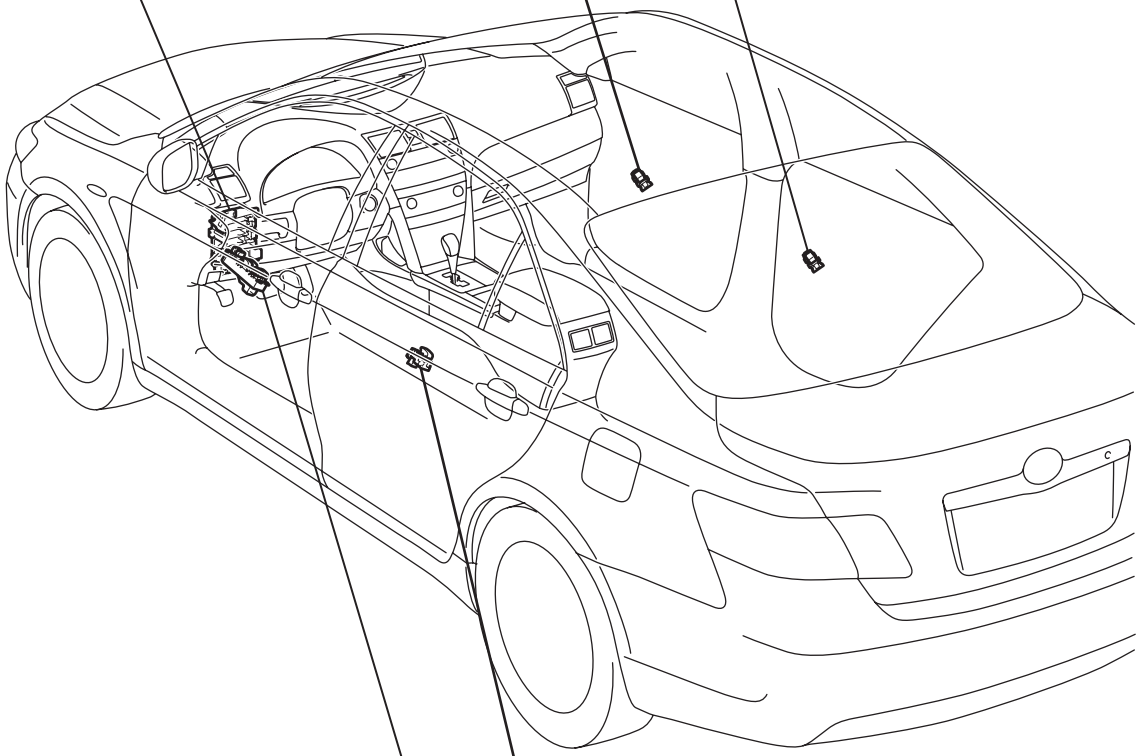
POWER WINDOW CONTROL SYSTEM

PARTS LOCATION



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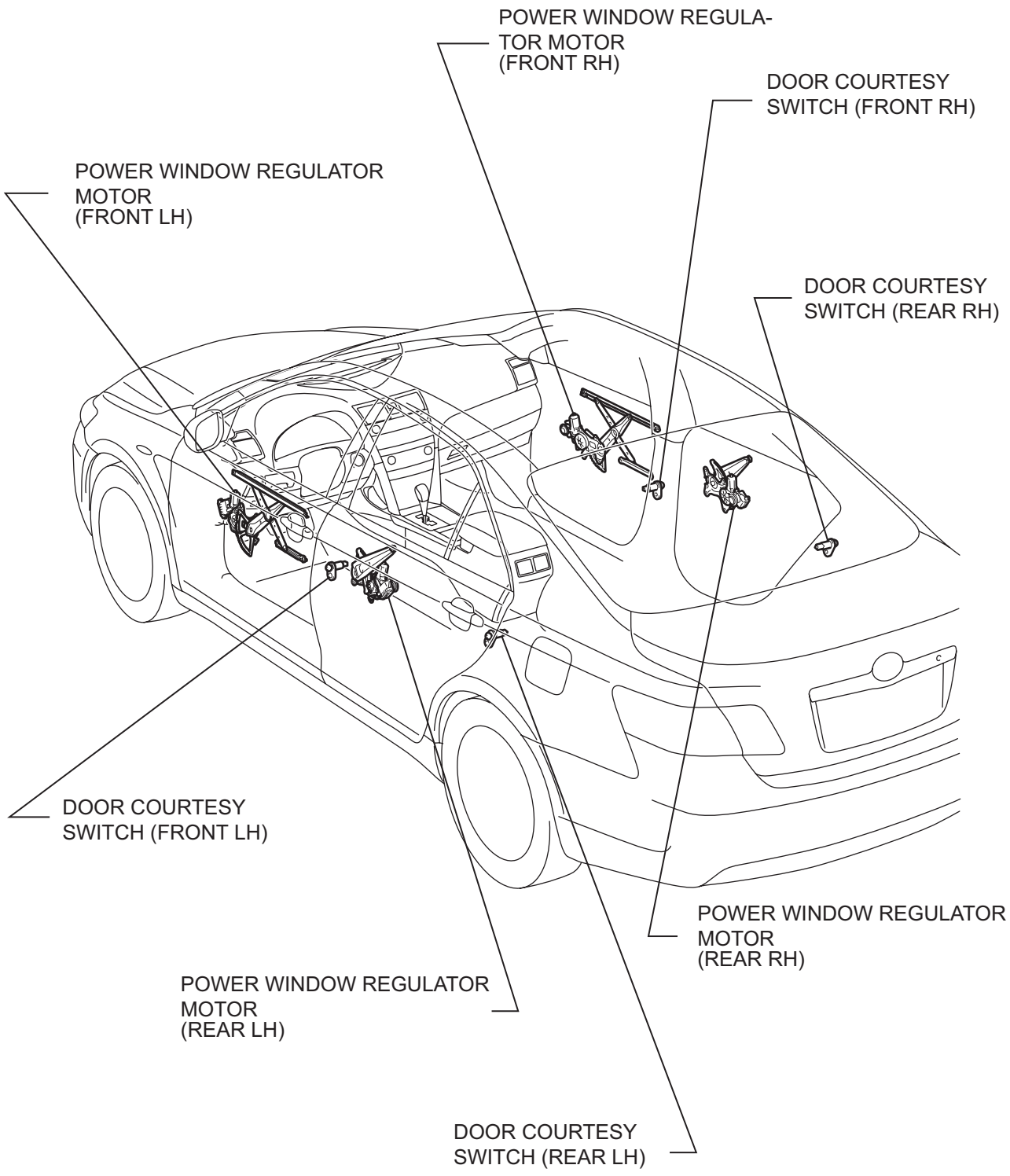
POWER WINDOW REGULA-
TOR MOTOR
(FRONT RH)
DOOR COURTESY
SWITCH (FRONT RH)
POWER WINDOW REGULATOR
MOTOR
(FRONT LH)
DOOR COURTESY
SWITCH (REAR RH)
DOOR COURTESY
SWITCH (FRONT LH)
POWER WINDOW REGULATOR
MOTOR
(REAR RH)
POWER WINDOW REGULATOR
MOTOR
(REAR LH)
DOOR COURTESY
SWITCH (REAR LH)
H
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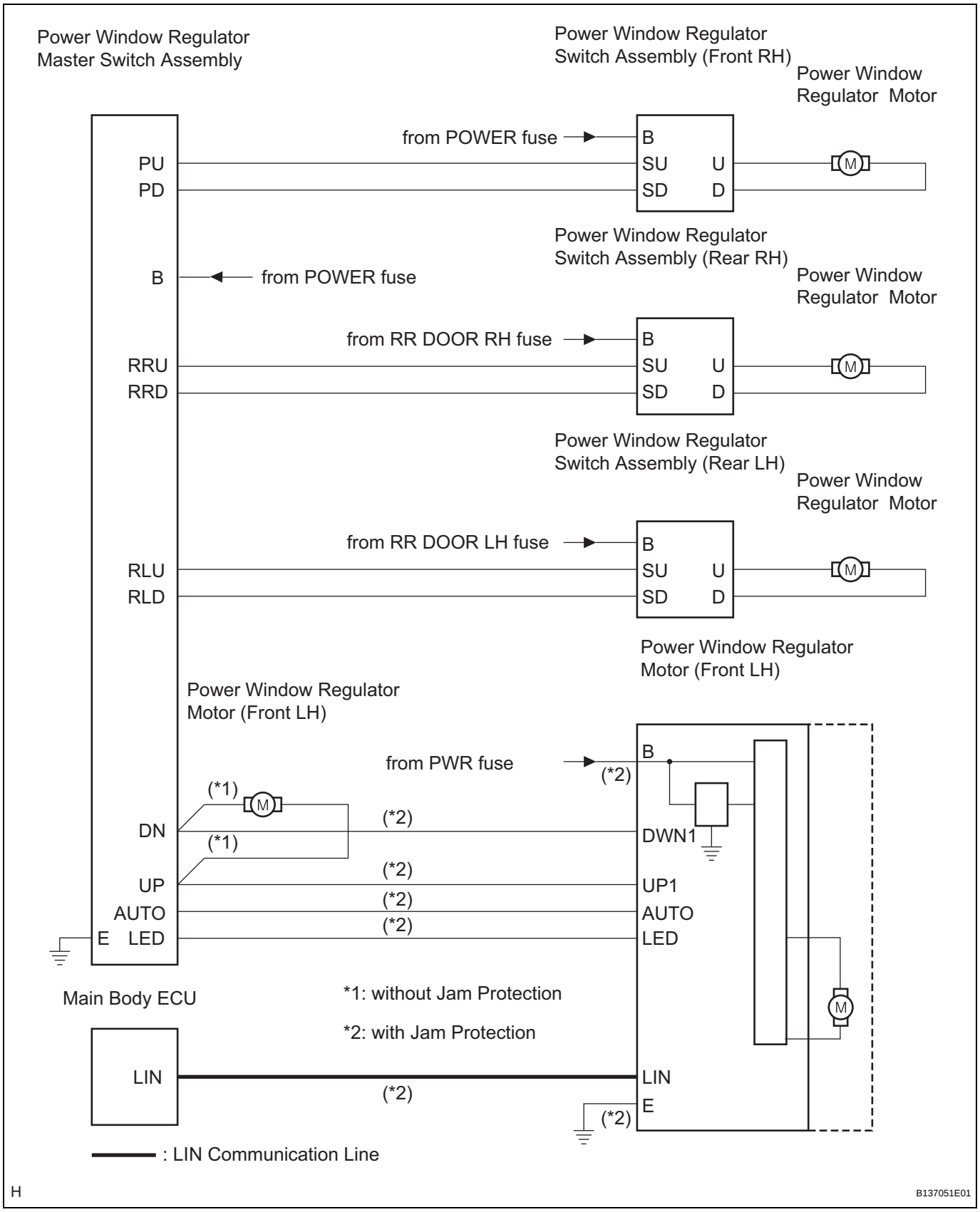
SYSTEM DIAGRAM



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SYSTEM DESCRIPTION

1. POWER WINDOW CONTROL SYSTEM DESCRIPTION

(a) The power window control system controls the power window operation using the power window regulator motors. The main controls of this system are the power window regulator master switch, which is mounted on the driver side door, and the power window regulator switches, which are mounted on the passenger side door and rear doors. Operating a window switch results in electrical power being transmitted to the corresponding power window regulator motor.

(b) The power window control system has the following functions:

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.
Driver's door auto up-and-down function *	Function that enables windows of driver's 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 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 on (ACC) or off, 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.
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: Driver's door auto up-and-down function and remote control function are disabled.

*: with Jam Protection

HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

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

1 VEHICLE BROUGHT TO WORKSHOP

NEXT

2 CUSTOMER PROBLEM ANALYSIS CHECK AND SYMPTOM CHECK

NEXT

3 CHECK COMMUNICATION FUNCTION OF LIN COMMUNICATION SYSTEM

(a) Use the intelligent tester, inspect the LIN communication function to ensure there are no malfunctions in the communication system.

Result

Result	Proceed to
No DTCs output	A
DTCs output	B

B → GO TO DIAGNOSIS TROUBLE CODE CHART

A

4 PROBLEM SYMPTOMS TABLE

HINT:

See page WS-9.

NEXT

5 OVERALL ANALYSIS AND TROUBLESHOOTING

(a) Data list/Active test

HINT:

See page WS-17.

(b) Circuit inspection

(c) Terminal of ECU

HINT:

See page WS-9.

NEXT

6	ADJUST, REPAIR OR REPLACE

NEXT

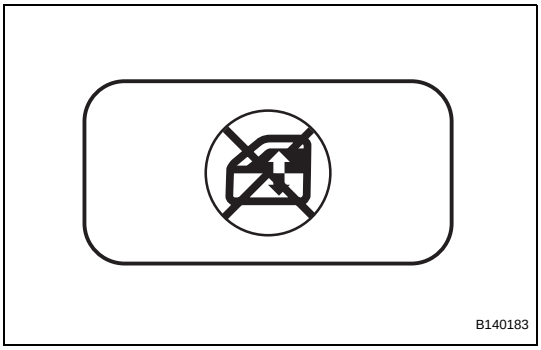
WS

7	RESET POWER WINDOW MOTOR

HINT:
See page WS-8.

NEXT

END



OPERATION CHECK

1. CHECK WINDOW LOCK SWITCH

(a) Check that the front passenger side power window and rear power windows operation are disabled when the window lock switch of the power window master switch is pressed.

Standard:

Front passenger side power window and rear power windows operation are disabled.

(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

Condition	Master Switch	Switch Operation	Power Window
Ignition switch on (IG)	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

Condition	Switch	Switch Operation	Power Window
• Ignition switch on (IG) • Window lock switch OFF	Passenger side	Pulled up	UP (Closed)
		Pushed down	DOWN (Open)
	Rear LH	Pulled up	UP (Closed)
		Pushed down	DOWN (Open)
	Rear RH	Pulled up	UP (Closed)
		Pushed down	DOWN (Open)

3. CHECK AUTO UP/DOWN FUNCTION

(a) Check that the driver side power window operates as follows:

Standard

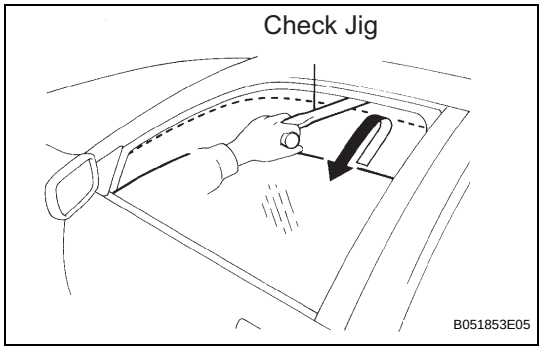
Condition	Master Switch	Switch Operation	Power Window
Ignition switch on (IG)	Driver side	Pulled up fully	UP (Closed)
		Pushed down fully	DOWN (Open)

4. CHECK REMOTE MANUAL UP/DOWN FUNCTION

(a) Check that the power windows except the driver side power window operate as follows:

Standard

Condition	Master Switch	Switch Operation	Power Window
• Ignition switch on (IG) • Window lock switch OFF	Passenger side	Pulled up	UP (Closed)
		Pushed down	DOWN (Open)
	Rear LH	Pulled up	UP (Closed)
		Pushed down	DOWN (Open)
	Rear RH	Pulled up	UP (Closed)
		Pushed down	DOWN (Open)



5. CHECK JAM PROTECTION FUNCTION

NOTICE:

- **The jam protection function can activate when either the AUTO UP function or MANUAL UP function is used.**
- **Limbs, fingers or other body parts should not be used to test the jam protection function. Do not allow any body parts to get caught by the moving window or regulator.**

HINT:

The jam protection function can activate when either the AUTO UP function or MANUAL UP function are used with the ignition switch ON. The jam protection function can also activate as long as the driver's door remains closed, within 45 seconds after the ignition switch is turned off.

(a) Check the reversing distance.
  (1) Fully open the door glass.
  (2) Place a check jig measuring 4 to 10 mm (0.16 to 0.40 in.) thick near the window fully closed position.
  (3) When the door glass is closed using AUTO or MANUAL operation, check that the door glass goes down after contacting the check jig. The glass should go 200 to 240 mm (7.90 to 9.44 in.) away from the position where it contacted the check jig.
  (4) While the door glass is going down, verify that the window switch can not be used to make the glass go up.

(b) Check the reversing distance.
  (1) Fully open the door glass.

(2) Place a check jig measuring 200 to 250 mm (7.90 to 9.84 in.) thick near the window fully closed position.
(3) When the door glass is closed using AUTO or MANUAL operation, check that the door glass goes down after contacting the check jig. The door glass should go 80 to 100 mm away from the position where it contacted the check jig.
(4) While the door glass is going down, verify that the window switch can not be used to make the glass go up.

INITIALIZATION

1. INITIALIZE POWER WINDOW REGULATOR MOTOR FRONT LH (WITH JAM PROTECTION)

NOTICE:

- **If the power window motor or power window regulator assembly is replaced, initialization is required (initialization is not necessary when the negative battery terminal is disconnected and reconnected).**
- **No other electrical systems should be operated during initialization. Initialization will be interrupted if a voltage drop occurs in the power being supplied to the power window motor.**
- **Replacing the door glass or door glass run may cause a difference to exist between the current door glass position and the position memorized in the ECU. In this case, the jam protection function may work improperly. Return the system to the pre-initialized condition and reinitialize the system.**

HINT:

- The AUTO UP function will not work unless initialization is completed.
- The indicator on the power window master switch will blink when the ignition switch is ON, until initialization has been completed. The indicator will remain on after initialization is successfully completed.

(a) Connect the negative battery terminal.

(b) Turn the ignition switch on (IG). The indicator on the power window master switch will blink.

(c) Fully close the door glass by operating the power window master switch. After the door glass stops, hold the power window master switch in the AUTO UP position for 1 second or more.

(d) Check that the indicator on the power window master switch remains on.

HINT:

If the indicator does not remain on, this means that initialization has not been completed successfully. In this case, lower the door glass at least 50 mm (1.96 in.) and hold the power window master switch in the AUTO UP position for 1 second after the window closes fully.

2. TO RETURN THE SYSTEM TO THE PRE-INITIALIZES CONDITION

Disconnect the power window regulator motor connector during power window operation. This will return the motor to the pre-initialized condition.

WS

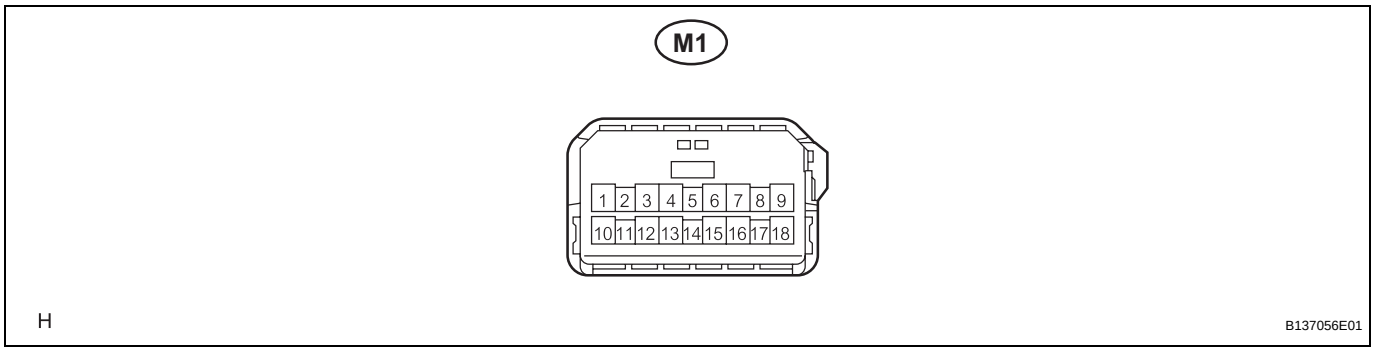
PROBLEM SYMPTOMS TABLE

POWER WINDOW CONTROL SYSTEM

Symptom	Suspected area	See page
Power window does not operate with power window regulator master switch	1. PWR, POWER, RR DOOR LH/RH fuses	-
	2. Power window master switch circuit (power source)	WS-26
	3. Power window regulator motor circuit	WS-33
	4. Power window regulator master switch	-
Front passenger side power window does not operate with power window regulator switch	1. Power window master switch circuit (power source)	-
	2. Power window regulator motor circuit (front passenger side)	WS-36
	3. Power window regulator switch (front LH side)	WS-30
Rear LH side power window does not operate with power window regulator switch	1. Power window regulator switch circuit (power source)	-
	2. Power window regulator motor circuit (rear LH side)	WS-38
	3. Power window regulator switch (rear LH side)	WS-31
Rear RH side power window does not operate with power window regulator switch	1. Power window regulator switch circuit (power source)	-
	2. Power window regulator motor circuit (rear RH side)	WS-40
	3. Power window regulator switch (rear RH side)	WS-32
AUTO UP/DOWN function does not operate on driver side (Only jam protection assistant)	1. Diagnosis check	WS-14
	2. Power window regulator motor reset	WS-8
	3. Power window regulator master switch	-
	4. Wire harness	-
Remote UP/DOWN function does not operate	1. DATA LIST/ACTIVE TEST	WS-17
	2. Power window regulator master switch	-
	3. Wire harness	-
Power window can be operated after ignition switch is turned off even if operated conditions are not met	1. Front door courtesy switch	LI-109
	2. Wire harness (LIN communication line)	-
AUTO UP operation does not fully close power window (Jam protection function is activated)	1. Power window regulator motor reset	WS-8
	2. Check & clean glass run	-
	3. Power window regulator master switch	-
AUTO DOWN function does not operate on driver side (only DOWN AUTO)	1. Power window regulator master switch	-
	2. Power window regulator motor circuit (driver side)	WS-33
	3. Wire harness	-

TERMINALS OF ECU

1. POWER WINDOW REGULATOR MASTER SWITCH ASSEMBLY



(a) Disconnect the M1 switch connector.
(b) Measure the voltage and resistance of each terminal according to the value(s) in the table below.

Standard resistance

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
E (M1-1) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω

Standard voltage

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
B (M1-6) - E (M1-1)	GR - W-B	Power supply	Ignition switch on (IG)	10 to 14 V

If the result is not as specified, there may be a malfunction in the wire harness.
(c) Reconnect the M1 switch connector and reset the power window motor.
(d) Measure the voltage according to the value(s) in the table below.

Standard voltage:
with Jam protection

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
UP (M1-8) - E (M1-1)	G - W-B	Power window motor UP output	Ignition switch on (IG), driver side power window switch OFF → UP (Manual operation)	10 to 14 V → 0 V
AUTO (M1-4) - E (M1-1)	B - W-B	Power window motor AUTO UP output	Ignition switch on (IG), driver side power window fully open → driver side power window switch UP (AUTO UP position) → driver side power window fully closed	10 to 14 V → 0 V → 10 to 14 V
		Power window motor AUTO DOWN output	Ignition switch on (IG), driver side power window fully closed → driver side power window switch DOWN (AUTO UP position) → driver side power window fully open	10 to 14 V → 0 V → 10 to 14 V

WS

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
DN (M1-5) - E (M1-1)	R - W-B	Power window motor DOWN output	Ignition switch on (IG), driver side power window switch OFF → DOWN (Manual operation)	10 to 14 V → 0 V
PU (M1-16) - E (M1-1)	W - W-B	Power window motor UP output	Ignition switch on (IG), front passenger side power window switch OFF → UP (Manual operation)	0 V → 10 to 14 V
PD (M1-15) - E (M1-1)	R - W-B	Power window motor DOWN output	Ignition switch on (IG), front passenger side power window switch OFF → DOWN (Manual operation)	0 V → 10 to 14 V
RLU (M1-12) - E (M1-1)	L - W-B	Power window motor UP output	Ignition switch on (IG), rear LH side power window switch OFF → UP (Manual operation)	0 V → 10 to 14 V
RLD (M1-13) - E (M1-1)	B - W-B	Power window motor DOWN output	Ignition switch on (IG), rear LH side power window switch OFF → UP (Manual operation)	0 V → 10 to 14 V
RRU (M1-10) - E (M1-1)	Y - W-B	Power window motor UP output	Ignition switch on (IG), rear RH side power window switch OFF → UP (Manual operation)	0 V → 10 to 14 V
RRD (M1-18) - E (M1-1)	LG - W-B	Power window motor DOWN output	Ignition switch on (IG), rear RH side power window switch OFF → UP (Manual operation)	0 V → 10 to 14 V

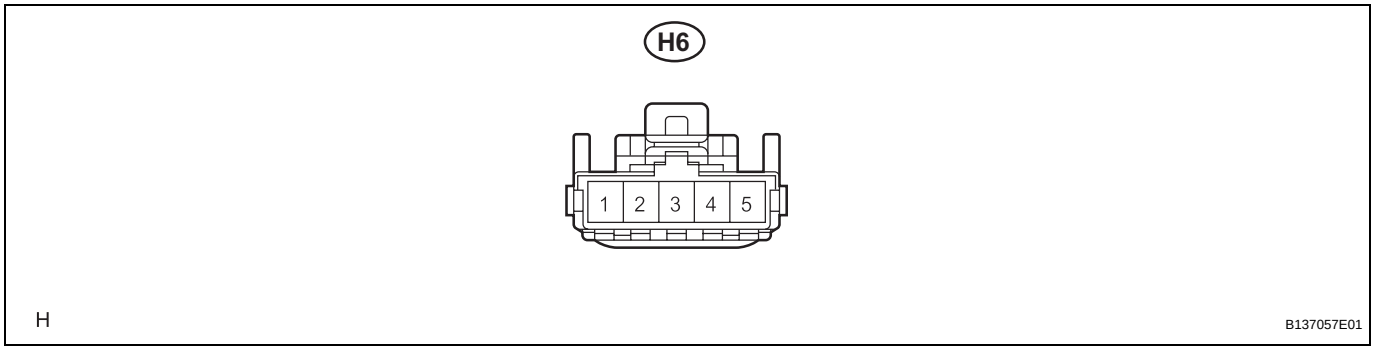
without Jam protection

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
UP (M1-3) - E (M1-1)	G - W-B	Power window motor UP output	Ignition switch on (IG), driver side power window switch OFF → UP (Manual operation)	0 V → 10 to 14 V
DN (M1-4) - E (M1-1)	G - W-B	Power window motor DOWN output	Ignition switch on (IG), driver side power window switch OFF → DOWN (Manual operation)	0 V → 10 to 14 V
		Power window motor AUTO DOWN output	Ignition switch on (IG), 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 → 10 to 14 V
PU (M1-16) - E (M1-1)	W - W-B	Power window motor UP output	Ignition switch on (IG), front passenger side power window switch OFF → UP (Manual operation)	0 V → 10 to 14 V
PD (M1-15) - E (M1-1)	R - W-B	Power window motor DOWN output	Ignition switch on (IG), front passenger side power window switch OFF → DOWN (Manual operation)	0 V → 10 to 14 V
RLU (M1-12) - E (M1-1)	L - W-B	Power window motor UP output	Ignition switch on (IG), rear LH side power window switch OFF → UP (Manual operation)	0 V → 10 to 14 V

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
RLD (M1-13) - E (M1-1)	B - W-B	Power window motor DOWN output	Ignition switch on (IG), rear LH side power window switch OFF → DOWN (Manual operation)	0 V → 10 to 14 V
RRU (M1-10) - E (M1-1)	Y - W-B	Power window motor UP output	Ignition switch on (IG), rear RH side power window switch OFF → UP (Manual operation)	0 V → 10 to 14 V
RRD (M1-18) - E (M1-1)	LG - W-B	Power window motor DOWN output	Ignition switch on (IG), rear RH side power window switch OFF → DOWN (Manual operation)	0 V → 10 to 14 V

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

2. CHECK POWER WINDOW REGULATOR SWITCH ASSEMBLY (FRONT RH)



(a) Disconnect the H6 switch connector.
(b) Measure the voltage according to the value(s) in the table below.

Standard voltage

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
B (H6-3) - Body ground	GR - Body ground	Power supply	Ignition switch on (IG)	10 to 14 V

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

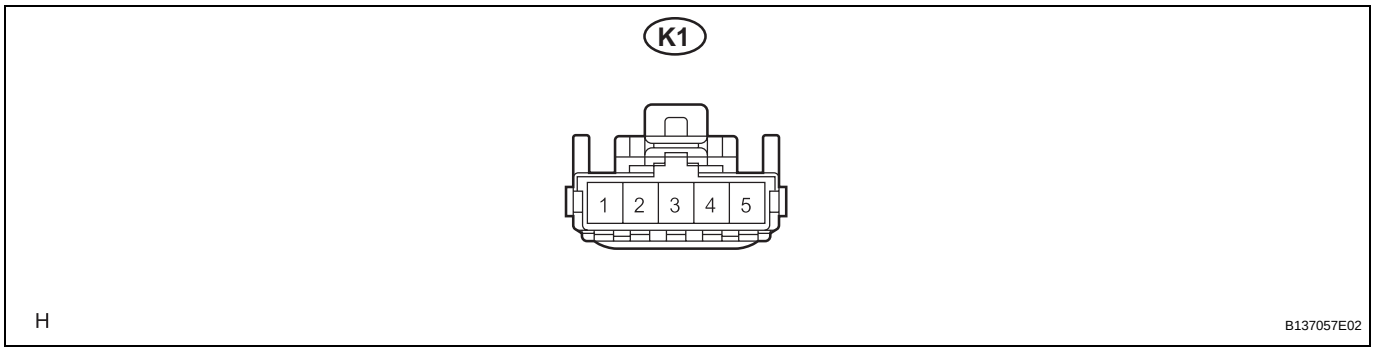
(c) Reconnect the H6 switch connector and reset the power window motor.
(d) Measure the voltage according to the value(s) in the table below.

Standard voltage

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
U (H6-4) - Body ground	G - Body ground	Power window motor UP output	Ignition switch on (IG), front passenger side power window switch OFF → UP (Manual operation)	0 V → 10 to 14 V
D (H6-1) - Body ground	Y - Body ground	Power window motor DOWN output	Ignition switch on (IG), front passenger side power window switch OFF → DOWN (Manual operation)	0 V → 10 to 14 V

If the result is not as specified, the power window regulator switch assembly may have a malfunction.

3. CHECK POWER WINDOW REGULATOR SWITCH ASSEMBLY (REAR LH)



(a) Disconnect the K1 switch connector.
(b) Measure the voltage according to the value(s) in the table below.

Standard voltage

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
B (K1-3) - Body ground	V - Body ground	Power supply	Ignition switch on (IG)	10 to 14 V

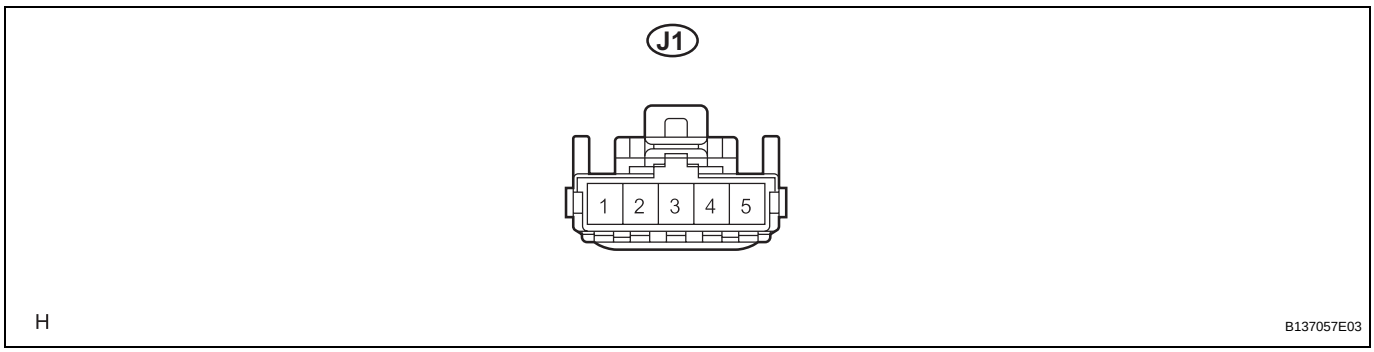
If the result is not as specified, there may be a malfunction in the wire harness.
(c) Reconnect the K1 switch connector and reset the power window motor.
(d) Measure the voltage according to the value(s) in the table below.

Standard voltage

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
U (K1-4) - Body ground	G - Body ground	Power window motor UP output	Ignition switch on (IG), front passenger side power window switch OFF → UP (Manual operation)	0 V → 10 to 14 V
D (K1-1) - Body ground	R - Body ground	Power window motor DOWN output	Ignition switch on (IG), front passenger side power window switch OFF → DOWN (Manual operation)	0 V → 10 to 14 V

If the result is not as specified, the power window regulator switch assembly may have a malfunction.

4. CHECK POWER WINDOW REGULATOR SWITCH ASSEMBLY (REAR RH)



(a) Disconnect the J1 switch connector.

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

Standard voltage

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
B (J1-3) - Body ground	G - Body ground	Power supply	Ignition switch on (IG)	10 to 14 V

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

(c) Reconnect the J1 switch connector and reset the power window motor.

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

Standard voltage

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
U (J1-4) - Body ground	V - Body ground	Power window motor UP output	Ignition switch on (IG), front passenger side power window switch OFF → UP (Manual operation)	0 V → 10 to 14 V
D (J1-1) - Body ground	R - Body ground	Power window motor DOWN output	Ignition switch on (IG), front passenger side power window switch OFF → DOWN (Manual operation)	0 V → 10 to 14 V

If the result is not as specified, the power window regulator switch assembly may have a malfunction.

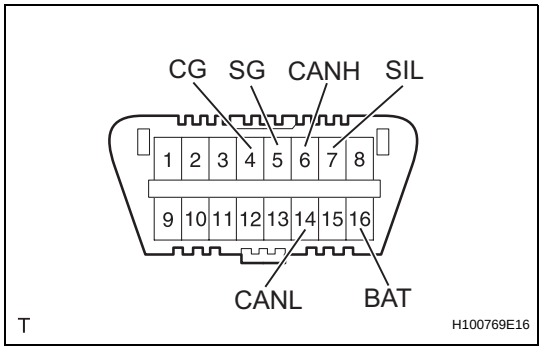
WS

DIAGNOSIS SYSTEM

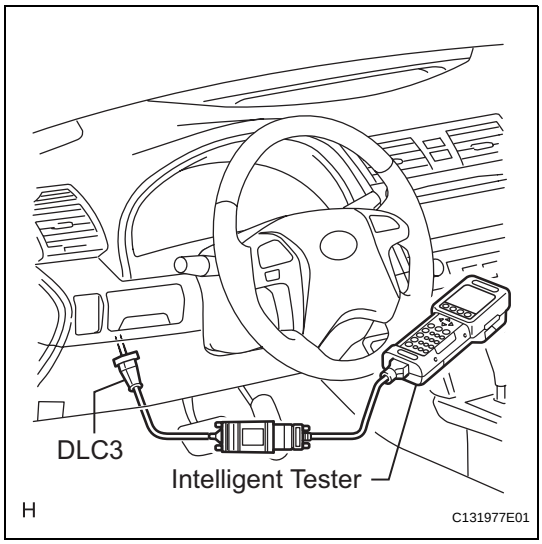
1. DESCRIPTION

(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.

