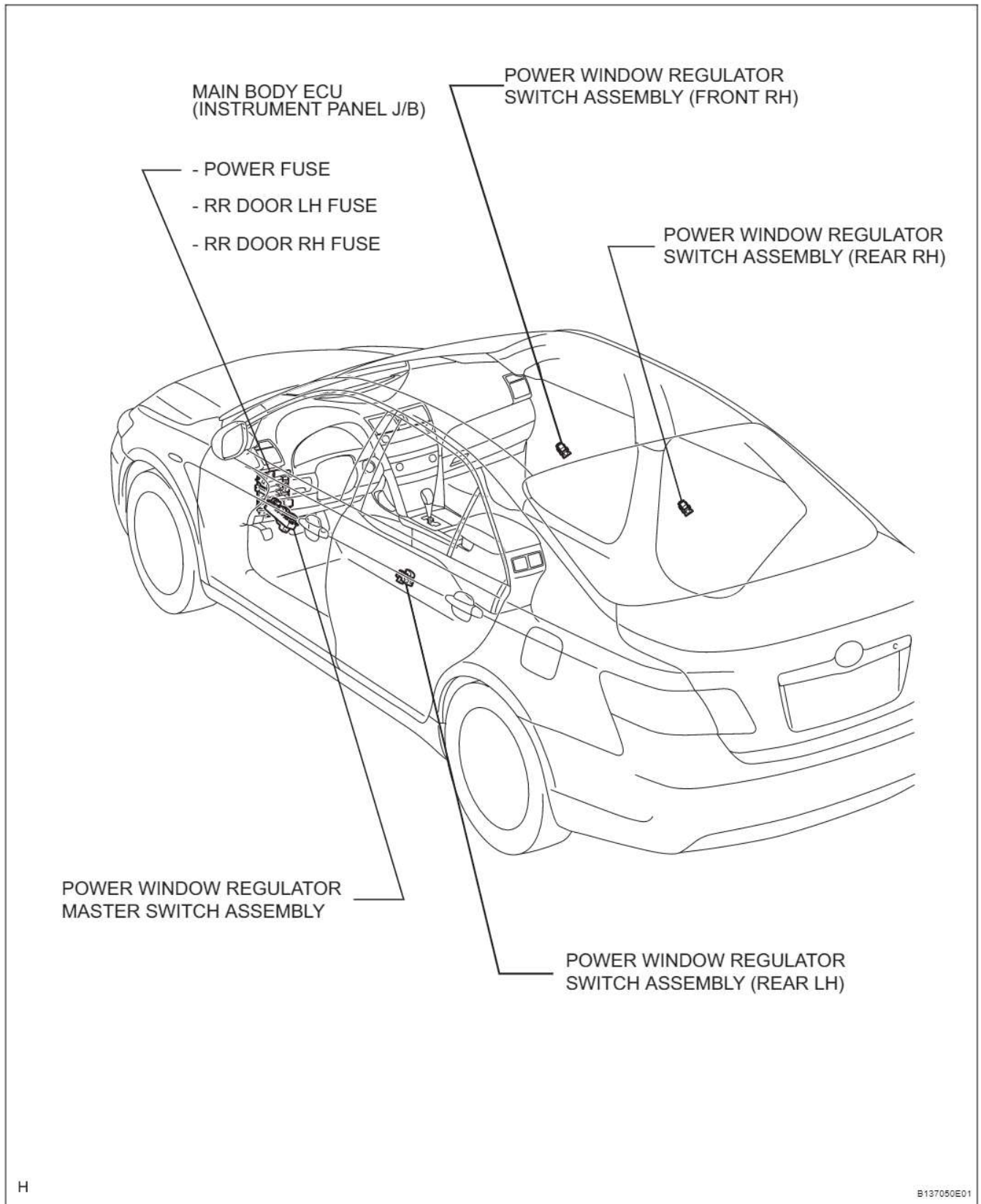


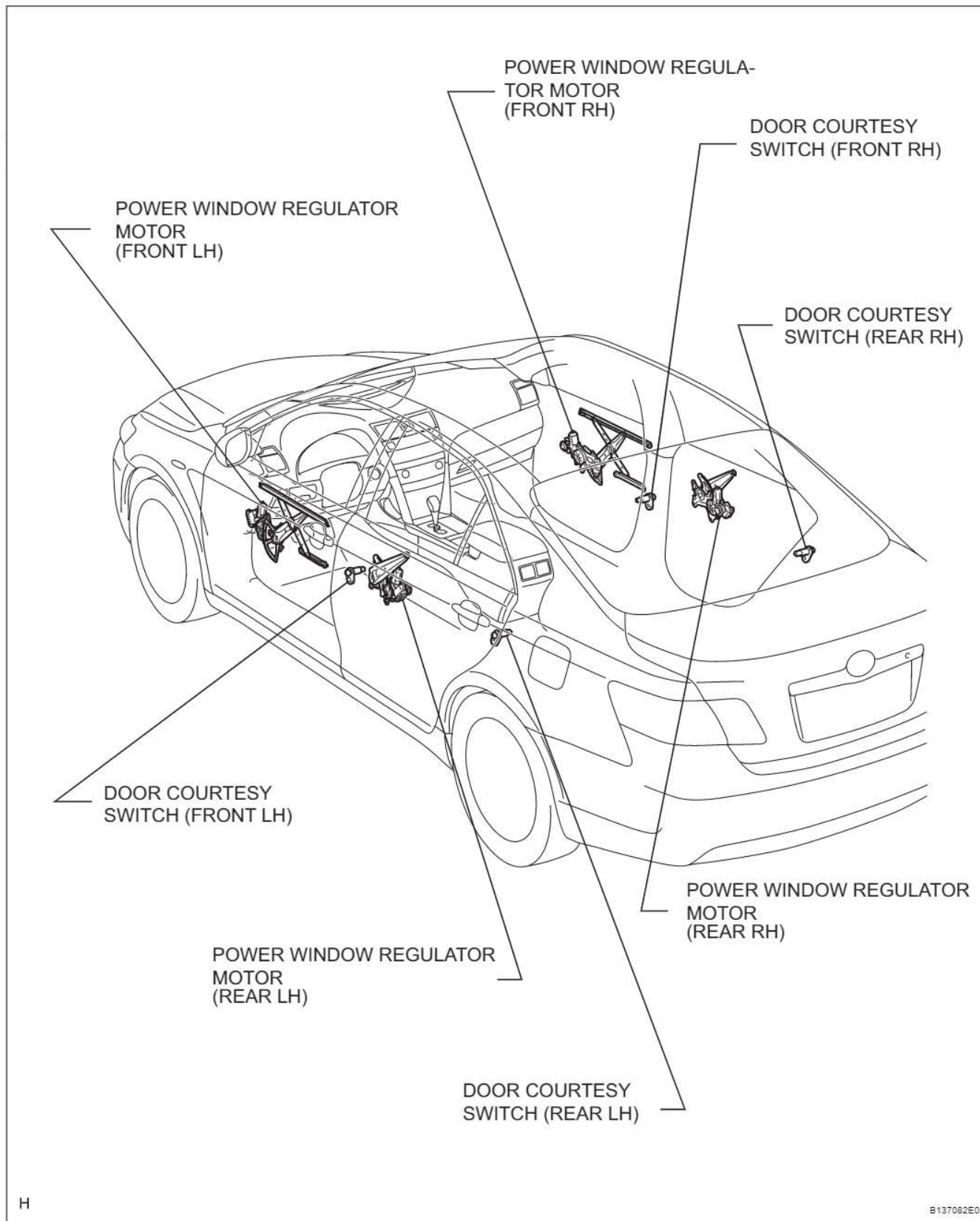
# POWER WINDOW CONTROL SYSTEM

## PARTS LOCATION



## WS-2

## WINDSHIELD / WINDOWGLASS – POWER WINDOW CONTROL SYSTEM



WINDSHIELD / WINDOWGLASS – POWER WINDOW CONTROL SYSTEM

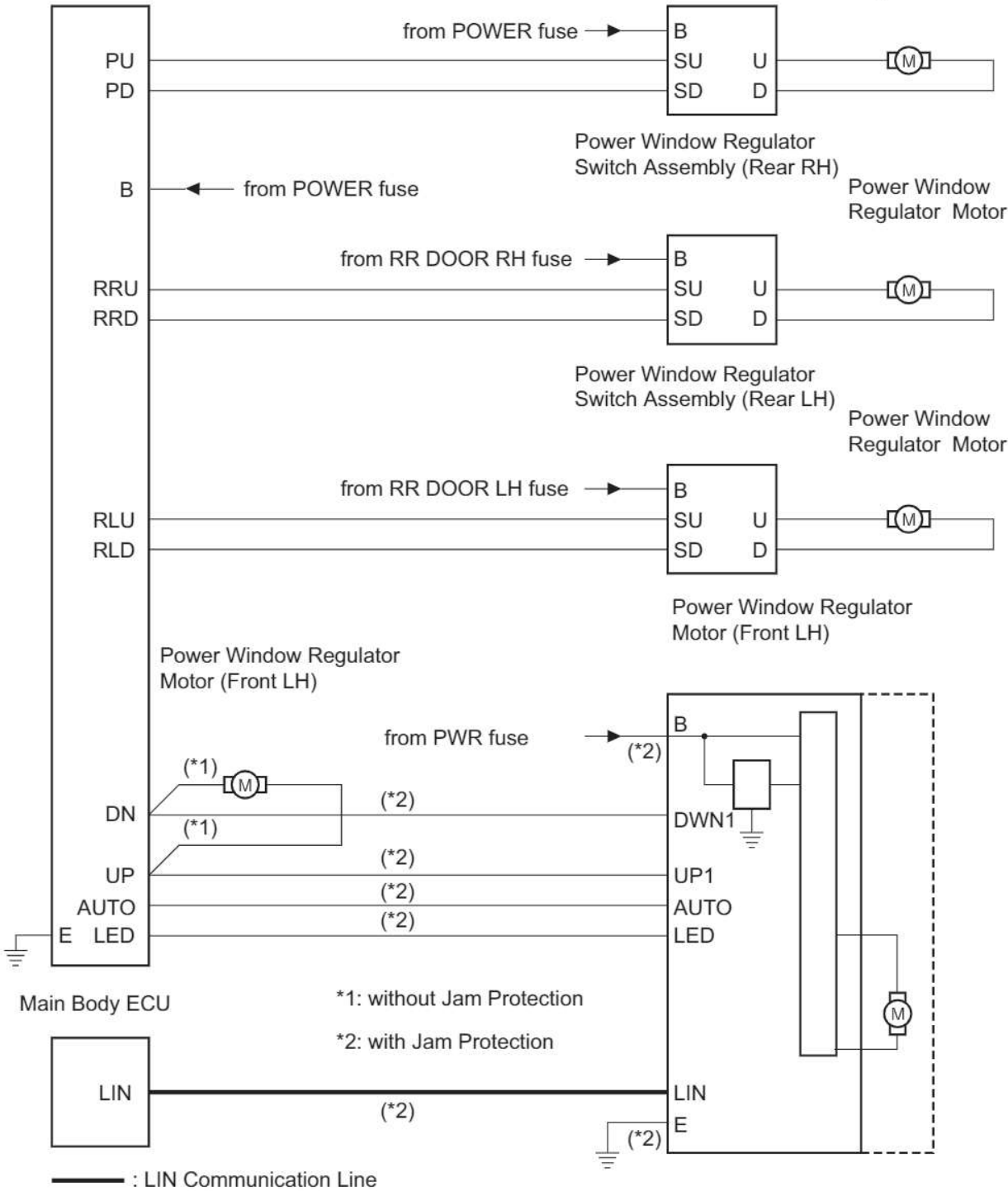
SYSTEM DIAGRAM

WS

Power Window Regulator  
Master Switch Assembly

Power Window Regulator  
Switch Assembly (Front RH)

Power Window  
Regulator Motor



H

B137051E01

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:<br>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.

WS

### 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

## WS-6

## WINDSHIELD / WINDOWGLASS – POWER WINDOW CONTROL SYSTEM

6

ADJUST, REPAIR OR REPLACE

NEXT

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 |
|-----------------------------------------------------------------------------------------------------------|----------------|------------------|--------------|
| <ul style="list-style-type: none"> <li>Ignition switch on (IG)</li> <li>Window lock switch OFF</li> </ul> | 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)  |

**WINDSHIELD / WINDOWGLASS – POWER WINDOW CONTROL SYSTEM****WS-7****3. CHECK AUTO UP/DOWN FUNCTION**

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

**Standard**

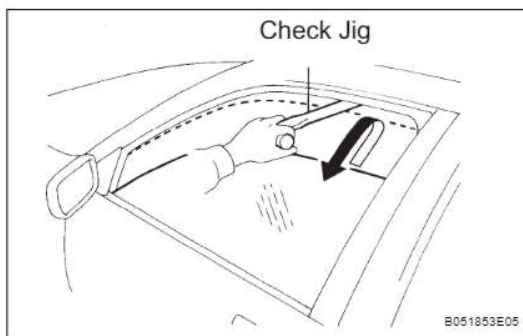
| Condition               | Master Switch | Switch Operation  | Power Window |
|-------------------------|---------------|-------------------|--------------|
| Ignition switch on (IG) | Driver side   | Pulled up fully   | UP (Closed)  |
|                         |               | Pushed down fully |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

**WS****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 |
|-----------------------------------------------------------------------------------------------------------|----------------|------------------|--------------|
| <ul style="list-style-type: none"> <li>Ignition switch on (IG)</li> <li>Window lock switch OFF</li> </ul> | 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.
- Fully open the door glass.
  - Place a check jig measuring 4 to 10 mm (0.16 to 0.40 in.) thick near the window fully closed position.
  - 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.
  - 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.
- Fully open the door glass.

**WS-8****WINDSHIELD / WINDOWGLASS – POWER WINDOW CONTROL SYSTEM**

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- (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.

