 ohms
CANH (6) - CG (4)	HIGH-level CAN bus line	Ignition Switch OFF ⁽¹⁾	200 ohms or more
CANL (14) - CG (4)	LOW-level CAN bus line	Ignition Switch OFF ⁽¹⁾	200 ohms or more
CANH (6) - BAT (16)	HIGH-level CAN bus line	Ignition Switch OFF ⁽¹⁾	6 kohms or more
CANL (14) - BAT (16)	LOW-level CAN bus line	Ignition Switch OFF ⁽¹⁾	6 kohms or more

NOTE:

(1) Before measuring the resistance, leave the vehicle as is for at least 1 minute and do not operate the ignition switch, any other switches or the door.

If the result is not as specified, the DLC3 may have a malfunction. Repair or replace the harness and connector.

HINT:

Connect the cable of the intelligent tester to the DLC3, turn the ignition switch on (IG) and attempt to use the tester. If the display indicates that a communication error has occurred, there is a problem either with the vehicle or with the tester.

- If communication is normal when the tester is connected to another vehicle, inspect the DLC3 of the original vehicle.
- If communication is still not possible when the tester is connected to another vehicle, the problem may be in the tester itself. Consult the Service Department listed in the tester's instruction information.

DATA LIST/ACTIVE TEST

1. PERFORM ACTIVE TEST

HINT:

Performing the intelligent tester's ACTIVE TEST allows relay, VSV, actuator and other items to be operated without removing any parts. Performing the ACTIVE TEST early in troubleshooting is one way to save time.

The DATA LIST can be displayed during the ACTIVE TEST.

- a. Connect the intelligent tester (with CAN VIM) to the DLC3.
- b. Turn the ignition switch on.
- c. Perform the ACTIVE TEST according to the display on the tester.

AIR CONDITIONER:

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ACTIVE TEST - AIR CONDITIONER

Item	Test Details	Diagnostic Note
DEFOGGER RLY-R	Operate rear window defogger OFF/ON	-

ON-VEHICLE INSPECTION

1. CHECK REAR WINDOW DEFOGGER SYSTEM OPERATION

- a. When the ignition switch is on and the defogger switch is pressed, check that the rear window defogger operates.

HINT:

After 15 minutes, check that the defogger automatically turns OFF.

REAR WINDOW DEFOGGER SYSTEM DOES NOT OPERATE

DESCRIPTION

- The rear defogger & mirror heater switch on the multi-display inputs a request signal to the A/C amplifier (ECU). Then, the A/C amplifier turns ON the RR-DEF relay built into the power distributor in response to the input, thus switching ON the rear defogger. (The deicer and mirror heater also turn ON at the same time.)

HINT:

The power distributor is built into the J/B No. 2.

- The RR-DEF relay is built into the J/B No. 2. For inspection, use the terminals in the J/B No. 2.
- If RR-DEF relay is malfunctioning, replace the J/B No. 2.

WIRING DIAGRAM

Rear Window Defogger:

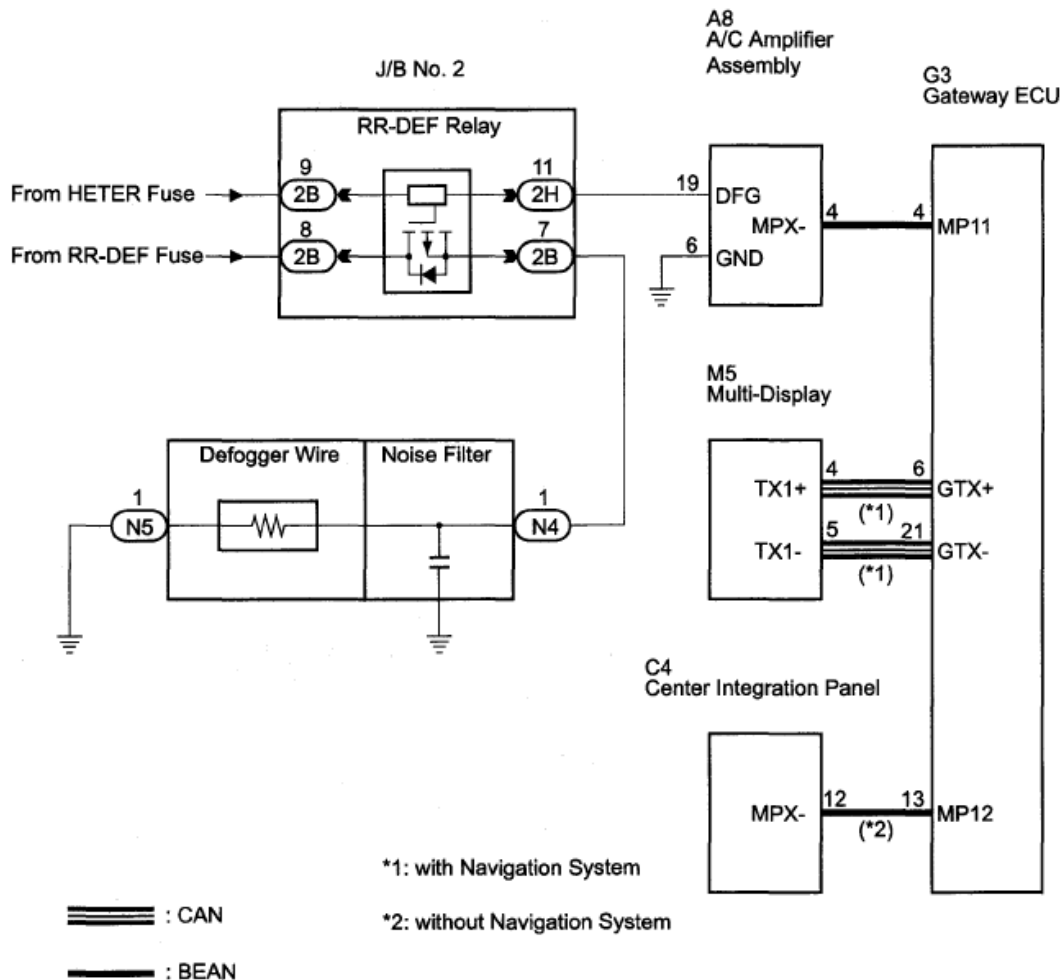


Fig. 83: Identifying Rear Window Defogger System Wiring Diagram

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

INSPECTION PROCEDURE

1. INSPECT COMMUNICATION LINE

- a. Use the intelligent tester to check for normal function of the multiplex communication system.
 1. (ECU unconnected, communication line malfunctioning) When DTC B1214, B1215 or B1262 does not output, proceed to A.
 2. (ECU unconnected, communication line malfunctioning) When DTC B1214, B1215 or B1262 outputs, proceed to B.

B: GO TO MULTIPLEX COMMUNICATION SYSTEM

A: Go to next step.

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2. INSPECT FUSE (HEATER, RR-DEF)

- a. Remove the HEATER fuse from the instrument panel J/B.
- b. Remove the RR-DEF fuse from the FL block.
- c. Check the resistance.

Standard resistance: Below 1 ohms

NG: REPLACE FUSE

OK: Go to next step.

3. PERFORM INTELLIGENT TESTER (ACTIVE TEST)

- a. Connect the intelligent tester (with CAN VIN) to the DLC3.
- b. Turn the ignition switch on.
- c. Perform the ACTIVE TEST according to the display on the tester.

AIR CONDITIONER:

ACTIVE TEST - AIR CONDITIONER

Item	Test Details	Diagnostic Note
DEFOGGER RLY-R	Operate rear window defogger OFF/ON	-

NG: Go to step 5

OK: Go to next step.

4. CHECK OPERATION (AIR CONDITIONING SYSTEM)

NG: GO TO AIR CONDITIONING SYSTEM

OK: REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY

5. INSPECT JUNCTION BLOCK (BATTERY POSITIVE AND BODY GROUND)

- a. Check the voltage of the terminal of the J/B.