2. CHECK DLC3



(a) The ECU uses ISO 15765-4 communication. The terminal arrangement of the DLC3 complies with SAE J1962 and matches the ISO 15765-4 format.



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 Ω
SG (5) - Body ground	Signal ground	Always	Below 1 Ω
BAT (16) - Body ground	Battery positive	Always	10 to 14 V
CANH (6) - CANL (14)	CAN bus line	Ignition switch OFF*	54 to 69 Ω
CANH (6) - CG (4)	HIGH-level CAN bus line	Ignition switch OFF*	200 Ω or more
CANL (14) - CG (4)	LOW-level CAN bus line	Ignition switch OFF*	200 Ω or more
CANH (6) - BAT (16)	HIGH-level CAN bus line	Ignition switch OFF*	6 kΩ or more
CANL (14) - BAT (16)	LOW-level CAN bus line	Ignition switch OFF*	6 kΩ or more

NOTICE:

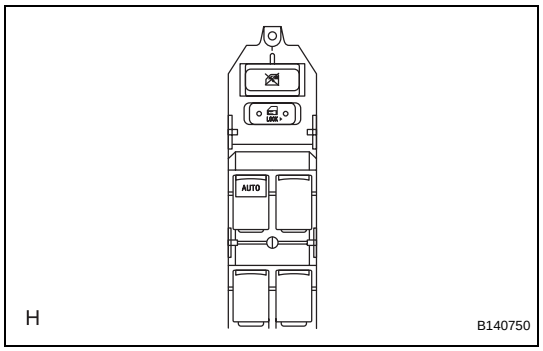
***: Before measuring the resistance, leave the vehicle as is for at least 1 minute and do not operate the ignition switch, any other switches or the door.**

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 manual.



3. CHECK DIAGNOSIS (WITH JAM PROTECTION)

HINT:

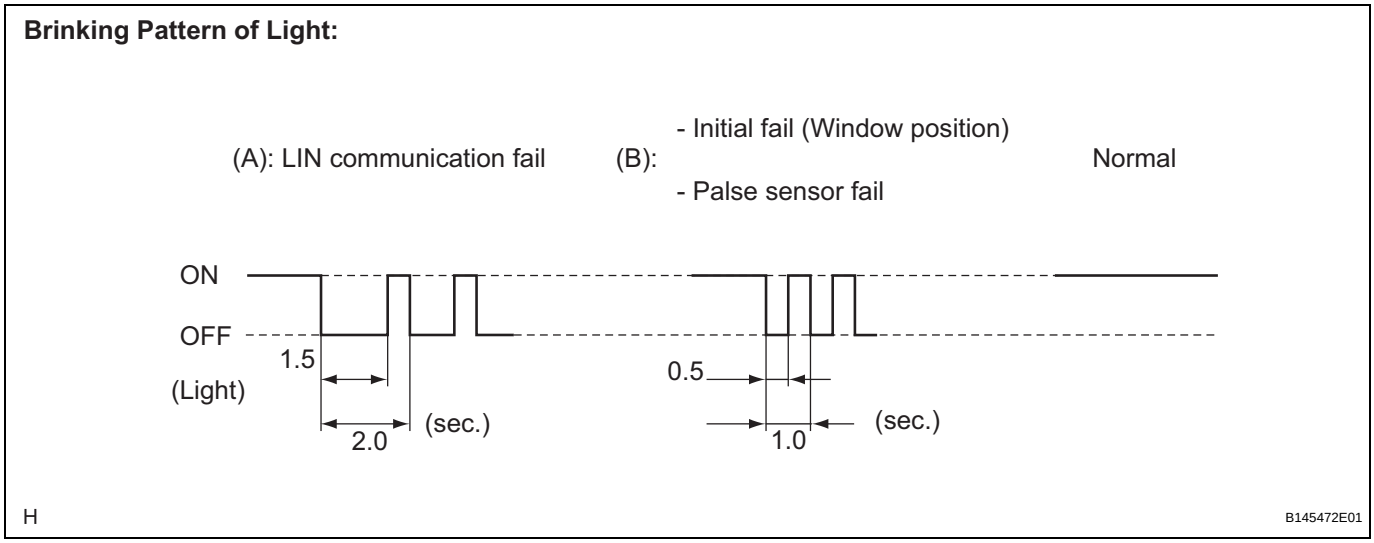
If there is a malfunction in the pulse sensor, manually operating the power window switch will cause the power window switch light to blink.

(a) Turn the ignition switch on (IG).

(b) Manually operate the power window master switch or power window switch on each door.

(c) Check the blinking pattern of the AUTO light as shown in the illustration.

Brinking Pattern of Light:



(1) If pattern (A) is displayed, check the wire harness or power window ECU.

(2) If pattern (B) is displayed, check the power window regulator motor or power window ECU.

(3) If the normal pattern is displayed, replace the power window regulator master switch.

WS

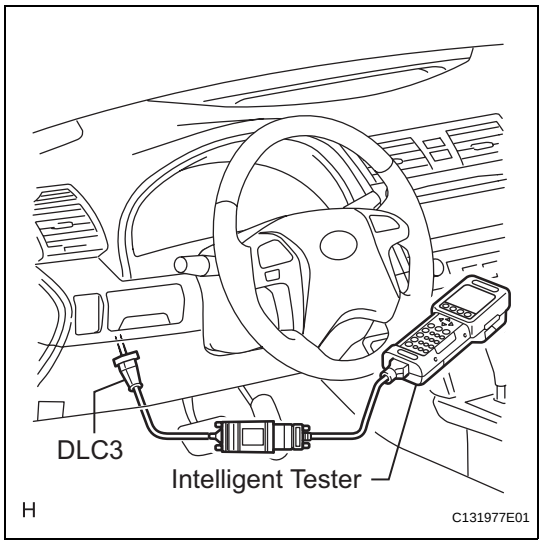
DTC CHECK / CLEAR

1. CHECK DTC

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch on (IG).
(c) Check the DTC(s).

2. CLEAR DTC

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch on (IG) .
(c) Clear the DTCs.
(d) Check that "DTCs are cleared" is displayed.
NOTICE:
If any DTCs are output, troubleshoot those DTCs again.



FAIL-SAFE CHART

1. POWER WINDOW OPERATION IN FAIL-SAFE MODE

HINT:

If the pulse sensor built into the power window regulator motor (on the driver side) malfunctions, the power window control system enters fail-safe mode.

Fail mode	Fail Detection Condition
Pulse direction error	With the door glass going up or down, the pulse that indicates door glass operation in the opposite direction is detected for 400 msec.
Pulse stop error	With the door glass going up or down, no pulse is detected for 350 to 450 msec.

(a) The power window control system prohibits the following power window operation when the pulse sensor for the jam protection function has problems and the window position or the learned value is abnormal.

Power window control system

Power window operation	Ignition switch on (IG)	Key-off (Within approx. 45 seconds after ignition switch turned off)	Key-off (After approx. 45 seconds elapsed after ignition switch turned off)
Manual UP	Operation prohibited	Operation prohibited	Operation prohibited
Manual DOWN	Operative (Jam protection not operative)	Operation prohibited	Operation prohibited
AUTO UP (hold switch at AUTO UP position)	Operative (in MANUAL mode) (Jam protection not operative)	Operation prohibited	Operation prohibited
AUTO UP	Operation prohibited	Operation prohibited	Operation prohibited
AUTO DOWN	Operation prohibited	Operation prohibited	Operation prohibited

HINT:

When the pulse sensor is normal, the AUTO UP / DOWN function can be resumed by deactivating fail-safe mode. To deactivate fail-safe mode, pull up the driver door power window switch to the AUTO UP position and hold it for at least 1 second to fully close the window from the fully open position.

(b) If the LIN communication system malfunctions (communication blackout), the power window control system prohibits the following operations.

LIN communication system

Power window operation	Ignition switch on (IG)
MANUAL UP	Operative (Jam protection operative)
MANUAL DOWN	Operative (Jam protection not operative)
AUTO UP (hold switch at AUTO UP position)	Operative (Jam protection operative)
AUTO UP	Operative (Jam protection operative)
AUTO DOWN	Operative (Jam protection not operative)

WS

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 manual for further details.

2. DATA LIST

HINT:

Using the DATA LIST displayed on the intelligent tester, the value of the switches, sensors, actuators, etc. can be read without part removal. Reading the DATA LIST as the first step in troubleshooting is one way to shorten the labor time.

(a) Connect the intelligent tester to the DLC3.

(b) Turn the ignition switch on (IG).

(c) Read the DATA LIST according to the display on the tester.

Body:

Item	Measurement Item/Display (Range)	Normal Condition	Diagnostic Note
Communication Master SW	Master switch communication signal OK/STOP	OK: Communication is normal STOP: Communication is stop	-
Ignition Switch	Ignition switch signal/ON or OFF	ON: Power source mode is (IG) OFF: Power source mode is off or on (ACC)	-
D Door Courtesy SW	Driver side door courtesy switch signal/ON or OFF	ON: Driver side door is open OFF: Driver side door is closed	-
P Door Courtesy 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 in troubleshooting is one way to shorten the labor time. It is possible to display the DATA LIST during the ACTIVE TEST.

(a) Connect the intelligent tester to the DLC3.

(b) Turn the ignition switch on (IG).

(c) Perform the ACTIVE TEST according to the display on the tester.

Body:

Item	Test Detail	Diagnostic Note
IG OFF P/W Control Permission Output	Operates power window ON/OFF (After ignition OFF)	-

DIAGNOSTIC TROUBLE CODE CHART

POWER WINDOW CONTROL SYSTEM

DTC No.	Detection Item	Trouble Area	See page
B2311	Driver Door Motor Malfunction	1. Battery disconnection when the ignition switch is on (IG) 2. Power window regulator motor (on driver side) 3. Incorrect installation of power window components 4. Overheated power window regulator motor (on driver side)	WS-19
B2312	Driver Side Door Master Switch Malfunction	1. Power window regulator motor (on driver side) 2. Power window regulator master switch 3. Wire harness 4. Power window regulator master switch is held same position for more than 20 seconds	WS-21
B2313	Glass Position Initialization Incomplete	1. Power window regulator motor (on driver side) 2. Power window regulator motor (on driver side) not initialized	WS-24

DTC	B2311	Driver Door Motor Malfunction

DESCRIPTION

The portion of the power window control system that is located in the driver door consists of a power window master switch, regulator, and a motor with an integrated ECU. The driver door power window regulator motor is controlled by the ECU when the power window master switch is operated (models with jam protection).

DTC B2311 is set when the ECU for the driver door power window regulator motor assembly malfunctions.

NOTICE:

The power window control system uses a serial communication protocol (LIN) to communicate with the main body ECU. Inspect the communication function by following HOW TO PROCEED WITH TROUBLESHOOTING. Troubleshoot the power window control system after confirming that the communication system is functioning properly.

HINT:

- Initialization is required only when the power window regulator motor is replaced. However, replacing the motor may cause the motor gear to be engaged in a different position. This can cause a difference to exist between the current door glass position and the position memorized in the ECU. In this case, the jam protection function may work improperly. Return the system to the pre-initialized condition and reinitialize the system.
- To return the system to the pre-initialized condition:
  Disconnect the power window regulator motor connector during power window operation. This will return the motor to the pre-initialized condition.

DTC No.	DTC Detection Condition	Trouble Area
B2311	When either condition below is met: • The power window regulator motor (on driver side) malfunctions • When the ECU in the power widow regulator motor (on driver side) determines that the fully closed window position has deviated approximately 20 mm (0.79 in.) or more from the normal position	• Battery disconnection when the ignition switch is on (IG) • Power window regulator motor (on driver side) • Incorrect installation of power window components • Overheated power window regulator motor (on driver side)

INSPECTION PROCEDURE

1	INITIALIZE POWER WINDOW CONTROL SYSTEM

(a) Initialize the power window regulator motor assembly (on the driver side) (see page WS-8).

(b) Check that the power window operates normally by opening and closing the window.

OK:

Driver side power window operates normally.

NG → **REPLACE POWER WINDOW REGULATOR MOTOR ASSEMBLY (for Driver Side)**

OK

2	**CHECK WHETHER PARTS HAVE BEEN INSTALLED CORRECTLY**

(a) Check that the power window components (on the driver side) are installed correctly.

OK:

Power window components (on driver side) are installed correctly.

HINT:

When the power window components are installed correctly, the problem has been caused by battery disconnection while the ignition switch is on (IG), improper installation of the power window components or the motor being overheated.

NG → **INSTALL PARTS CORRECTLY**

OK

END

DTC	B2312	Driver Side Door Master Switch Malfunction

DESCRIPTION

The portion of the power window control system that is located in the driver door consists of a power window master switch, regulator, and a motor with an integrated ECU. The driver door power window regulator motor is controlled by the ECU when the power window master switch is operated (models with jam protection).

When the ECU determines that the power window master switch is stuck, DTC B2312 is set.

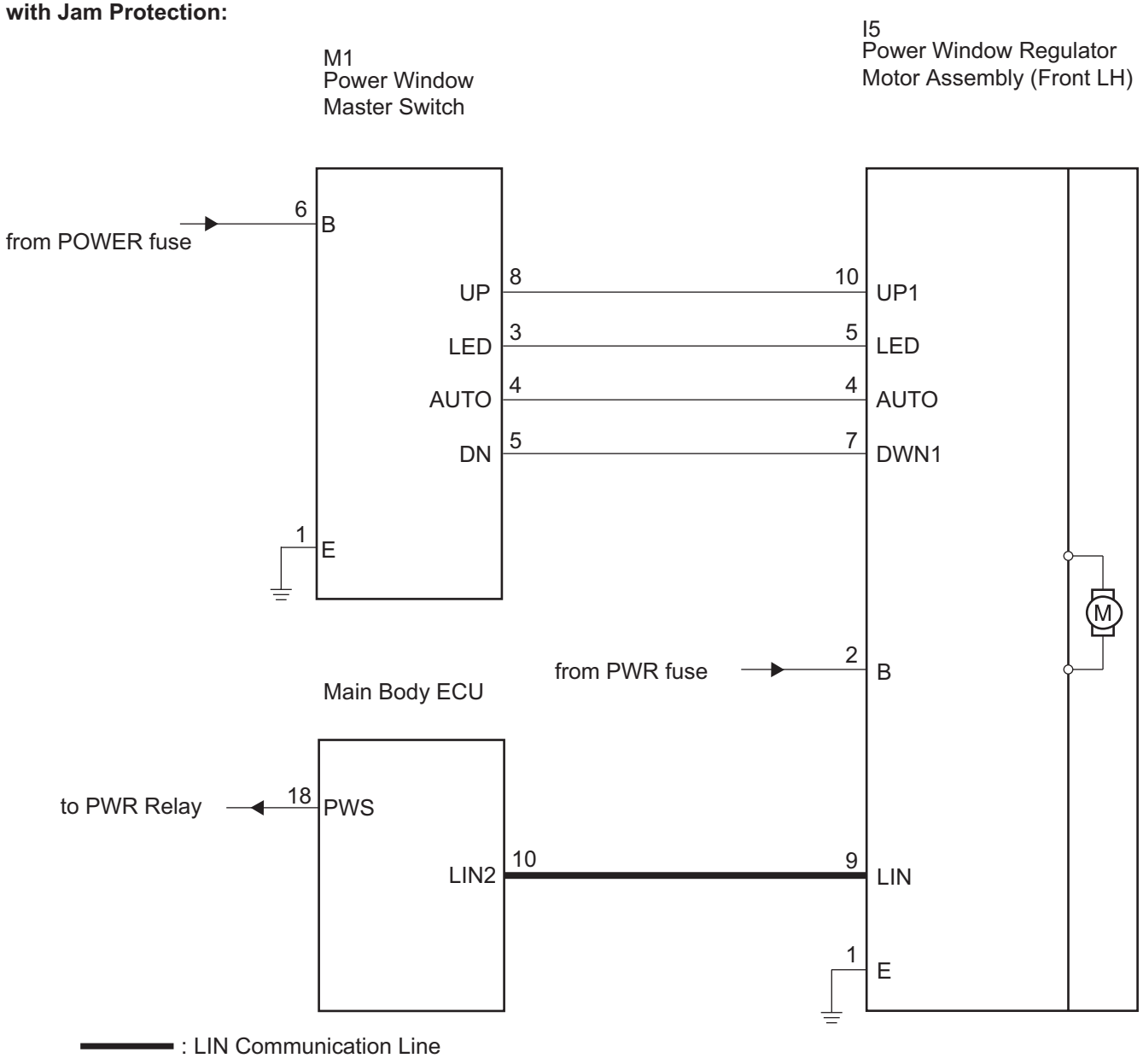
NOTICE:

The power window control system uses a serial communication protocol (LIN) to communicate with the main body ECU. Inspect the communication function by following HOW TO PROCEED WITH TROUBLESHOOTING. Troubleshoot the power window control system after confirming that the communication system is functioning properly.

DTC No.	DTC Detection Condition	Trouble Area
B2312	The power window regulator master switch is stuck	• Power window regulator motor (on driver side) • Power window regulator master switch • Wire harness • Power window regulator master switch is held in same position for more than 20 seconds

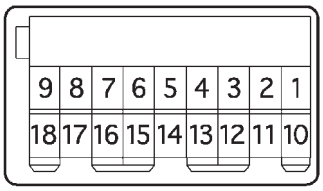
WIRING DIAGRAM

with Jam Protection:



INSPECTION PROCEDURE

1 **INSPECT POWER WINDOW REGULATOR MASTER SWITCH ASSEMBLY**



B108710

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

Standard resistance

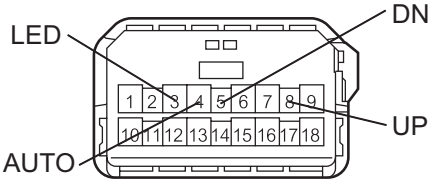
Tester Connection	Condition	Specified Condition
8 (UP) - 1 (E) - 4 (AUTO)	Auto UP	Below 1 Ω
5 (DN) - 6 (B)	Auto UP	Below 1 Ω
8 (UP) - 1 (E)	Manual UP	Below 1 Ω
5 (DN) - 6 (B)	Manual UP	Below 1 Ω
8 (UP) - 5 (DN) - 6 (B)	OFF	Below 1 Ω
5 (DN) - 1 (E)	Manual DOWN	Below 1 Ω
8 (UP) - 6 (B)	Manual DOWN	Below 1 Ω
4 (AUTO) - 5 (DN) - 1 (E)	Auto DOWN	Below 1 Ω
8 (UP) - 6 (B)	Auto DOWN	Below 1 Ω

NG → **REPLACE POWER WINDOW REGULATOR MASTER SWITCH**

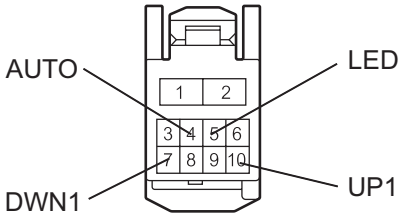
OK

2 **CHECK WIRE HARNESS (WINDOW REGULATOR MASTER SWITCH - WINDOW REGULATOR MOTOR)**

M1
Power Window Regulator Master Switch Assembly:



I5
Power Window Regulator Motor (Front LH):



B137046E02

(a) Disconnect the M1 and I5 connectors.
(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester Connection	Condition	Specified Condition
M1-8 (UP) - I5-10 (UP1)	Always	Below 1 Ω
M1-3 (LED) - I5-5 (LED)	Always	Below 1 Ω
M1-4 (AUTO) - I5-4 (AUTO)	Always	Below 1 Ω
M1-5 (DN) - I5-7 (DWN1)	Always	Below 1 Ω
M1-8 (UP) - Body ground	Always	10 kΩ or higher
M1-3 (LED) - Body ground	Always	10 kΩ or higher
M1-4 (AUTO) - Body ground	Always	10 kΩ or higher
M1-5 (DN) - Body ground	Always	10 kΩ or higher

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

REPLACE DRIVER SIDE POWER WINDOW REGULATOR MOTOR ASSEMBLY

DTC	B2313	Glass Position Initialization Incomplete

DESCRIPTION

The portion of the power window control system that is located in the driver door consists of a power window master switch, regulator, and a motor with an integrated ECU. The driver door power window regulator motor is controlled by the ECU when the power window master switch is operated (models with jam protection).

When the ECU determines that the driver's door power window regulator motor assembly has not been initialized, DTC B2313 is set.

NOTICE:

The power window control system uses a serial communication protocol (LIN) to communicate with the main body ECU. Inspect the communication function by following HOW TO PROCEED WITH TROUBLESHOOTING. Troubleshoot the power window control system after confirming that the communication system is functioning properly.

HINT:

- Replacing the door glass or door glass run may cause a difference to exist between the current door glass position and the position memorized in the ECU. In this case, the jam protection function may work improperly. Return the system to the pre-initialized condition and reinitialize the system.
- To return the system to the pre-initialized condition:
  Disconnect the power window regulator motor connector during power window operation. This will return the motor to the pre-initialized condition.

DTC No.	DTC Detection Condition	Trouble Area
B2313	• The power window regulator motor (on driver side) is not initialized • The power window regulator motor (on driver side) malfunctions	• Power window regulator motor (on driver side) • Power window regulator motor (on driver side) not initialized

INSPECTION PROCEDURE

NOTICE:

When using the intelligent tester to troubleshoot the LIN communication line: Connect the intelligent tester to the vehicle, and turn the courtesy light switch on and off at 1.5 second intervals until communication between the tester and vehicle begins.

1	CHECK DTC OUTPUT

(a) Turn the ignition switch off.
(b) Wait for at least 10 seconds, and then turn the ignition switch on (IG).
(c) Check whether the DTC output recurs.
Result

Display (DTC Output)	Proceed to
B2313	A
No output	B

B → END

A

2	SYSTEM INITIALIZE (POWER WINDOW CONTROL SYSTEM)

(a) Turn the ignition switch on (IG) and initialize the power window regulator motor (on the driver side) (see page WS-8).
(b) Turn the ignition switch off.
(c) Wait for at least 10 seconds, and then turn the ignition switch on (IG).
(d) Check whether the DTC output recurs.

Display (DTC Output)	Proceed to
No output	A
B2313	B

B → **REPLACE POWER WINDOW REGULATOR MOTOR ASSEMBLY FRONT LH**

A

END

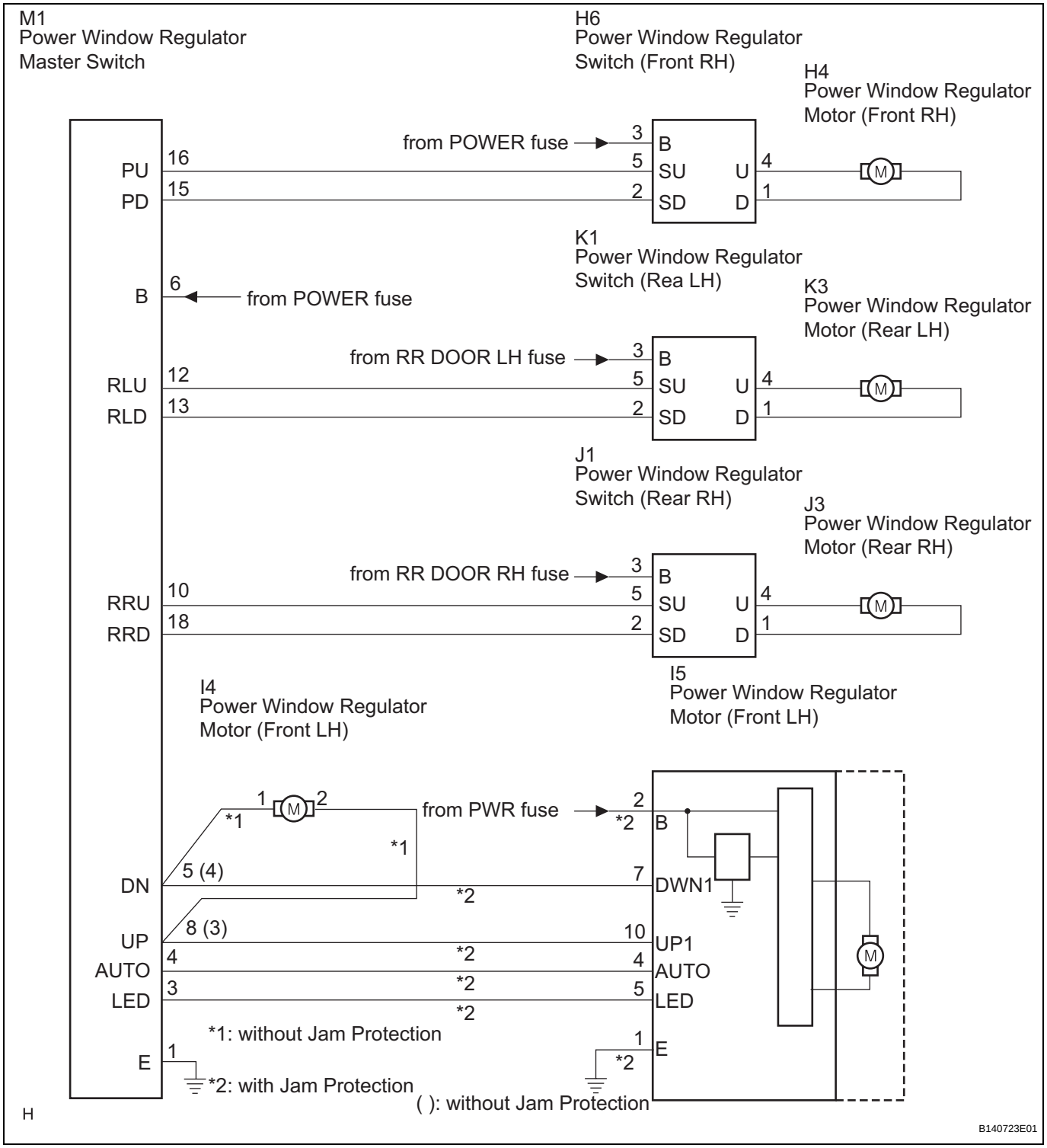
Power Window Master Switch Circuit

DESCRIPTION

This circuit transmits signal from the power window regulator master switch assembly to the power window regulator switch.

WS

WIRING DIAGRAM



INSPECTION PROCEDURE

1 CHECK DTC OUTPUT

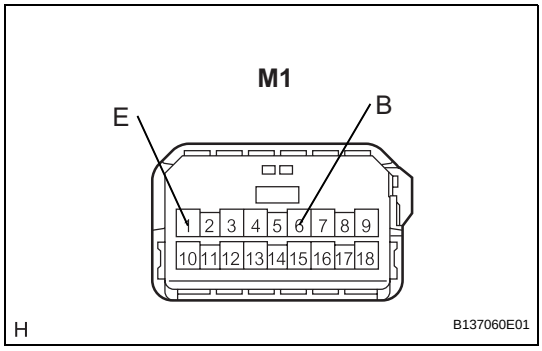
(a) Turn the ignition switch off.
(b) Wait for at least 10 seconds, and then turn the ignition switch on (IG).
(c) Check whether the DTC output recurs.
Result

Display (DTC output)	Proceed to
No output	A
Output DTCs	B

B → **GO TO DTC CHART**

A

2 INSPECT POWER WINDOW REGULATOR MASTER SWITCH ASSEMBLY



(a) Disconnect the M1 connector.
(b) Measure the voltage and resistance according to the value(s) in the table below.
Standard voltage

Tester Connection	Condition	Specified Condition
6 (B) - Body ground	Ignition switch on (IG)	10 to 14 V

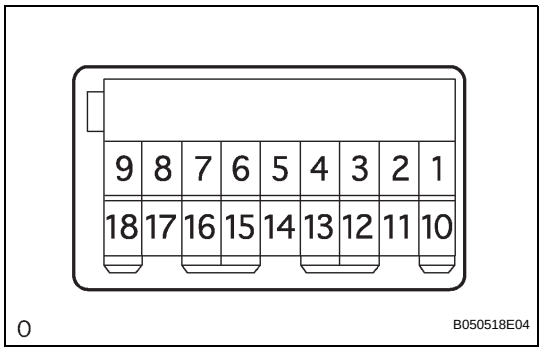
Standard resistance

Tester Connection	Condition	Specified Condition
1 (E) - Body ground	Always	Below 1 Ω

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

3 INSPECT POWER WINDOW REGULATOR MASTER SWITCH ASSEMBLY



(a) Measure the resistance according to the value(s) in the table below.
Standard resistance:
(with Jam Protection)

Tester Connection	Condition	Specified Condition
8 (UP) - 1 (E) - 4 (AUTO)	Auto UP	Below 1 Ω
5 (DN) - 6 (B)		Below 1 Ω
8 (UP) - 1 (E)	Manual UP	Below 1 Ω
5 (DN) - 6 (B)		Below 1 Ω
8 (UP) - 5 (DN) - 6 (B)	OFF	Below 1 Ω
5 (DN) - 1 (E)	Manual DOWN	Below 1 Ω
8 (UP) - 6 (B)		Below 1 Ω

Tester Connection	Condition	Specified Condition
4 (AUTO) - 5 (DN) - 1 (E)	Auto DOWN	Below 1 Ω
8 (UP) - 6 (B)		Below 1 Ω
1 (E) - 10 (RRU)	Lock/Unlock switch	UNLOCK (Below 1 Ω) →LOCK (10 kΩ or higher)
1 (E) - 12 (RLU)		
1 (E) - 13 (RLD)		
1 (E) - 15 (PD)		
1 (E) - 16 (PU)		
1 (E) - 18 (RRD)		

(without Jam Protection)

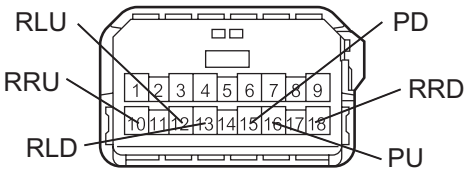
Tester Connection	Condition	Specified Condition
1 (E) - 3 (UP)	OFF	Below 1 Ω
1 (E) - 4 (DN)		Below 1 Ω
1 (E) - 10 (RRU)	Lock/Unlock switch	UNLOCK (Below 1 Ω) →LOCK (10 kΩ or higher)
1 (E) - 12 (RLU)		
1 (E) - 13 (RLD)		
1 (E) - 15 (PD)		
1 (E) - 16 (PU)		
1 (E) - 18 (RRD)		

NG → **REPLACE POWER WINDOW REGULATOR MASTER SWITCH ASSEMBLY**

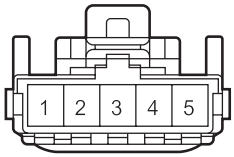
OK

4 CHECK WIRE HARNESS (POWER WINDOW MASTER SWITCH - FRONT LH, REAR LH/RH SWITCH)

M1
Power Window Regulator Master Switch Assembly:



H6 (K1, J1)
Power Window Switch (Front RH, Rear LH/RH):



H B137067E01

(a) Disconnect the M1 and H6 (K1, J1) connectors.
(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:
Front RH side

Tester Connection	Condition	Specified Condition
M1-16 (PU) - H6-5 (SU)	Always	Below 1 Ω
M1-15 (PD) - H6-2 (SD)	Always	Below 1 Ω
M1-16 (PU) - Body ground	Always	10 kΩ or higher
M1-15 (PD) - Body ground	Always	10 kΩ or higher

Rear LH side

Tester Connection	Condition	Specified Condition
M1-12 (RLU) - K1-5 (SU)	Always	Below 1 Ω
M1-13 (RLD) - K1-2 (SD)	Always	Below 1 Ω
M1-12 (RLU) - Body ground	Always	10 kΩ or higher
M1-13 (RLD) - Body ground	Always	10 kΩ or higher

Rear RH side

Tester Connection	Condition	Specified Condition
M1-10 (RRU) - J1-5 (SU)	Always	Below 1 Ω
M1-18 (RRD) - J1-2 (SD)	Always	Below 1 Ω
M1-10 (RRU) - Body ground	Always	10 kΩ or higher
M1-18 (RRD) - Body ground	Always	10 kΩ or higher

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

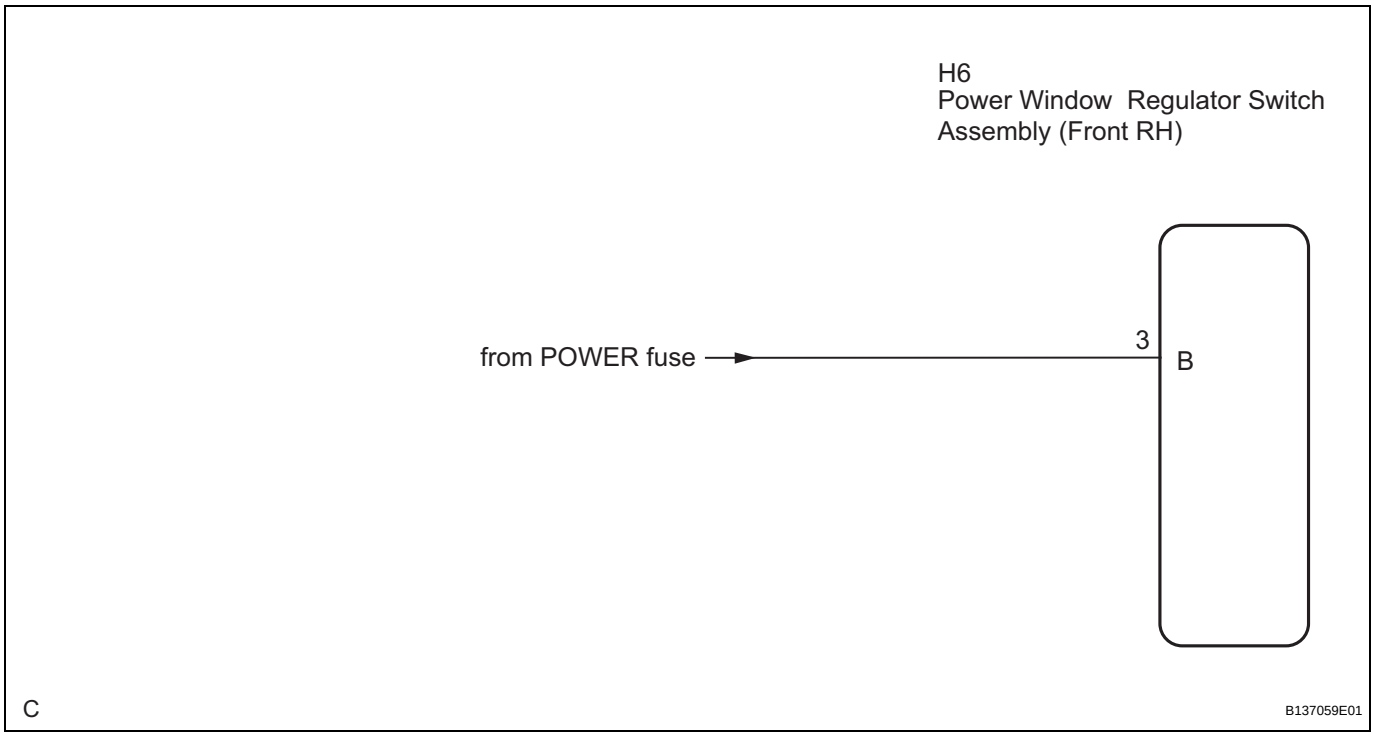
PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

Front Passenger Side Power Window Switch Power Source Circuit

DESCRIPTION

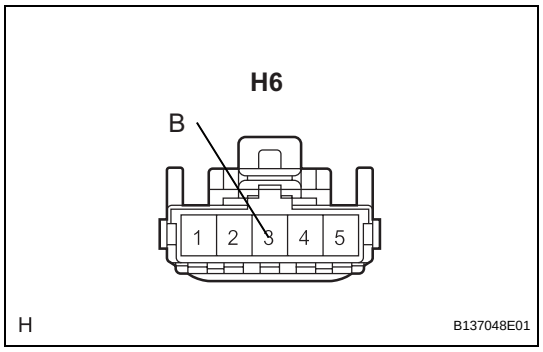
This circuit supplies power to operate the power window regulator switch assembly (Front RH).