**WS**

## 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**

## WS-10

## WINDSHIELD / WINDOWGLASS – POWER WINDOW CONTROL SYSTEM

## PROBLEM SYMPTOMS TABLE

## POWER WINDOW CONTROL SYSTEM

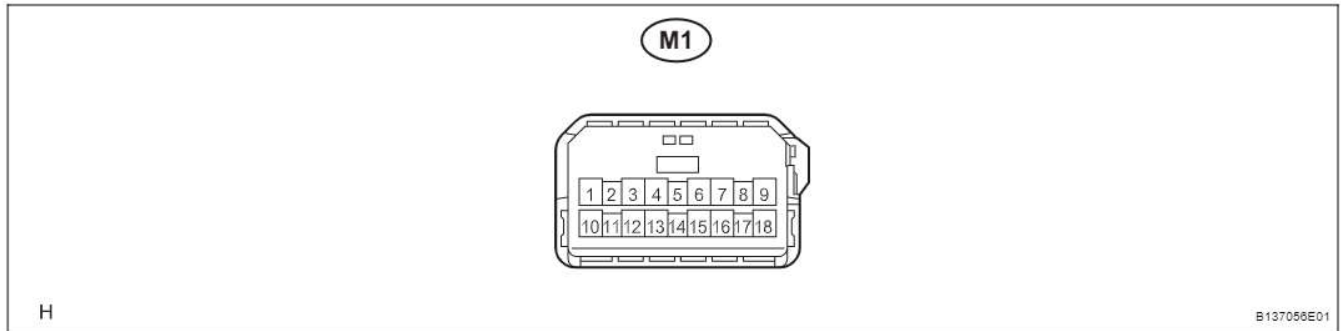
| Symptom                                                                                                  | Suspected area                                                 | See page |
|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|----------|
| 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                                                | -        |

## WINDSHIELD / WINDOWGLASS – POWER WINDOW CONTROL SYSTEM

WS-11

## 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 $\Omega$    |

## 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-12

## WINDSHIELD / WINDOWGLASS – POWER WINDOW CONTROL SYSTEM

| 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

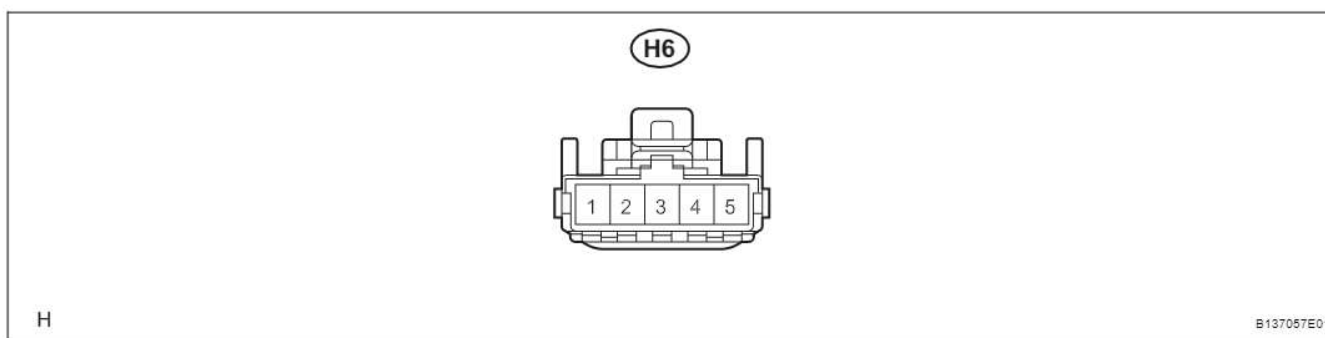
| Symbols (Terminal No.) | Wiring Color | Terminal Description                | Condition                                                                                                                                                    | Specified Condition           |
|------------------------|--------------|-------------------------------------|--------------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

**WINDSHIELD / WINDOWGLASS – POWER WINDOW CONTROL SYSTEM****WS-13**

| 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.

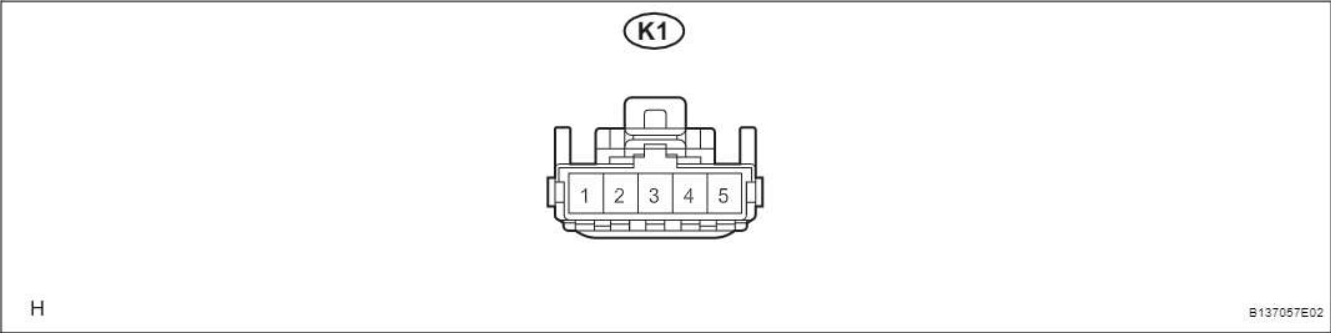
- (c) Reconnect the H6 switch connector and reset the power window motor.
- (d) Measure the voltage according to the value(s) in the table below.

### 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.

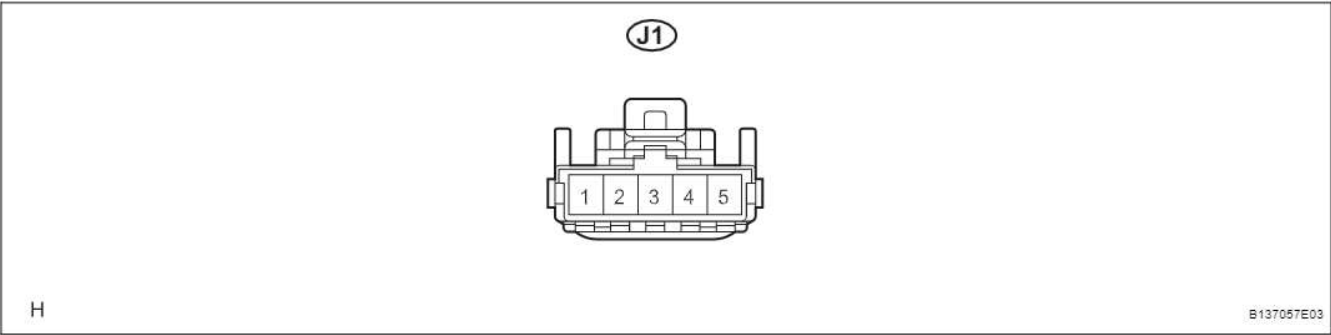
- (c) Reconnect the K1 switch connector and reset the power window motor.
- (d) Measure the voltage according to the value(s) in the table below.

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.

**WINDSHIELD / WINDOWGLASS – POWER WINDOW CONTROL SYSTEM****WS-15**

- (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**

## WS-16

## WINDSHIELD / WINDOWGLASS – POWER WINDOW CONTROL SYSTEM

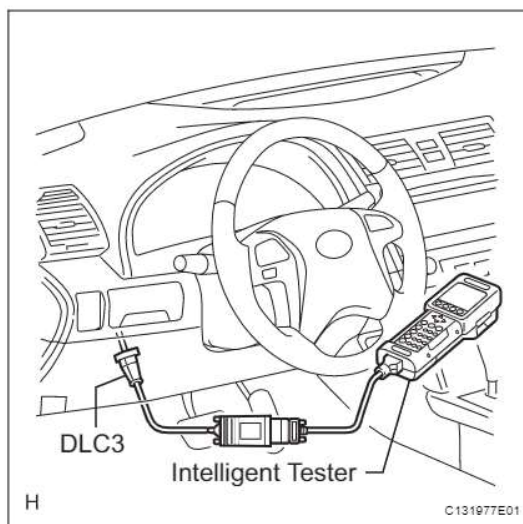
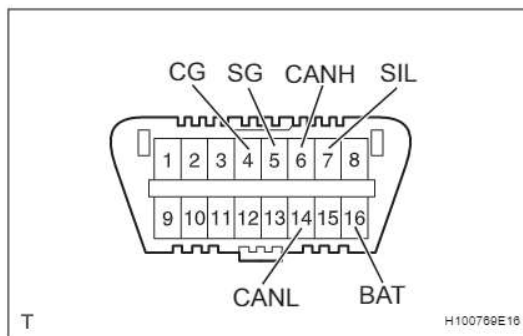
## DIAGNOSIS SYSTEM

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

## WINDSHIELD / WINDOWGLASS – POWER WINDOW CONTROL SYSTEM

WS-17

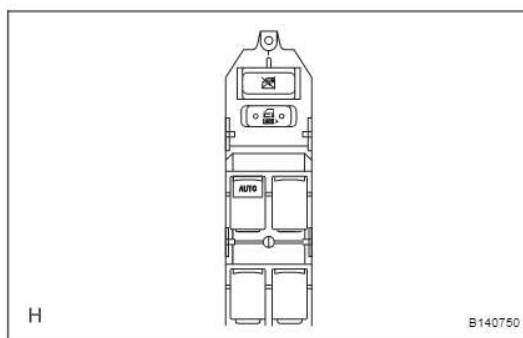
If the result is not as specified, the DLC3 may have a malfunction. Repair or replace the harness and connector.

**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.

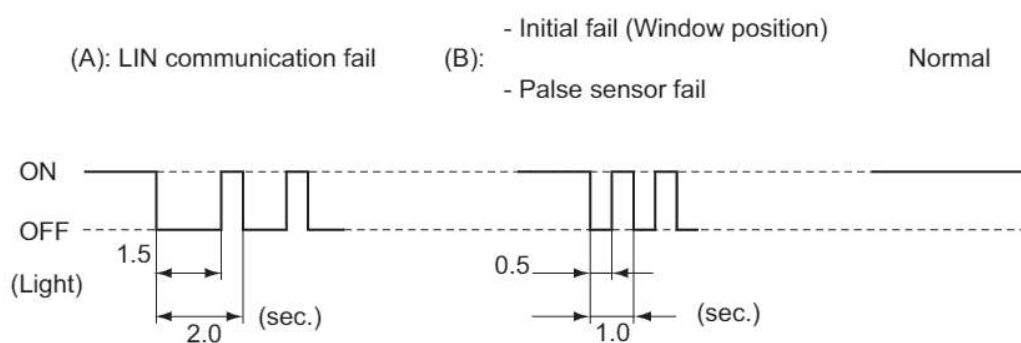
- If communication is normal when the tester is connected to another vehicle, inspect the DLC3 of the original vehicle.
- If communication is still not possible when the tester is connected to another vehicle, the problem may be in the tester itself. Consult the Service Department listed in the tester's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

WS

**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.

- Turn the ignition switch on (IG).
- Manually operate the power window master switch or power window switch on each door.
- Check the blinking pattern of the AUTO light as shown in the illustration.

**Blinking Pattern of Light:**

H

B145472E01

- If pattern (A) is displayed, check the wire harness or power window ECU.
- If pattern (B) is displayed, check the power window regulator motor or power window ECU.
- If the normal pattern is displayed, replace the power window regulator master switch.

## WS-18

## WINDSHIELD / WINDOWGLASS – POWER WINDOW CONTROL SYSTEM

**DTC CHECK / CLEAR****1. CHECK DTC**

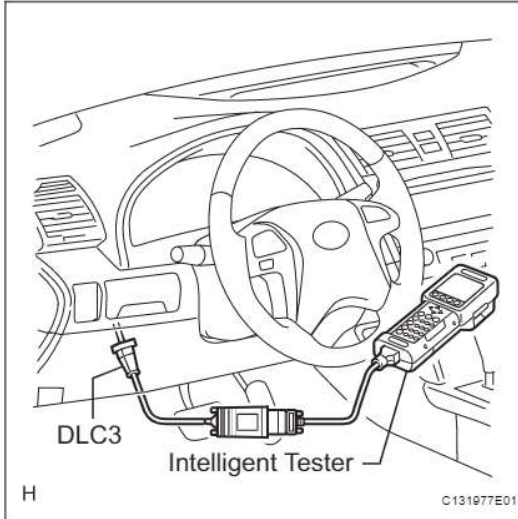
- (a) Connect the intelligent tester to the DLC3.
- (b) Turn the ignition switch on (IG).
- (c) Check the DTC(s).

**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.**



## WINDSHIELD / WINDOWGLASS – POWER WINDOW CONTROL SYSTEM

WS-19

## 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<br>(Within approx. 45 seconds<br>after ignition switch turned off) | Key-off<br>(After approx. 45 seconds<br>elapsed after ignition switch<br>turned off) |
|-------------------------------------------------|-----------------------------------------------------------------|----------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Manual UP                                       | Operation prohibited                                            | Operation prohibited                                                       | Operation prohibited                                                                 |
| Manual DOWN                                     | Operative<br>(Jam protection not operative)                     | Operation prohibited                                                       | Operation prohibited                                                                 |
| AUTO UP<br>(hold switch at AUTO UP<br>position) | Operative<br>(in MANUAL mode)<br>(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-20

## WINDSHIELD / WINDOWGLASS – POWER WINDOW CONTROL SYSTEM

**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<br>STOP: Communication is stop                        | -               |
| Ignition Switch         | Ignition switch signal/ON or OFF                           | ON: Power source mode is (IG)<br>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<br>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<br>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) | -               |

## WINDSHIELD / WINDOWGLASS – POWER WINDOW CONTROL SYSTEM

WS-21

## 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)<br>2. Power window regulator motor (on driver side)<br>3. Incorrect installation of power window components<br>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)<br>2. Power window regulator master switch<br>3. Wire harness<br>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)<br>2. Power window regulator motor (on driver side) not initialized                                                                                                                    | WS-24    |

WS

## WS-22

## WINDSHIELD / WINDOWGLASS – POWER WINDOW CONTROL SYSTEM

| 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: <ul style="list-style-type: none"> <li>The power window regulator motor (on driver side) malfunctions</li> <li>When the ECU in the power window 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</li> </ul> | <ul style="list-style-type: none"> <li>Battery disconnection when the ignition switch is on (IG)</li> <li>Power window regulator motor (on driver side)</li> <li>Incorrect installation of power window components</li> <li>Overheated power window regulator motor (on driver side)</li> </ul> |

**INSPECTION PROCEDURE**

|          |                                               |
|----------|-----------------------------------------------|
| <b>1</b> | <b>INITIALIZE POWER WINDOW CONTROL SYSTEM</b> |
|----------|-----------------------------------------------|

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

WS

WS-24

WINDSHIELD / WINDOWGLASS – POWER WINDOW CONTROL SYSTEM

|     |       |                                            |
|-----|-------|--------------------------------------------|
| 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).