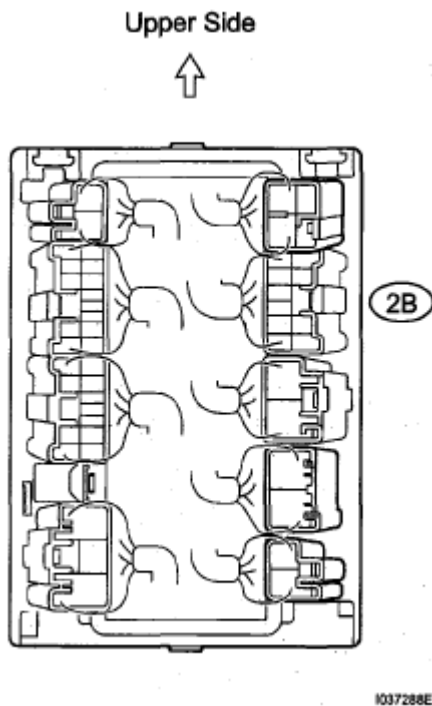


Fig. 84: Identifying Junction Block Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard voltage

STANDARD VOLTAGE SPECIFICATION

Tester Connection	Switch Position	Specified Condition
2B-9 - Body Ground	Ignition switch ON	10 to 14 V
2B-9 - Body Ground	Ignition switch OFF	Below 1 V
2B-8 - Body Ground	Always	10 to 14 V

NG: REPAIR OR REPLACE FUSE, HARNESS AND CONNECTOR (HEATER, RR DEF FUSE)

OK: Go to next step.

6. INSPECT JUNCTION BLOCK (RR-DEF RELAY)

- a. Remove the junction block No. 2.
- b. Connect the battery positive (+) lead to terminal 2B-8 and battery negative (-) terminal lead to terminal 2B-9, 2B-7 and 2H-11.
- c. Check the voltage of the RR-DEF relay terminals.

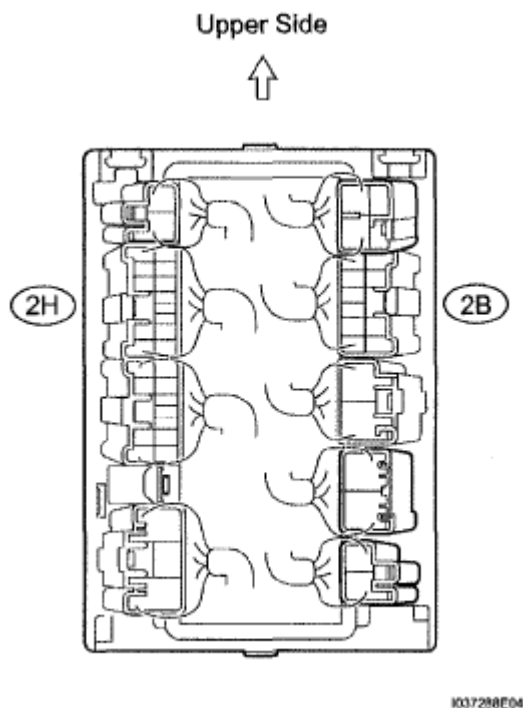


Fig. 85: Identifying Junction Block
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard voltage

STANDARD VOLTAGE SPECIFICATION

Tester Connection	Condition	Specified Condition
2B-7 - 2B-8	Always	Below 1 V

- d. Connect another battery positive (+) lead to the terminal 2B-9.
- e. Check the voltage of the RR-DEF relay terminals.

Standard voltage

STANDARD VOLTAGE SPECIFICATION

Tester Connection	Condition	Specified Condition
2B-7 - 2B-8	Always	10 to 14 V

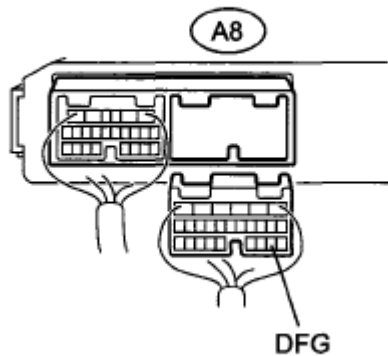
NG: REPLACE JUNCTION BLOCK

OK: Go to next step.

7. INSPECT AIR CONDITIONING AMPLIFIER ASSEMBLY

- a. Disconnect the A8 connector.