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK WIRE HARNESS (POWER WINDOW REGULATOR SWITCH - BATTERY AND BODY GROUND)



(a) Disconnect the H6 connector.
(b) Measure the voltage according to the value(s) in the table below.

Standard voltage

Tester Connection	Condition	Specified Condition
3 (B) - Body ground	Ignition switch on (IG)	10 to 14 V

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

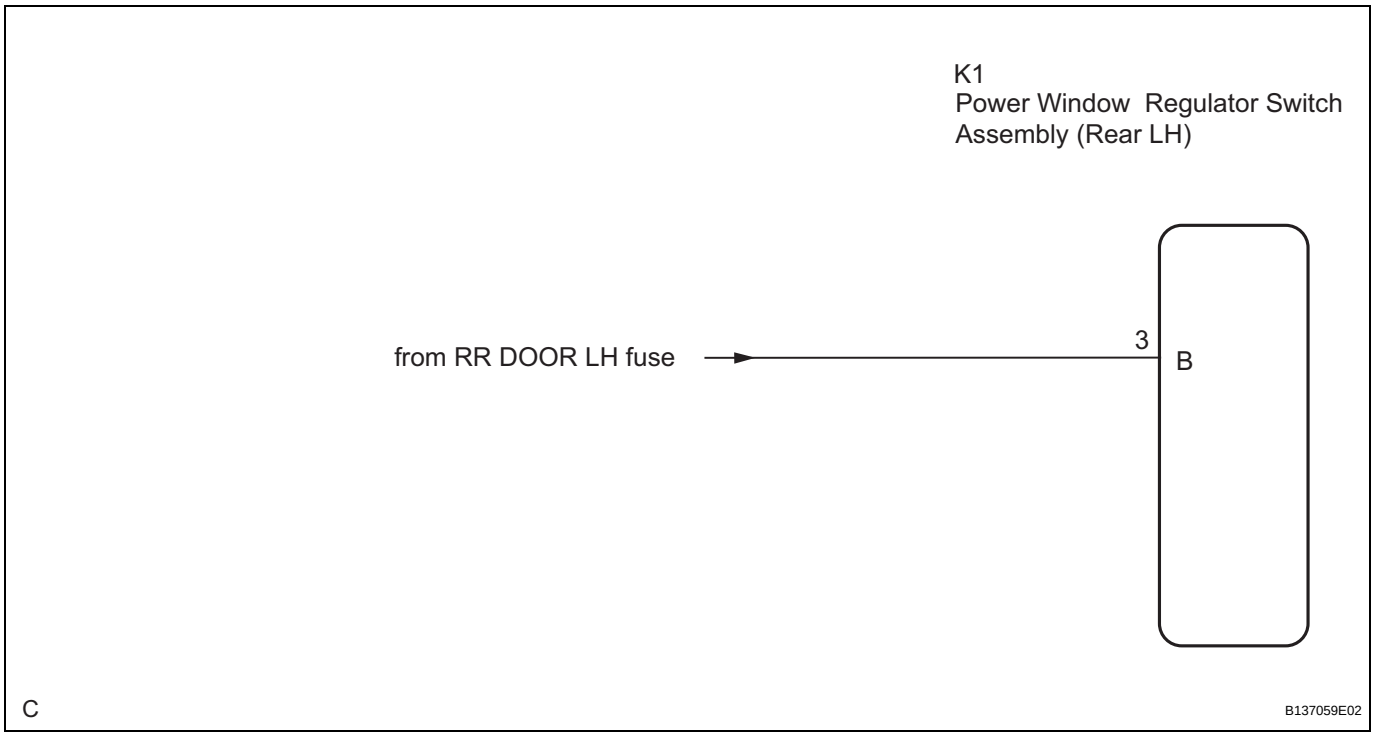
Rear Power Window Switch LH Circuit

DESCRIPTION

This circuit supplies power to operate the power window regulator switch assembly (Rear LH).

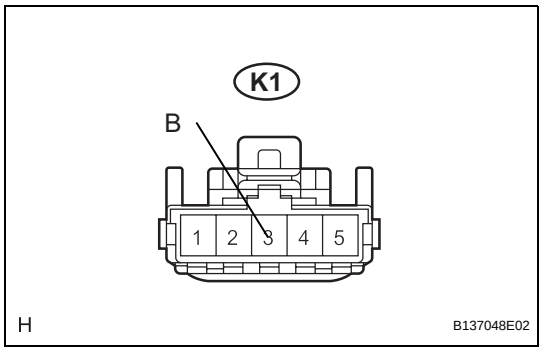
WS

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK WIRE HARNESS (POWER WINDOW REGULATOR SWITCH - BATTERY AND BODY GROUND)



(a) Disconnect the K1 connector.
(b) Measure the voltage according to the value(s) in the table below.

Standard voltage

Tester Connection	Condition	Specified Condition
3 (B) - Body ground	Ignition switch on (IG)	10 to 14 V

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

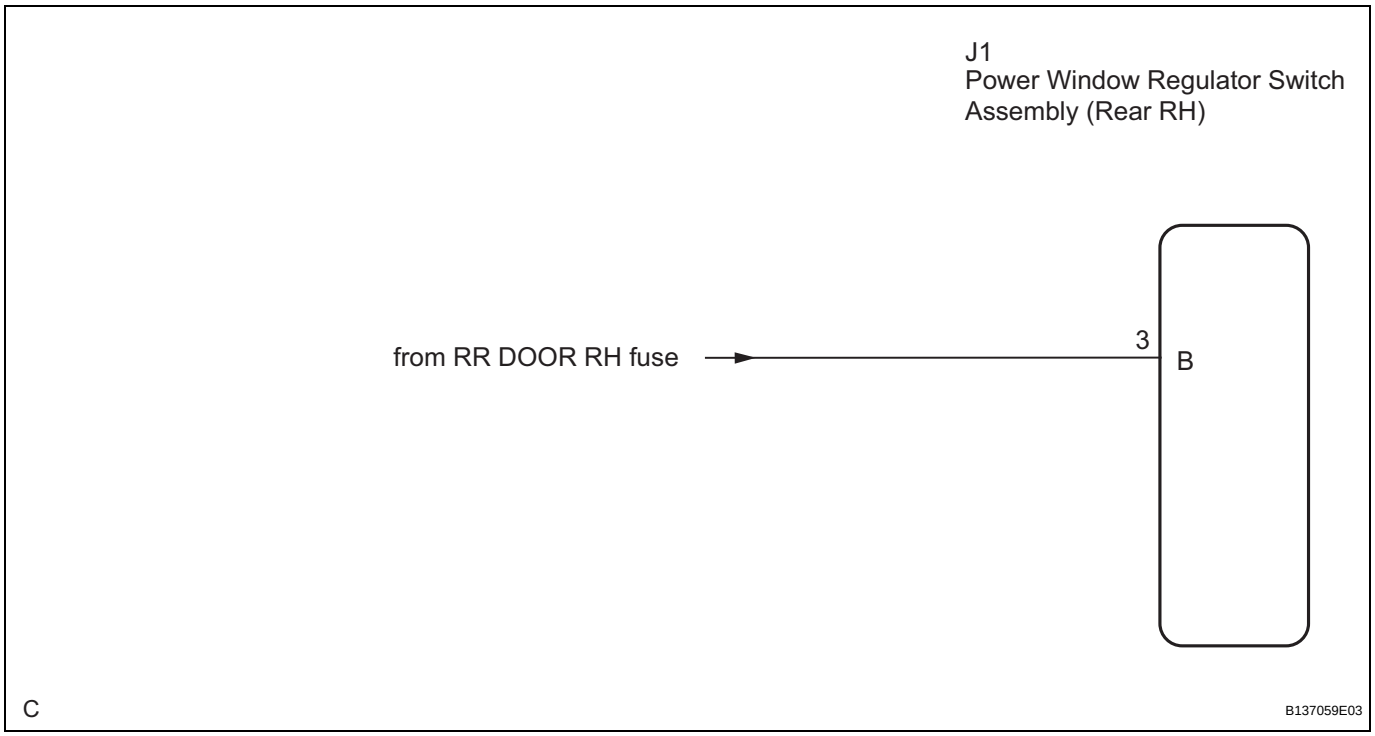
PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

Rear Power Window Switch RH Circuit

DESCRIPTION

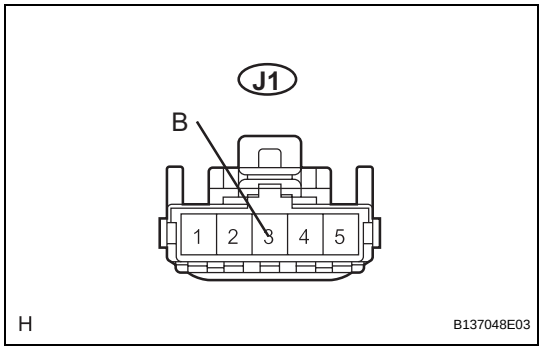
This circuit supplies power to operate the power window regulator switch (Rear RH).

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK WIRE HARNESS (POWER WINDOW REGULATOR SWITCH - BATTERY AND BODY GROUND)



(a) Disconnect the J1 connector.
(b) Measure the voltage according to the value(s) in the table below.

Standard voltage

Tester Connection	Condition	Specified Condition
3 (B) - Body ground	Ignition switch on (IG)	10 to 14 V

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

Driver Side Power Window Motor Circuit

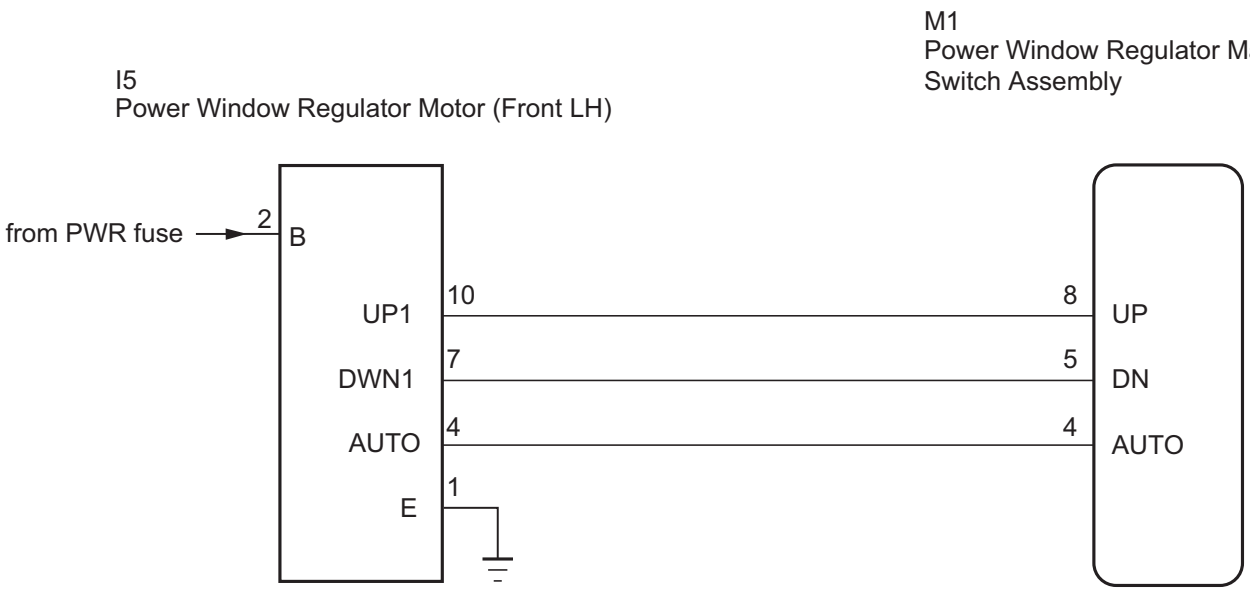
DESCRIPTION

This circuit transmits signals from the power window regulator master switch assembly to the power window regulator motor (Front LH).

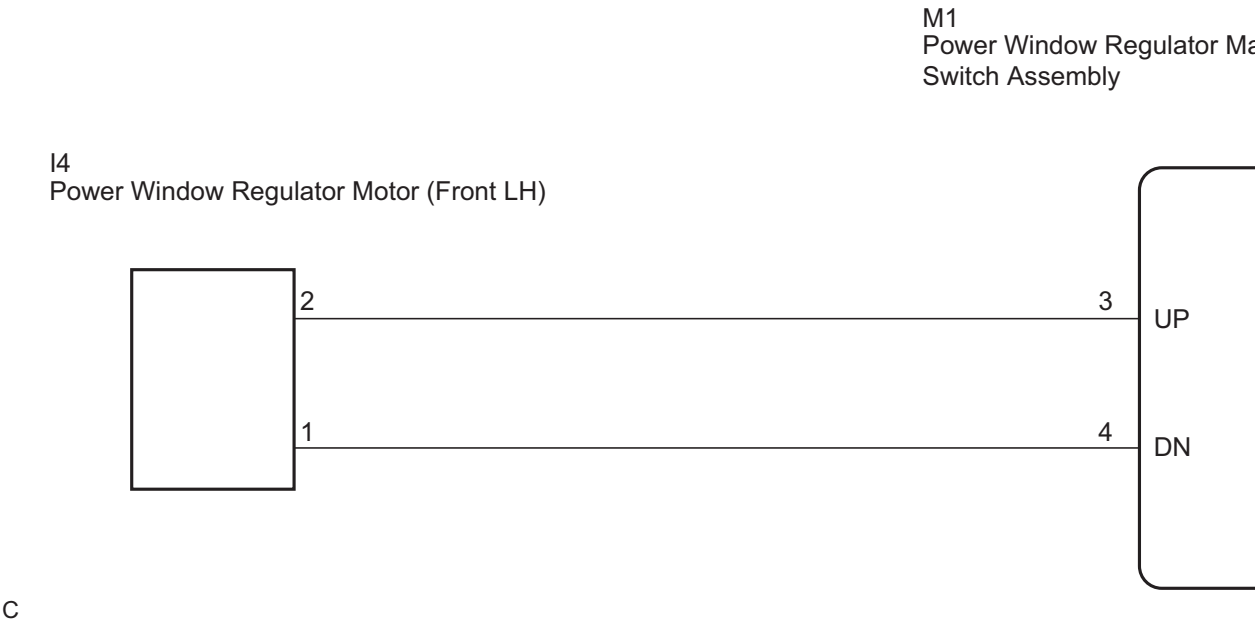
WS

WIRING DIAGRAM

with Jam Protection:

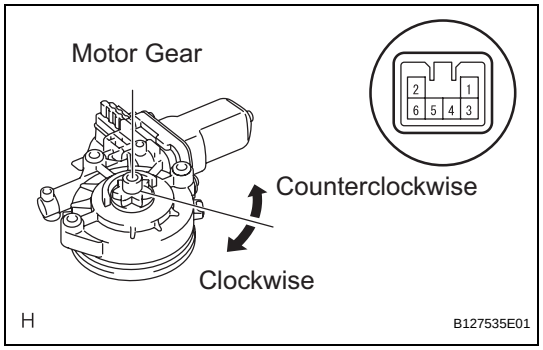


without Jam Protection:



INSPECTION PROCEDURE

1	**INSPECT POWER WINDOW REGULATOR MOTOR**



without Jam protection:

(a) Remove the power window motor.

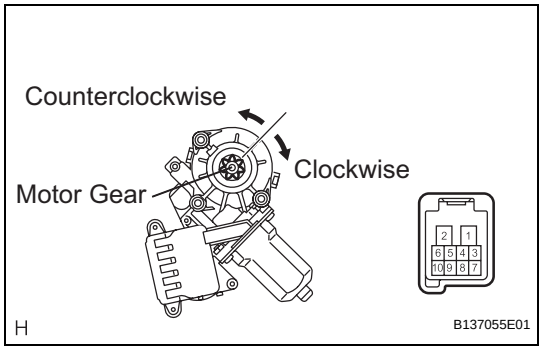
(1) Apply battery voltage to the motor connector according to the table below.

NOTICE:

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

Standard

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



(b) with Jam protection:

Remove the power window motor.

(1) Apply battery voltage to the motor connector according to the table below.

NOTICE:

Do not apply battery voltage to any terminals except terminals 1, 2, 4, 7 and 10.

Standard

Switch Condition	Measurement Condition	Specified Condition
Manual Operation	Battery positive (+) → Terminal 2 (PWR) Battery negative (-) → Terminal 1 (E), 7 (DN)	Motor gear rotates clockwise
	Battery positive (+) → Terminal 2 (PWR) Battery negative (-) → Terminal 1 (E), 10 (UP)	Motor gear rotates counterclockwise
Auto Operation	Battery positive (+) → Terminal 2 (PWR) Battery negative (-) → Terminal 1 (E), 4 (AUTO), 7 (DN)	Motor gear rotates clockwise
	Battery positive (+) → Terminal 2 (PWR) Battery negative (-) → Terminal 1 (E), 4 (AUTO), 10 (UP)	Motor gear rotates counterclockwise

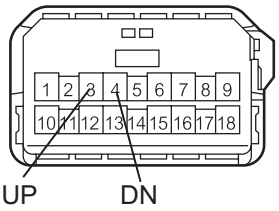
NG → **REPLACE POWER WINDOW REGULATOR MOTOR**

OK

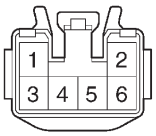
2	CHECK WIRE HARNESS (WINDOW REGULATOR MOTOR - WINDOW REGULATOR MASTER SWITCH)

WS

M1
Power Window Regulator Master Switch Assembly:



I4
Power Window Regulator Motor (Front LH):

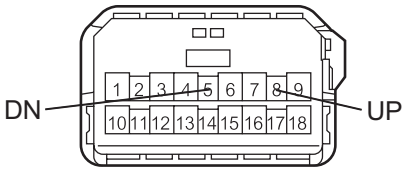


B137061E01

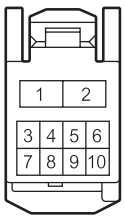
(a) without Jam protection:
Disconnect the M1 and I4 connectors.
(1) Measure the resistance according to the value(s) in the table below.
Standard resistance

Tester Connection	Condition	Specified Condition
M1-3 (UP) - I4-2	Always	Below 1 Ω
M1-4 (DN) - I4-1	Always	Below 1 Ω
M1-3 (UP) - Body ground	Always	10 kΩ or higher
M1-4 (DN) - Body ground	Always	10 kΩ or higher

M1
Power Window Regulator Master Switch Assembly:



I5
Power Window Regulator Motor (Front LH):



B137046E01

(b) with Jam protection:
Disconnect the M1 and I5 connectors.
(1) Measure the resistance according to the value(s) in the table below.
Standard resistance

Tester Connection	Condition	Specified Condition
M1-8 (UP) - I5-10	Always	Below 1 Ω
M1-5 (DN) - I5-7	Always	Below 1 Ω
M1-8 (UP) - Body ground	Always	10 kΩ or higher
M1-5 (DN) - Body ground	Always	10 kΩ or higher

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

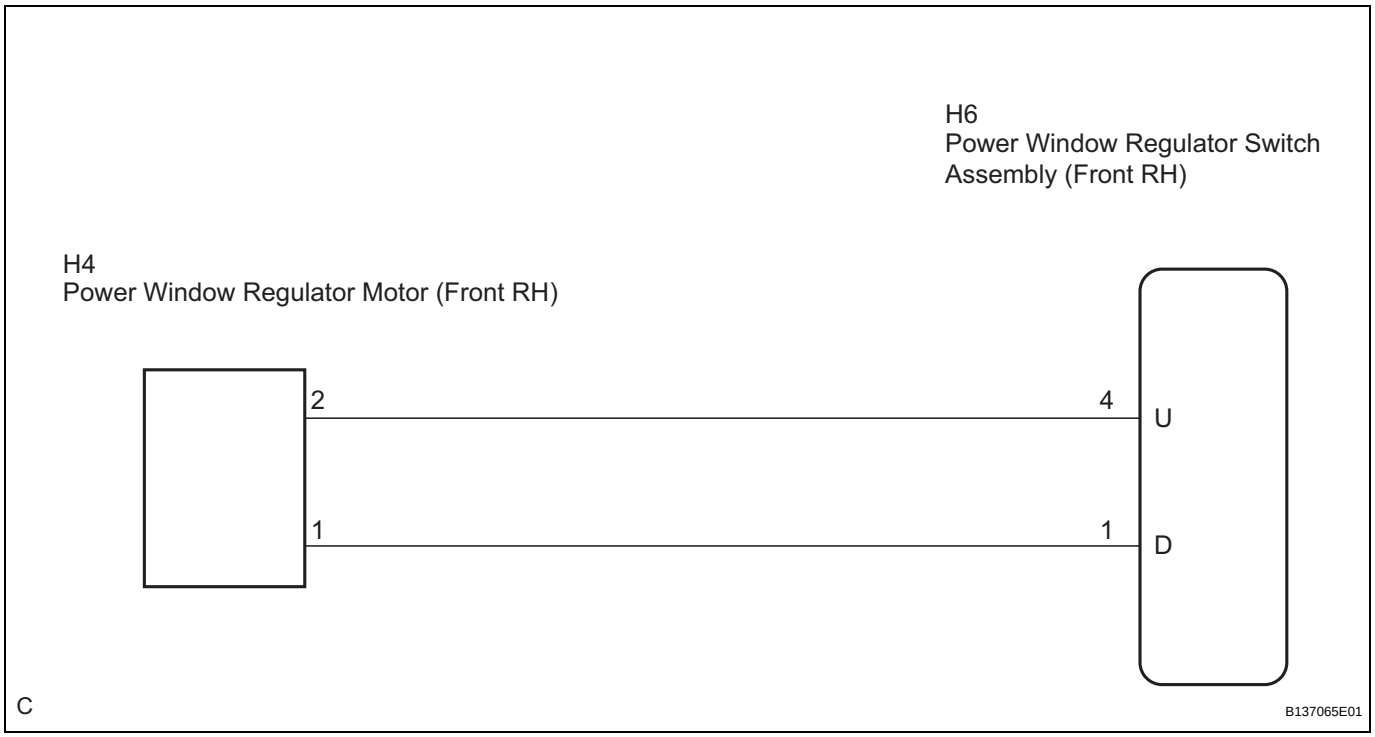
Front Passenger Side Power Window Motor Circuit

DESCRIPTION

This circuit transmits signals from the power window regulator switch assembly (Front RH) to the power window regulator motor (Front RH).

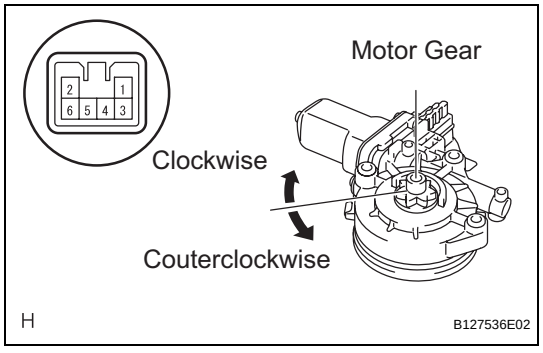
WS

WIRING DIAGRAM



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.

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

Standard

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

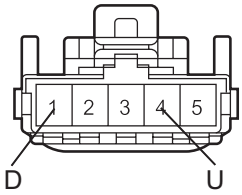
NG → **REPLACE POWER WINDOW REGULATOR MOTOR**

OK

2	CHECK WIRE HARNESS (WINDOW REGULATOR MOTOR - POWER WINDOW REGULATOR SWITCH)

WS

H6
Power Window Regulator Switch Assembly (Front RH):



H4
Power Window Regulator Motor (Front RH):

B137066E01

(a) Disconnect the H6 and H4 connectors.
(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester Connection	Condition	Specified Condition
H6-4 (U) - H4-2	Always	Below 1 Ω
H6-1 (D) - H4-1	Always	Below 1 Ω
H6-4 (U) - Body ground	Always	10 kΩ or higher
H6-1 (D) - Body ground	Always	10 kΩ or higher

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

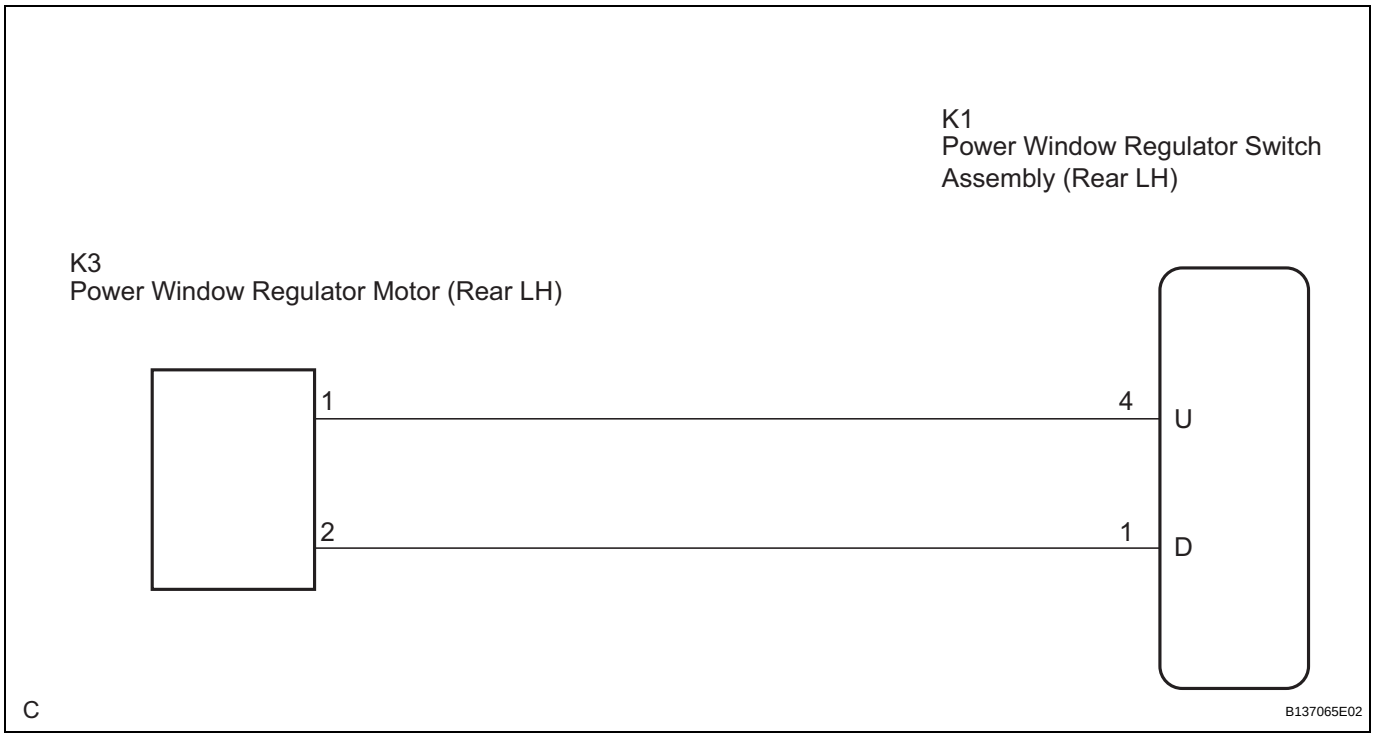
Rear Power Window Motor LH Circuit

DESCRIPTION

This circuit transmits signals from the power window regulator switch assembly (Rear LH) to the power window regulator motor (Rear LH).

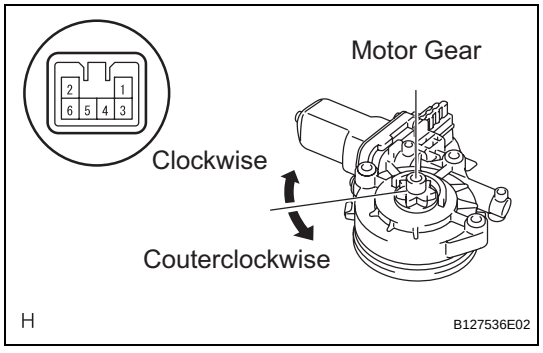
WS

WIRING DIAGRAM



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.
NOTICE:
Do not apply battery voltage to any terminals except terminals 1 and 2.
Standard

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

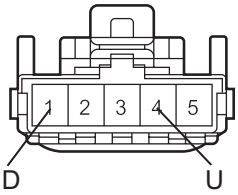
NG → **REPLACE POWER WINDOW REGULATOR MOTOR**

OK

2	CHECK WIRE HARNESS (WINDOW REGULATOR MOTOR - WINDOW REGULATOR SWITCH)

WS

K1
Power Window Regulator Switch Assembly (Rear LH):



K3
Power Window Regulator Motor (Rear LH):

B137066E02

(a) Disconnect the K1 and K3 connectors.
(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester Connection	Condition	Specified Condition
K1-4 (U) - K3-1	Always	Below 1 Ω
K1-1 (D) - K3-2	Always	Below 1 Ω
K1-4 (U) - Body ground	Always	10 kΩ or higher
K1-1 (D) - Body ground	Always	10 kΩ or higher

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

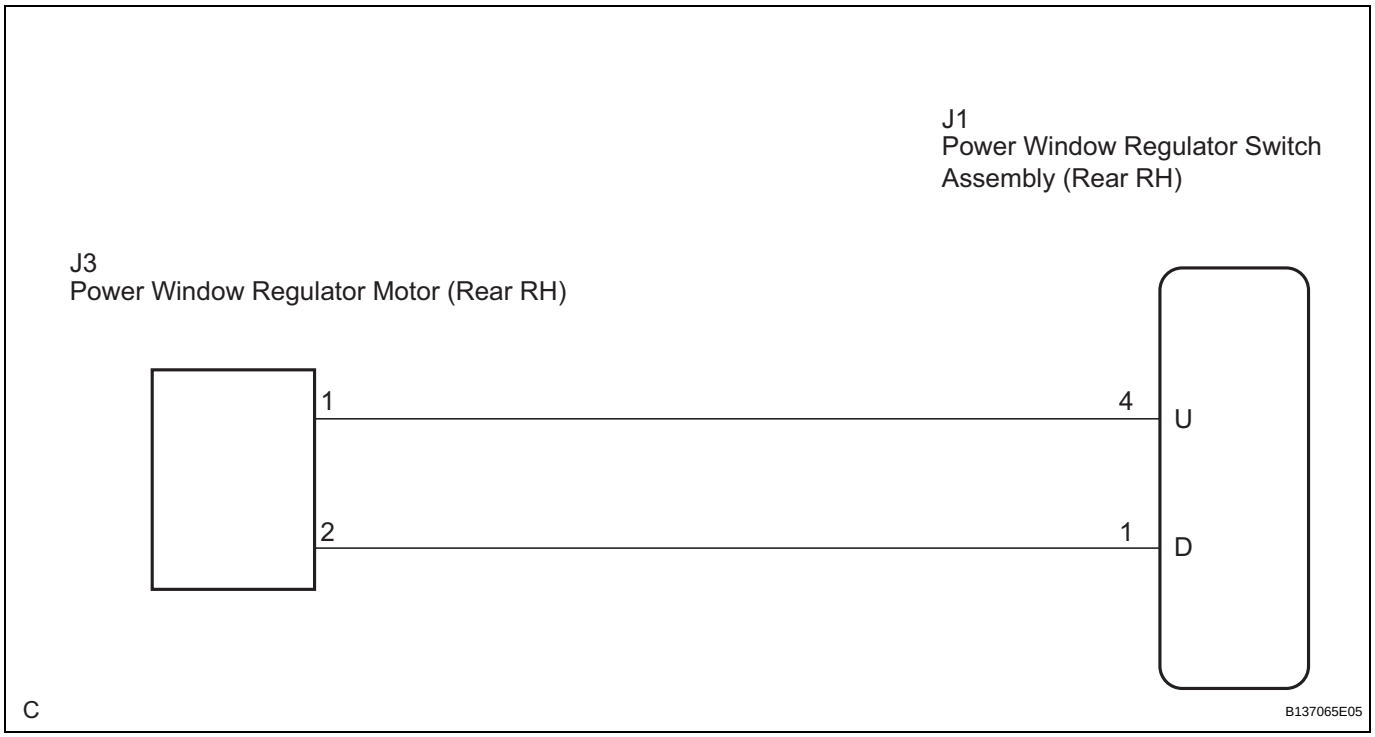
Rear Power Window Motor RH Circuit

DESCRIPTION

This circuit transmits signals from the power window regulator switch assembly (Rear RH) to the power window regulator motor (Rear RH).

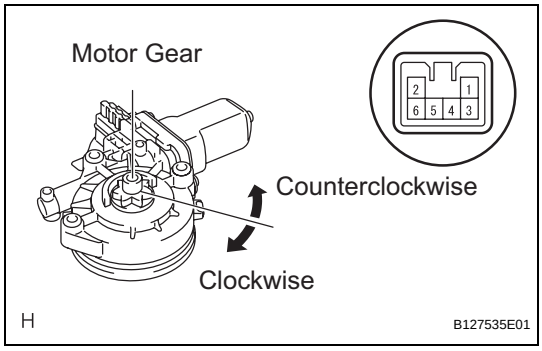
WS

WIRING DIAGRAM



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.
NOTICE:
Do not apply battery voltage to any terminals except terminals 1 and 2.
Standard

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

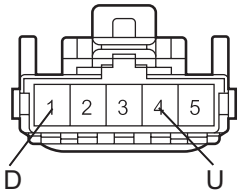
NG → **REPLACE POWER WINDOW REGULATOR MOTOR**

OK

2	CHECK WIRE HARNESS (WINDOW REGULATOR MOTOR - WINDOW REGULATOR SWITCH)

WS

J1
Power Window Regulator Switch Assembly (Rear RH):



J3
Power Window Regulator Motor (Rear RH):

B137066E03

(a) Disconnect the J1 and J3 connectors.
(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

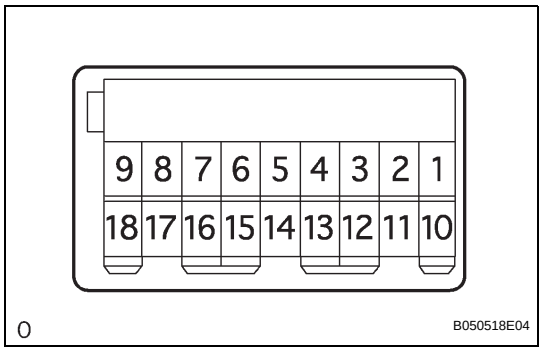
Tester Connection	Condition	Specified Condition
J1-4 (U) - J3-1	Always	Below 1 Ω
J1-1 (D) - J3-2	Always	Below 1 Ω
J1-4 (U) - Body ground	Always	10 kΩ or higher
J1-1 (D) - Body ground	Always	10 kΩ or higher

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

WS



POWER WINDOW MASTER SWITCH

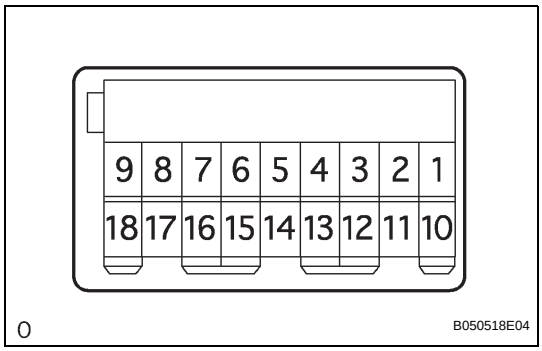
INSPECTION

1. INSPECT POWER WINDOW MASTER SWITCH (w/ Jam Protection Function)

(a) Measure the resistance when the switch is operated according to the value(s) in the table below.