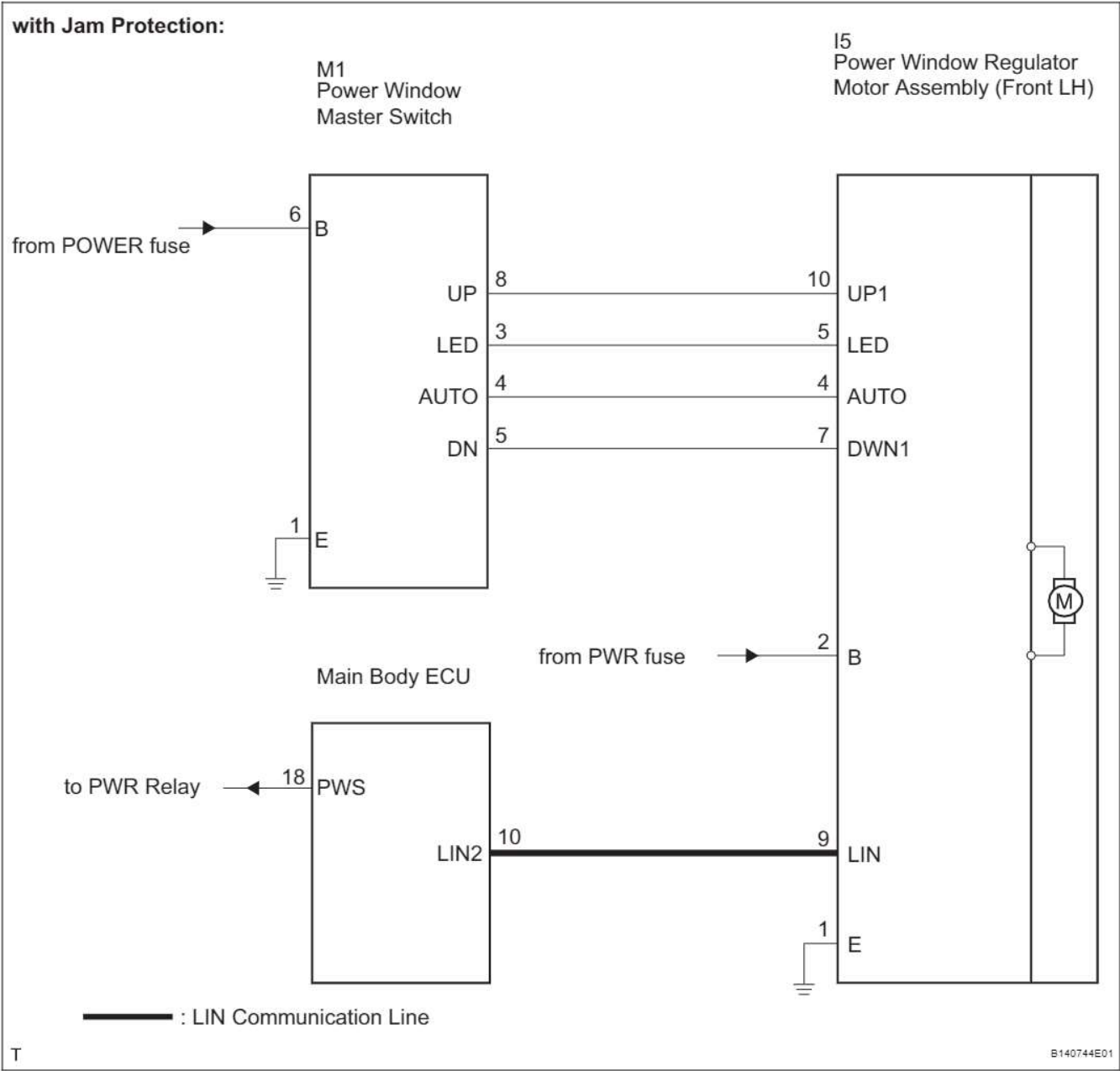
When the ECU determines that the power window master switch is stuck, DTC B2312 is set.

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 | <ul style="list-style-type: none"><li>• Power window regulator motor (on driver side)</li><li>• Power window regulator master switch</li><li>• Wire harness</li><li>• Power window regulator master switch is held in same position for more than 20 seconds</li></ul> |

WIRING DIAGRAM



## WS-26

## WINDSHIELD / WINDOWGLASS – POWER WINDOW CONTROL SYSTEM

## INSPECTION PROCEDURE

## 1 INSPECT POWER WINDOW REGULATOR MASTER SWITCH ASSEMBLY

- (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 $\Omega$    |
| 5 (DN) - 6 (B)            | Auto UP     | Below 1 $\Omega$    |
| 8 (UP) - 1 (E)            | Manual UP   | Below 1 $\Omega$    |
| 5 (DN) - 6 (B)            | Manual UP   | Below 1 $\Omega$    |
| 8 (UP) - 5 (DN) - 6 (B)   | OFF         | Below 1 $\Omega$    |
| 5 (DN) - 1 (E)            | Manual DOWN | Below 1 $\Omega$    |
| 8 (UP) - 6 (B)            | Manual DOWN | Below 1 $\Omega$    |
| 4 (AUTO) - 5 (DN) - 1 (E) | Auto DOWN   | Below 1 $\Omega$    |
| 8 (UP) - 6 (B)            | Auto DOWN   | Below 1 $\Omega$    |

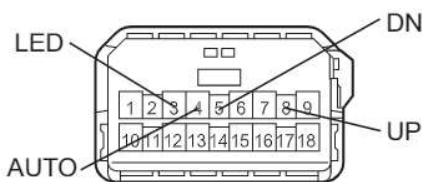
NG

REPLACE POWER WINDOW REGULATOR MASTER SWITCH

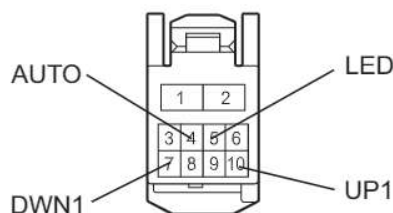
OK

## 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):



- (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 $\Omega$        |
| M1-3 (LED) - I5-5 (LED)   | Always    | Below 1 $\Omega$        |
| M1-4 (AUTO) - I5-4 (AUTO) | Always    | Below 1 $\Omega$        |
| M1-5 (DN) - I5-7 (DWN1)   | Always    | Below 1 $\Omega$        |
| M1-8 (UP) - Body ground   | Always    | 10 k $\Omega$ or higher |
| M1-3 (LED) - Body ground  | Always    | 10 k $\Omega$ or higher |
| M1-4 (AUTO) - Body ground | Always    | 10 k $\Omega$ or higher |
| M1-5 (DN) - Body ground   | Always    | 10 k $\Omega$ or higher |

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

## REPLACE DRIVER SIDE POWER WINDOW REGULATOR MOTOR ASSEMBLY

## WINDSHIELD / WINDOWGLASS – POWER WINDOW CONTROL SYSTEM

WS-27

|            |              |                                                 |
|------------|--------------|-------------------------------------------------|
| <b>DTC</b> | <b>B2313</b> | <b>Glass Position Initialization Incomplete</b> |
|------------|--------------|-------------------------------------------------|

**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   | <ul style="list-style-type: none"> <li>The power window regulator motor (on driver side) is not initialized</li> <li>The power window regulator motor (on driver side) malfunctions</li> </ul> | <ul style="list-style-type: none"> <li>Power window regulator motor (on driver side)</li> <li>Power window regulator motor (on driver side) not initialized</li> </ul> |

**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.

|          |                         |
|----------|-------------------------|
| <b>1</b> | <b>CHECK DTC OUTPUT</b> |
|----------|-------------------------|

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

**Result**

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

B

END

A

WS-28

WINDSHIELD / WINDOWGLASS – POWER WINDOW CONTROL SYSTEM

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

## WINDSHIELD / WINDOWGLASS – POWER WINDOW CONTROL SYSTEM

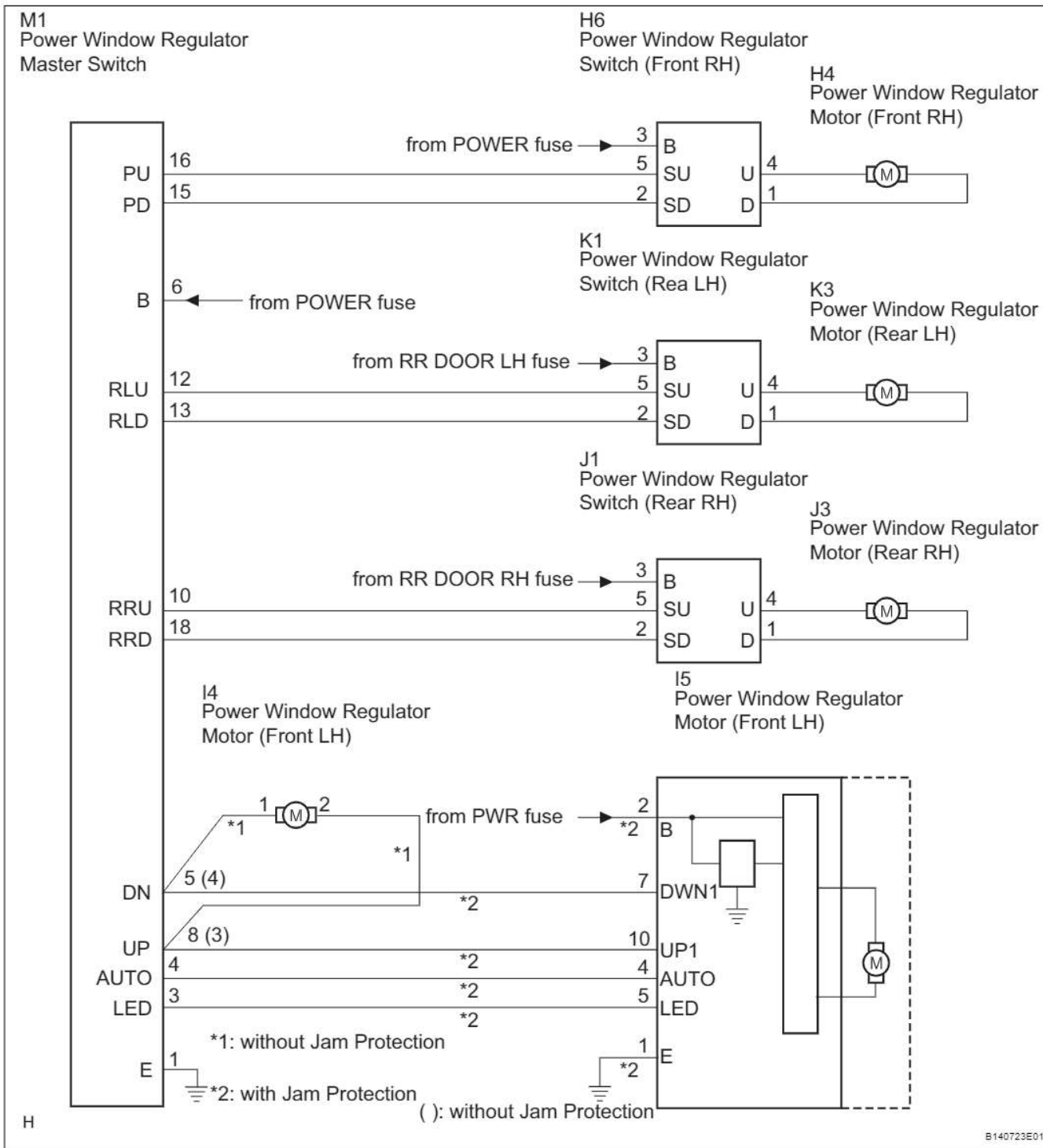
WS-29

## Power Window Master Switch Circuit

### DESCRIPTION

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

### WIRING DIAGRAM



B140723E01

WS-30

## WINDSHIELD / WINDOWGLASS – POWER WINDOW CONTROL SYSTEM

## 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**

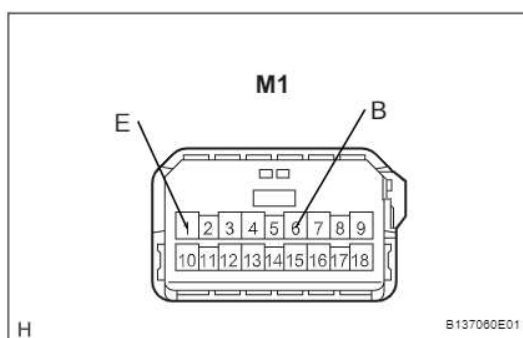
| Display (DTC output) | Proceed to |
|----------------------|------------|
| No output            | A          |
| Output DTCs          | B          |

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**

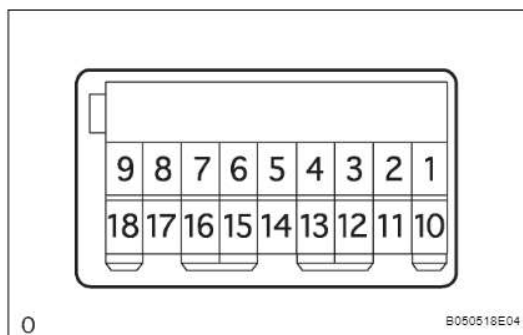
| Tester Connection   | Condition | Specified Condition |
|---------------------|-----------|---------------------|
| 1 (E) - Body ground | Always    | Below 1 $\Omega$    |

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 $\Omega$    |
| 5 (DN) - 6 (B)            |             | Below 1 $\Omega$    |
| 8 (UP) - 1 (E)            | Manual UP   | Below 1 $\Omega$    |
| 5 (DN) - 6 (B)            |             | Below 1 $\Omega$    |
| 8 (UP) - 5 (DN) - 6 (B)   | OFF         | Below 1 $\Omega$    |
| 5 (DN) - 1 (E)            | Manual DOWN | Below 1 $\Omega$    |
| 8 (UP) - 6 (B)            |             | Below 1 $\Omega$    |

## WINDSHIELD / WINDOWGLASS – POWER WINDOW CONTROL SYSTEM

WS-31

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

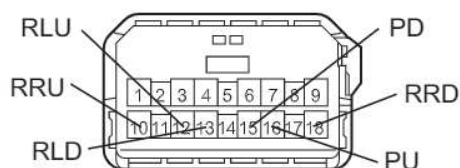
NG

**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

- Disconnect the M1 and H6 (K1, J1) connectors.
- 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 $\Omega$        |
| M1-15 (PD) - H6-2 (SD)   | Always    | Below 1 $\Omega$        |
| M1-16 (PU) - Body ground | Always    | 10 k $\Omega$ or higher |
| M1-15 (PD) - Body ground | Always    | 10 k $\Omega$ or higher |

##### Rear LH side

| Tester Connection         | Condition | Specified Condition     |
|---------------------------|-----------|-------------------------|
| M1-12 (RLU) - K1-5 (SU)   | Always    | Below 1 $\Omega$        |
| M1-13 (RLD) - K1-2 (SD)   | Always    | Below 1 $\Omega$        |
| M1-12 (RLU) - Body ground | Always    | 10 k $\Omega$ or higher |
| M1-13 (RLD) - Body ground | Always    | 10 k $\Omega$ or higher |