Air Conditioning Amplifier Connector
Wire Harness View:



H

E100218E26

Fig. 86: Identifying A8 Connector

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

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

Standard voltage

STANDARD VOLTAGE SPECIFICATION TABLE

Tester connection	Condition	Specified condition
A8-19 (RDFG) - Body ground	Ignition switch: ON	10 to 14 V
A8-19 (RDFG) - Body ground	Ignition switch: OFF	Below 1 V

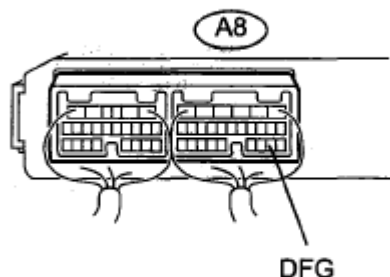
NG: REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: Go to next step.

8. INSPECT AIR CONDITIONING AMPLIFIER ASSEMBLY

- a. Connect the A8 connector.

Air Conditionig Amplifier Connector
Wire Harness View:



H

E109266E31

Fig. 87: Identifying A8 Connector

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

- b. Connect the intelligent tester to the DLC3.
- c. Measure the voltage according to the value(s) in the table below.

Standard voltage

STANDARD VOLTAGE SPECIFICATION TABLE

Tester connection	Intelligent tester condition	Specified condition
A8-19 (RDFG) - Body ground	ACTIVE TEST: ON (*1)	10 to 14 V
A8-19 (RDFG) - Body ground	ACTIVE TEST: OFF (*1)	Below 1 V
HINT:		
*1: Perform the ACTIVE TEST according to the display on the tester.		

AIR CONDITIONER:

AIR CONDITIONER

Item	Test Details	Diagnostic Note
DEFOGGER RLY-R	Operate rear window defogger OFF/ON	-

NG: REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY

OK: Go to next step.

9. INSPECT REAR WINDOW DEFOGGER WIRE

NOTE:

- When cleaning the glass, wipe the glass along the wire using a soft and dry cloth. Take care not to damage the wires.
- Do not use detergents or glass cleaners that have abrasive

ingredients.

- When measuring voltage, wrap a piece of tin foil around the tip of the negative tester probe and press the foil against the wire with your finger.

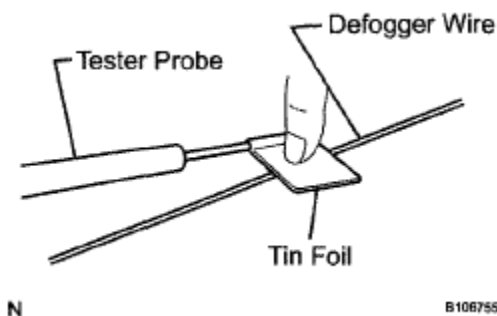


Fig. 88: Wrapping Piece Of Tin Foil Around Tip Of Negative Tester Probe

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

- Turn the ignition switch on.

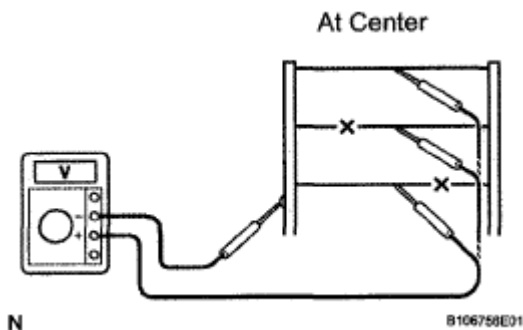


Fig. 89: Measuring Voltage At Center Of Each Defogger Wire

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

- Turn the defogger switch ON.
- Check the voltage at the center of each defogger wire.