Standard resistance

Tester Connection	Switch Condition	Specified Condition
8 (UP) - 1 (E) - 4 (AUTO)	Auto UP	Below 1 Ω
5 (DN) - 6 (B)		Below 1 Ω
8 (UP) - 1 (E)	Manual UP	Below 1 Ω
5 (DN) - 6 (B)		Below 1 Ω
8 (UP) - 5 (DN) - 6 (B)	OFF	Below 1 Ω
5 (DN) - 1 (E)	Manual DOWN	Below 1 Ω
8 (UP) - 6 (B)		Below 1 Ω
4 (AUTO) - 5 (DN) - 1 (E)	Auto DOWN	Below 1 Ω
8 (UP) - 6 (B)		Below 1 Ω
1 (E) - 10 (RRU)	Lock/Unlock switch	UNLOCK (Below 1 Ω) → LOCK (10 kΩ or higher)
1 (E) - 12 (RLU)		
1 (E) - 13 (RLD)		
1 (E) - 15 (PD)		
1 (E) - 16 (PU)		
1 (E) - 18 (RRD)		

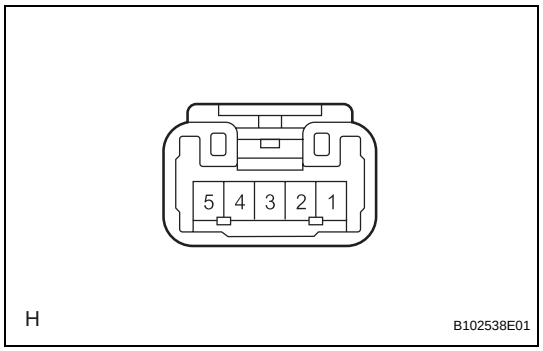


2. INSPECT POWER WINDOW MASTER SWITCH (w/o Jam Protection Function)

(a) Measure the resistance when the switch is operated according to the value(s) in the table below.

Standard resistance

Tester Connection	Switch Condition	Specified Condition
1 (E) - 3 (DU)	OFF	Below 1 Ω
1 (E) - 4 (DD)		Below 1 Ω
1 (E) - 10 (RRU)	Lock/Unlock switch	UNLOCK (Below 1 Ω) → LOCK (10 kΩ or higher)
1 (E) - 12 (RLU)		
1 (E) - 13 (RLD)		
1 (E) - 15 (PD)		
1 (E) - 16 (PU)		
1 (E) - 18 (RRD)		



FRONT PASSENGER SIDE POWER WINDOW SWITCH

INSPECTION

1. INSPECT POWER WINDOW SWITCH

(a) Remove the power window switch.

(b) Measure the resistance when the switch is operated according to the value(s) in the table below.

Standard resistance

Tester Connection	Switch Condition	Specified Condition
1 (D) - 2 (SD)	UP	Below 1 Ω
3 (B) - 4 (U)		Below 1 Ω
1 (D) - 2 (SD)	OFF	Below 1 Ω
4 (U) - 5 (SU)		Below 1 Ω
4 (U) - 5 (SU)	DOWN	Below 1 Ω
1 (D) - 3 (B)		Below 1 Ω

WS

REAR POWER WINDOW SWITCH

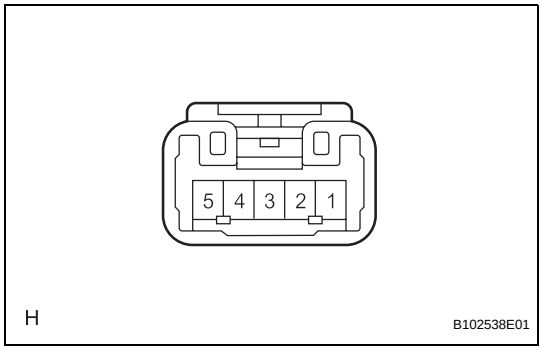
INSPECTION

1. INSPECT POWER WINDOW SWITCH (for Rear RH)

(a) Remove the power window switch.

(b) Measure the resistance when the switch is operated according to the value(s) in the table below.

Standard resistance



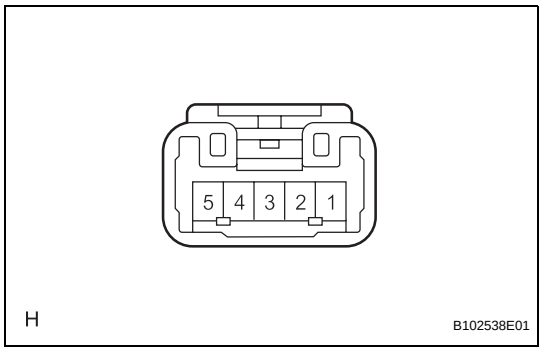
Tester Connection	Switch Condition	Specified Condition
1 (D) - 2 (SD)	UP	Below 1 Ω
3 (B) - 4 (U)		Below 1 Ω
1 (D) - 2 (SD)	OFF	Below 1 Ω
4 (U) - 5 (SU)		Below 1 Ω
4 (U) - 5 (SU)	DOWN	Below 1 Ω
1 (D) - 3 (B)		Below 1 Ω

2. REMOVE POWER WINDOW SWITCH (for Rear LH)

(a) Remove the power window switch.

(b) Measure the resistance when the switch is operated according to the value(s) in the table below.

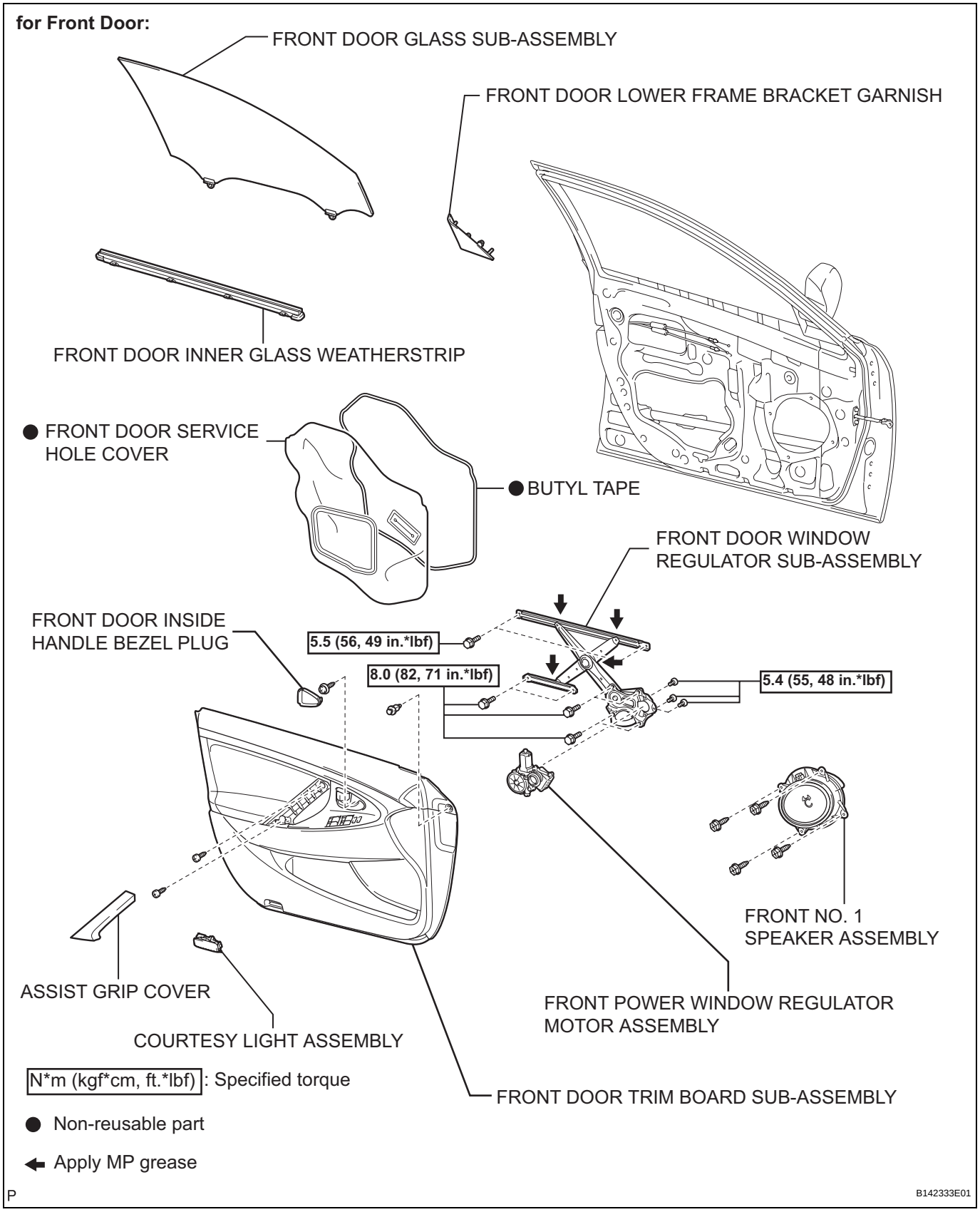
Standard resistance



Tester Connection	Switch Condition	Specified Condition
1 (D) - 2 (SD)	UP	Below 1 Ω
3 (B) - 4 (U)		Below 1 Ω
1 (D) - 2 (SD)	OFF	Below 1 Ω
4 (U) - 5 (SU)		Below 1 Ω
4 (U) - 5 (SU)	DOWN	Below 1 Ω
1 (D) - 3 (B)		Below 1 Ω

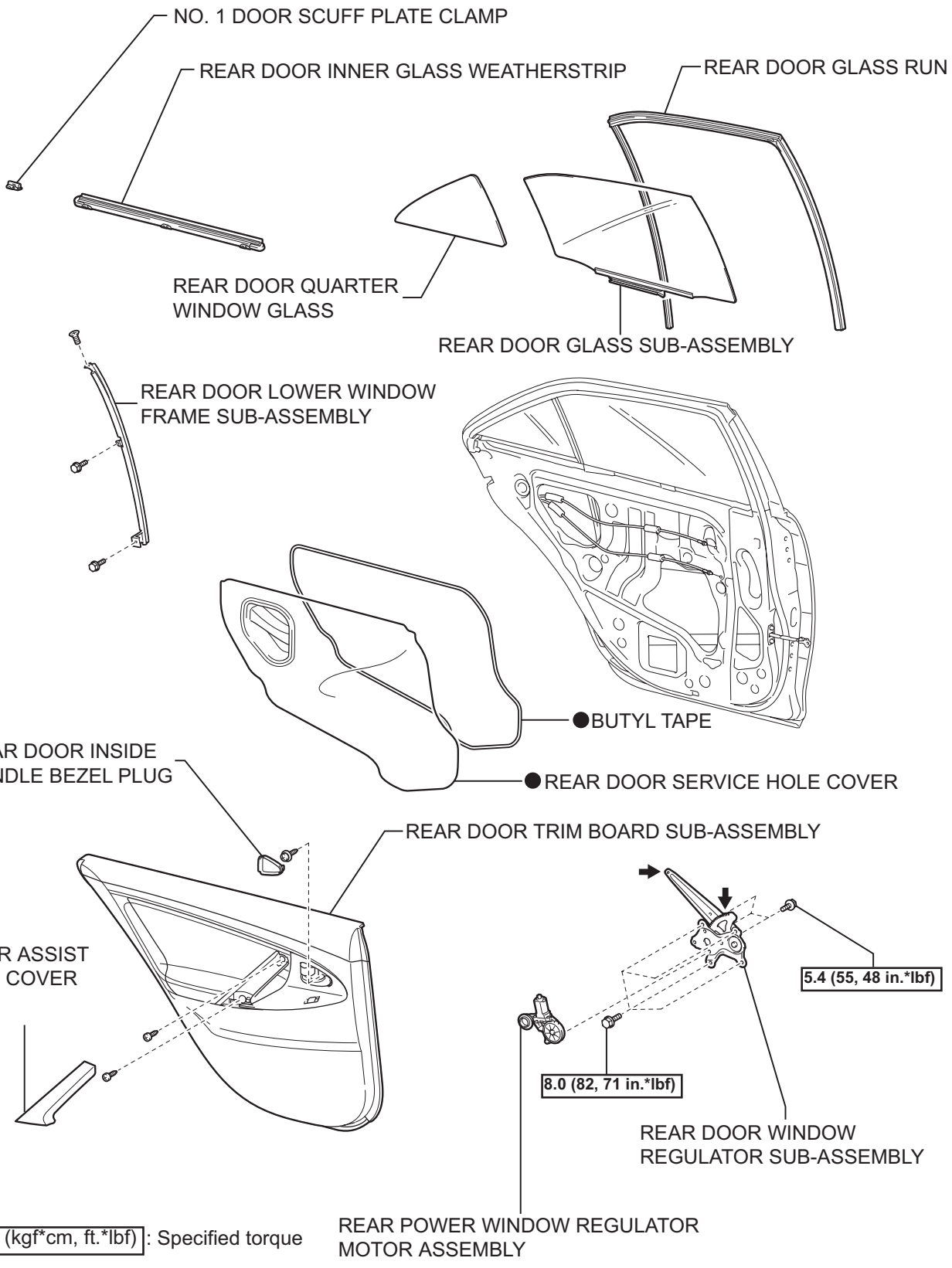
POWER WINDOW REGULATOR MOTOR

COMPONENTS



WS

for Rear Door:



N*m (kgf*cm, ft.*lbf) : Specified torque

● Non-reusable part

◀ Apply MP grease

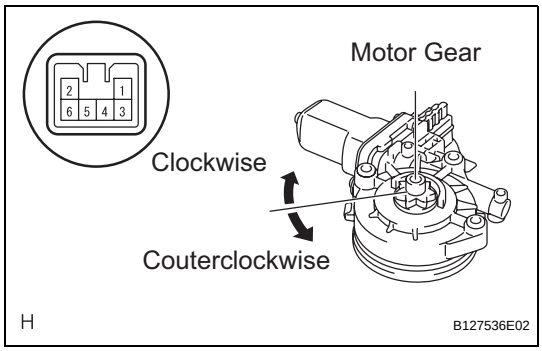
P

B142334E01

REMOVAL

1. REMOVE FRONT DOOR LOWER FRAME BRACKET GARNISH (See page ED-14)
2. REMOVE FRONT DOOR INSIDE HANDLE BEZEL PLUG (See page ED-14)
3. REMOVE ASSIST GRIP COVER (See page ED-15)
4. REMOVE COURTESY LIGHT ASSEMBLY (See page ED-15)
5. REMOVE FRONT DOOR TRIM BOARD SUB-ASSEMBLY (See page ED-15)
6. REMOVE FRONT DOOR INNER GLASS WEATHERSTRIP (See page ED-16)
7. REMOVE FRONT NO. 1 SPEAKER ASSEMBLY (See page AV-155)
8. REMOVE FRONT DOOR SERVICE HOLE COVER (See page ED-17)
9. REMOVE FRONT DOOR GLASS SUB-ASSEMBLY (See page ED-17)
10. REMOVE FRONT DOOR WINDOW REGULATOR SUB-ASSEMBLY (See page ED-18)
11. REMOVE FRONT POWER WINDOW REGULATOR MOTOR ASSEMBLY (See page ED-18)
12. REMOVE REAR DOOR INSIDE HANDLE BEZEL PLUG (See page ED-38)
13. REMOVE DOOR ASSIST GRIP COVER (See page ED-38)
14. REMOVE REAR DOOR TRIM BOARD SUB-ASSEMBLY (See page ED-39)
15. REMOVE REAR DOOR INNER GLASS WEATHERSTRIP (See page ED-40)
16. REMOVE REAR DOOR SERVICE HOLE COVER (See page ED-41)
17. REMOVE REAR DOOR GLASS RUN (See page ED-42)
18. REMOVE REAR DOOR LOWER WINDOW FRAME SUB-ASSEMBLY (See page ED-42)
19. REMOVE REAR DOOR QUARTER WINDOW GLASS (See page ED-43)
20. REMOVE REAR DOOR GLASS SUB-ASSEMBLY (See page ED-43)
21. REMOVE REAR DOOR WINDOW REGULATOR SUB-ASSEMBLY (See page ED-43)
22. REMOVE REAR POWER WINDOW REGULATOR MOTOR ASSEMBLY (See page ED-43)

WS



INSPECTION

1. INSPECT POWER WINDOW REGULATOR MOTOR (FRONT RH)

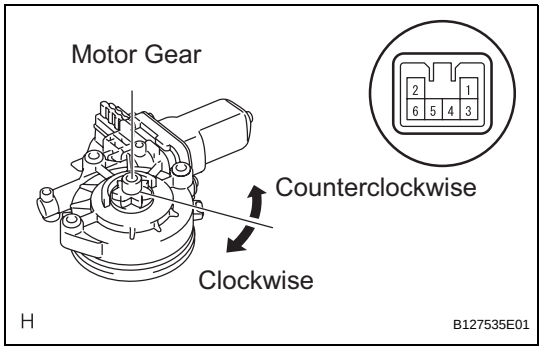
(a) Apply battery voltage to the motor connector according to the table below.

NOTICE:

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

Standard

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



2. INSPECT POWER WINDOW REGULATOR MOTOR (FRONT LH)

(a) without Jam protection:

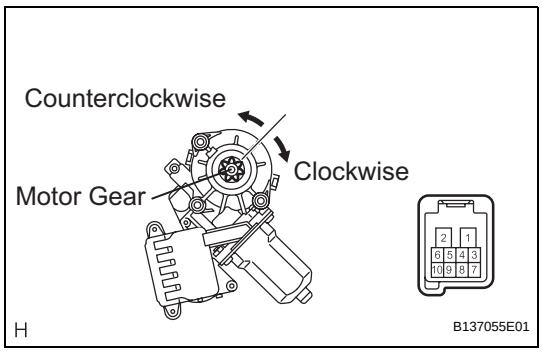
Apply battery voltage to the motor connector according to the table below.

NOTICE:

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

Standard

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



(b) with Jam protection:

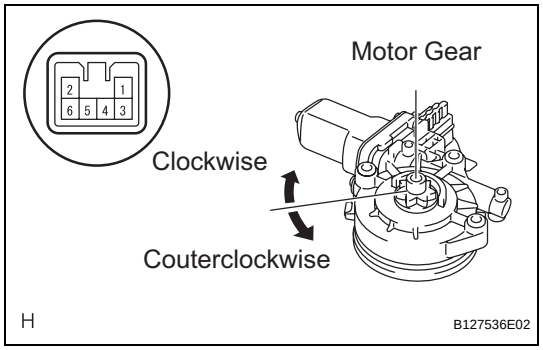
Apply battery voltage to the motor connector according to the table below.

NOTICE:

Do not apply battery voltage to any terminals except terminals 1, 2, 4, 7 and 10.

Standard

Switch Condition	Measurement Condition	Specified Condition
Manual Operation	Battery positive (+) → Terminal 2 (PWR) Battery negative (-) → Terminal 1 (E), 7 (DN)	Motor gear rotates clockwise
	Battery positive (+) → Terminal 2 (PWR) Battery negative (-) → Terminal 1 (E), 10 (UP)	Motor gear rotates counterclockwise
Auto Operation	Battery positive (+) → Terminal 2 (PWR) Battery negative (-) → Terminal 1 (E), 4 (AUTO), 7 (DN)	Motor gear rotates clockwise
	Battery positive (+) → Terminal 2 (PWR) Battery negative (-) → Terminal 1 (E), 4 (AUTO) 10 (UP)	Motor gear rotates counterclockwise

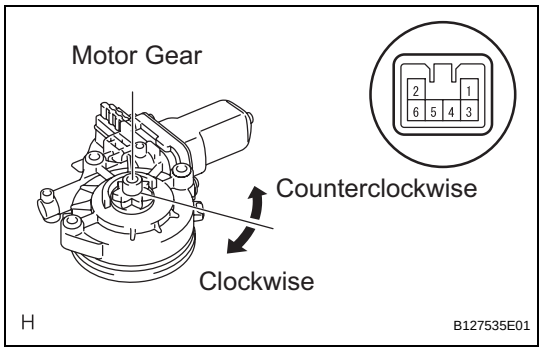


3. INSPECT POWER WINDOW REGULATOR MOTOR (REAR RH)

(a) Apply battery voltage to the motor connector according to the table below.

NOTICE:
Do not apply battery voltage to any terminals except terminals 1 and 2.
Standard

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



4. INSPECT POWER WINDOW REGULATOR MOTOR (REAR LH)

(a) Apply battery voltage to the motor connector according to the table below.

NOTICE:
Do not apply battery voltage to any terminals except terminals 1 and 2.
Standard

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

WS

INSTALLATION

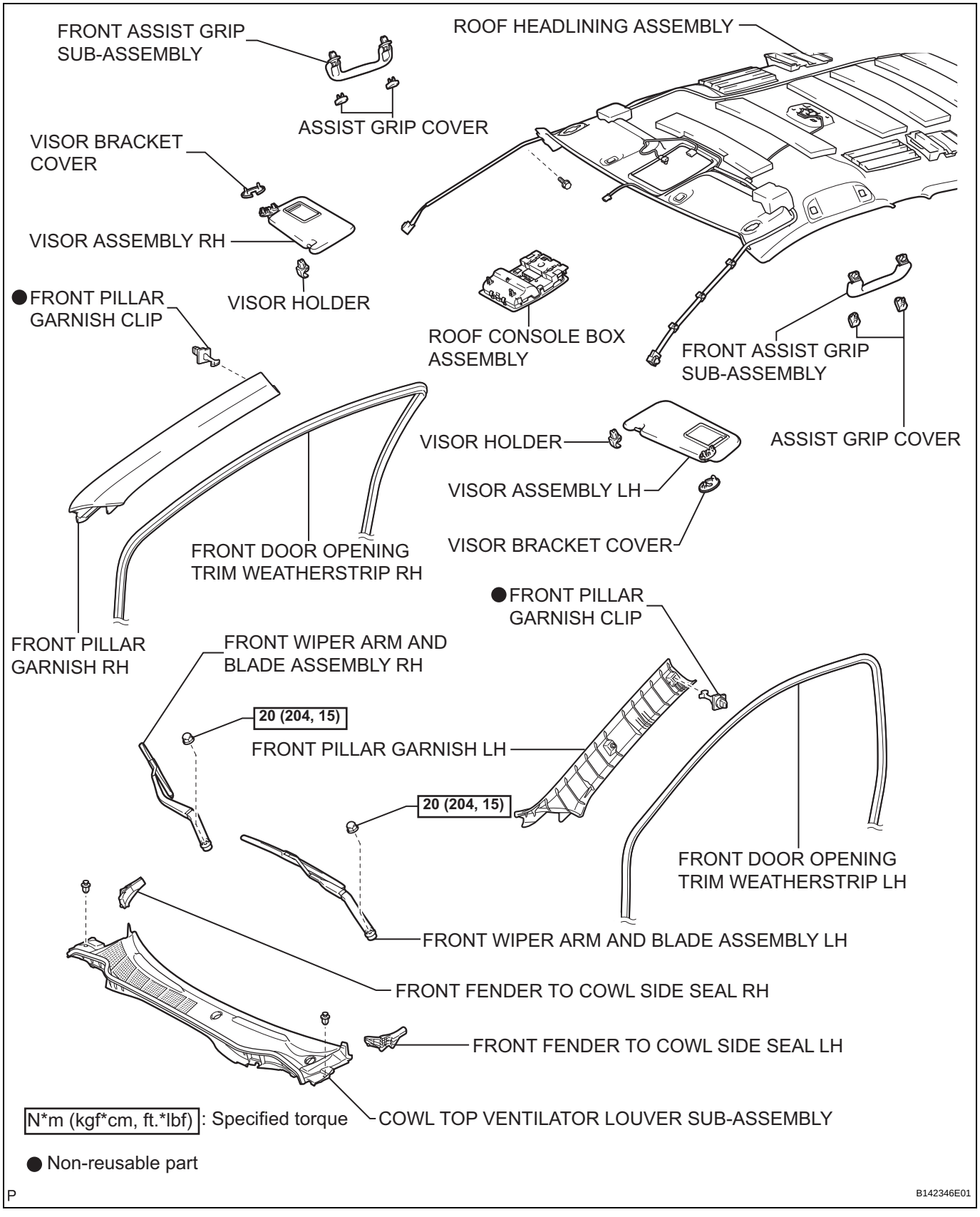
1. **INSTALL REAR POWER WINDOW REGULATOR MOTOR ASSEMBLY (See page ED-51)**
2. **INSTALL REAR DOOR WINDOW REGULATOR SUB-ASSEMBLY (See page ED-51)**
3. **INSTALL REAR DOOR GLASS RUN (See page ED-52)**
4. **INSTALL REAR DOOR GLASS SUB-ASSEMBLY (See page ED-52)**
5. **INSTALL REAR DOOR QUARTER WINDOW GLASS (See page ED-52)**
6. **INSTALL REAR DOOR LOWER WINDOW FRAME SUB-ASSEMBLY (See page ED-52)**
7. **INSTALL REAR DOOR SERVICE HOLE COVER (See page ED-53)**
8. **INSTALL REAR DOOR INNER GLASS WEATHERSTRIP (See page ED-54)**
9. **INSTALL REAR DOOR TRIM BOARD SUB-ASSEMBLY (See page ED-55)**
10. **INSTALL DOOR ASSIST GRIP COVER (See page ED-56)**
11. **INSTALL REAR DOOR INSIDE HANDLE BEZEL PLUG (See page ED-56)**
12. **INITIALIZATION POWER WINDOW CONTROL SYSTEM**
    (See page WS-8)
13. **INSTALL FRONT POWER WINDOW REGULATOR MOTOR ASSEMBLY (See page ED-31)**
14. **INSTALL FRONT DOOR WINDOW REGULATOR SUB-ASSEMBLY (See page ED-31)**
15. **INSTALL FRONT DOOR GLASS SUB-ASSEMBLY (See page ED-31)**
16. **INSTALL FRONT DOOR SERVICE HOLE COVER (See page ED-32)**
17. **INSTALL FRONT NO. 1 SPEAKER ASSEMBLY (See page AV-157)**
18. **INSTALL FRONT DOOR INNER GLASS WEATHERSTRIP (See page ED-32)**
19. **INSTALL FRONT DOOR TRIM BOARD SUB-ASSEMBLY (See page ED-33)**
20. **INSTALL COURTESY LIGHT ASSEMBLY (See page ED-34)**
21. **INSTALL ASSIST GRIP COVER (See page ED-34)**
22. **INSTALL FRONT DOOR INSIDE HANDLE BEZEL PLUG (See page ED-34)**

23. **INSTALL FRONT DOOR LOWER FRAME BRACKET GARNISH (See page ED-34)**

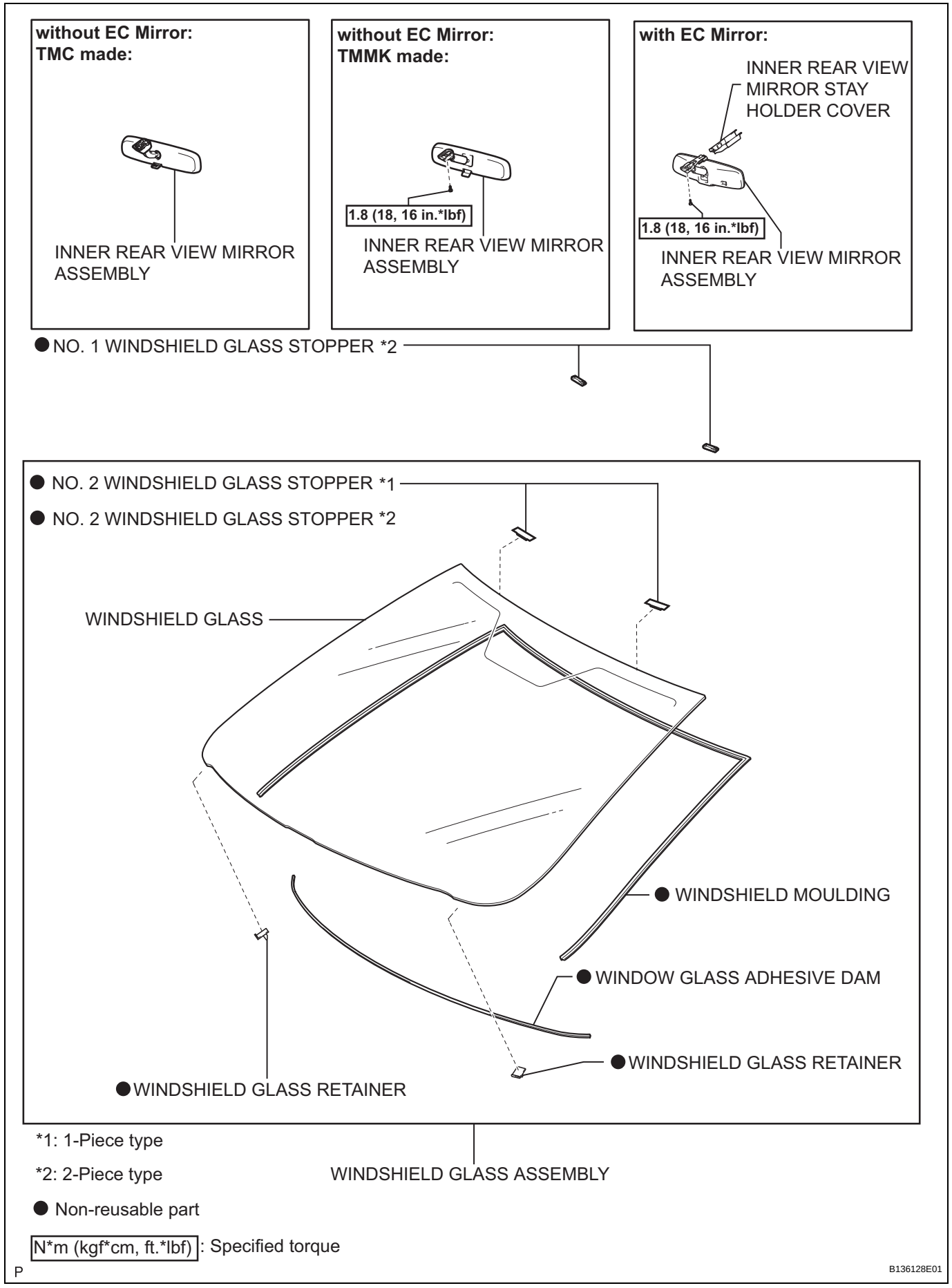
24. **INITIALIZE POWER WINDOW CONTROL SYSTEM** (See page WS-8)

WINDSHIELD GLASS

COMPONENTS



WS



*1: 1-Piece type

*2: 2-Piece type

● Non-reusable part

N*m (kgf*cm, ft.*lbf) : Specified torque

P

B136128E01

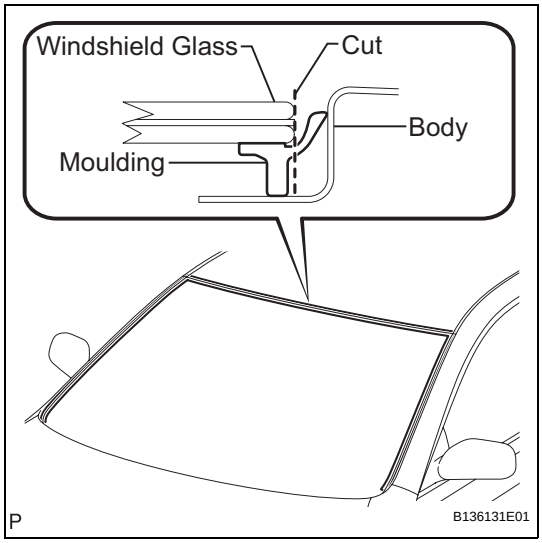
REMOVAL

1. **DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL**
2. **REMOVE FRONT WIPER ARM AND BLADE ASSEMBLY LH (See page WW-9)**
3. **REMOVE FRONT WIPER ARM AND BLADE ASSEMBLY RH (See page WW-9)**
4. **REMOVE FRONT FENDER TO COWL SIDE SEAL LH (See page WW-9)**
5. **REMOVE FRONT FENDER TO COWL SIDE SEAL RH (See page WW-9)**
6. **REMOVE COWL TOP VENTILATOR LOUVER SUB-ASSEMBLY (See page WW-10)**
7. **REMOVE INNER REAR VIEW MIRROR ASSEMBLY (for TMC Made without EC Mirror) (See page MI-11)**
8. **REMOVE INNER REAR VIEW MIRROR ASSEMBLY (for TMMK Made without EC Mirror) (See page MI-11)**
9. **REMOVE INNER REAR VIEW MIRROR STAY HOLDER COVER (w/ EC Mirror) (See page MI-11)**
10. **REMOVE INNER REAR VIEW MIRROR ASSEMBLY (w/ EC Mirror) (See page MI-12)**
11. **REMOVE FRONT DOOR OPENING TRIM WEATHERSTRIP LH**
12. **REMOVE FRONT DOOR OPENING TRIM WEATHERSTRIP RH**
13. **REMOVE FRONT PILLAR GARNISH LH (See page IR-27)**
14. **REMOVE FRONT PILLAR GARNISH RH (See page IR-27)**
15. **REMOVE ROOF CONSOLE BOX ASSEMBLY (See page IR-28)**
16. **REMOVE VISOR ASSEMBLY LH (See page IR-28)**
17. **REMOVE VISOR ASSEMBLY RH (See page IR-29)**
18. **REMOVE VISOR HOLDER (See page IR-29)**
19. **REMOVE FRONT ASSIST GRIP SUB-ASSEMBLY (See page IR-29)**
20. **REMOVE ROOF HEADLINING ASSEMBLY (w/o Sliding Roof)**
    It is not necessary to completely remove the roof headlining assembly. Slightly lower the front section of the roof headlining assembly so that the windshield glass can be removed (See page IR-31).

WS

21. REMOVE ROOF HEADLINING ASSEMBLY (w/ Sliding Roof)

It is not necessary to completely remove the roof headlining assembly. Slightly lower the front section of the roof headlining assembly so that the windshield glass can be removed (See page IR-32).



22. REMOVE WINDSHIELD MOULDING

(a) Using a knife, cut off the moulding, as shown in the illustration.