##### Rear RH side

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WINDSHIELD / WINDOWGLASS – POWER WINDOW CONTROL SYSTEM

| 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

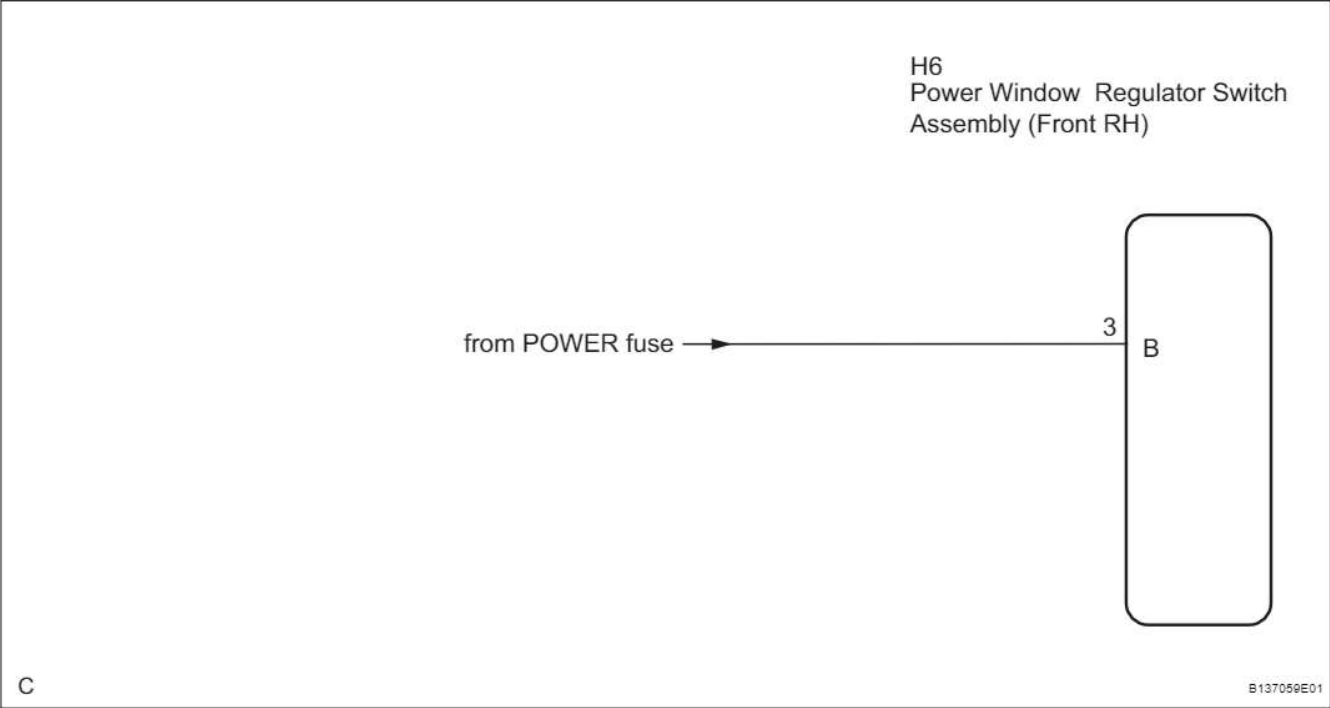
PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

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**

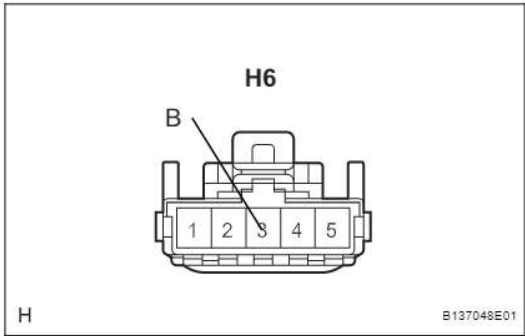
WS



**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

WS-34

WINDSHIELD / WINDOWGLASS – POWER WINDOW CONTROL SYSTEM

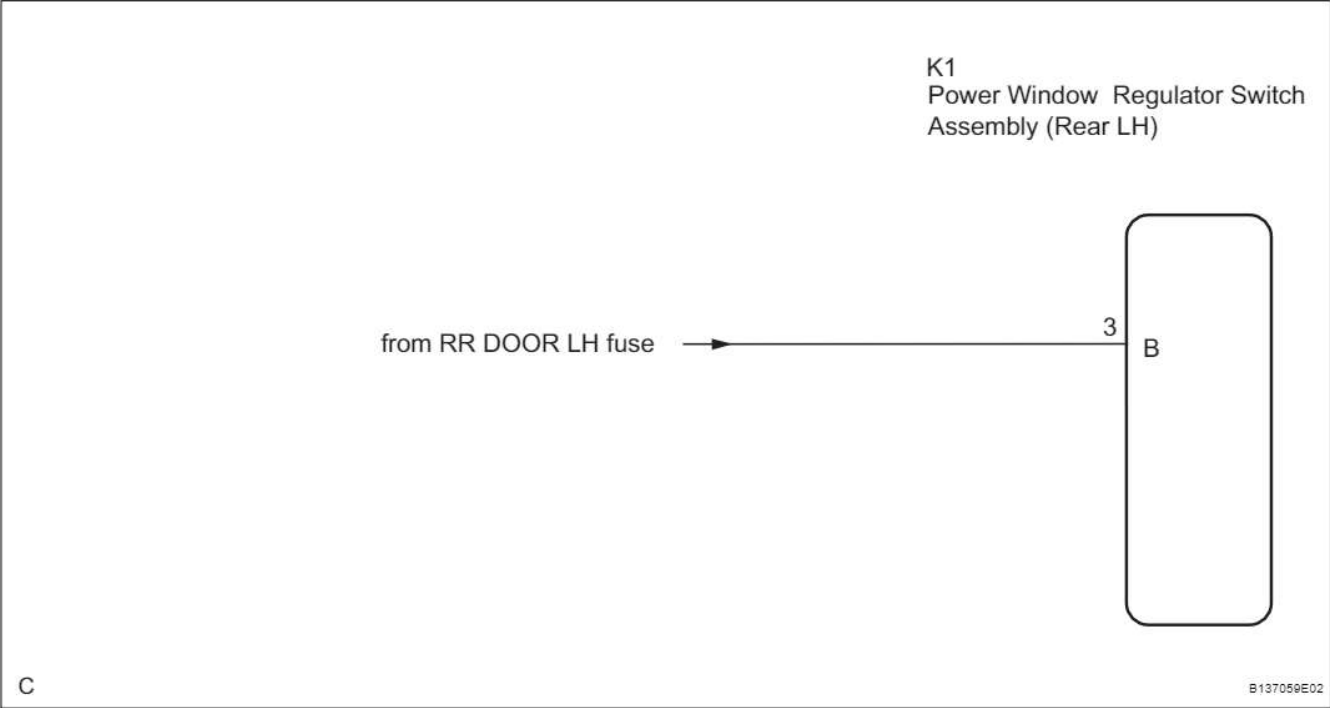
Rear Power Window Switch LH Circuit

DESCRIPTION

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

WS

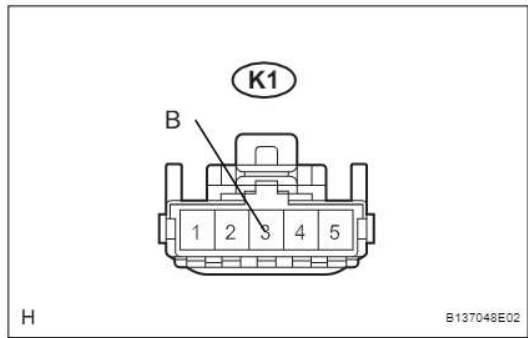
WIRING DIAGRAM



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

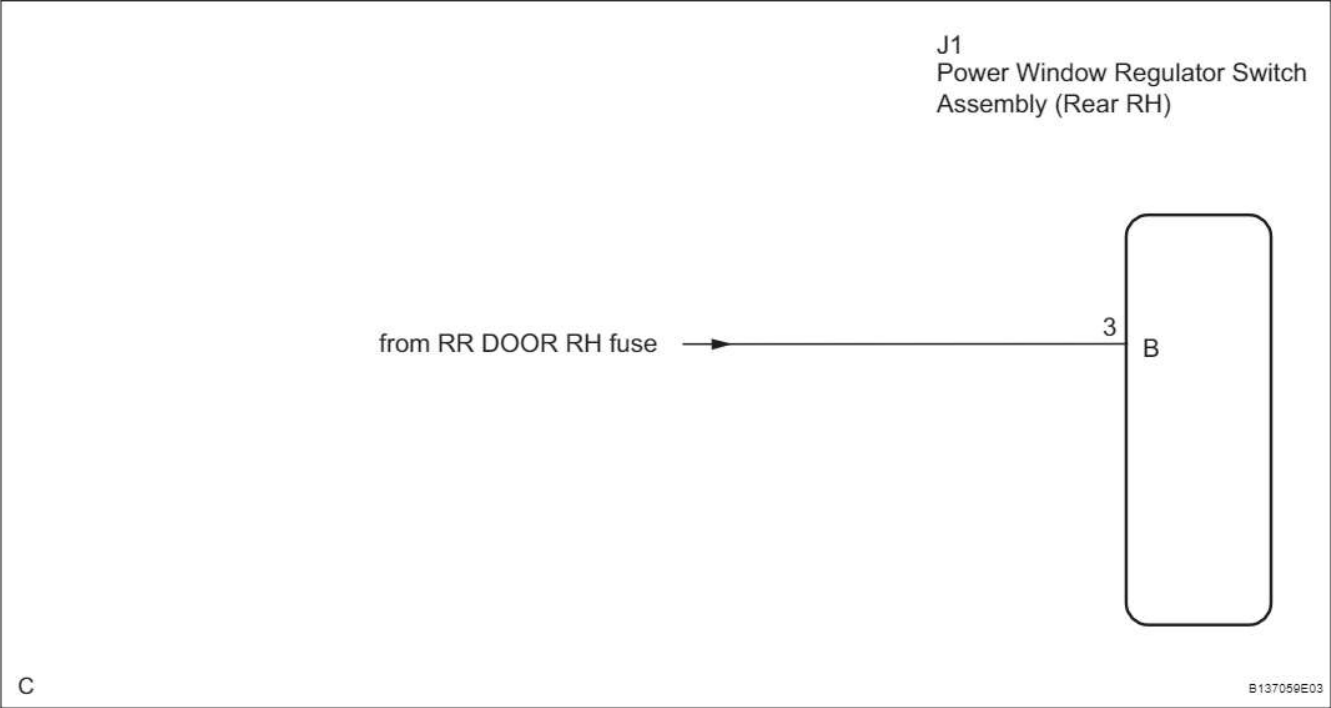
Rear Power Window Switch RH Circuit

DESCRIPTION

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

WIRING DIAGRAM

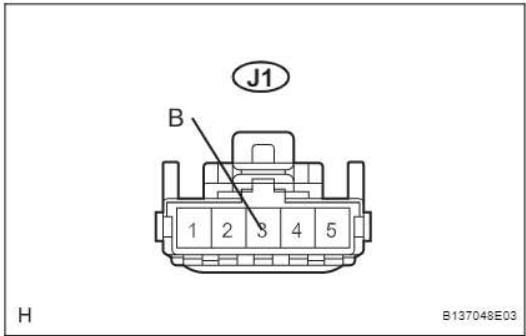
WS



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

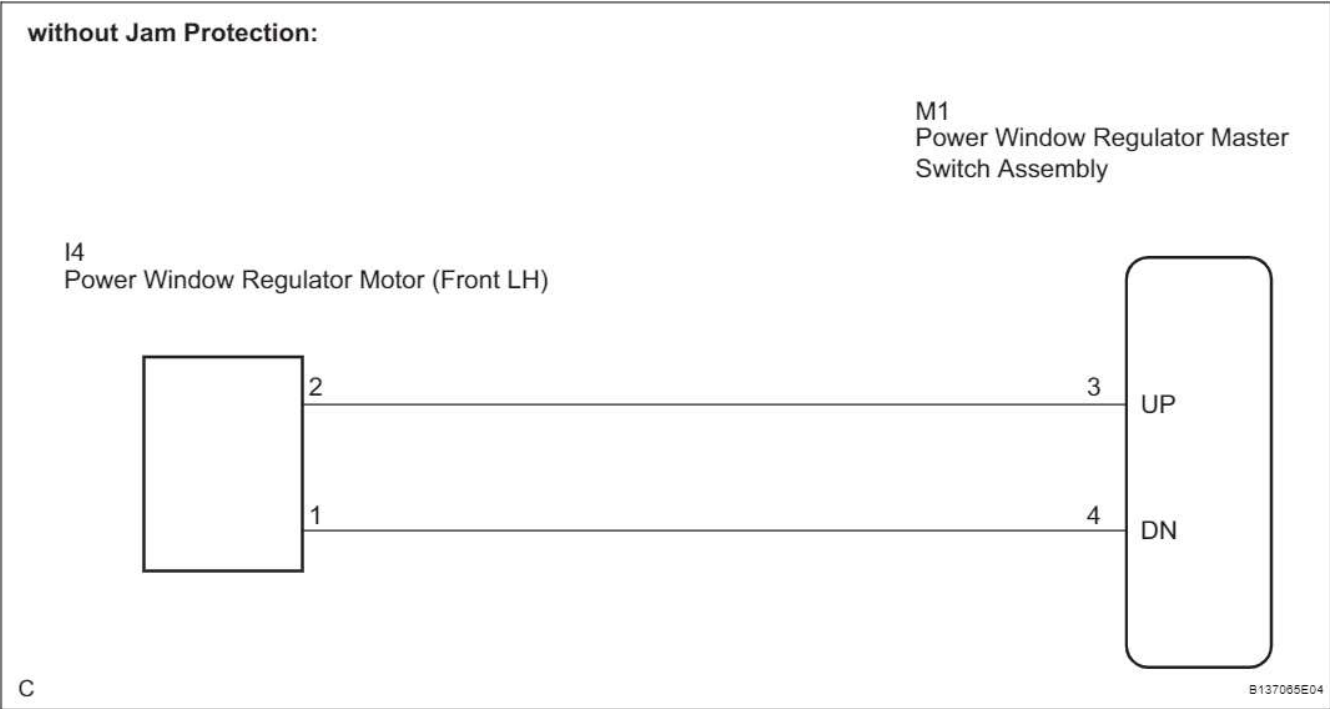
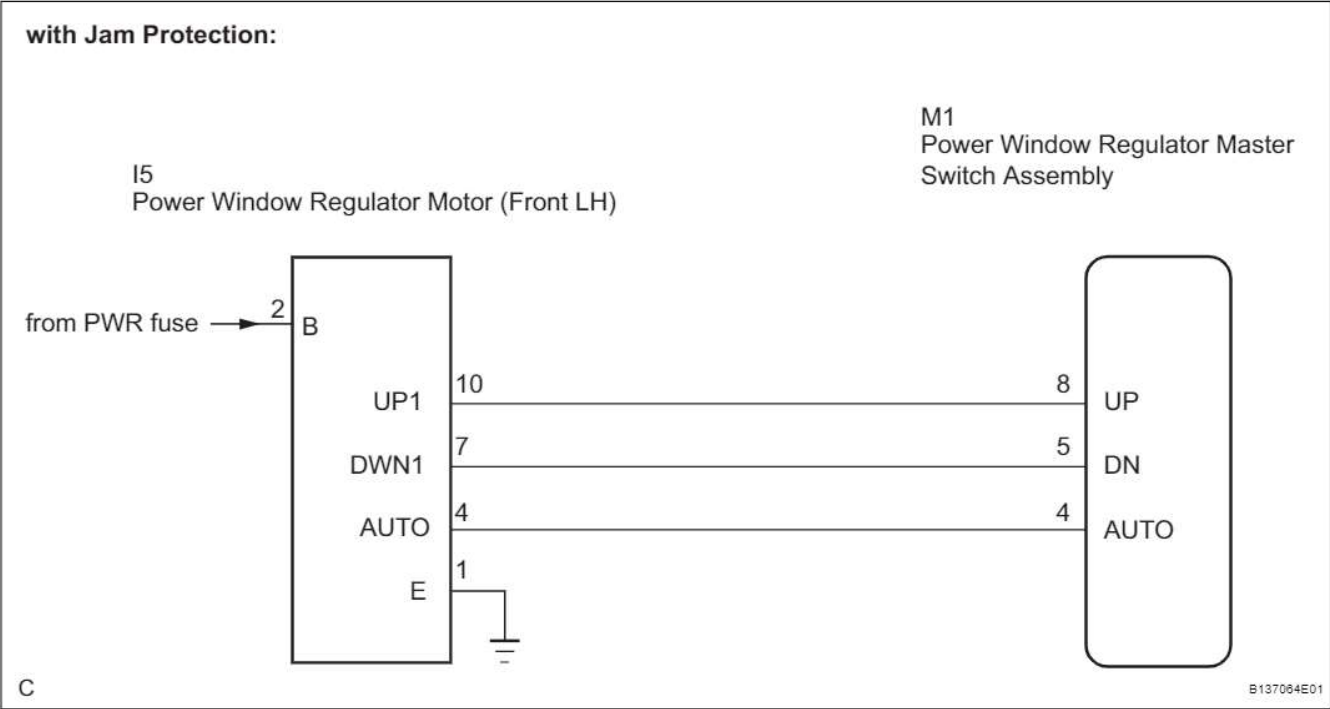
PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

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).