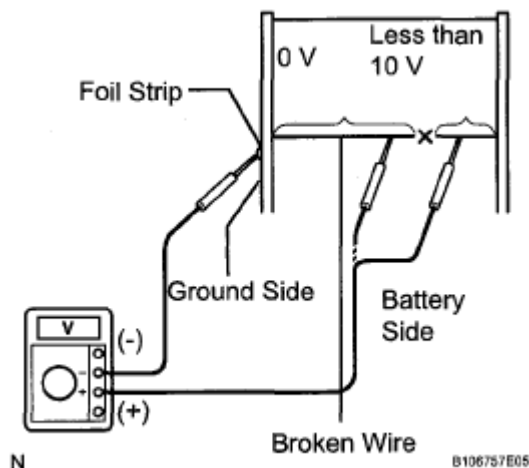


Fig. 90: Checking Voltage At Center Of Each Defogger Wire
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard voltage

STANDARD VOLTAGE SPECIFICATION

Voltage	Criteria
Approx. 5 V	Wire is not broken
Approx. 10 or 0 V	Wire is broken

HINT:

If there is approximately 10 V, the wire may be broken between the center of the wire and the wire end on the battery side. If there is no voltage, the wire may be broken between the center of the wire and the end on the ground side.

- d. Place the voltmeter positive (+) lead against the defogger wire on the battery side.
- e. Place the voltmeter negative (-) lead with the foil strip against the wire on the ground side.
- f. Slide the positive (+) lead from the battery side to the ground side.
- g. The point where the voltage drops from approximately 10 V to 0 V is where the defogger wire is broken.

HINT:

If the defogger wire is not broken, the voltmeter indicates 0 V at the positive (+) end of the defogger wire but gradually increases to approximately 12 V as the meter probe moves to the other end.

NG: REPAIR REAR WINDOW DEFOGGER WIRE

OK: Go to next step.

10. **CHECK WIRE HARNESS (REAR WINDOW DEFOGGER - JUNCTION BLOCK NO. 2)**
 - a. Disconnect the N4, N5 defogger and 2B J/B connectors.
 - b. Check the resistance of the wire harness side connectors.

Standard resistance

STANDARD VOLTAGE SPECIFICATION

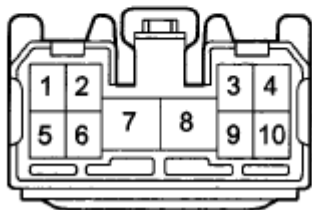
Tester Connection	Specified Condition
N4-1 - 2B-7	Below 1 ohms
N4-1 - Body ground	10 kohms or higher
N5-1 - Body ground	Below 1 ohms

Wire Harness Side

N4, N5
Rear Window Defogger



2B
J/B No. 2



806889E03

Fig. 91: Checking Wire Harness (Rear Window Defogger - Junction Block No. 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NG: REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: REPLACE NOISE FILTER

WINDOW DEFOGGER WIRE

ON-VEHICLE INSPECTION

1. **INSPECT BACK WINDOW (DEFOGGER WIRE)**

NOTE:

- When cleaning the glass, wipe the glass along the wire using a soft and dry cloth. Take care not to damage the wires.
- Do not use detergents or glass cleaners that have abrasive ingredients.
- When measuring voltage, wrap a piece of tin foil around the tip of the negative tester probe and press the foil against the wire with your finger.

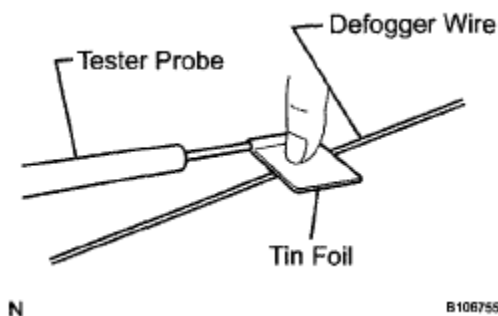


Fig. 92: Measuring Voltage By Wrapping Piece Of Tin Foil Around Tip Of Negative Tester Probe
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- Turn the ignition switch on.

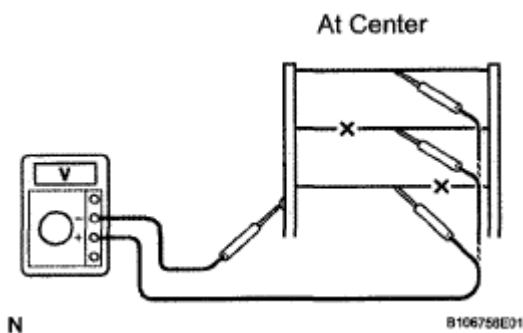


Fig. 93: Measuring Voltage At Center Of Each Defogger Wire
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- Turn the defogger switch ON.
- Check the voltage at the center of each defogger wire.