NOTICE:

- **Do not damage the vehicle body with the knife.**
- **If the vehicle body is damaged, repair the damaged portion by applying an anti-rust coating after removing the windshield glass.**

(b) Remove the remaining moulding from the windshield glass.

HINT:

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

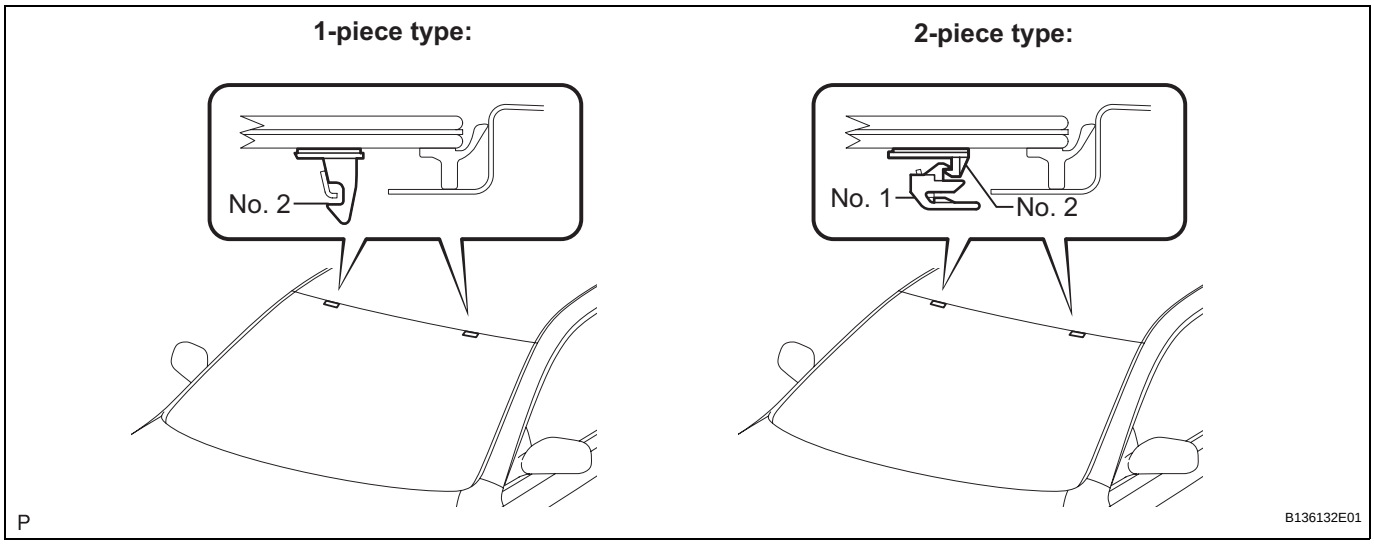
23. REMOVE WINDSHIELD GLASS ASSEMBLY

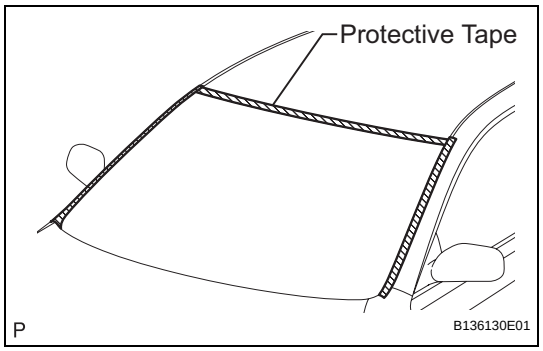
NOTICE:

- **There are No. 1 and No. 2 stoppers on the windshield glass as shown in the illustration. Be careful not to damage the windshield glass when cutting off the adhesive.**
- **To prevent the windshield glass from dropping when performing this operation, be sure to hold the windshield glass using suction cups.**

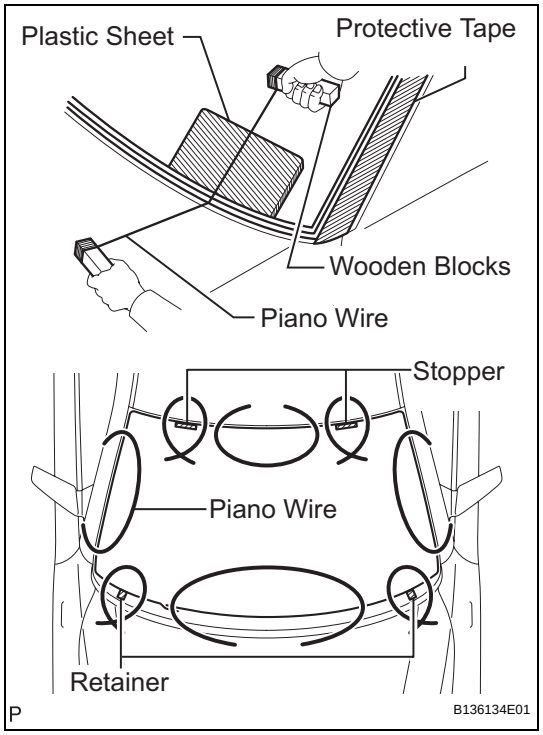
HINT:

Depending on vehicles, a 1-piece or 2-piece type stopper is used.

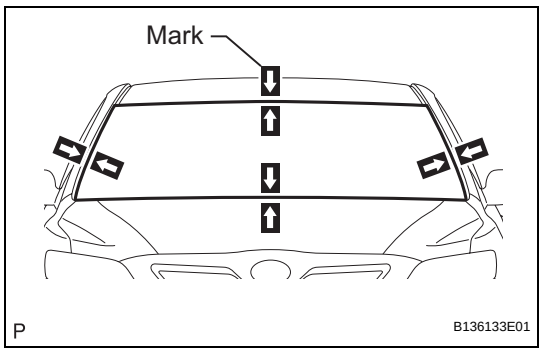




(a) Apply protective tape to the installation position of the windshield glass assembly on the vehicle body.
HINT:
Apply protective tape to the installation surface to prevent it from being scratched.



(b) Pass a piano wire between the vehicle body and glass from the interior.
(c) Tie both wire ends to wooden blocks or similar objects.
(d) Cut off the adhesive by pulling the piano wire around the windshield glass.
NOTICE:
- **When separating the windshield glass, take care not to damage the paint or the interior and exterior ornaments.**
- **To prevent the safety pad from being scratched when removing the windshield glass, place a plastic sheet between the piano wire and safety pad.**



(e) Place matchmarks on the windshield glass and vehicle body on the locations indicated in the illustration.
HINT:
Matchmarks do not need to be placed if the windshield glass is not going to be reused.
(f) Using a suction cup, remove the windshield glass assembly.
NOTICE:
- **Be careful not to drop the windshield glass.**
- **Leave as much adhesive on the vehicle body as possible when removing the windshield glass.**

24. REMOVE WINDOW GLASS ADHESIVE DAM

(a) Using a scraper, remove the adhesive dam.
NOTICE:
- **Be careful not to damage the windshield glass.**
- **Be sure to replace the adhesive dam with a new one.**

25. REMOVE NO. 2 WINDSHIELD GLASS STOPPER

(a) Using a scraper, remove the 2 No. 2 stoppers.

NOTICE:

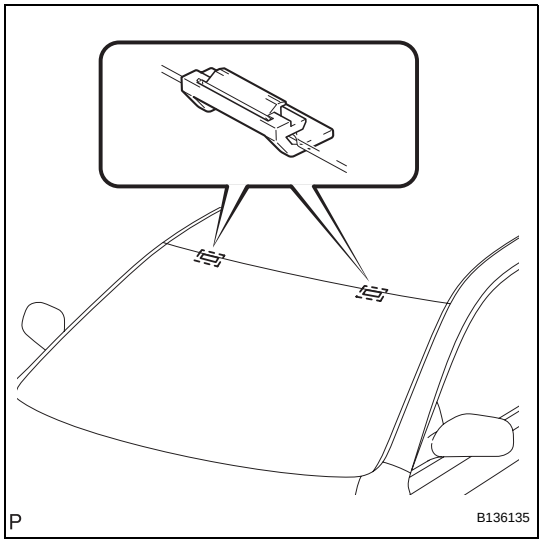
- **Be careful not to damage the windshield glass.**
- **Be sure to replace the No. 2 stoppers with new ones.**

26. REMOVE WINDSHIELD GLASS RETAINER

(a) Using a scraper, remove the 2 retainers.

NOTICE:

- **Be careful not to damage the windshield glass.**
- **Be sure to replace the retainer with a new one.**

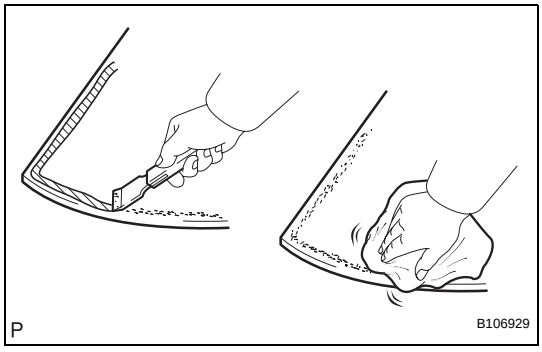


27. REMOVE NO. 1 WINDSHIELD GLASS STOPPER (for 2 Piece Type)

(a) Remove the 2 No. 1 stoppers.

NOTICE:

Be sure to replace the No. 1 stoppers with new ones.



28. CLEAN WINDSHIELD GLASS

(a) Using a scraper, remove the adhesive tape and adhesive sticking to the windshield glass.

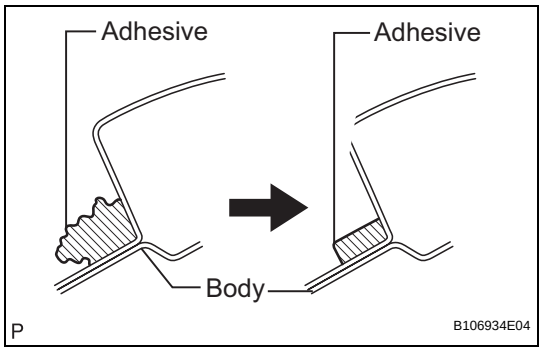
NOTICE:

Be careful not to damage the windshield glass.

(b) Clean the outer circumference of the windshield glass with a non-residue solvent.

NOTICE:

- **Do not touch the windshield glass surface after cleaning it.**
- **Even if using a new windshield glass, clean the windshield glass with a non-residue solvent.**



29. CLEAN VEHICLE BODY

(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.

NOTICE:

Be careful not to damage the vehicle body.

HINT:

Leave as much adhesive on the vehicle body as possible.

(2) Clean the contact surface of the vehicle body with a piece of cloth saturated with cleaner.

HINT:

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

WS

INSTALLATION

1. INSTALL NO. 2 WINDSHIELD GLASS STOPPER

(a) Using a brush or sponge, coat the application area of the No. 2 stoppers with Primer G.

NOTICE:

- **Do not apply too much primer.**
- **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 piece of cloth before it dries.

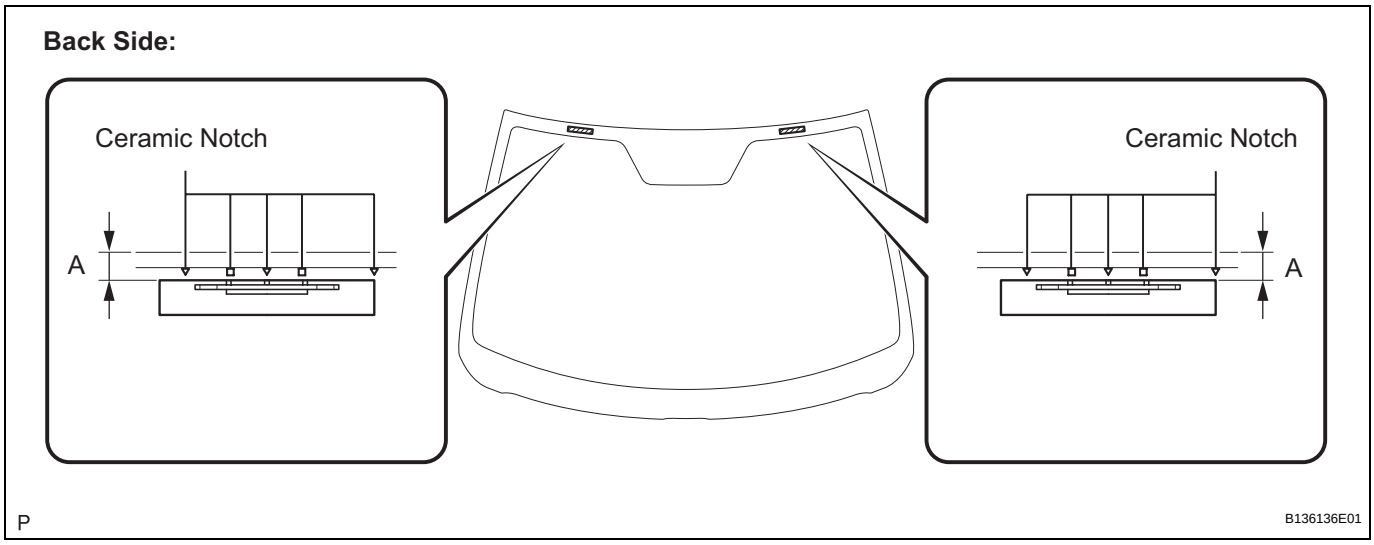
(b) Install 2 new No. 2 stoppers onto the windshield glass, as shown in the illustration.

HINT:

Only 2-piece type No. 1 stoppers are supplied. Use the 2-piece type stoppers even if a 1-piece type was used.

Standard dimension

Area	Dimension
A	13.2 mm (0.519 in.)



2. INSTALL WINDSHIELD GLASS RETAINER

(a) Using a brush or sponge, coat the application area of the retainers with Primer G.

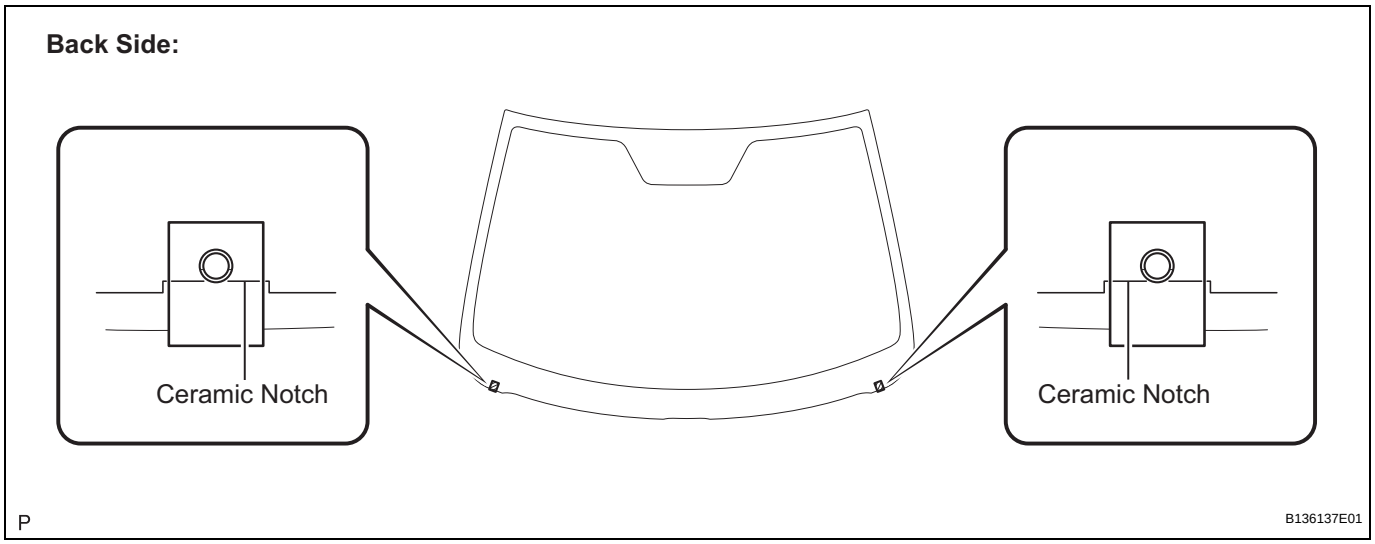
NOTICE:

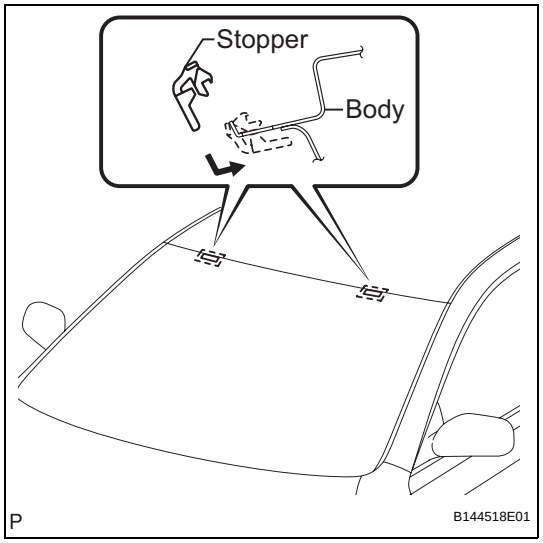
- **Do not apply too much primer.**
- **Allow the primer coating to dry for 3 minutes or more.**
- **Do not keep any of the opened Primer G for later use.**

HINT:

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

(b) Install 2 new retainers onto the windshield glass, as shown in the illustration.





3. INSTALL NO. 1 WINDSHIELD GLASS STOPPER

(a) Install 2 new No. 1 stoppers to the vehicle body, as shown in the illustration.

HINT:

Only 2-piece type No. 1 stoppers are supplied. Use the 2-piece type stoppers even if a 1-piece type was used.

4. INSTALL WINDSHIELD MOULDING

(a) Using a brush or sponge, coat the application area of moulding with Primer G.

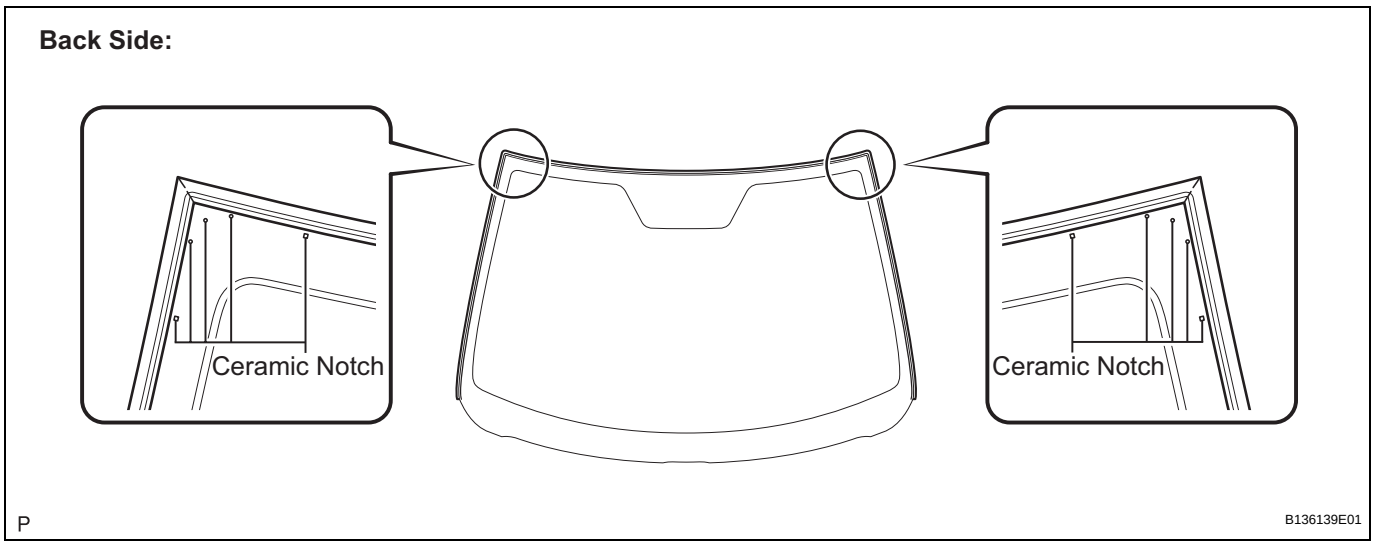
NOTICE:

- **Do not apply too much primer.**
- **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 piece of cloth before it dries.

(b) Install a new moulding, as shown in the illustration.



5. INSTALL WINDOW GLASS ADHESIVE DAM

(a) Using a brush or sponge, coat the application area of adhesive dam with Primer G.

NOTICE:

- **Do not apply too much primer.**
- **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 piece of cloth before it dries.

(b) Install a new adhesive dam onto the windshield glass, as shown in the illustration.

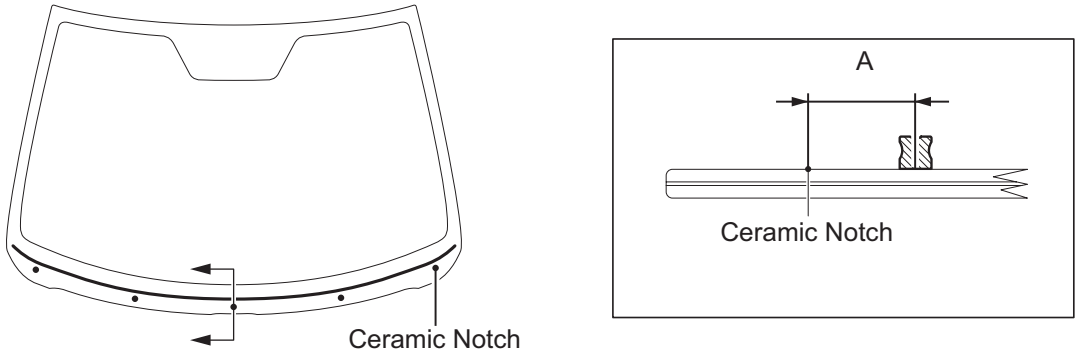
NOTICE:

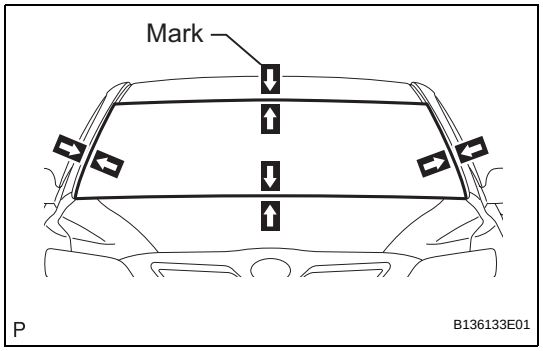
Install the new adhesive dam along the ceramic notches.

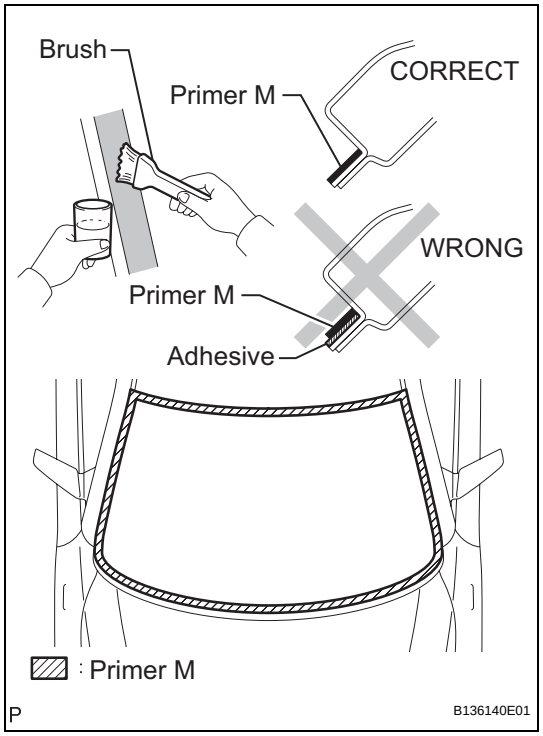
Standard dimension

Area	Dimension
A	6.5 mm (0.255 in.)

Back Side:







6. INSTALL WINDSHIELD GLASS ASSEMBLY

(a) Position the windshield glass assembly.
  (1) Using a suction cup, place the windshield glass assembly in the correct position.
  (2) Check that the whole contact surface of the windshield glass rim is perfectly even.
  (3) Align the matchmarks on the windshield glass and vehicle body.
  NOTICE:
  Check that the windshield glass stoppers are attached to the vehicle body correctly.
  (4) Remove the windshield glass assembly.

(b) Using a brush, coat the installation surface on the vehicle body with Primer M.
NOTICE:
- **Do not coat the adhesive with Primer M.**
- **Do not apply too much primer.**
- **Allow the primer coating to dry for 3 minutes or more.**
- **Do not keep any of the opened Primer M for later use.**

HINT:
If an area other than that specified is coated by accident, wipe off the primer with a clean piece of cloth before it dries.

(c) Using a brush or sponge, coat the application area of adhesive with Primer G.
NOTICE:
- **Do not apply too much primer.**
- **Allow the primer coating to dry for 3 minutes or more.**
- **Do not keep any of the opened Primer G for later use.**

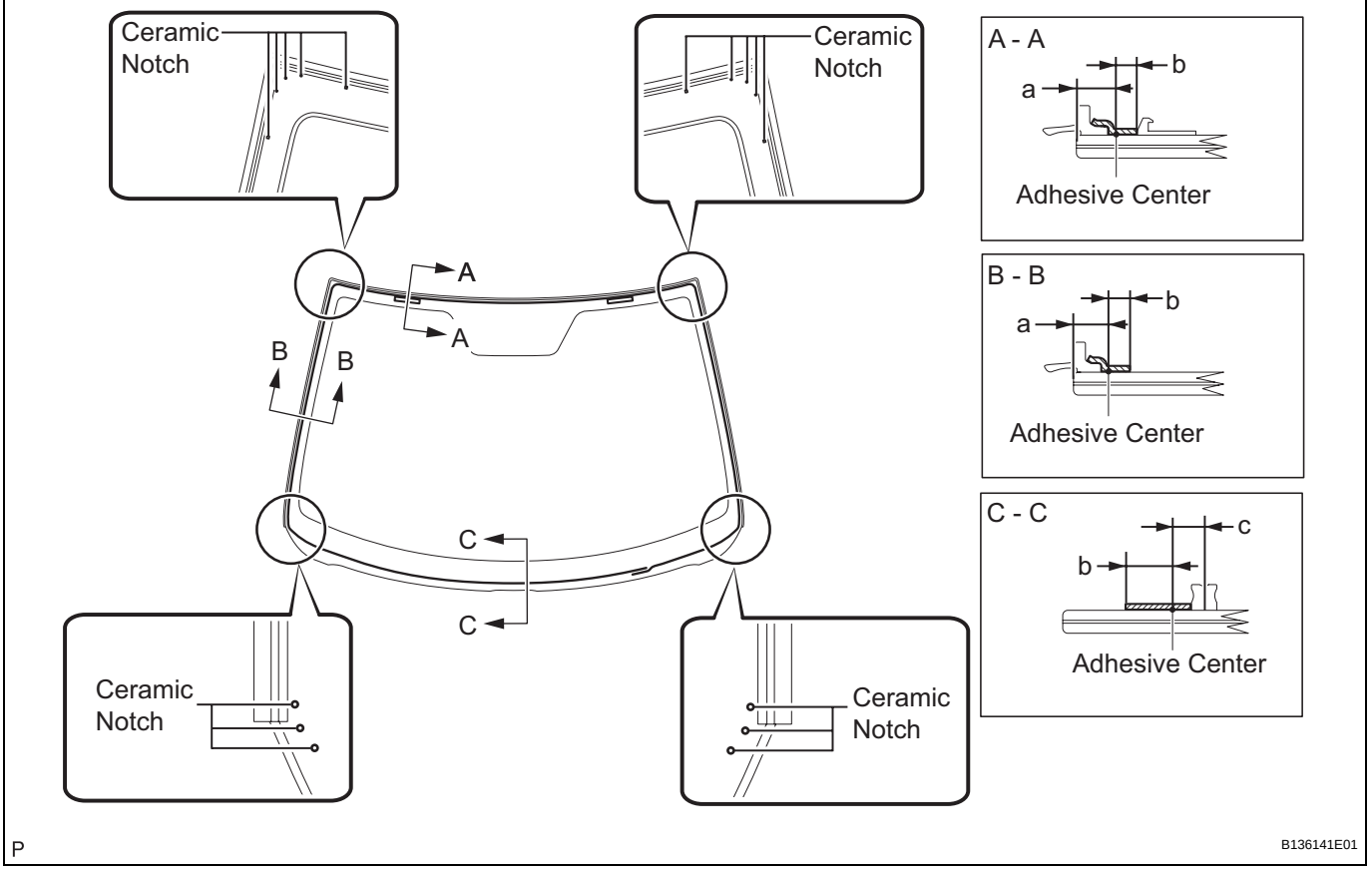
HINT:
- Apply Primer G onto the ceramic notches.
- If an area other than that specified is coated by accident, wipe off the primer with a clean piece of cloth before it dries.

Standard dimension

Area	Dimension
a	8.7 mm (0.342 in.)
b	7.0 mm (0.275 in.)
c	6.5 mm (0.255 in.)

WS

Back Side:



(d) Apply adhesive (Adhesive: TOYOTA genuine windshield glass adhesive or equivalent).

(1) Cut off the tip of the cartridge nozzle, as shown in the illustration.

HINT:

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

Usage time frame

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

(2) Load the sealer gun with cartridge.

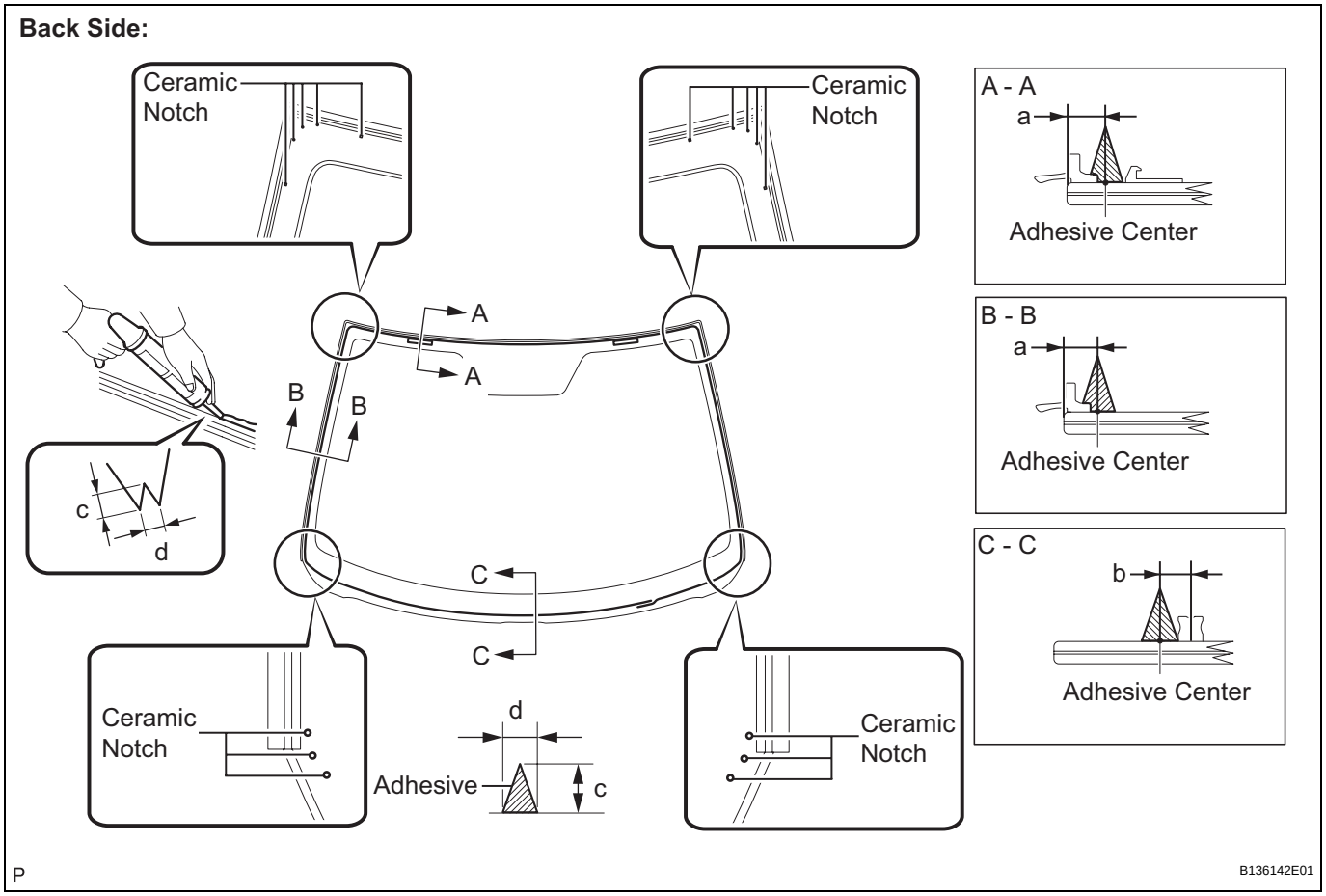
(3) Apply adhesive to the windshield glass, as shown in the illustration.

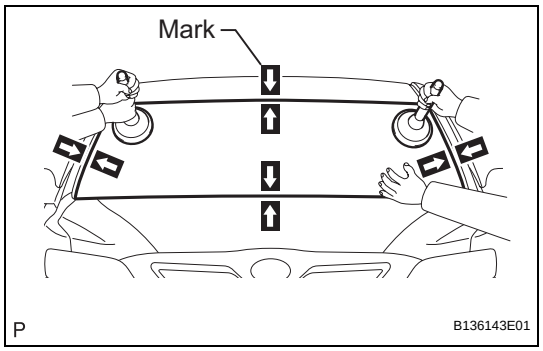
HINT:

Apply adhesive onto the ceramic notches.

Standard dimension

Area	Dimension
a	8.7 mm (0.342 in.)
b	6.5 mm (0.255 in.)
c	12.0 mm (0.472 in.)
d	8.0 mm (0.315 in.)





(e) Install the windshield glass assembly.

(1) Using a suction cup, position the windshield glass so that the matchmarks are aligned, and press it in gently along the rim.

NOTICE:

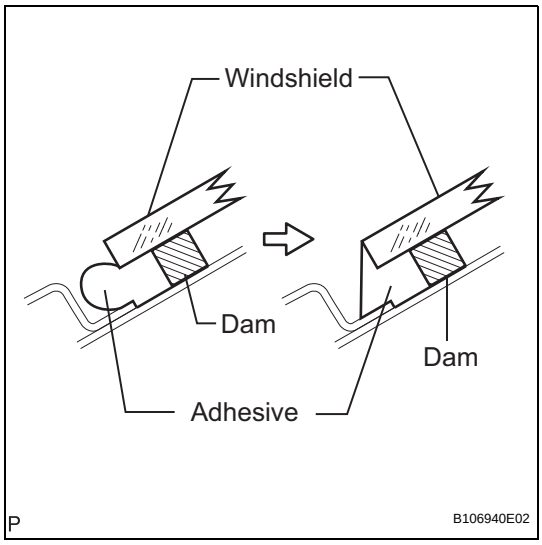
- **Check that the windshield glass stoppers are attached to the vehicle body correctly.**
- **Check the clearance between the vehicle body and windshield glass.**

(2) Lightly press the front surface of the windshield glass to ensure a close fit.