WIRING DIAGRAM

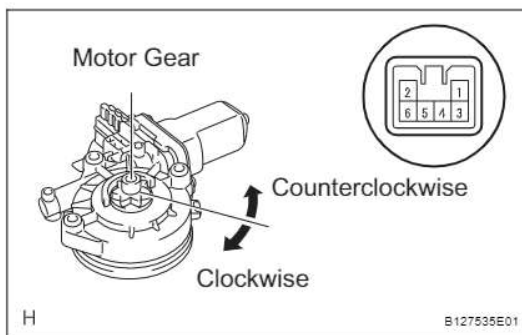


## WINDSHIELD / WINDOWGLASS – POWER WINDOW CONTROL SYSTEM

WS-37

## INSPECTION PROCEDURE

## 1 INSPECT POWER WINDOW REGULATOR MOTOR



without Jam protection:

(a) Remove the power window motor.

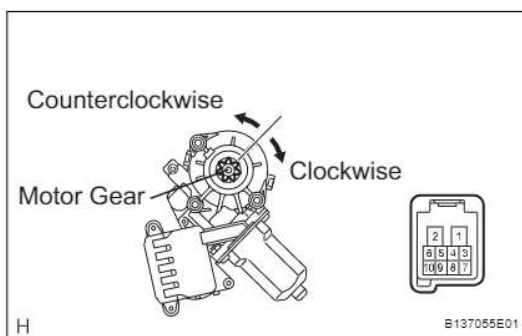
- (1) Apply battery voltage to the motor connector according to the table below.

**NOTICE:**

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

**Standard**

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

NG

**REPLACE POWER WINDOW REGULATOR MOTOR**

OK

## WS-38

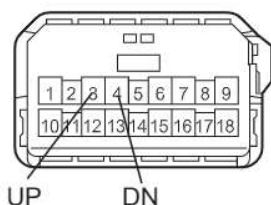
## WINDSHIELD / WINDOWGLASS – POWER WINDOW CONTROL SYSTEM

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):



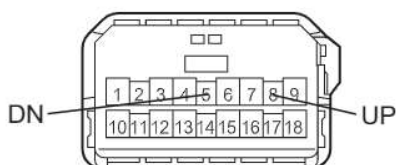
B137081E01

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

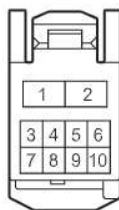
## Standard resistance

| Tester Connection       | Condition | Specified Condition     |
|-------------------------|-----------|-------------------------|
| M1-3 (UP) - I4-2        | Always    | Below 1 $\Omega$        |
| M1-4 (DN) - I4-1        | Always    | Below 1 $\Omega$        |
| M1-3 (UP) - Body ground | Always    | 10 k $\Omega$ or higher |
| M1-4 (DN) - Body ground | Always    | 10 k $\Omega$ or higher |

**M1**  
Power Window Regulator Master  
Switch Assembly:



**I5**  
Power Window Regulator Motor  
(Front LH):



B137048E01

- (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 $\Omega$        |
| M1-5 (DN) - I5-7        | Always    | Below 1 $\Omega$        |
| M1-8 (UP) - Body ground | Always    | 10 k $\Omega$ or higher |
| M1-5 (DN) - Body ground | Always    | 10 k $\Omega$ or higher |

NG

**REPAIR OR REPLACE HARNESS OR  
CONNECTOR**

OK

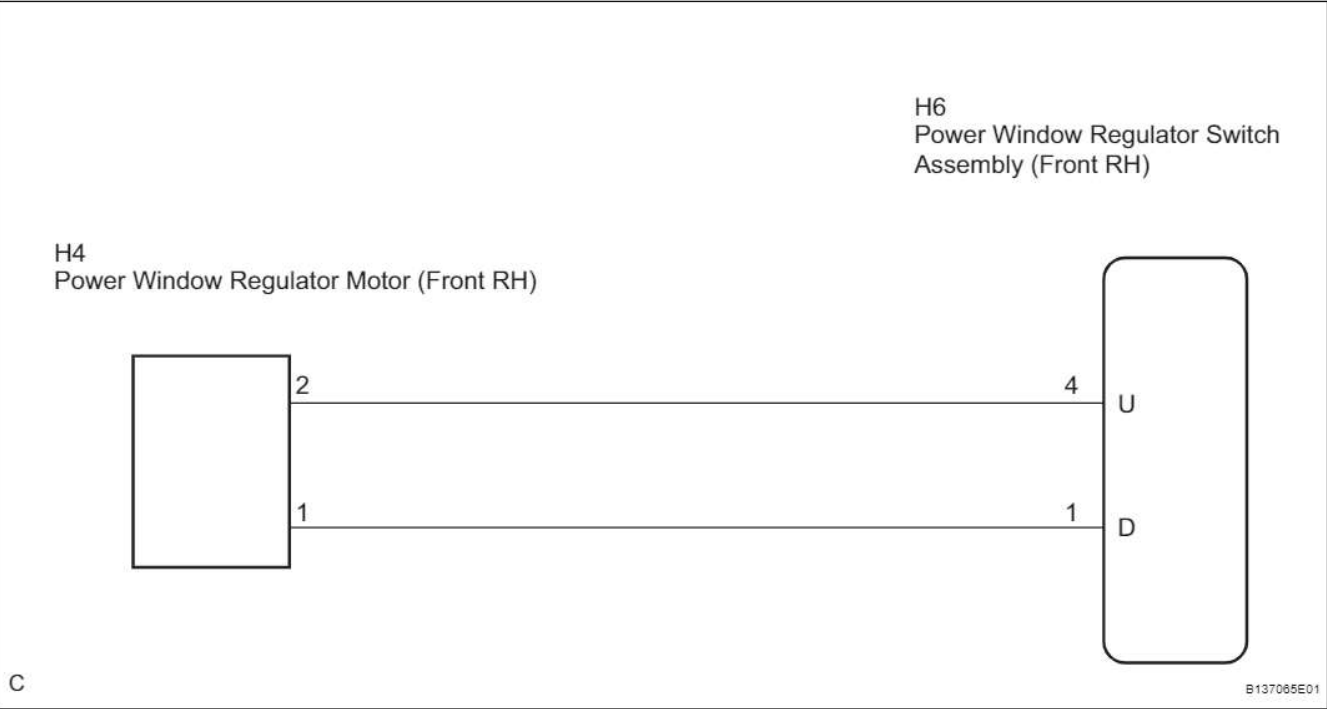
**PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE**

Front Passenger Side Power Window Motor Circuit

DESCRIPTION

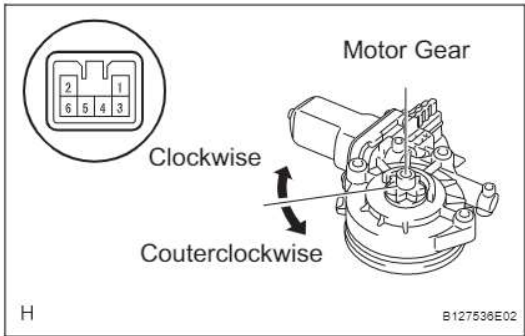
This circuit transmits signals from the power window regulator switch assembly (Front RH) to the power window regulator motor (Front RH).

WIRING DIAGRAM



INSPECTION PROCEDURE

1INSPECT 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<br>Battery negative (-) → Terminal 2 | Motor gear rotates clockwise        |
| Battery positive (+) → Terminal 2<br>Battery negative (-) → Terminal 1 | Motor gear rotates counterclockwise |

NG

REPLACE POWER WINDOW REGULATOR MOTOR

OK

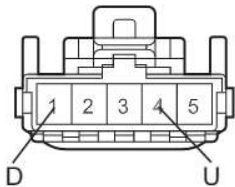
WS-40

WINDSHIELD / WINDOWGLASS – POWER WINDOW CONTROL SYSTEM

2

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

H6  
Power Window Regulator  
Switch Assembly (Front RH):



H4  
Power Window Regulator  
Motor (Front RH):



B137088E01

- (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

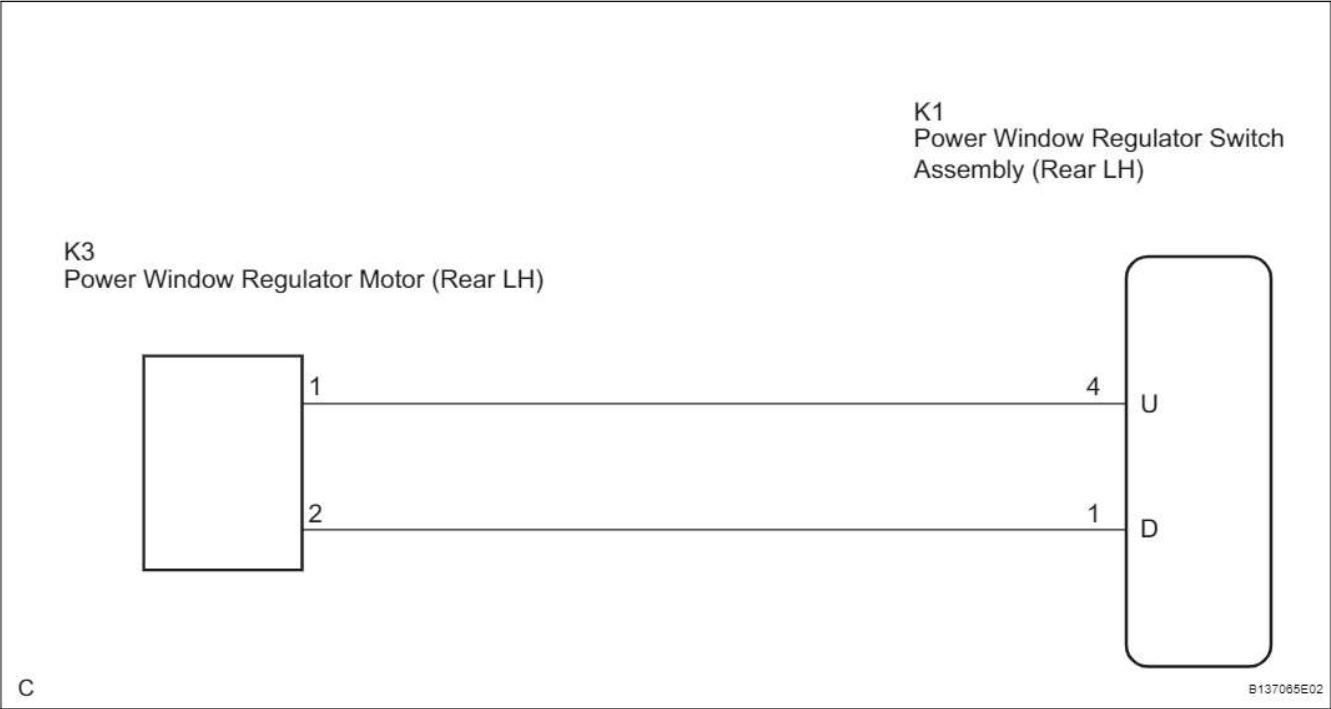
PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

Rear Power Window Motor LH Circuit

DESCRIPTION

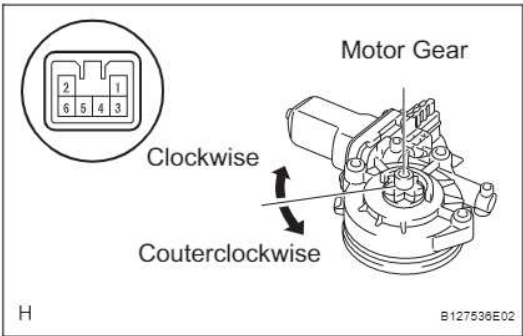
This circuit transmits signals from the power window regulator switch assembly (Rear LH) to the power window regulator motor (Rear LH).

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<br>Battery negative (-) → Terminal 2 | Motor gear rotates clockwise        |
| Battery positive (+) → Terminal 2<br>Battery negative (-) → Terminal 1 | Motor gear rotates counterclockwise |

NG

REPLACE POWER WINDOW REGULATOR MOTOR

OK

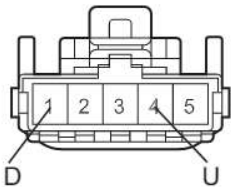
WS-42

WINDSHIELD / WINDOWGLASS – POWER WINDOW CONTROL SYSTEM

2

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

K1  
Power Window Regulator  
Switch Assembly (Rear LH):



K3  
Power Window Regulator  
Motor (Rear LH):



B137088E02

- (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 $\Omega$        |
| K1-1 (D) - K3-2        | Always    | Below 1 $\Omega$        |
| K1-4 (U) - Body ground | Always    | 10 k $\Omega$ or higher |
| K1-1 (D) - Body ground | Always    | 10 k $\Omega$ or higher |