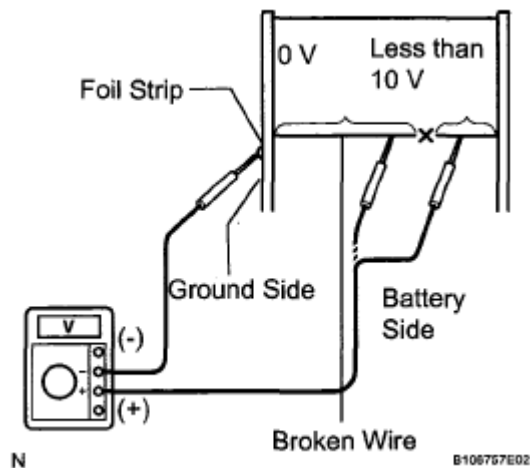


Fig. 94: Checking Voltage Center Of Each Defogger Wire
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard voltage

STANDARD VOLTAGE SPECIFICATION TABLE

Voltage	Criteria
Approx. 5 V	Wire is not broken
Approx. 10 or 0 V	Wire is broken

HINT:

If there is approximately 10V, the wire may be faulty between the center of the wire and the wire and on the battery side. If there is no voltage, the wire may be faulty between the center of the wire and the wire end on the ground side.

- d. Place the voltmeter's positive (+) lead against the defogger wire on the battery side.
- e. Place the voltmeter's negative (-) lead with the foil strip against the wire on the ground side.
- f. Slide the positive (+) lead from the battery side to the ground side.
- g. The point where the voltage drops from approximately 10 V to 0 V is the place where the defogger wire is broken.

HINT:

If the defogger wire is not broken, the voltmeter should indicate 0 V at the positive (+) end of the defogger wire but gradually increases to approximately 12 V as the meter probe moves to the other end.

2. INSPECT FRONT WINDOW (DEICER WIRE)

- a. Check the resistance of the deicer wire.

Standard resistance**STANDARD RESISTANCE SPECIFICATION**

Tester Connection	Condition	Specified Condition
1 - 2	Always	Below 1 ohms
3 - 2	Always	Below 1 ohms



Y

B069720E01

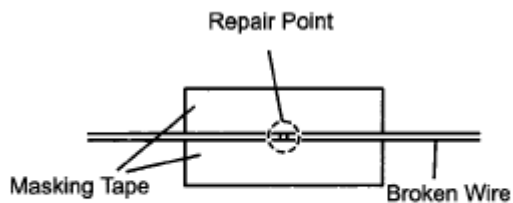
Fig. 95: Identifying Front Window Connector Terminals
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

If the result is not as specified, replace the front window.

REPAIR**1. IF NECESSARY, REPAIR THE DEFOGGER WIRE**

- a. Clean the broken wire tips with grease, wax and silicone remover.



N

B106758E04

Fig. 96: Cleaning Broken Wire Tips With Grease
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Place the masking tape along both sides of the wire.
- c. Thoroughly mix the repair agent (DuPont paste No. 4817 or equivalent).
- d. Using a fine tip brush, apply a small amount of the agent to the wire.

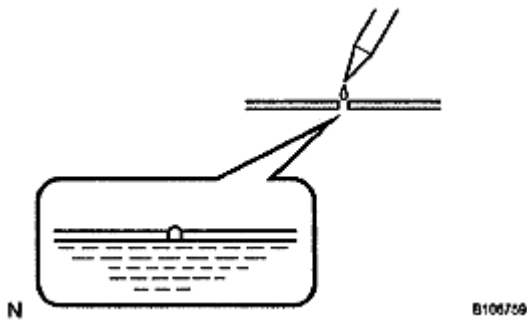


Fig. 97: Applying Amount Of Agent To Wire
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. After a few minutes, remove the masking tape.

NOTE: Do not repair the defogger wire again for at least 24 hours.