HINT:

Press the glass with force of 98 N (10 kgf, 22 lb) or more.

WS



(3) If necessary, use a scraper to correct the level or position of adhesive that has been applied.
HINT:
Apply adhesive onto the windshield glass rim.

(4) Hold the windshield glass using protective tape until the applied adhesive becomes hard.
NOTICE:
Do not drive the vehicle for the time described in the table below.
Minimum time

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

7. CHECK FOR LEAKS AND REPAIR

(a) After the adhesive has hardened, apply water from the outside of the vehicle. Check that no water leaks into the cabin.

(b) If water leaks into the cabin, allow the water to dry and add adhesive.

(c) Remove the protective tape.

8. INSTALL ROOF HEADLINING ASSEMBLY (w/o Sliding Roof) (See page IR-45)

9. INSTALL ROOF HEADLINING ASSEMBLY (w/ Sliding Roof) (See page IR-46)

10. INSTALL FRONT ASSIST GRIP SUB-ASSEMBLY (See page IR-49)

11. INSTALL VISOR HOLDER (See page IR-49)

12. INSTALL VISOR ASSEMBLY LH (See page IR-50)

13. INSTALL VISOR ASSEMBLY RH (See page IR-50)

14. INSTALL ROOF CONSOLE BOX ASSEMBLY (See page IR-50)

15. INSTALL FRONT PILLAR GARNISH LH (See page IR-51)

16. INSTALL FRONT PILLAR GARNISH RH (See page IR-52)

17. INSTALL FRONT DOOR OPENING TRIM WEATHERSTRIP LH (See page IR-54)

18. INSTALL FRONT DOOR OPENING TRIM WEATHERSTRIP RH (See page IR-55)

19. INSTALL INNER REAR VIEW MIRROR ASSEMBLY (for TMC Made without EC Mirror) (See page MI-13)

20. INSTALL INNER REAR VIEW MIRROR ASSEMBLY (for TMMK Made without EC Mirror) (See page MI-13)

21. INSTALL INNER REAR VIEW MIRROR ASSEMBLY (w/ EC Mirror) (See page MI-13)

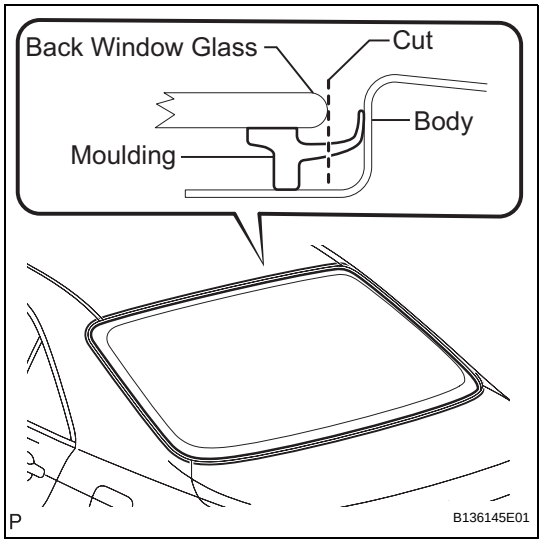
22. **INSTALL INNER REAR VIEW MIRROR STAY HOLDER COVER (w/ EC Mirror) (See page MI-14)**
23. **INSTALL COWL TOP VENTILATOR LOUVER SUB-ASSEMBLY (See page WW-15)**
24. **INSTALL FRONT FENDER TO COWL SIDE SEAL RH (See page WW-15)**
25. **INSTALL FRONT FENDER TO COWL SIDE SEAL LH (See page WW-15)**
26. **CONNECT CABLE TO NEGATIVE BATTERY TERMINAL**
27. **INSTALL FRONT WIPER ARM AND BLADE ASSEMBLY LH (See page WW-15)**
28. **INSTALL FRONT WIPER ARM AND BLADE ASSEMBLY RH (See page WW-16)**
29. **INSPECT SRS WARNING LIGHT**
    (See page RS-32)

WS

REMOVAL

1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL
2. REMOVE REAR SEAT CUSHION ASSEMBLY
3. REMOVE REAR SEAT HEADREST ASSEMBLY
4. REMOVE REAR CENTER SEAT HEADREST ASSEMBLY
5. REMOVE REAR SEAT BACK ASSEMBLY (for Fixed Seat Type) (See page SE-77)
6. REMOVE SEPARATE TYPE REAR SEAT BACK ASSEMBLY LH (for Fold Down Seat Type) (See page SE-47)
7. REMOVE SEPARATE TYPE REAR SEAT BACK ASSEMBLY RH (for Fold Down Seat Type) (See page SE-47)
8. REMOVE REAR SIDE SEAT BACK ASSEMBLY LH (for Fold Down Seat Type) (See page SE-48)
9. REMOVE REAR SIDE SEAT BACK ASSEMBLY RH (for Fold Down Seat Type) (See page SE-48)
10. REMOVE REAR SEAT BACK COVER (for Reclining Seat Type) (See page SE-63)
11. REMOVE SEPARATE TYPE REAR SEAT BACK ASSEMBLY LH (for Reclining Seat Type) (See page SE-63)
12. REMOVE SEPARATE TYPE REAR SEAT BACK ASSEMBLY RH (for Reclining Seat Type) (See page SE-64)
13. REMOVE CENTER SEAT BACK ASSEMBLY (for Reclining Seat Type) (See page SE-64)
14. REMOVE REAR DOOR SCUFF PLATE LH (See page IR-24)
15. REMOVE REAR DOOR OPENING TRIM WEATHERSTRIP LH
16. REMOVE REAR DOOR SCUFF PLATE RH (See page IR-24)
17. REMOVE REAR DOOR OPENING TRIM WEATHERSTRIP RH
18. REMOVE RECLINING REMOTE CONTROL LEVER SUB-ASSEMBLY LH (for Reclining Seat Type) (See page SE-68)
19. REMOVE RECLINING REMOTE CONTROL LEVER SUB-ASSEMBLY RH (for Reclining Seat Type)
20. REMOVE ROOF SIDE INNER GARNISH LH (See page IR-26)

21. **REMOVE ROOF SIDE INNER GARNISH RH (See page IR-26)**
22. **REMOVE CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSEMBLY LH (See page SB-66)**
23. **DISCONNECT REAR SEAT INNER WITH CENTER BELT ASSEMBLY LH (for TMC Made) (See page SB-35)**
24. **DISCONNECT REAR SEAT INNER WITH CENTER BELT ASSEMBLY LH (for TMMK Made) (See page SB-35)**
25. **DISCONNECT REAR SEAT OUTER BELT ASSEMBLY (for LH Side) (See page SB-50)**
26. **DISCONNECT REAR SEAT OUTER BELT ASSEMBLY (for RH Side) (See page SB-50)**
27. **REMOVE REAR SEAT SHOULDER BELT COVER (See page SB-36)**
28. **REMOVE REAR SEAT SHOULDER BELT HOLE COVER (See page SB-36)**
29. **REMOVE PACKAGE TRAY TRIM PANEL ASSEMBLY (See page SB-37)**
30. **REMOVE PACKAGE TRAY TRIM PANEL ASSEMBLY (for Reclining Seat Type) (See page SB-37)**
31. **REMOVE REAR ASSIST GRIP SUB-ASSEMBLY (See page IR-29)**
32. **REMOVE SPOT LIGHT ASSEMBLY (w/ Sliding Roof) (See page IR-30)**
33. **REMOVE SUNSHADE TRIM HOLDER (w/ Rear Sunshade) (See page IR-31)**
34. **REMOVE ROOF HEADLINING ASSEMBLY (w/o Sliding Roof)**
    It is not necessary to completely remove the roof headlining. Slightly lower the rear section of the roof headlining so that the back window glass can be removed (See page IR-31).
35. **REMOVE ROOF HEADLINING ASSEMBLY (w/ Sliding Roof)**
    It is not necessary to completely remove the roof headlining. Slightly lower the rear section of the roof headlining so that the back window glass can be removed (See page IR-32).



36. REMOVE BACK WINDOW MOULDING

(a) Using a knife, cut off the moulding, as shown in the illustration.

NOTICE:

- **Do not damage the vehicle body with the knife.**
- **If the vehicle body is damaged, repair the damaged portion by applying an anti-rust coating after removing the back window glass assembly.**

(b) Remove the remaining moulding from the back window glass.

HINT:

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

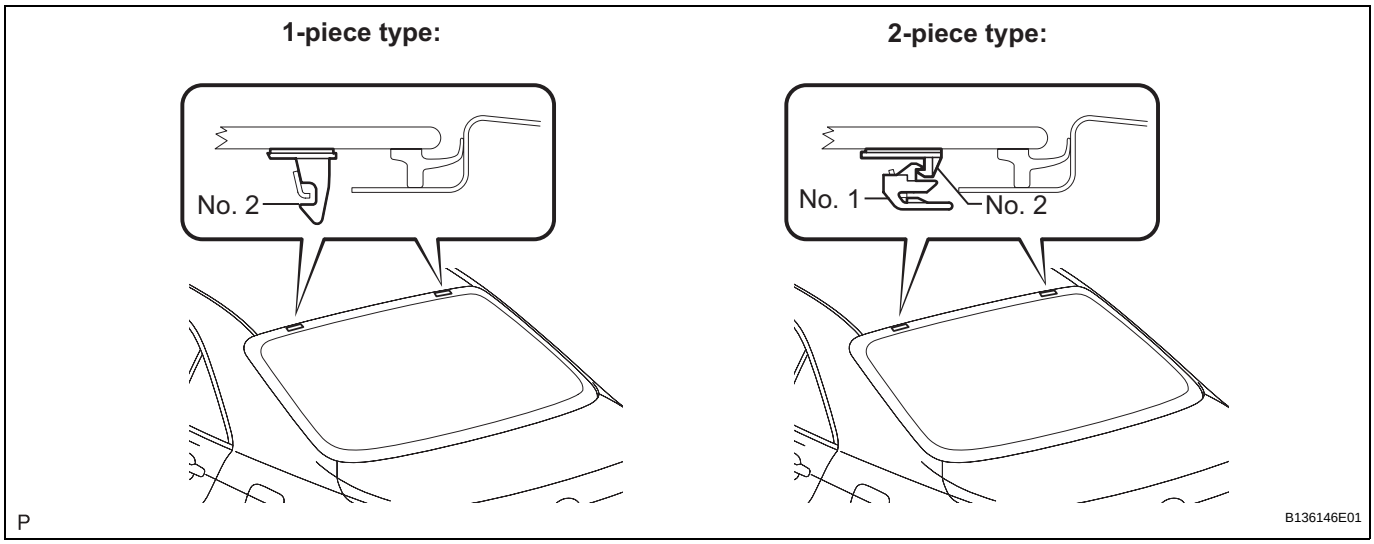
37. REMOVE BACK WINDOW GLASS ASSEMBLY

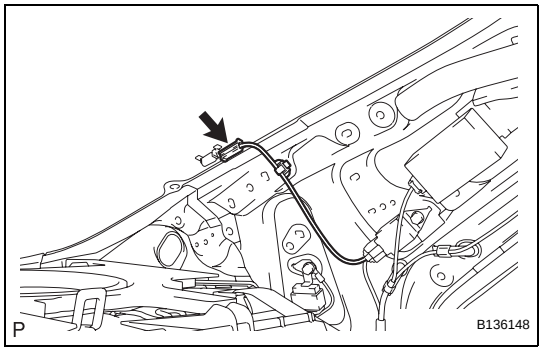
NOTICE:

- **There are No. 1 and No. 2 stoppers on the back window glass as shown in the illustration. Be careful not to damage the back window glass when cutting off the adhesive.**
- **To prevent the back window glass from dropping when performing this operation, be sure to hold the back window glass using suction cups.**

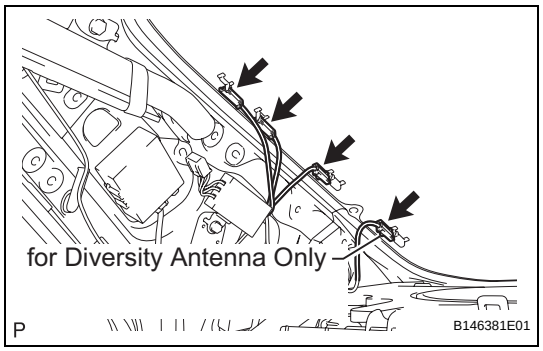
HINT:

Depending on vehicles, a 1-piece or 2-piece type stopper is used.

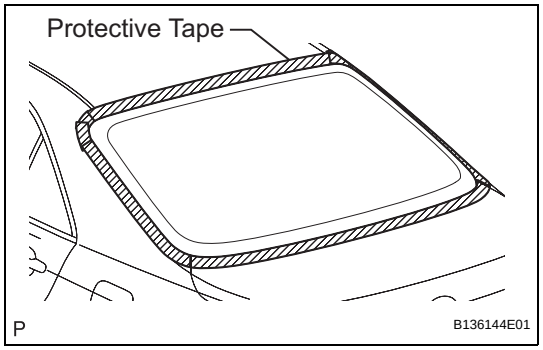




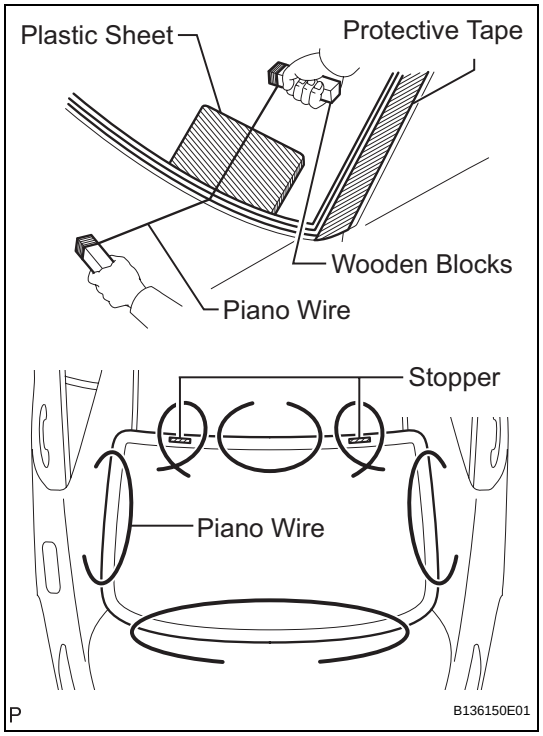
(a) Disconnect the connector.



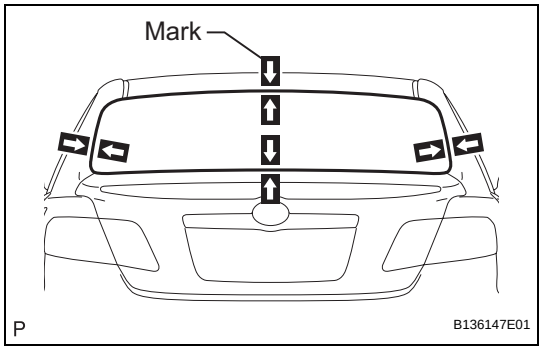
(b) Disconnect the connectors.



(c) Apply protective tape to the installation position of the back window glass assembly on the vehicle body.
HINT:
Apply protective tape to the installation surface to prevent it from being scratched.



(d) Pass a piano wire between the vehicle body and glass from the interior.
(e) Tie both wire ends to wooden blocks or similar objects.
(f) Cut off the adhesive by pulling the piano wire around the back window glass.
NOTICE:
- **When separating the back window glass, take care not to damage the paint or the interior and exterior ornaments.**
- **To prevent the package tray trim panel from being scratched when removing the back window glass, place a plastic sheet between the piano wire and package tray trim panel.**



(g) Place matchmarks on the back window glass and vehicle body on the locations indicated in the illustration.
HINT:
Matchmarks do not need to be placed if the back window glass is not going to be reused.
(h) Using a suction cup, remove the back window glass assembly.
NOTICE:
- **Be careful not to drop the back window glass.**

WS

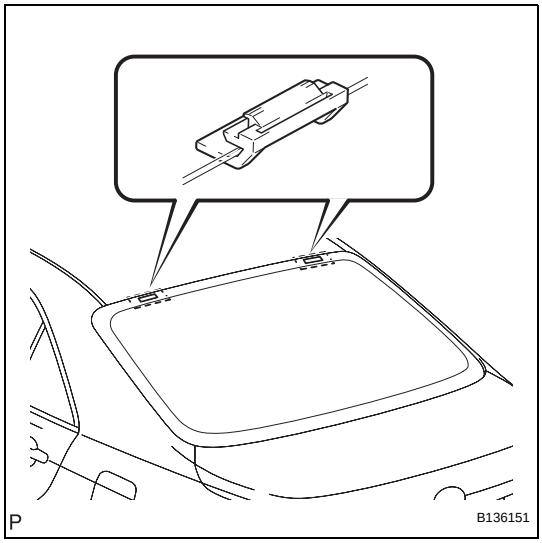
- **Leave as much adhesive on the vehicle body as possible when removing the back window glass.**

38. REMOVE NO. 2 BACK WINDOW GLASS STOPPER

(a) Using a scraper, remove the 2 No. 2 stoppers.

NOTICE:

- **Be careful not to damage the back window glass.**
- **Be sure to replace the No. 2 stoppers with new ones.**

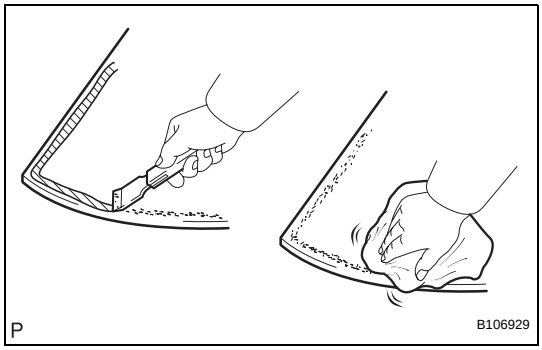


39. REMOVE NO. 1 BACK WINDOW GLASS STOPPER (for 2 Piece Type)

(a) Using a scraper, remove the 2 No. 1 stoppers.

NOTICE:

Be sure to replace the No. 1 stoppers with new ones.



40. CLEAN BACK WINDOW GLASS

(a) Using a scraper, remove the adhesive tape and adhesive sticking to the back window glass.

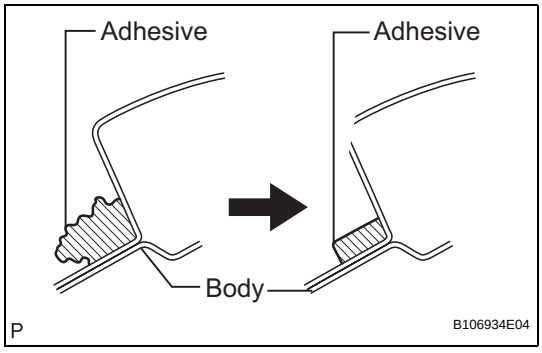
NOTICE:

Be careful not to damage the windshield glass.

(b) Clean the outer circumference of the back window glass with a non-residue solvent.

NOTICE:

- **Do not touch the back window glass surface after cleaning it.**
- **Even if using a new back window glass, clean the back window glass with a non-residue solvent.**



41. CLEAN VEHICLE BODY

(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.

NOTICE:

Be careful not to damage the vehicle body.

HINT:

Leave as much adhesive on the vehicle body as possible.

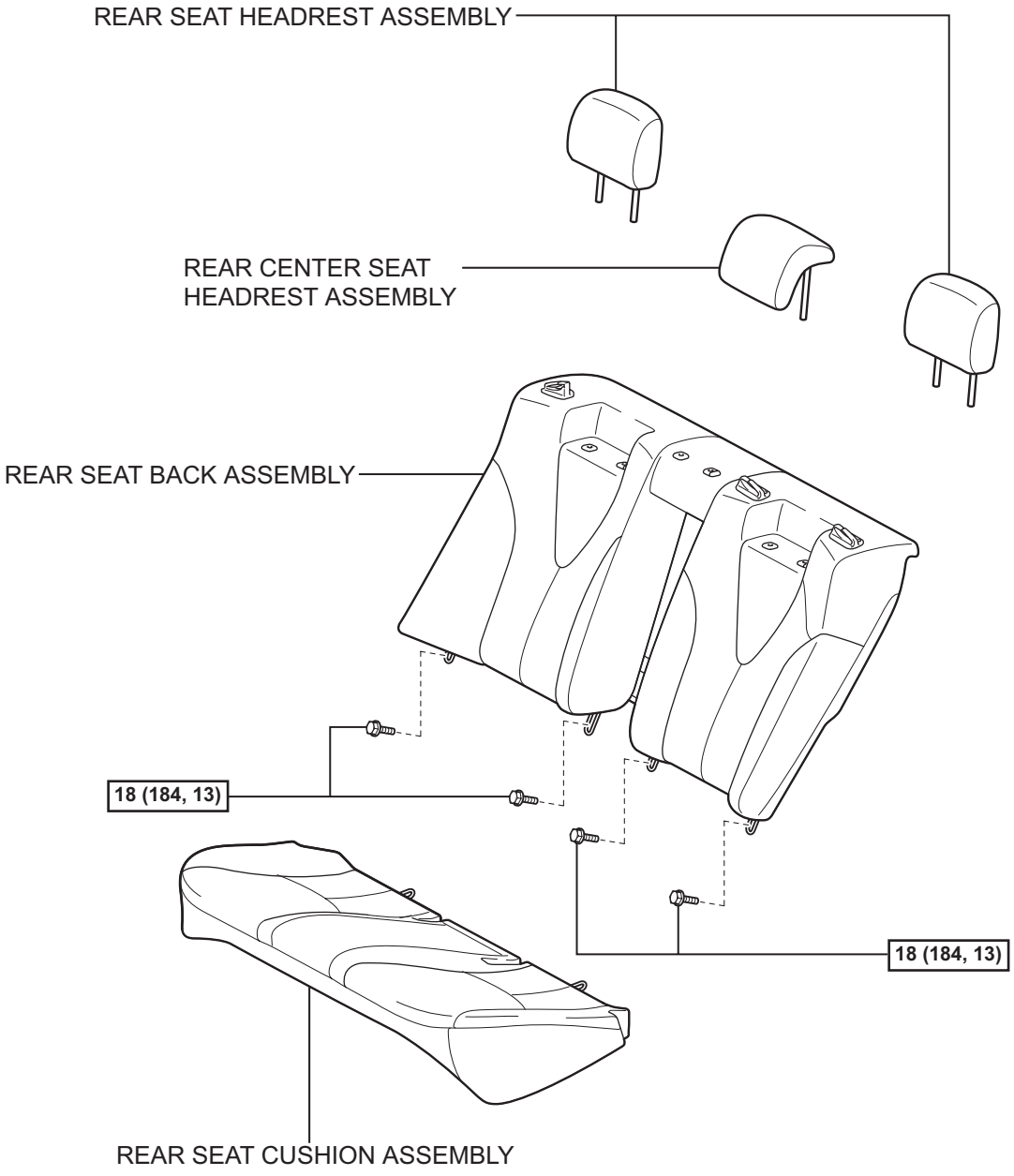
(2) Clean the contact surface of the vehicle body with a piece of cloth saturated with cleaner.
HINT:
Even if all the adhesive has been removed, clean the vehicle body.

BACK WINDOW GLASS

COMPONENTS

WS

for Fixed Seat Type:

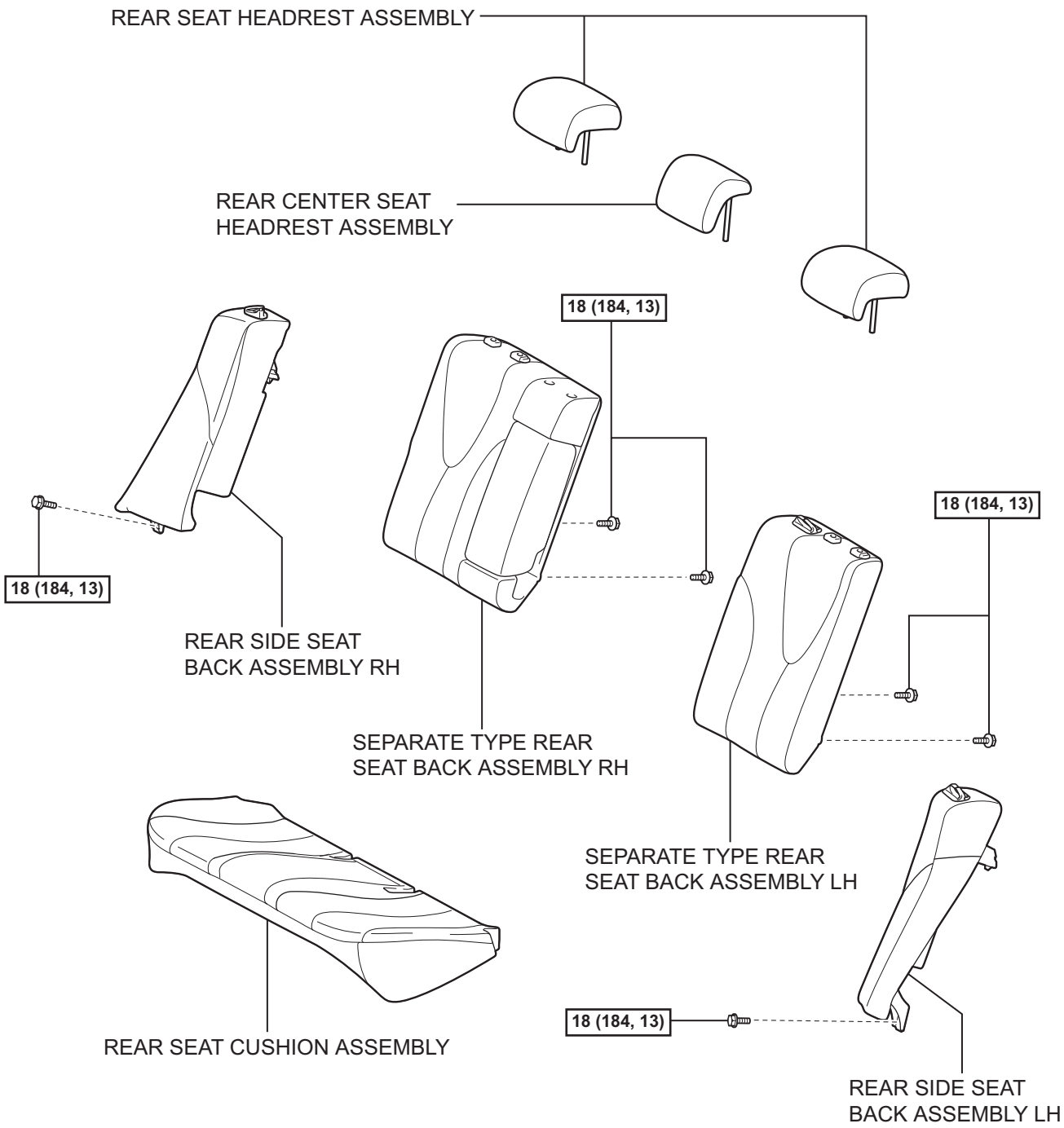


N*m (kgf*cm, ft.*lbf): Specified torque

P

B136589E02

for Fold Down Seat Type:



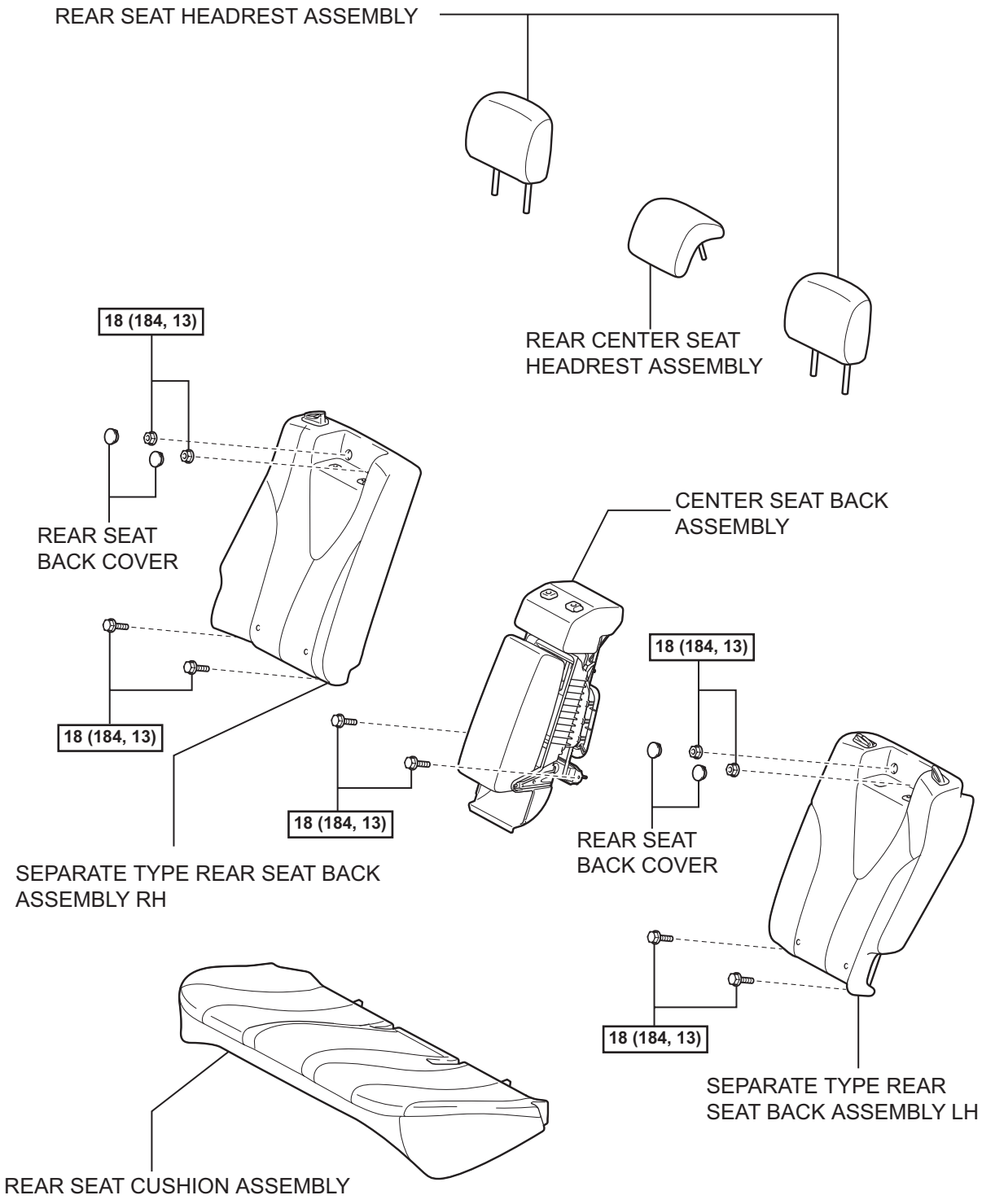
N*m (kgf*cm, ft.*lbf): Specified torque

P

B136564E02

WS

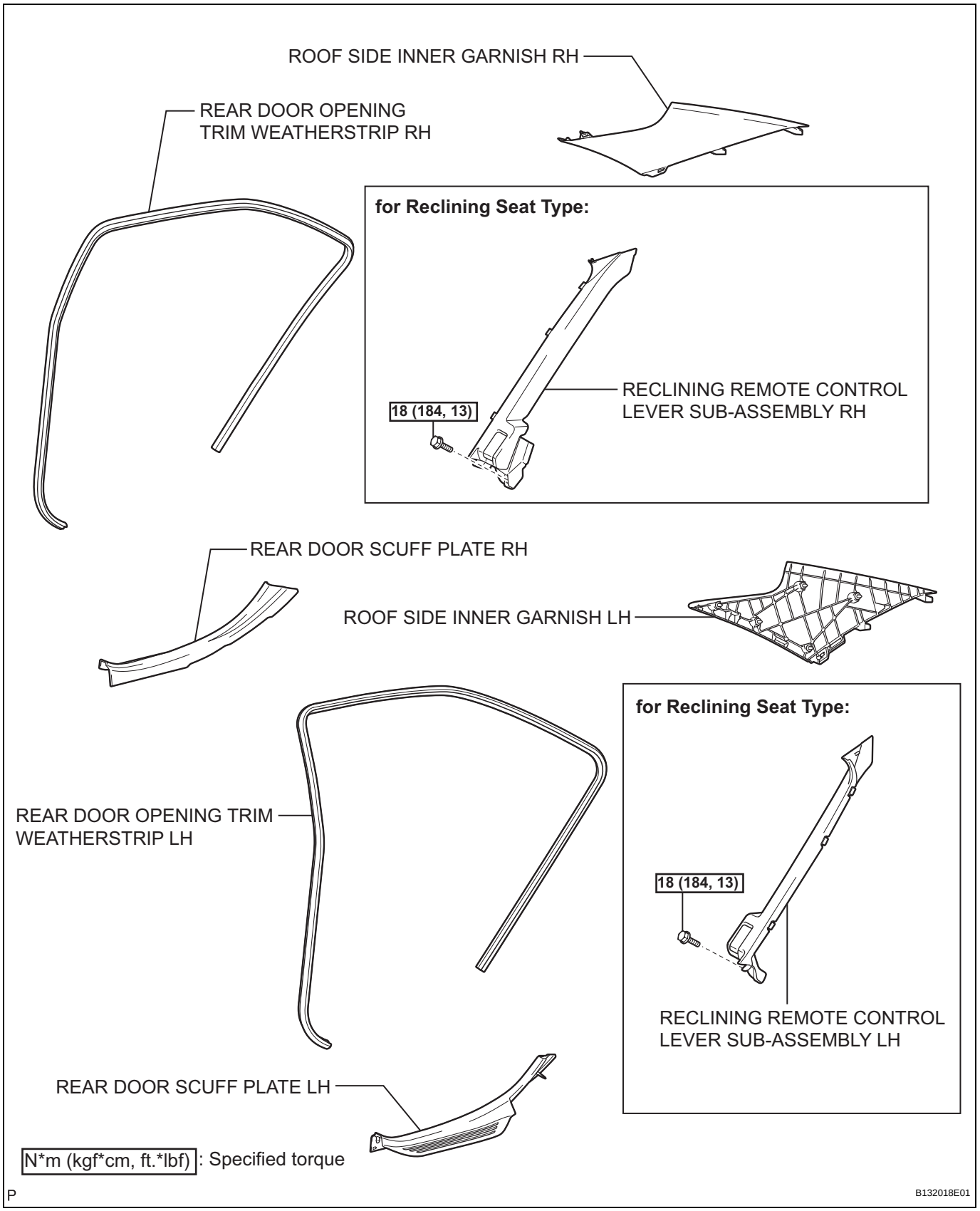
for Reclining Seat Type:



N*m (kgf*cm, ft.*lbf): Specified torque

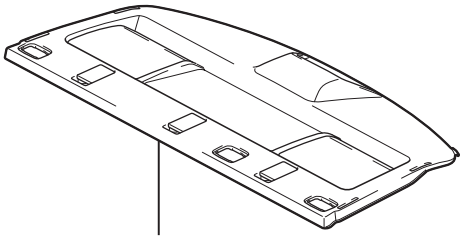
P

B139095E03


ROOF SIDE INNER GARNISH RH
REAR DOOR OPENING TRIM WEATHERSTRIP RH
for Reclining Seat Type:
18 (184, 13)
RECLINING REMOTE CONTROL LEVER SUB-ASSEMBLY RH
REAR DOOR SCUFF PLATE RH
ROOF SIDE INNER GARNISH LH
REAR DOOR OPENING TRIM WEATHERSTRIP LH
for Reclining Seat Type:
18 (184, 13)
RECLINING REMOTE CONTROL LEVER SUB-ASSEMBLY LH
REAR DOOR SCUFF PLATE LH
N*m (kgf*cm, ft.*lbf): Specified torque
P
B132018E01

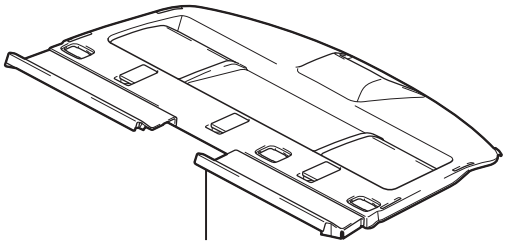
WS

for TMC made:

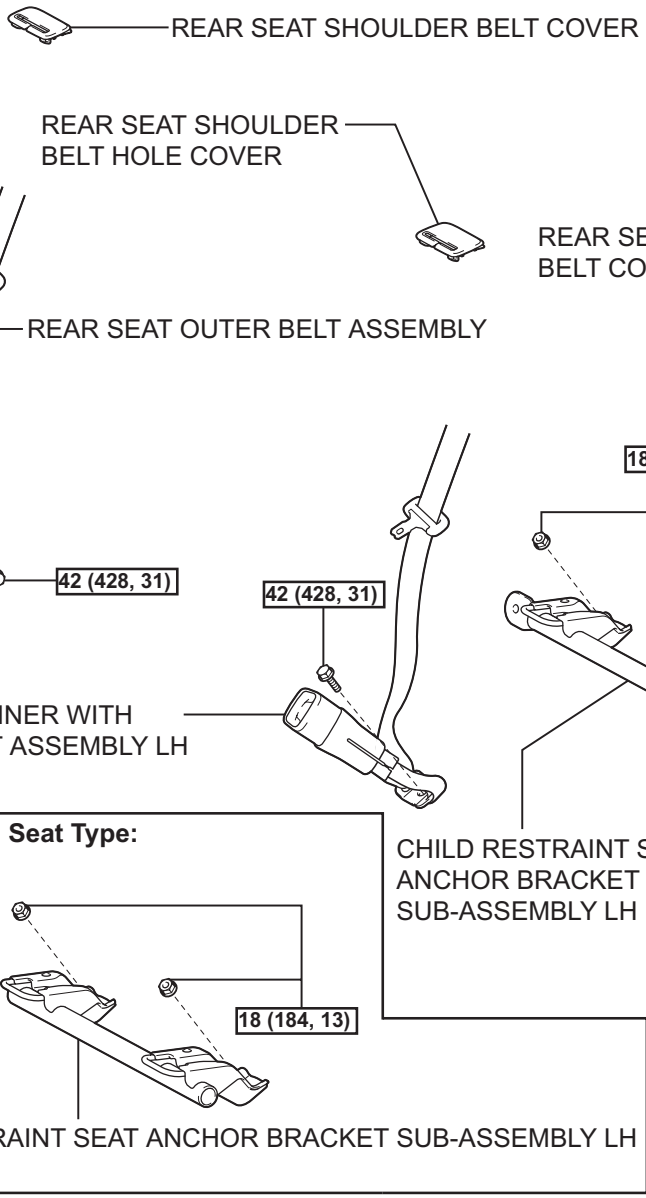


PACKAGE TRAY TRIM PANEL ASSEMBLY

for Reclining Seat Type:



PACKAGE TRAY TRIM PANEL ASSEMBLY

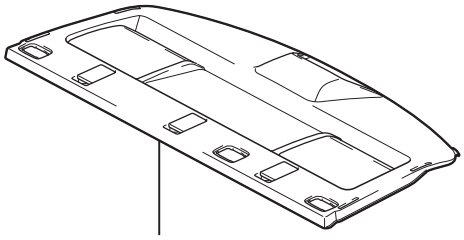


N*m (kgf*cm, ft.*lbf) : Specified torque

P

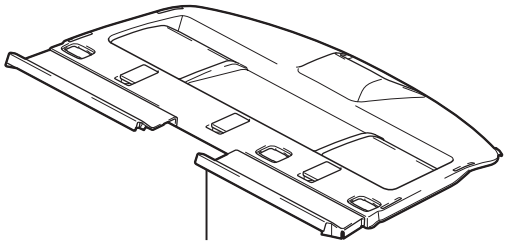
B132113E03

for TMMK made:



PACKAGE TRAY TRIM PANEL ASSEMBLY

for Reclining Seat Type:

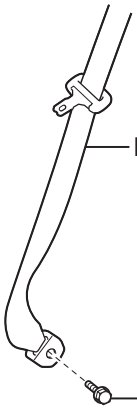


PACKAGE TRAY TRIM PANEL ASSEMBLY

REAR SEAT SHOULDER BELT COVER

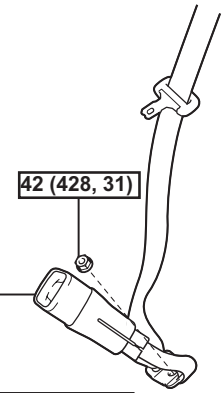
REAR SEAT SHOULDER BELT HOLE COVER

REAR SEAT SHOULDER BELT COVER



REAR SEAT OUTER BELT ASSEMBLY

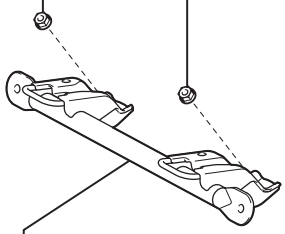
42 (428, 31)



42 (428, 31)

REAR SEAT INNER WITH CENTER BELT ASSEMBLY LH

18 (184, 13)

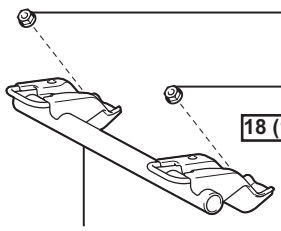


CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSEMBLY LH

42 (428, 31)

REAR SEAT OUTER BELT ASSEMBLY

for Fold Down Seat Type:



18 (184, 13)

CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSEMBLY LH

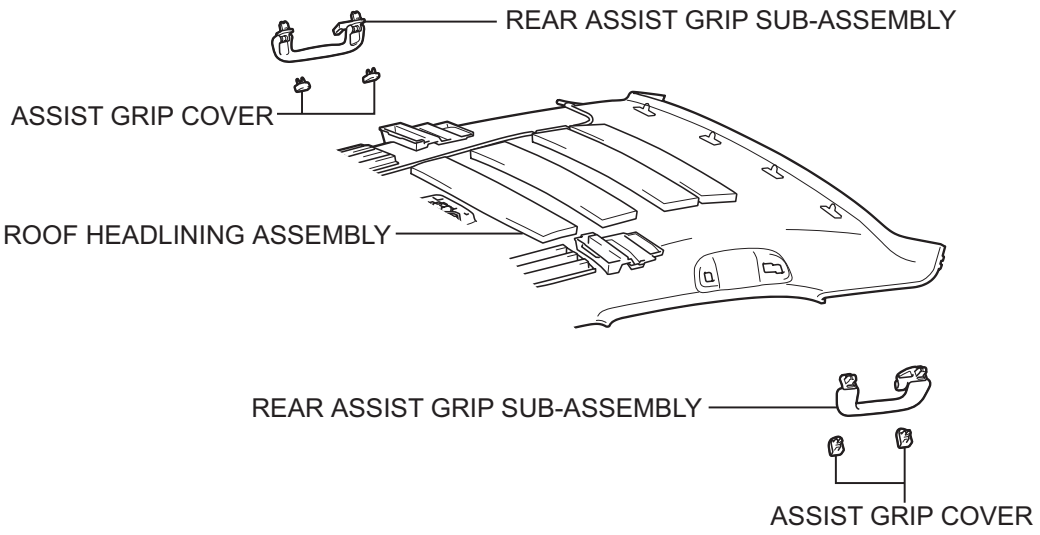
N*m (kgf*cm, ft.*lbf): Specified torque

P

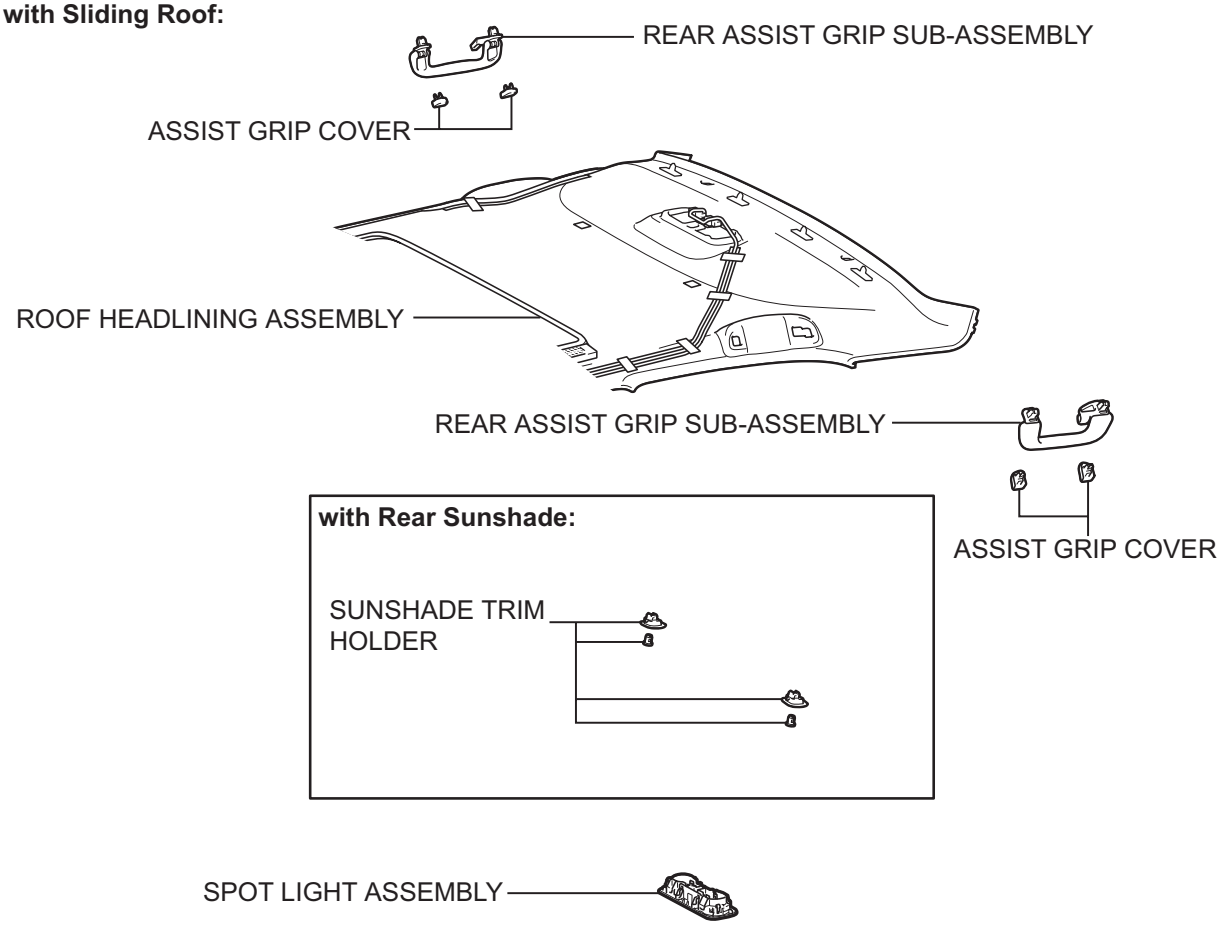
B142742E02

WS

without Sliding Roof:

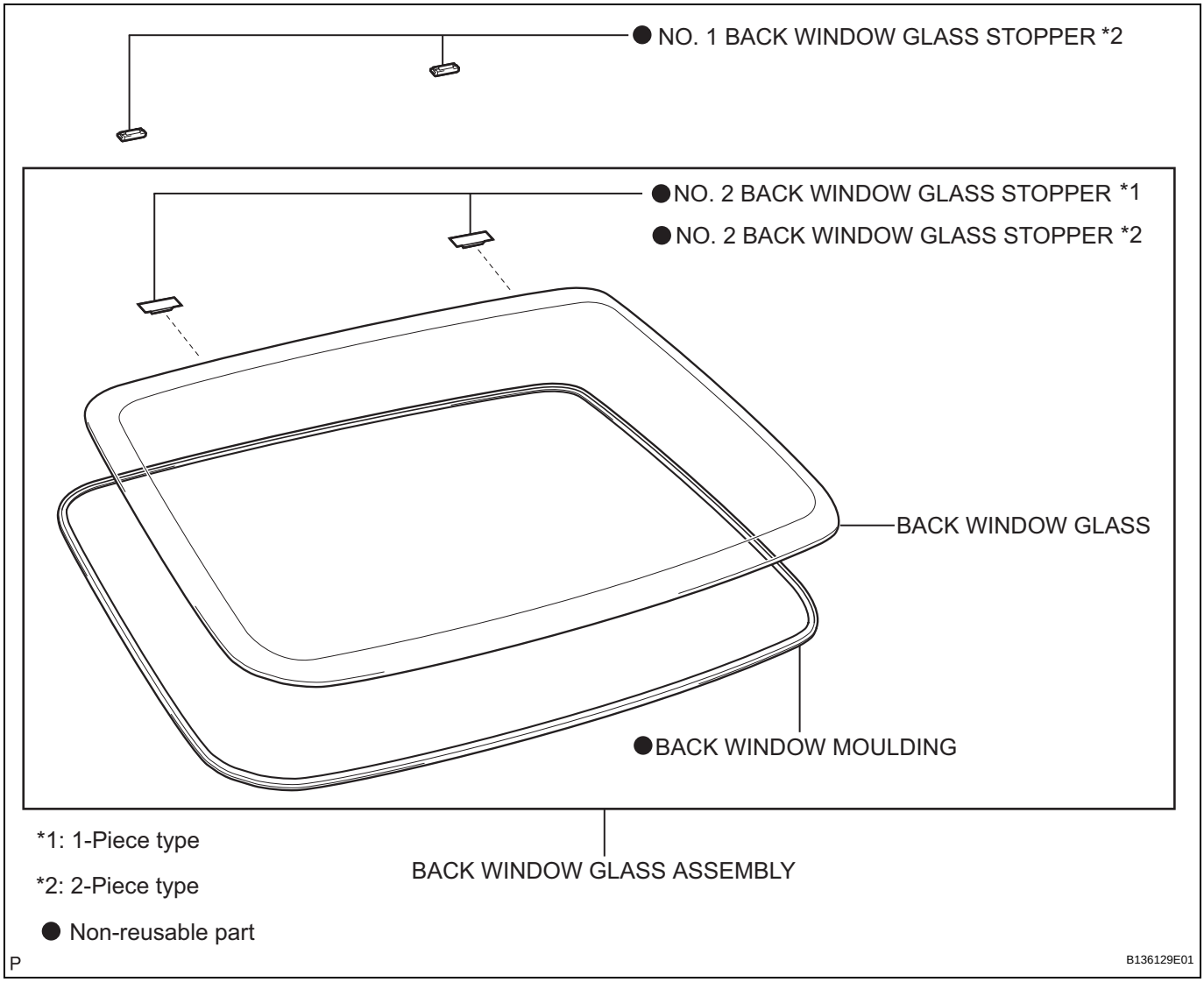


with Sliding Roof:



P

B142347E01


● NO. 1 BACK WINDOW GLASS STOPPER *2
●NO. 2 BACK WINDOW GLASS STOPPER *1
●NO. 2 BACK WINDOW GLASS STOPPER *2
BACK WINDOW GLASS
●BACK WINDOW MOULDING
BACK WINDOW GLASS ASSEMBLY
*1: 1-Piece type
*2: 2-Piece type
● Non-reusable part
P
B136129E01

WS

INSTALLATION

1. INSTALL NO. 2 BACK WINDOW GLASS STOPPER

(a) Using a brush or sponge, coat the application area of the No. 2 stoppers with Primer G.

NOTICE:

- **Do not apply too much primer.**
- **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 piece of cloth before it dries.

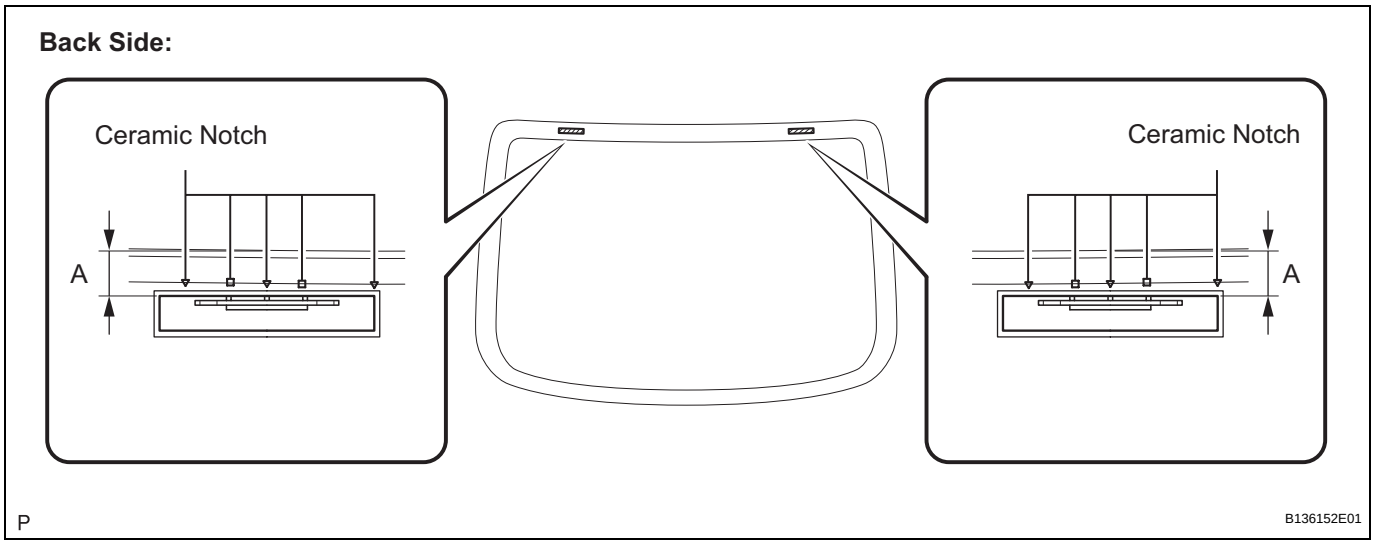
(b) Install 2 new No. 2 stoppers onto the windshield glass, as shown in the illustration.

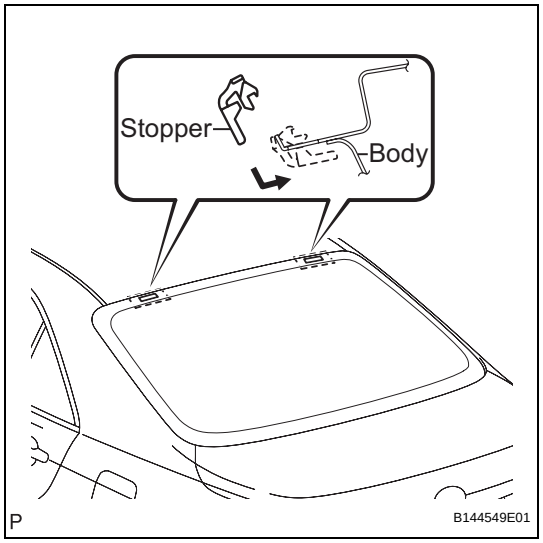
HINT:

Only 2-piece type No. 2 stoppers are supplied. Use the 2-piece type stoppers even if a 1-piece type was used.

Standard dimension

Area	Dimension
A	16.4 mm (0.645 in.)



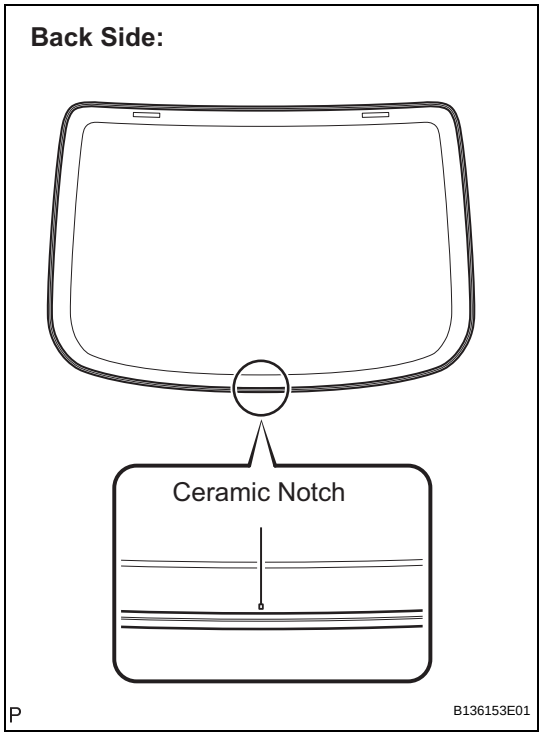


2. INSTALL NO. 1 BACK WINDOW GLASS STOPPER

(a) Install 2 new No. 1 stoppers to the vehicle body, as shown in the illustration.

HINT:

Only 2-piece type No. 1 stoppers are supplied. Use the 2-piece type stoppers even if a 1-piece type was used.



3. INSTALL BACK WINDOW MOULDING

(a) Using a brush or sponge, coat the application area of moulding with Primer G.

NOTICE:

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

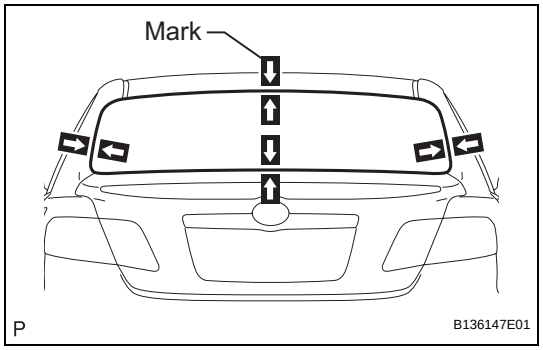
HINT:

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

(b) Install a new moulding, as shown in the illustration.

NOTICE:

Align the joint of the new moulding with the ceramic notch.



4. INSTALL BACK WINDOW GLASS ASSEMBLY

(a) Position the back window glass assembly.

(1) Using a suction cup, place the back window glass in the correct position.

(2) Check that the whole contact surface of the back window glass rim is perfectly even.

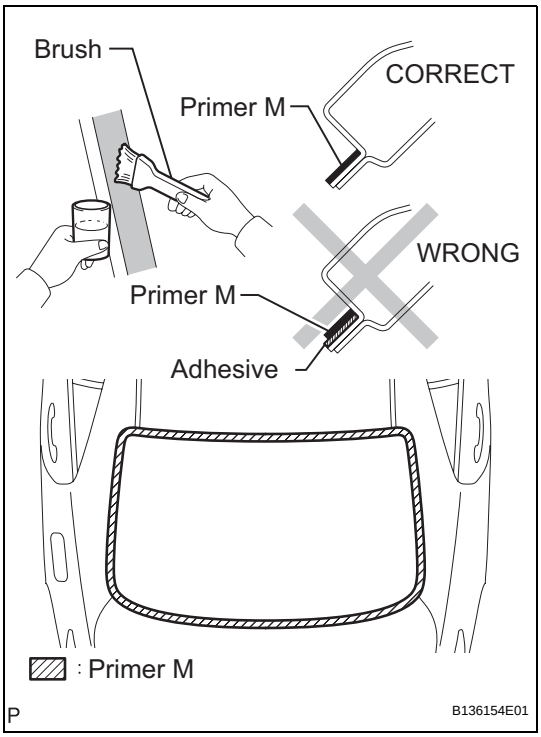
(3) Align the matchmarks on the back window glass and vehicle body.

NOTICE:

Check that the back window glass stoppers are attached to the vehicle body correctly.

(4) Remove the back window glass assembly.

WS



(b) Using a brush, coat the installation surface on the vehicle body with Primer M.

NOTICE:

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

HINT:

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

(c) Using a brush or sponge, coat the application area of adhesive with Primer G.

NOTICE:

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

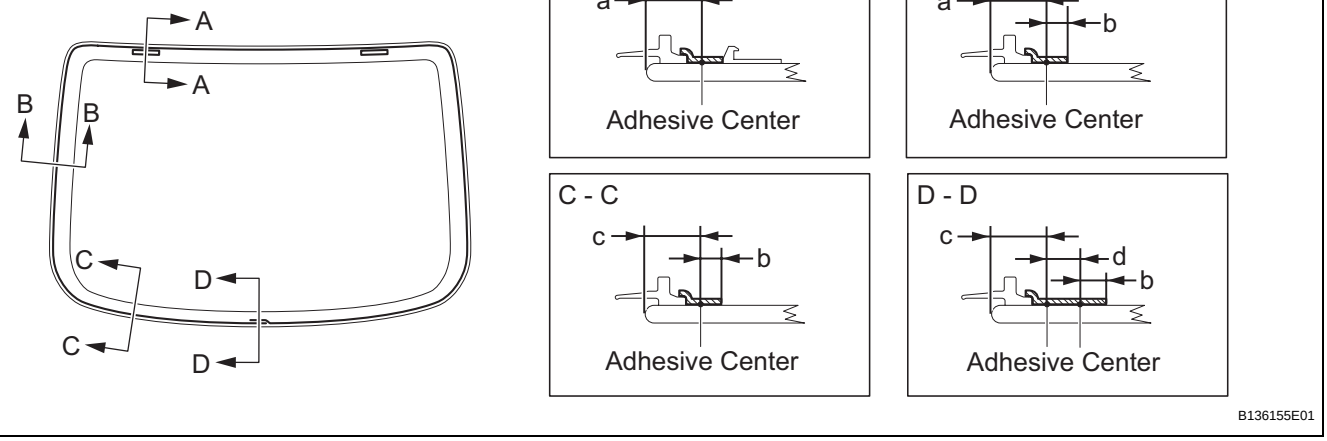
HINT:

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

Standard dimension

Area	Dimension
a	10.75 mm (0.423 in.)
b	7.0 mm (0.275 in.)
c	10.25 mm (0.403 in.)
d	8.0 mm (0.315 in.)

Back Side:



(d) Apply adhesive (Adhesive: TOYOTA genuine windshield glass adhesive or equivalent).

(1) Cut off the tip of the cartridge nozzle, as shown in the illustration.

HINT:

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

Usage time frame

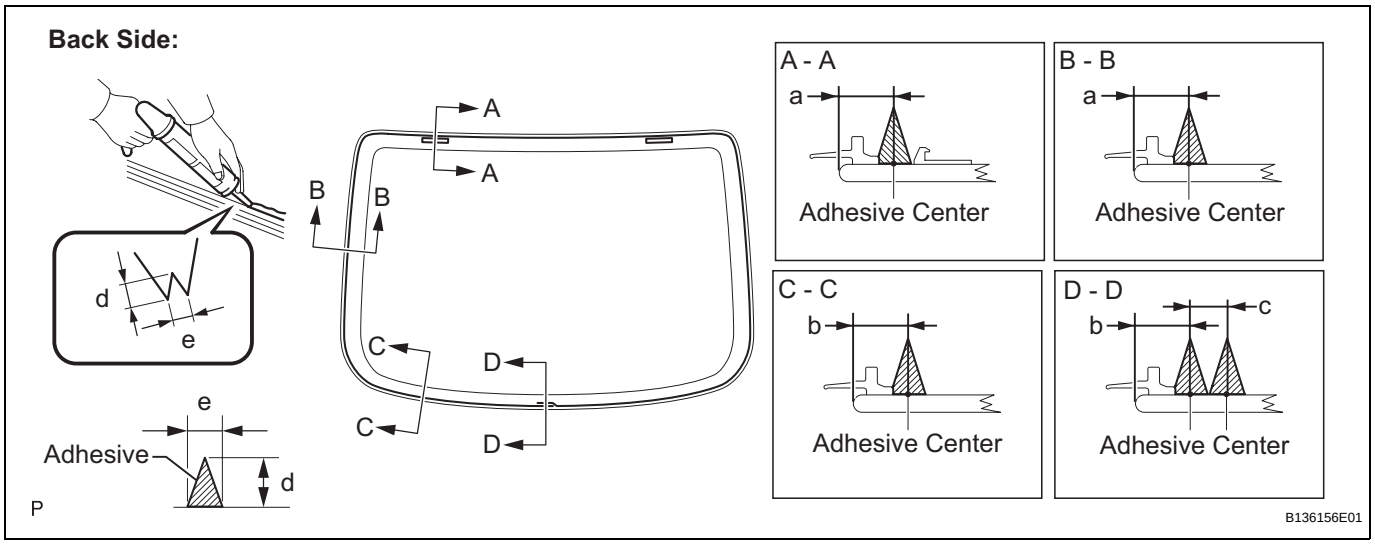
Temperature	Tack-free Time
35°C (95°F)	15 minutes
20°C (68°F)	1 hour and 40 minutes
5°C (41°F)	8 hours

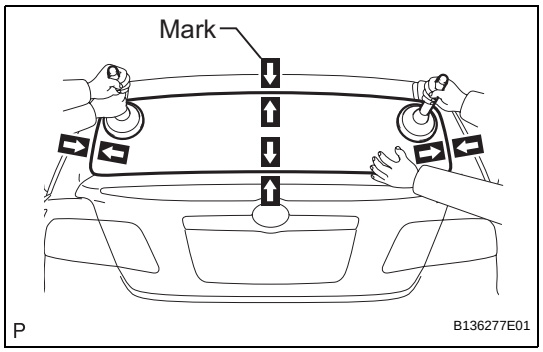
(2) Load the sealer gun with cartridge.

(3) Apply adhesive to the back window glass, as shown in the illustration.

Standard dimension

Area	Dimension
a	10.75 mm (0.423 in.)
b	10.25 mm (0.403 in.)
c	8.0 mm (0.315 in.)
d	12.0 mm (0.472 in.)
e	8.0 mm (0.315 in.)





(e) Install the back window glass assembly.

(1) Using a suction cup, position the back window glass so that the matchmarks are aligned, and press it in gently along the rim.

NOTICE:

- **Check that the back window glass stoppers are attached to the vehicle body correctly.**
- **Check the clearance between the vehicle body and back window glass.**

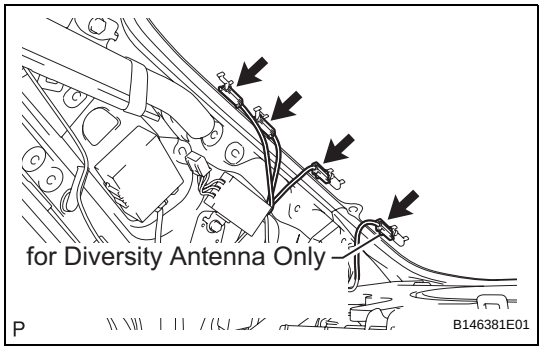
WS

(2) Lightly press the front surface of the back window glass to ensure a close fit.
HINT:
Press the glass with force of 98 N (10 kgf, 22 lb) or more.

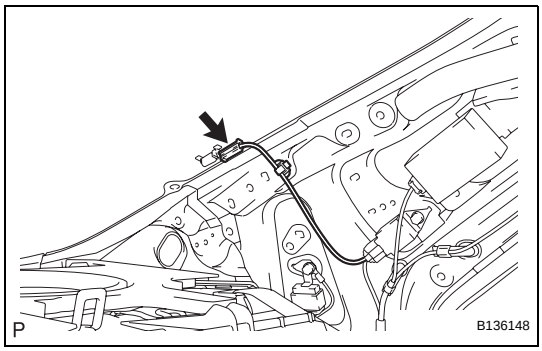
(3) Hold the back window glass using protective tape until applied adhesive becomes hard.
NOTICE:
Do not drive the vehicle for the time described in the table below.
Minimum time

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

(f) Connect the connectors.



(g) Connect the connector.



5. CHECK FOR LEAKS AND REPAIR

(a) After the adhesive has hardened, apply water from the outside of the vehicle. Check that no water leaks into the cabin.

(b) If water leaks into the cabin, allow the water to dry and add adhesive.

(c) Remove the protective tape.