NG

REPAIR OR REPLACE HARNESS OR  
CONNECTOR

OK

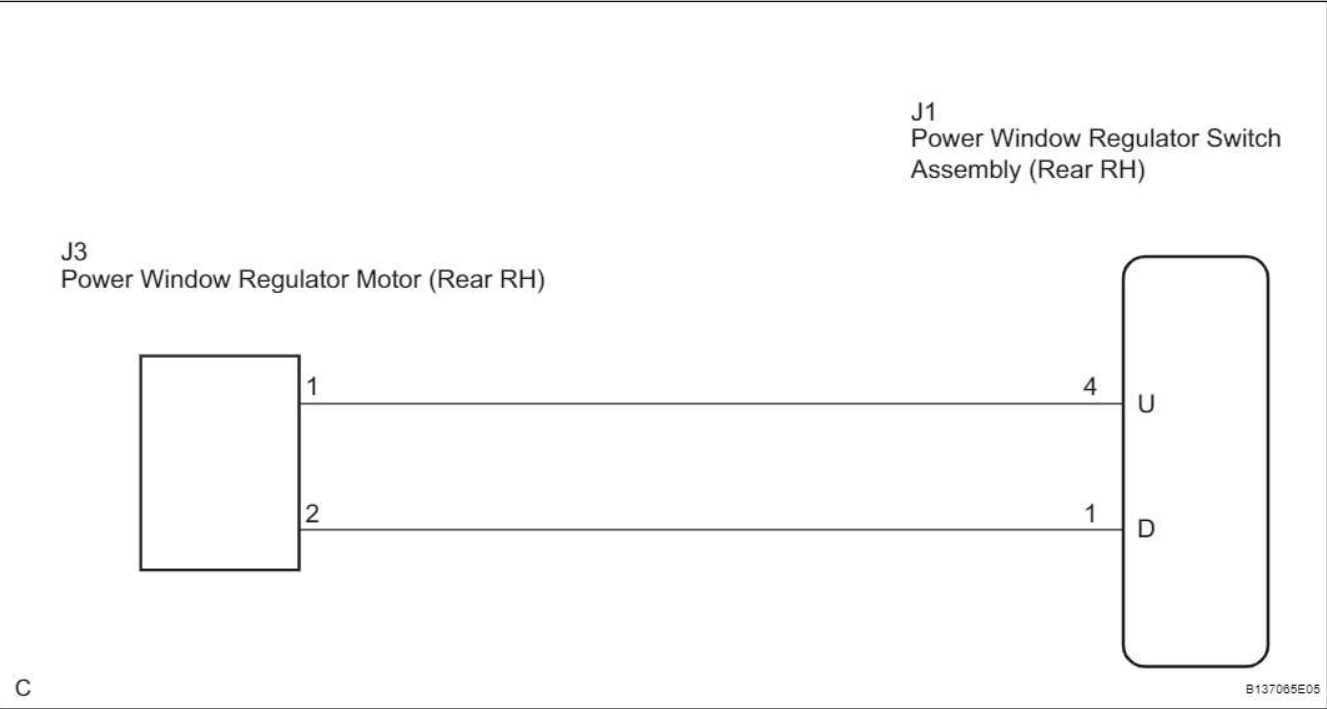
PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

Rear Power Window Motor RH Circuit

DESCRIPTION

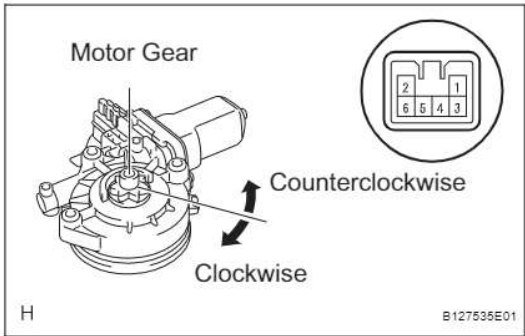
This circuit transmits signals from the power window regulator switch assembly (Rear RH) to the power window regulator motor (Rear RH).

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<br>Battery negative (-) → Terminal 1 | Motor gear rotates clockwise        |
| Battery positive (+) → Terminal 1<br>Battery negative (-) → Terminal 2 | Motor gear rotates counterclockwise |

NG

REPLACE POWER WINDOW REGULATOR MOTOR

OK

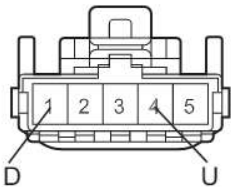
WS-44

WINDSHIELD / WINDOWGLASS – POWER WINDOW CONTROL SYSTEM

2

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

J1  
Power Window Regulator  
Switch Assembly (Rear RH):



J3  
Power Window Regulator  
Motor (Rear RH):



B137088E03

- (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-42

## WINDSHIELD / WINDOWGLASS – POWER WINDOW MASTER SWITCH

# 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

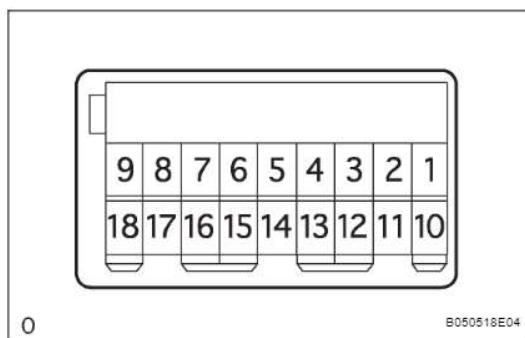
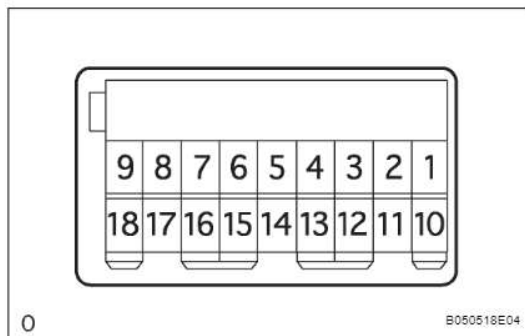
| Tester Connection         | Switch Condition   | Specified Condition                                         |
|---------------------------|--------------------|-------------------------------------------------------------|
| 8 (UP) - 1 (E) - 4 (AUTO) | Auto UP            | Below 1 $\Omega$       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

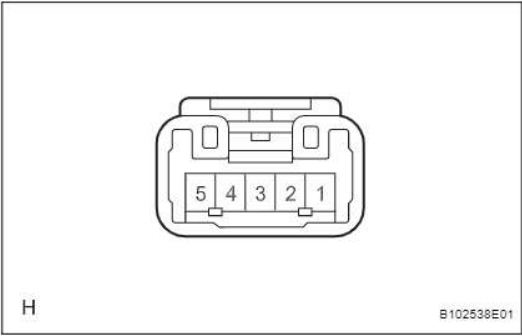
### 2. INSPECT POWER WINDOW MASTER SWITCH (w/o Jam Protection Function)

- (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 $\Omega$                                            |
| 1 (E) - 4 (DD)    |                    | Below 1 $\Omega$                                            |
| 1 (E) - 10 (RRU)  | Lock/Unlock switch | UNLOCK (Below 1 $\Omega$ ) → LOCK (10 k $\Omega$ 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

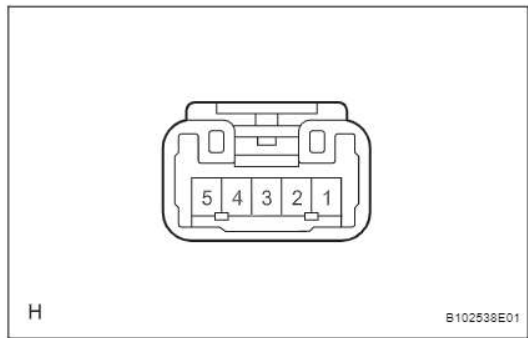
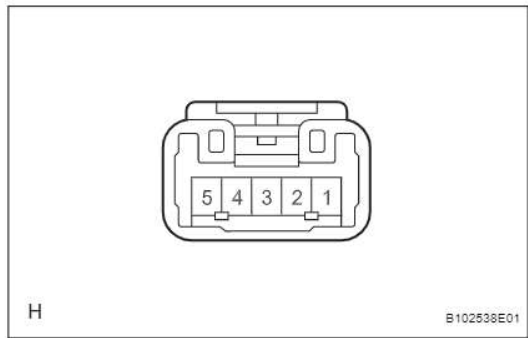
1. INSPECT POWER WINDOW SWITCH
- (a) Remove the power window switch.

(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**

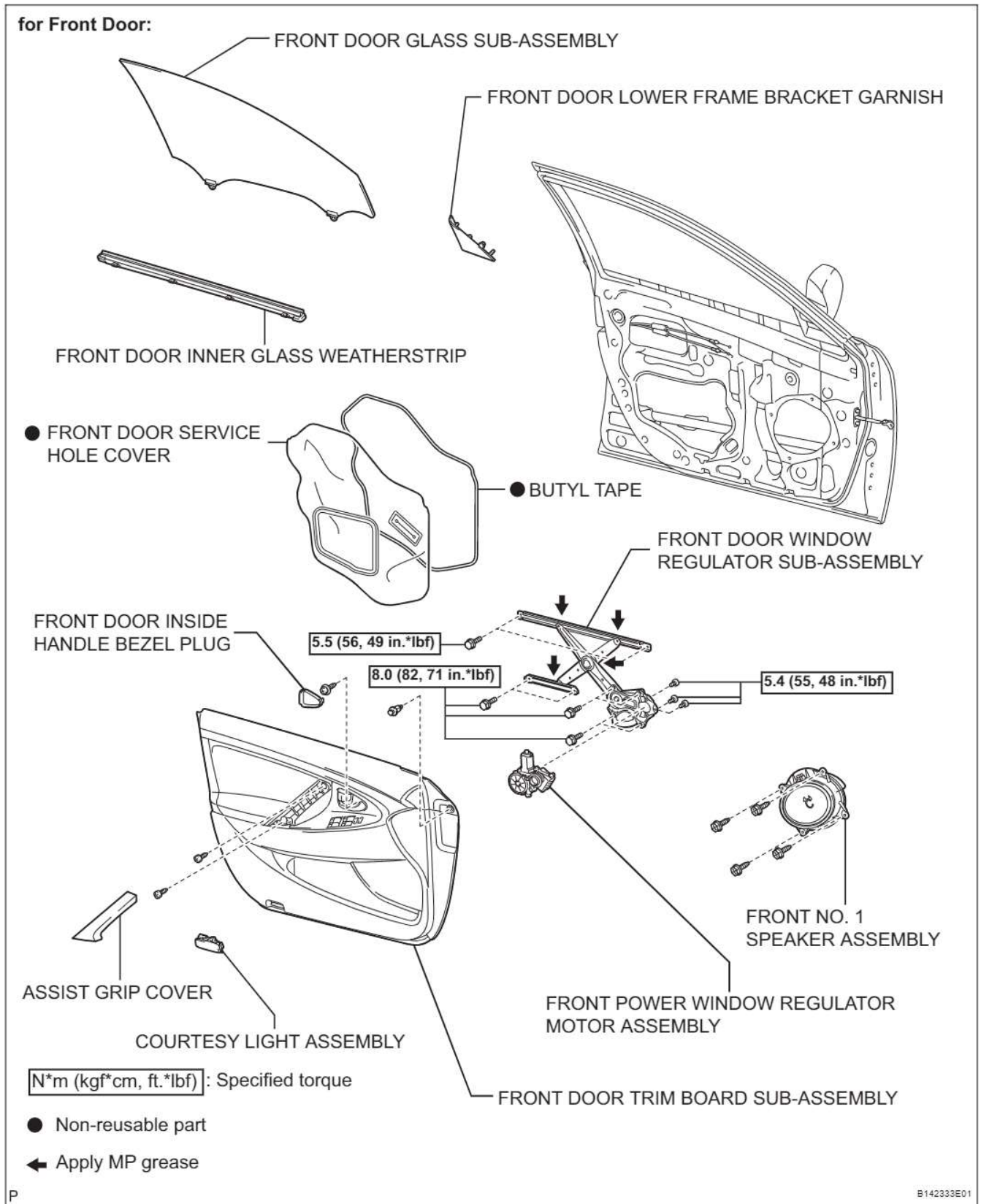
| Tester Connection | Switch Condition | Specified Condition |
|-------------------|------------------|---------------------|
| 1 (D) - 2 (SD)    | UP               | Below 1 Ω           |
| 3 (B) - 4 (U)     |                  | Below 1 Ω           |
| 1 (D) - 2 (SD)    | OFF              | Below 1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

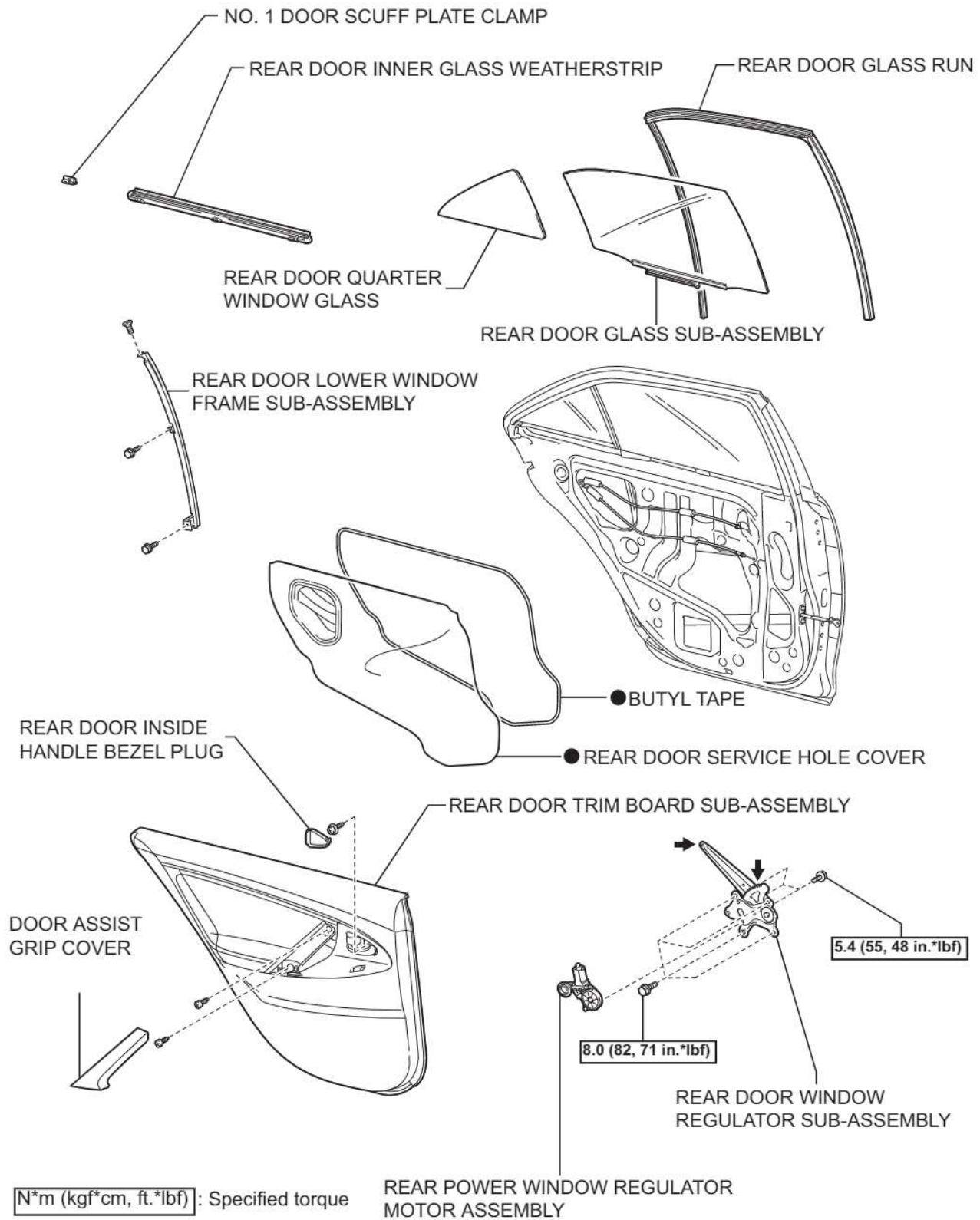


WS

## WS-46

## WINDSHIELD / WINDOWGLASS – POWER WINDOW REGULATOR MOTOR

for Rear Door:



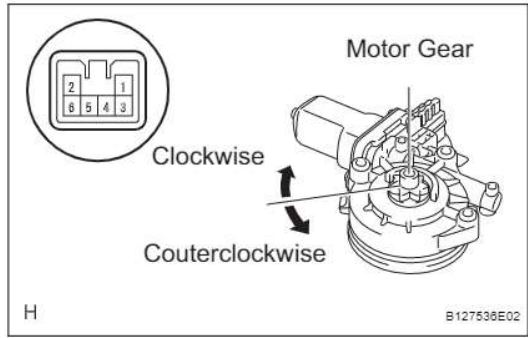
P

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)

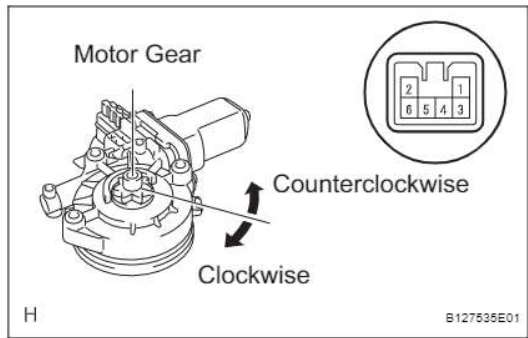
- (a) Apply battery voltage to the motor connector according to the table below.

**NOTICE:**

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

**Standard**

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

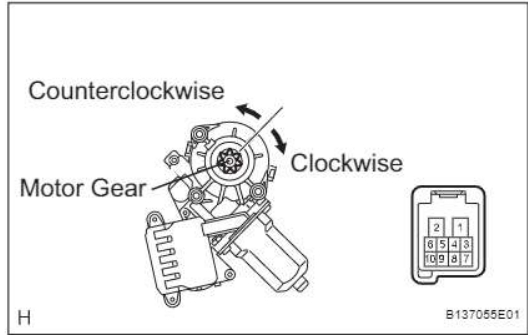
- (b) with Jam protection:

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

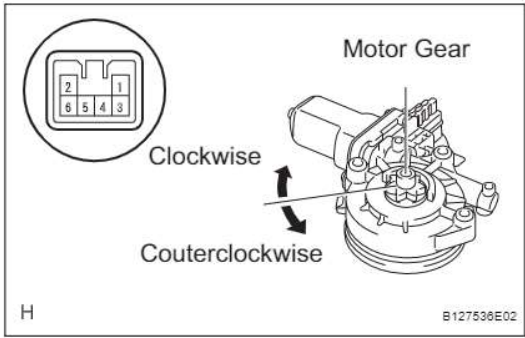
**NOTICE:**

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)<br>Battery negative (-) → Terminal 1 (E), 7 (DN)           | Motor gear rotates clockwise        |
|                  | Battery positive (+) → Terminal 2 (PWR)<br>Battery negative (-) → Terminal 1 (E), 10 (UP)          | Motor gear rotates counterclockwise |
| Auto Operation   | Battery positive (+) → Terminal 2 (PWR)<br>Battery negative (-) → Terminal 1 (E), 4 (AUTO), 7 (DN) | Motor gear rotates clockwise        |
|                  | Battery positive (+) → Terminal 2 (PWR)<br>Battery negative (-) → Terminal 1 (E), 4 (AUTO) 10 (UP) | Motor gear rotates counterclockwise |

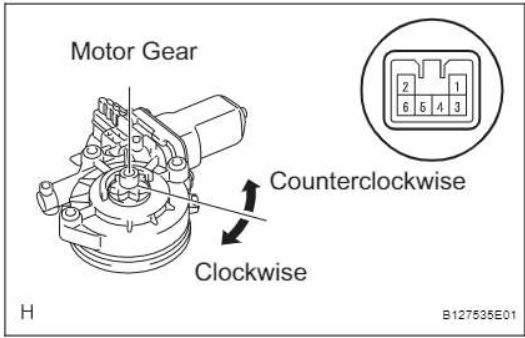


3. INSPECT POWER WINDOW REGULATOR MOTOR (REAR RH)

- (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<br>Battery negative (-) → Terminal 1 | Motor gear rotates clockwise        |
| Battery positive (+) → Terminal 1<br>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<br>Battery negative (-) → Terminal 2 | Motor gear rotates clockwise        |
| Battery positive (+) → Terminal 2<br>Battery negative (-) → Terminal 1 | Motor gear rotates counterclockwise |

## INSTALLATION

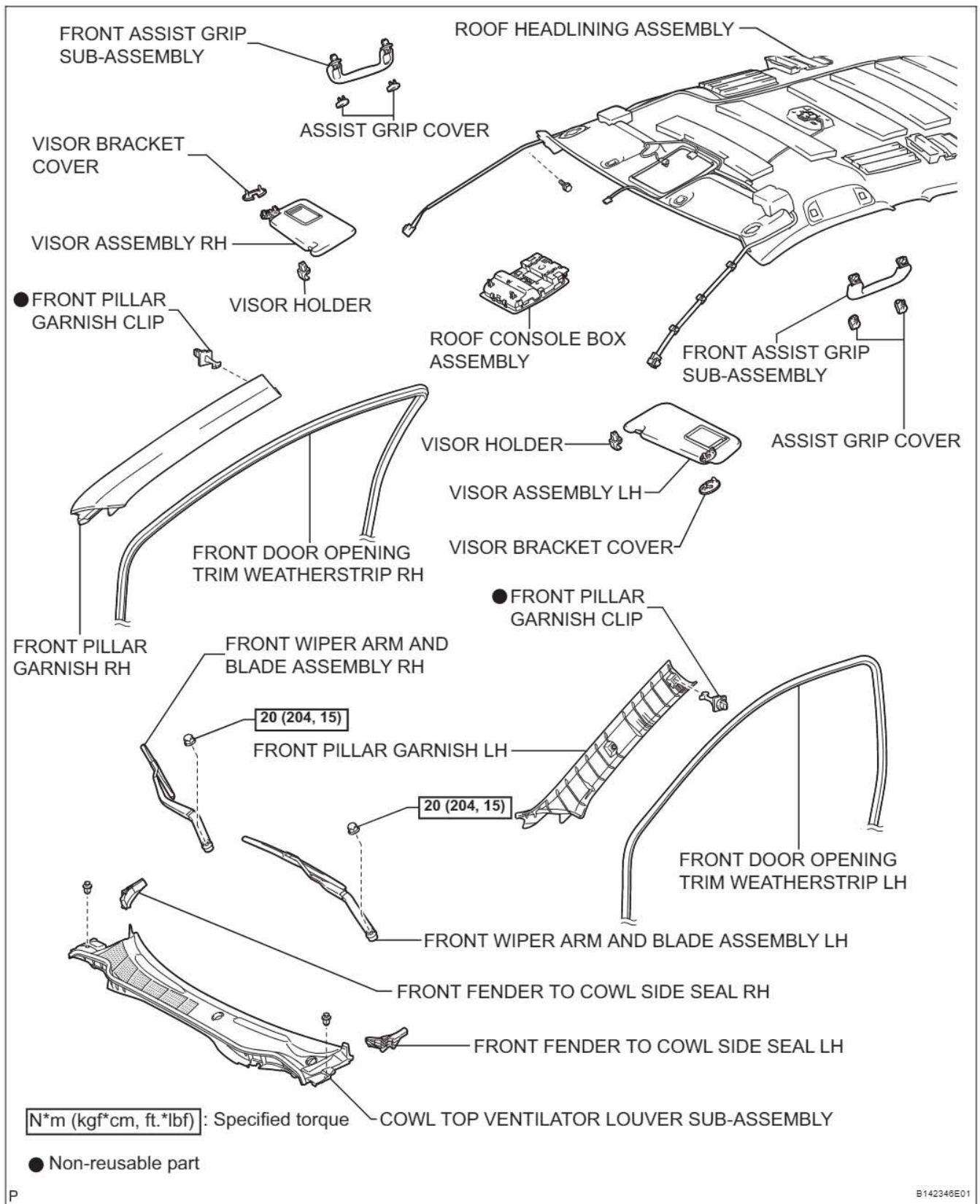
1. INSTALL REAR POWER WINDOW REGULATOR MOTOR ASSEMBLY (See page [ED-51](#))
2. INSTALL REAR DOOR WINDOW REGULATOR SUB-ASSEMBLY (See page [ED-51](#))
3. INSTALL REAR DOOR GLASS RUN (See page [ED-52](#))
4. INSTALL REAR DOOR GLASS SUB-ASSEMBLY (See page [ED-52](#))
5. INSTALL REAR DOOR QUARTER WINDOW GLASS (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](#))

**WS**

# WINDSHIELD GLASS

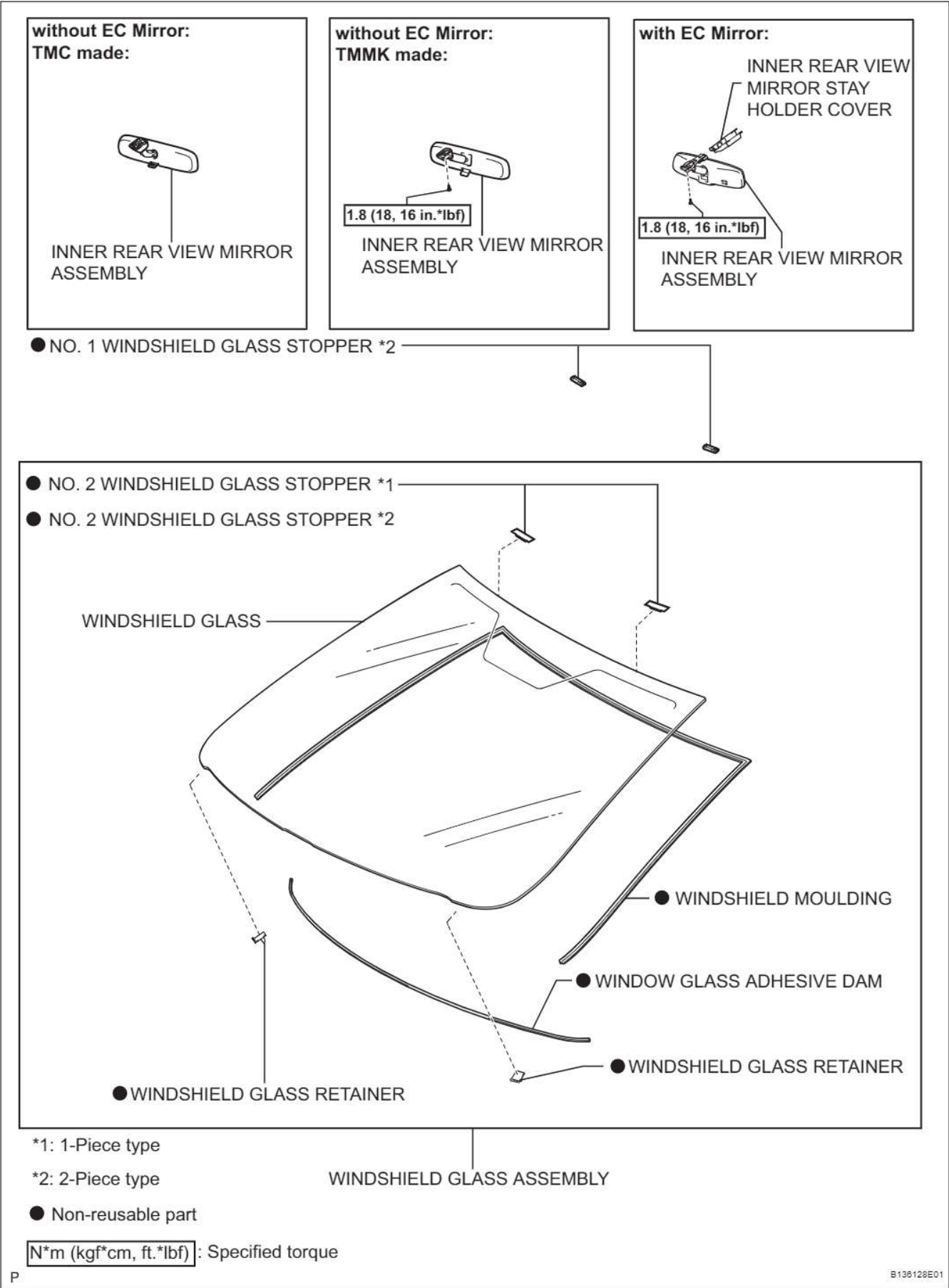
## COMPONENTS



WS

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WINDSHIELD / WINDOWGLASS – WINDSHIELD GLASS



## 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**

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## WINDSHIELD / WINDOWGLASS – WINDSHIELD GLASS

**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:**

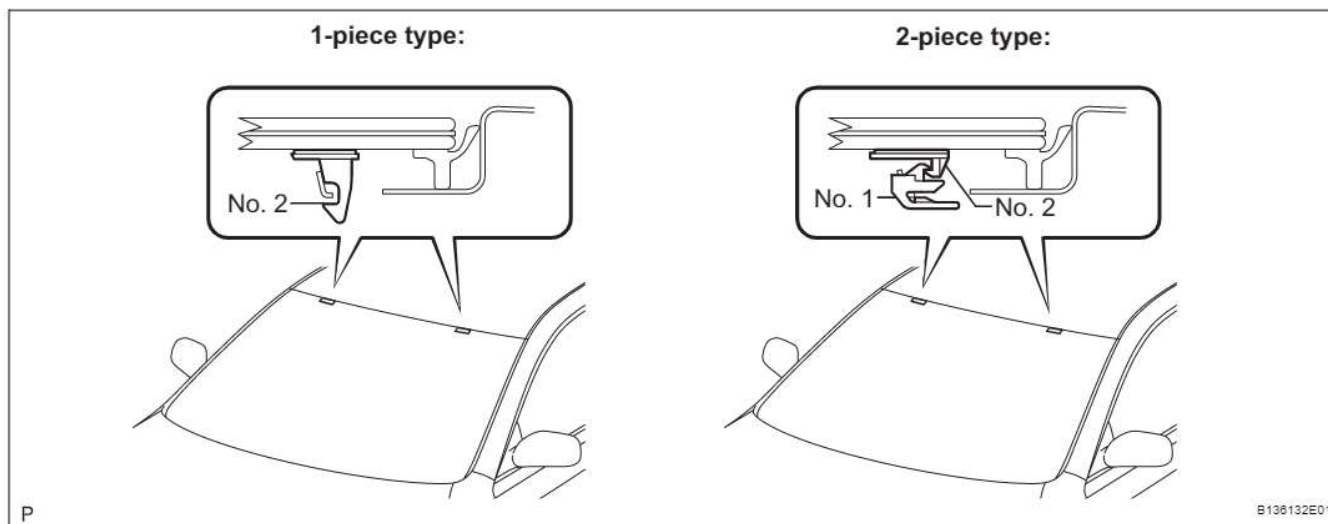
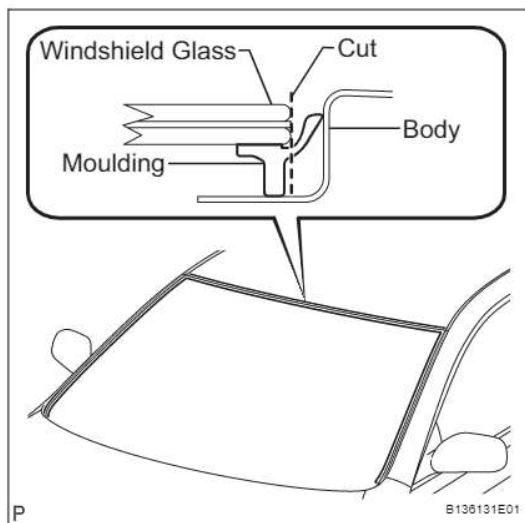
When removing the moulding, make a partial cut, then pull and remove it by hand.