6. INSTALL ROOF HEADLINING ASSEMBLY (w/o Sliding Roof) (See page IR-45)

7. INSTALL ROOF HEADLINING ASSEMBLY (w/ Sliding Roof) (See page IR-46)

8. INSTALL SUNSHADE TRIM HOLDER (w/ Rear Sunshade) (See page IR-47)

9. INSTALL SPOT LIGHT ASSEMBLY (w/ Sliding Roof) (See page IR-48)

10. INSTALL REAR ASSIST GRIP SUB-ASSEMBLY (See page IR-49)

11. INSTALL PACKAGE TRAY TRIM PANEL ASSEMBLY (See page SB-38)

12. INSTALL PACKAGE TRAY TRIM PANEL ASSEMBLY (for Reclining Seat Type) (See page SB-39)

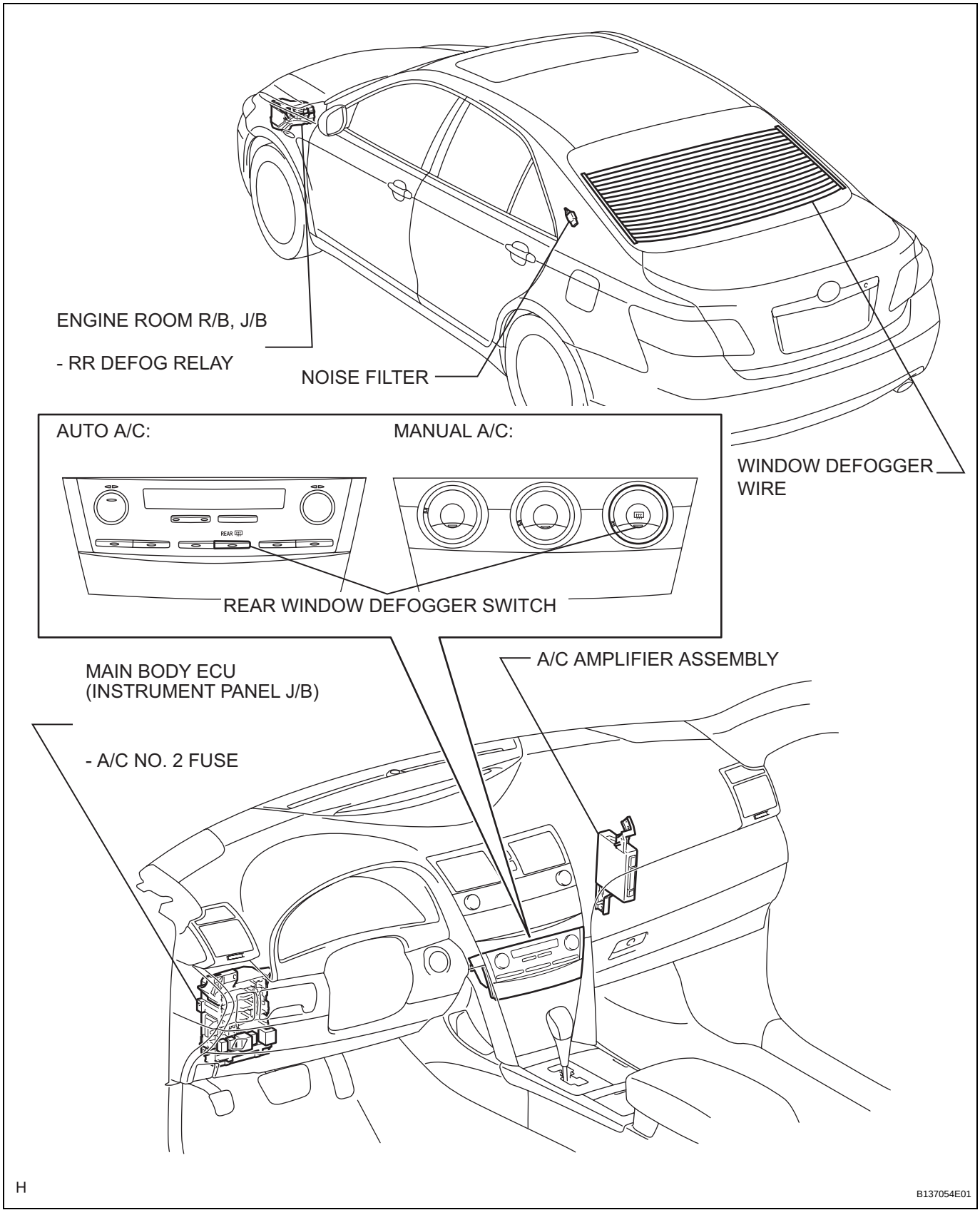
13. INSTALL REAR SEAT SHOULDER BELT HOLE COVER (See page SB-39)
14. INSTALL REAR SEAT SHOULDER BELT COVER (See page SB-39)
15. CONNECT REAR SEAT OUTER BELT ASSEMBLY (for LH Side) (See page SB-52)
16. CONNECT REAR SEAT OUTER BELT ASSEMBLY (for RH Side) (See page SB-52)
17. CONNECT REAR SEAT INNER WITH CENTER BELT ASSEMBLY LH (for TMC Made) (See page SB-40)
18. CONNECT REAR SEAT INNER WITH CENTER BELT ASSEMBLY LH (for TMMK Made) (See page SB-40)
19. INSTALL CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSEMBLY LH (See page SB-66)
20. INSTALL ROOF SIDE INNER GARNISH LH (See page IR-52)
21. INSTALL ROOF SIDE INNER GARNISH RH (See page IR-52)
22. INSTALL RECLINING REMOTE CONTROL LEVER SUB-ASSEMBLY LH (for Reclining Seat Type) (See page SE-69)
23. INSTALL RECLINING REMOTE CONTROL LEVER SUB-ASSEMBLY RH (for Reclining Seat Type)
24. INSTALL REAR DOOR OPENING TRIM WEATHERSTRIP LH (See page IR-55)
25. INSTALL REAR DOOR SCUFF PLATE LH (See page IR-56)
26. INSTALL REAR DOOR OPENING TRIM WEATHERSTRIP RH (See page IR-56)
27. INSTALL REAR DOOR SCUFF PLATE RH (See page IR-56)
28. INSTALL CENTER SEAT BACK ASSEMBLY (for Reclining Seat Type) (See page SE-71)
29. INSTALL SEPARATE TYPE REAR SEAT BACK ASSEMBLY LH (for Reclining Seat Type) (See page SE-72)
30. INSTALL SEPARATE TYPE REAR SEAT BACK ASSEMBLY RH (for Reclining Seat Type) (See page SE-71)
31. INSTALL REAR SEAT BACK COVER (for Reclining Seat Type)
32. INSTALL REAR SIDE SEAT BACK ASSEMBLY LH (for Fold Down Seat Type) (See page SE-57)
33. INSTALL REAR SIDE SEAT BACK ASSEMBLY RH (for Fold Down Seat Type)

34. **INSTALL SEPARATE TYPE REAR SEAT BACK ASSEMBLY LH (for Fold Down Seat Type) (See page SE-57)**
35. **INSTALL SEPARATE TYPE REAR SEAT BACK ASSEMBLY RH (for Fold Down Seat Type) (See page SE-57)**
36. **INSTALL REAR SEAT BACK ASSEMBLY (for Fixed Seat Type) (See page SE-84)**
37. **INSTALL REAR CENTER SEAT HEADREST ASSEMBLY**
38. **INSTALL REAR SEAT HEADREST ASSEMBLY**
39. **INSTALL REAR SEAT CUSHION ASSEMBLY**
40. **CONNECT CABLE TO NEGATIVE BATTERY TERMINAL**
41. **INSPECT SRS WARNING LIGHT**
(See page RS-32)

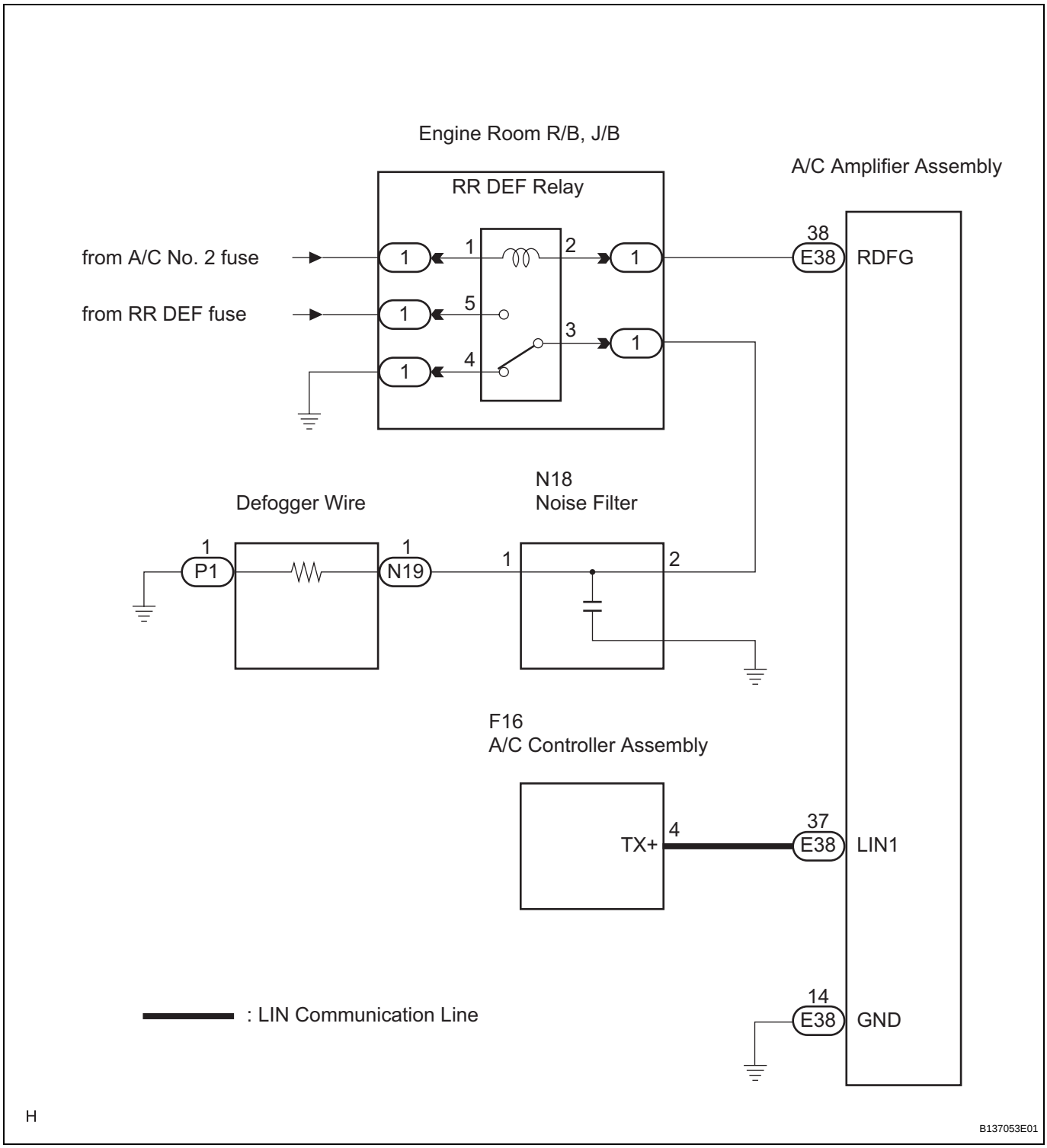
WINDOW DEFOGGER SYSTEM

PARTS LOCATION

WS



SYSTEM DIAGRAM



WS

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

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.

3. DESCRIPTION

Function	Outline
Defogs the rear window surface	• Receives rear defogger activation request signals from A/C amplifier assembly (A/C ECU) and supplies power to rear window defogger. • Receives power from DEFOG relay and heats defogger wire.

HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

- Use the following procedure to troubleshoot the defogger system.
- The intelligent tester should be used in step 4.

1	VEHICLE BROUGHT TO WORKSHOP

NEXT

2	INSPECT BATTERY VOLTAGE

Standard voltage:
11 to 14 V

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

NEXT

3	PROBLEM SYMPTOMS TABLE

HINT:

(See page WS-89)

NEXT

4	OVERALL ANALYSIS AND TROUBLESHOOTING

(a) Terminals of ECU (See page WS-89)
(b) Data List/Active Test (See page WS-91)
(c) On-vehicle inspection (See page WS-92)

NEXT

5	REPAIR OR REPLACE

NEXT

6	CONFIRMATION TEST

NEXT

END

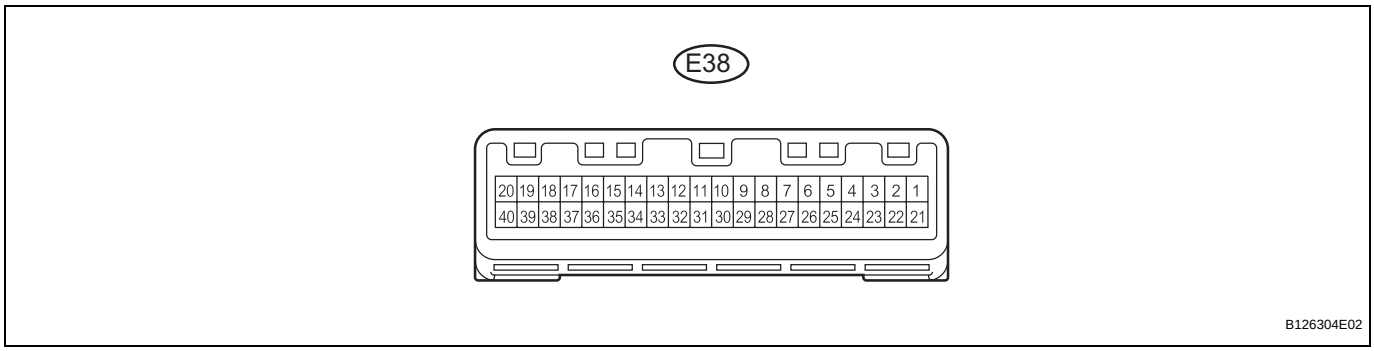
PROBLEM SYMPTOMS TABLE

WINDOW DEFOGGER SYSTEM:

Symptom	Suspected area	See page
Rear window defogger does not operate	1. A/C No. 2, RR DEF fuses	-
	2. RR DEF relay	WS-94
	3. A/C controller assembly	WS-94
	4. A/C amplifier assembly	WS-94
	5. Rear window defogger wire	WS-92
	6. Wire harness	-

TERMINALS OF ECU

1. CHECK A/C AMPLIFIER ASSEMBLY



(a) Measure the voltage and resistance of each terminal of the connectors.

Standard voltage

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
RDFG (E38-38) - GND (E38-14)	G - W-B	Rear Defogger Signal	Ignition switch on (IG), Rear defogger switch OFF	10 to 14 V

Standard resistance

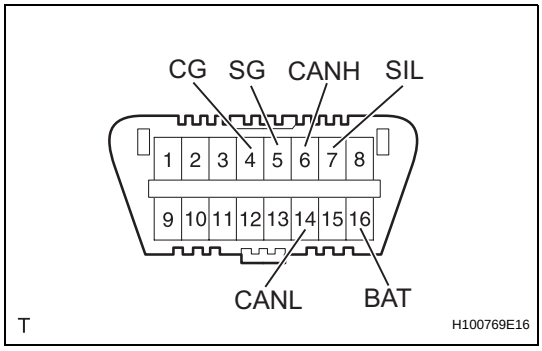
Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
GND (E38-14) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω

DIAGNOSIS SYSTEM

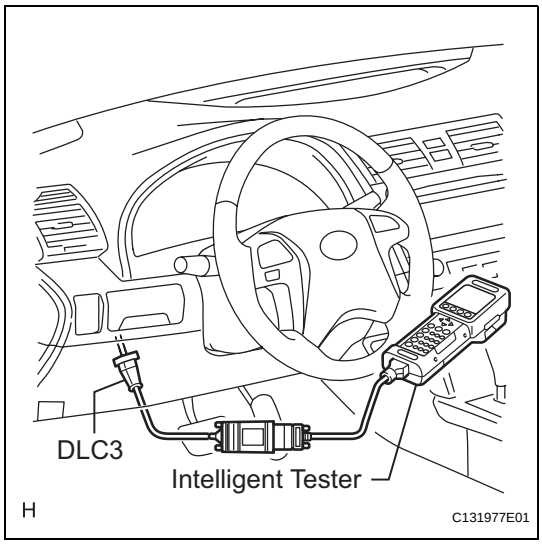
1. DESCRIPTION

(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.

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.



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 Ω
SG (5) - Body ground	Signal ground	Always	Below 1 Ω
BAT (16) - Body ground	Battery positive	Always	10 to 14 V
CANH (6) - CANL (14)	CAN bus line	Ignition switch OFF*	54 to 69 Ω
CANH (6) - CG (4)	HIGH-level CAN bus line	Ignition switch OFF*	200 Ω or more
CANL (14) - CG (4)	LOW-level CAN bus line	Ignition switch OFF*	200 Ω or more
CANH (6) - BAT (16)	HIGH-level CAN bus line	Ignition switch OFF*	6 kΩ or more
CANL (14) - BAT (16)	LOW-level CAN bus line	Ignition switch OFF*	6 kΩ or more

NOTICE:

***: 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 manual.

WS

DATA LIST / ACTIVE TEST

1. PERFORM ACTIVE TEST

HINT:

Performing the intelligent tester's ACTIVE TEST allows a 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 (IG).

(c) Perform the ACTIVE TEST according to the display on the tester.

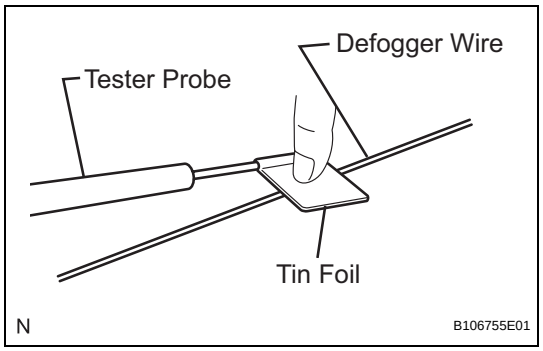
Air Conditioner:

Item	Test Details	Diagnostic Note
Defogger Relay (Rear)	Turns rear window defogger OFF/ON	-

ON-VEHICLE INSPECTION

1. CHECK REAR WINDOW DEFOGGER SYSTEM OPERATION

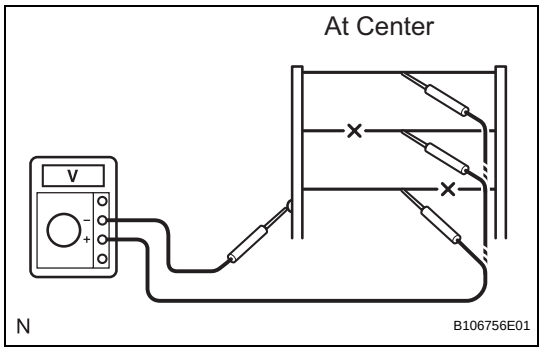
(a) When the ignition switch is turned on (IG) and the defogger switch is pressed, check that the rear window defogger operates.
HINT:
After 15 minutes, check that the defogger automatically turns off.



2. INSPECT BACK WINDOW (DEFOGGER WIRE)

NOTICE:

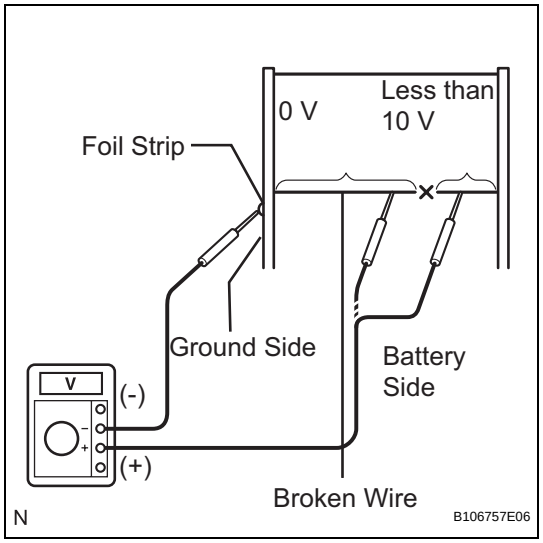
- **When cleaning the glass, wipe the glass along the wire using a soft and dry cloth. Take care not to damage the wires.**
- **Do not use detergents or glass cleaners that have abrasive ingredients.**



- **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, as shown in the illustration.**

(a) Turn the ignition switch on (IG).

(b) Turn the defogger switch on.



(c) Check the voltage at the center of each defogger wire, as shown in the illustration.
Standard voltage

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 faulty between the center of the wire and the wire end 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.

WS

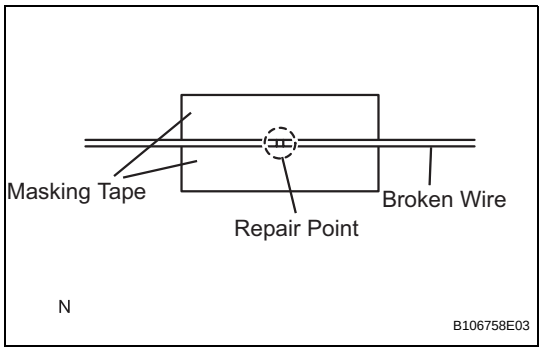
(g) The point where the voltage drops from approximately 10 V to 0 V is the place where the defogger wire is broken.
HINT:
If the defogger wire is not broken, the voltmeter should indicate 0 V at the positive (+) end of the defogger wire but gradually increase to approximately 12 V as the meter probe moves to the other end.

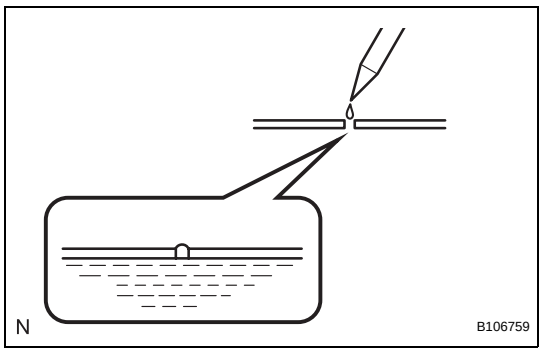
REPAIR

1. REPAIR WINDOW DEFOGGER WIRE

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

(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.

(e) After a few minutes, remove the masking tape.
NOTICE:
Do not repair the defogger wire again for at least 24 hours.

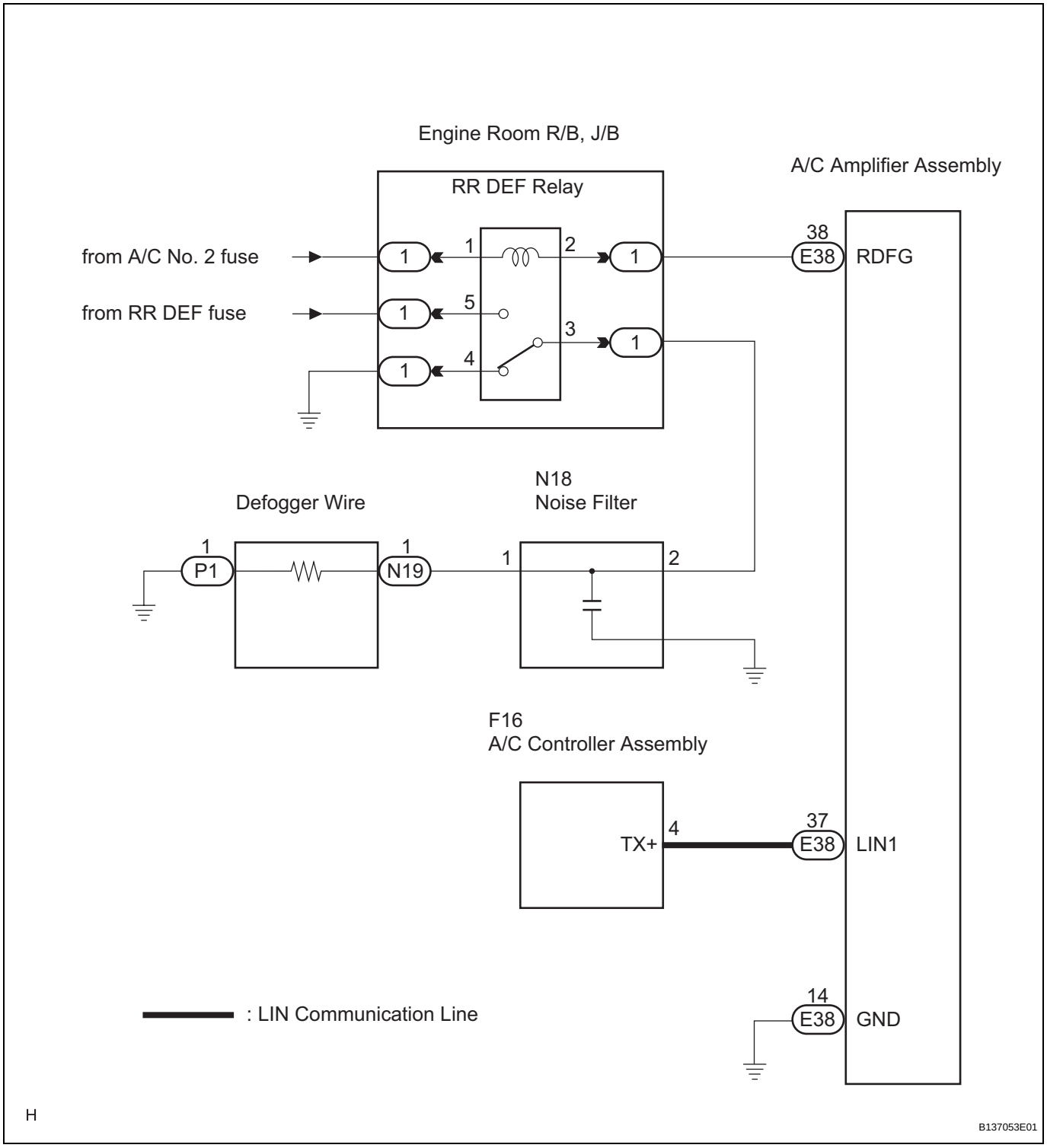
Rear Window Defogger System does not Operate

DESCRIPTION

When the rear window defogger switch, which is built into the heater control assembly, is operated, the operation signals are transmitted to the A/C amplifier assembly through LIN. When the A/C amplifier assembly receives the signals, it turns on the DEFOG relay to operate the rear window defogger.

WS

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK FOR DTCs

(a) Select the DTC check on the intelligent tester to check for communication errors.

Result

Result	Proceed to
Not output DTC codes	A
Output DTC codes (LIN communication)	B

B → GO TO MULTIPLEX COMMUNICATION SYSTEM

A

2	PERFORM ACTIVE TEST BY INTELLIGENT TESTER

(a) Select the ACTIVE TEST, use the intelligent tester to issue a control command, and then check the window defogger operation.

Air Conditioner

Item	Test Details
Defogger Relay (Rear)	Turns rear window defogger OFF/ON

OK → Go to step 5

NG

3	REPLACE AIR CONDITIONER CONTROL ASSEMBLY

(a) Replace the air conditioner control assembly.

NEXT

4	CONFIRM REAR WINDOW DEFOGGER OPERATION

(a) Turn the ignition switch on (IG), press the defogger switch, and check that the window defogger operates.

OK:

System operates normally

NG → REPLACE A/C AMPLIFIER ASSEMBLY

OK

END

5	PERFORM ACTIVE TEST BY INTELLIGENT TESTER

(a) Select the ACTIVE TEST, use the intelligent tester to issue a control command, and then check the DEFOG relay operation.
(b) Check that operation sound of the RR DEF relay is heard.

Result	Proceed to
Relay operating sound is heard	OK
Relay operating sound is not heard	NG

OK → Go to step 9

NG

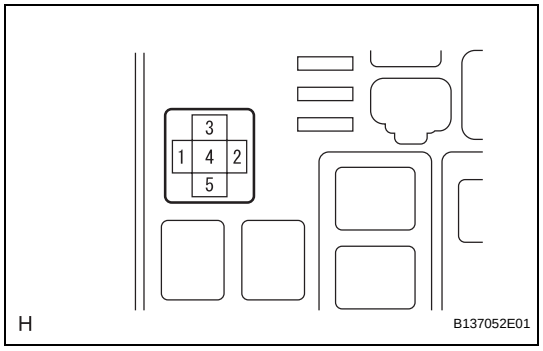
6	INSPECT RR DEF RELAY

See page WS-100.

NG → REPLACE RR DEF RELAY

OK

7	CHECK WIRE HARNESS (RR DEF RELAY - BATTERY POSITIVE)



(a) Disconnect the RR DEF relay.
(b) Measure the voltage according to the value(s) in the table below.
Standard voltage:
Engine room R/B, J/B

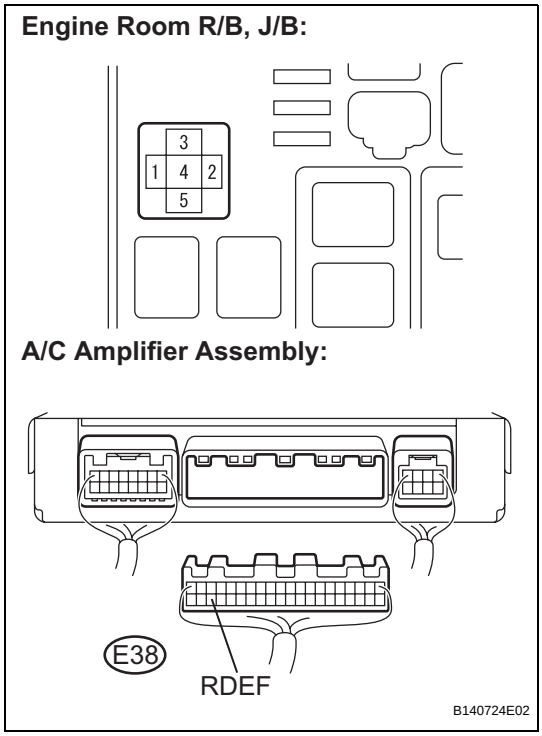
Tester Connection	Condition	Specified Condition
1 - Body ground	Ignition switch on (IG)	10 to 14 V

NG → REPAIR OR REPLACE A/C NO. 2 FUSE, HARNESS OR CONNECTOR

OK

WS

8	CHECK WIRE HARNESS (RR DEF RELAY - A/C AMPLIFIER ASSEMBLY)



(a) Disconnect the RR DEF relay and A/C amplifier assembly connector.
(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester Connection	Condition	Specified Condition
2 - E38-38	Always	Below 1 Ω
2 - Body ground	Always	10 kΩ or higher

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

REPLACE A/C AMPLIFIER ASSEMBLY

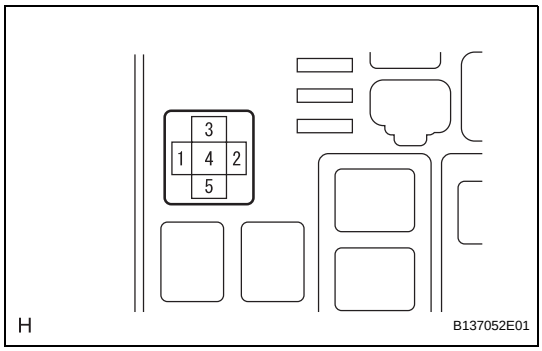
9	INSPECT RR DEF RELAY

See page WS-100.

NG → **REPLACE RR DEF RELAY**

OK

10	CHECK WIRE HARNESS (RR DEF RELAY - BATTERY POSITIVE AND BODY GROUND)



(a) Disconnect the RR DEF relay.
(b) Measure the voltage and resistance according to the value(s) in the table below.

Standard resistance:
Engine room R/B, J/B

Tester Connection	Condition	Specified Condition
4 - Body ground	Always	Below 1 Ω

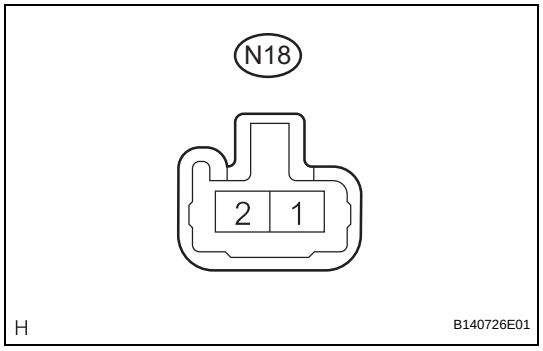
Standard voltage:
Engine room R/B, J/B

Tester Connection	Condition	Specified Condition
5 - Body ground	Always	10 to 14 V

NG → REPAIR OR REPLACE RR DEF FUSE, HARNESS OR CONNECTOR

OK

11 INSPECT NOISE FILTER



(a) Disconnect the noise filter connector.
(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

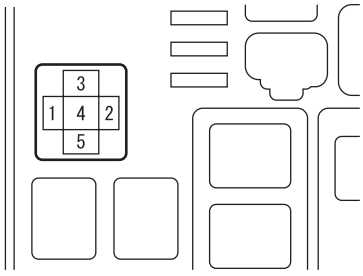
Tester Connection	Condition	Specified Condition
N18-1 - N18-2	Always	Below 1 Ω
N18-1 - Body ground	Always	10 kΩ or higher

NG → REPLACE NOISE FILTER

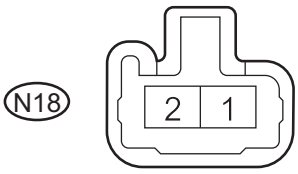
OK

12 CHECK WIRE HARNESS (RR DEF RELAY - NOISE FILTER)

Engine Room R/B, J/B:



Noise Filter:



B140738E01

(a) Disconnect the RR DEF relay and defogger wire connectors.
(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

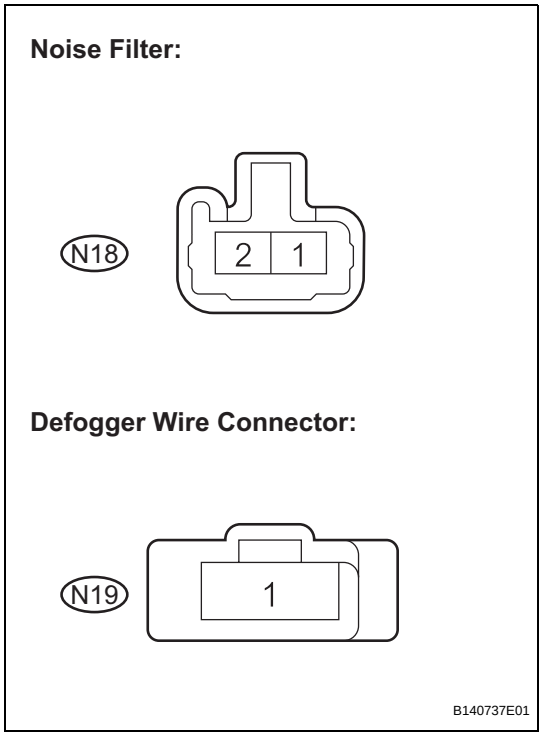
Tester Connection	Condition	Specified Condition
3 - N18-2	Always	Below 1 Ω
3 - Body ground	Always	10 kΩ or higher

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

WS

13 CHECK WIRE HARNESS (NOISE FILTER - DEFOGGER WIRE CONNECTOR)



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

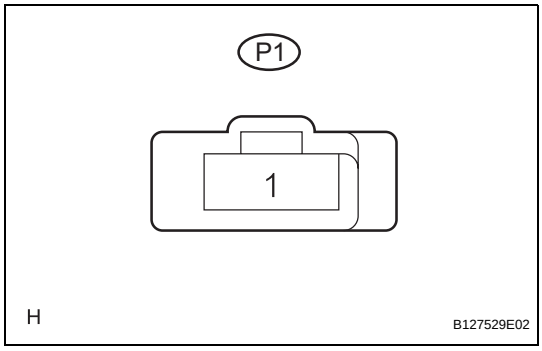
Standard resistance

Tester Connection	Condition	Specified Condition
N18-1 - N19-1	Always	Below 1 Ω
N18-1 - Body ground	Always	10 kΩ or higher

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

14 CHECK WIRE HARNESS (DEFOGGER WIRE CONNECTOR - BODY GROUND)



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

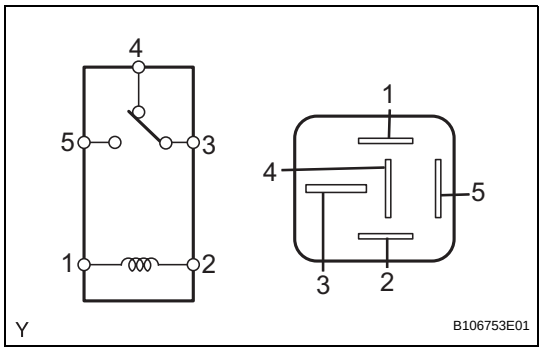
Standard resistance

Tester Connection	Condition	Specified Condition
P1-1 - Body ground	Always	Below 1 Ω

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

REPAIR OR REPLACE REAR WINDOW DEFOGGER WIRE



DEFOGGER RELAY

ON-VEHICLE INSPECTION

1. INSPECT DEFOGGER RELAY (Marking: DEFOG)

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

Standard resistance

Tester Condition	Specified Condition
3 - 4	Below 1 Ω (when battery voltage is not applied between terminals)
3 - 5	10 kΩ or higher (when battery voltage is not applied between terminals)
3 - 5	Below 1 Ω (when battery voltage is applied to terminals 1 and 2)

If the result is not as specified, replace the relay.