**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.

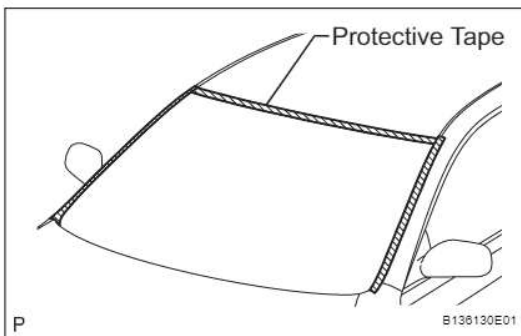
**HINT:**

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

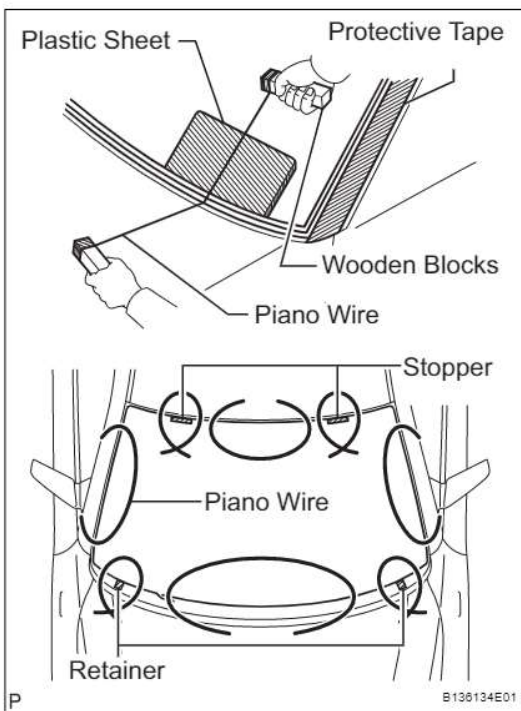


## WINDSHIELD / WINDOWGLASS – WINDSHIELD GLASS

WS-55



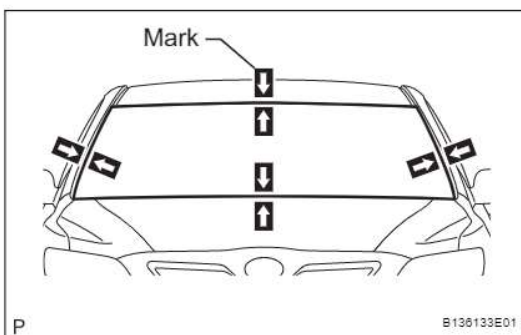
- (a) Apply protective tape to the installation position of the windshield glass assembly on the vehicle body.  
**HINT:**  
 Apply protective tape to the installation surface to prevent it from being scratched.



- (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.

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## WINDSHIELD / WINDOWGLASS – WINDSHIELD GLASS

**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:**

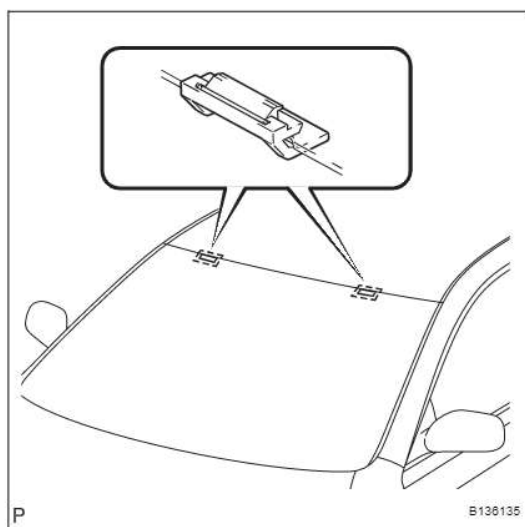
- Be careful not to damage the windshield glass.
- Be sure to replace the retainer with a new one.

**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.

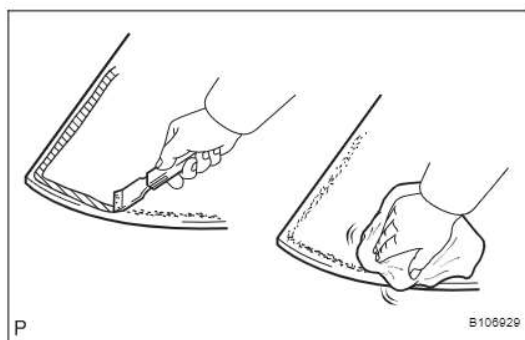
**NOTICE:**

Be careful not to damage the windshield glass.

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

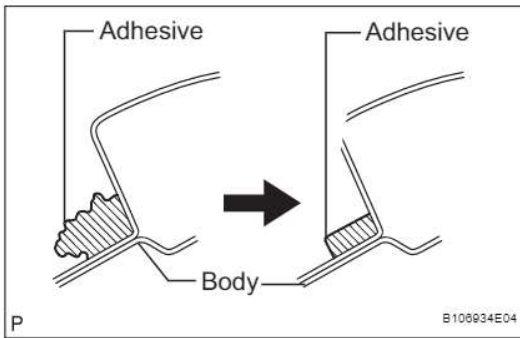
**NOTICE:**

- 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.



## WINDSHIELD / WINDOWGLASS – WINDSHIELD GLASS

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**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.

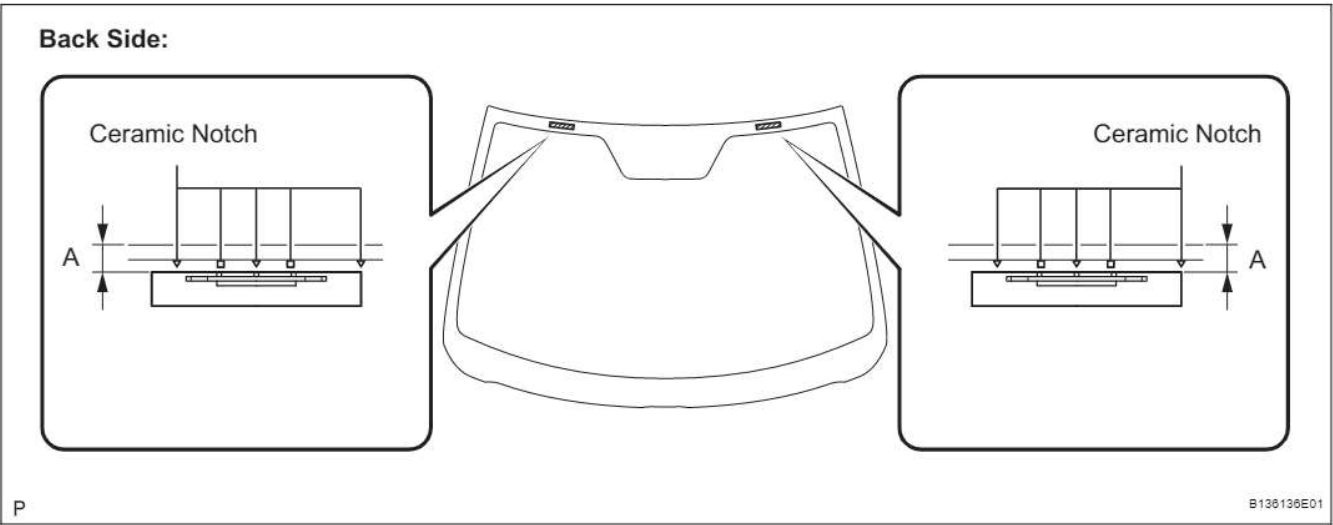
- (b) Install 2 new No. 2 stoppers onto the windshield glass, as shown in the illustration.

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.

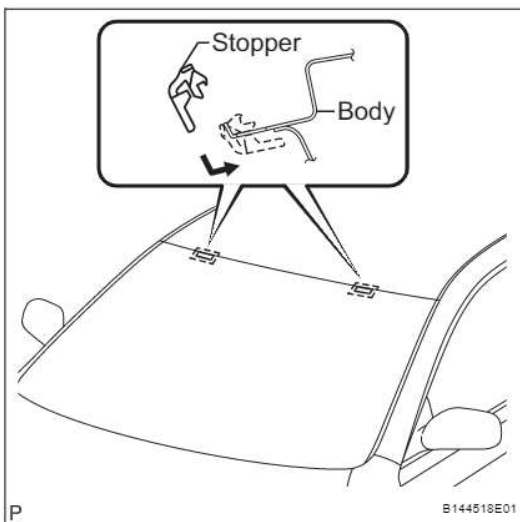
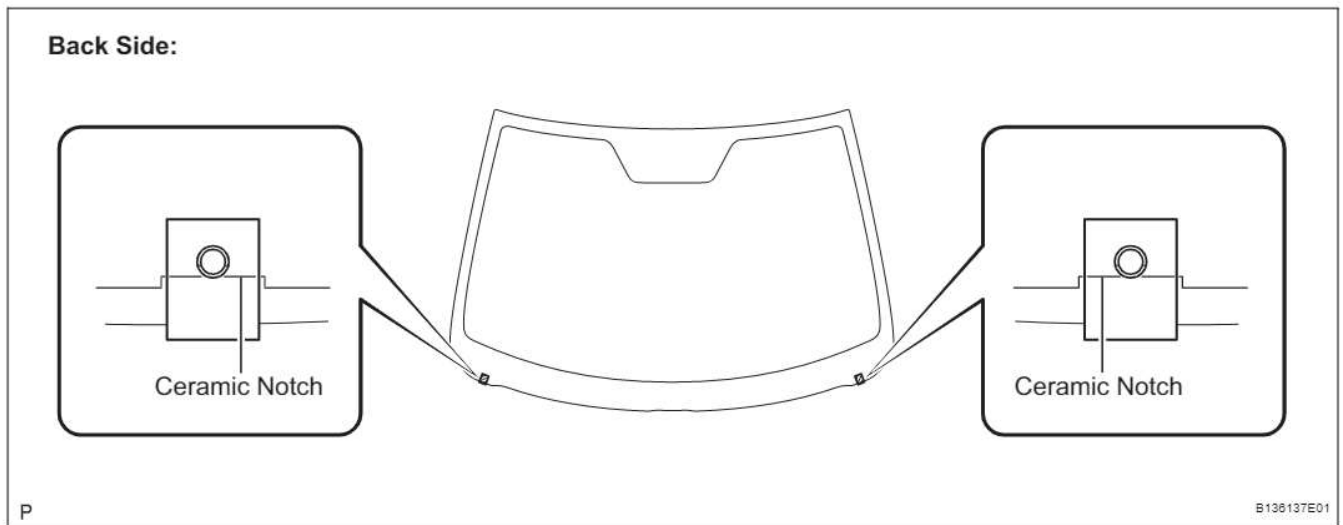
HINT:

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

## WINDSHIELD / WINDOWGLASS – WINDSHIELD GLASS

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- (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.

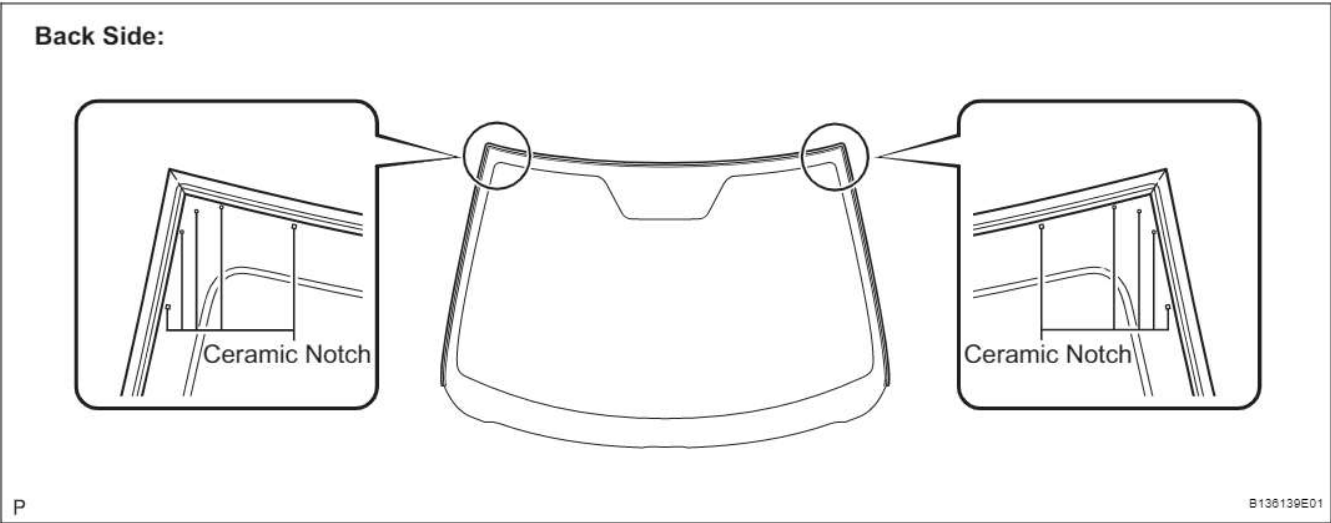
**HINT:**

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

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WINDSHIELD / WINDOWGLASS – WINDSHIELD GLASS

(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.**

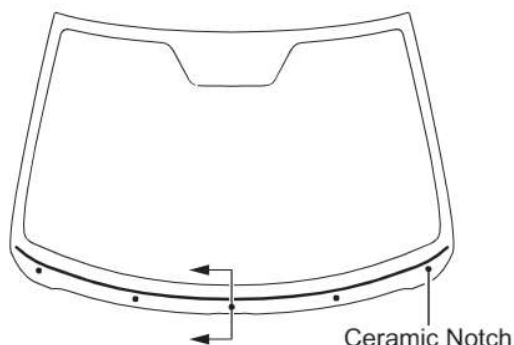
**Standard dimension**

| Area | Dimension          |
|------|--------------------|
| A    | 6.5 mm (0.255 in.) |

## WINDSHIELD / WINDOWGLASS – WINDSHIELD GLASS

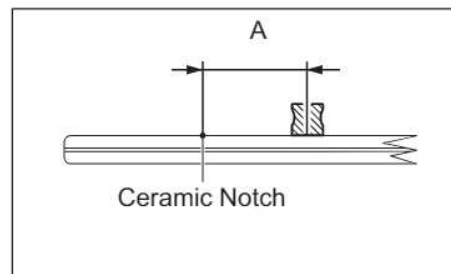
WS-61

Back Side:

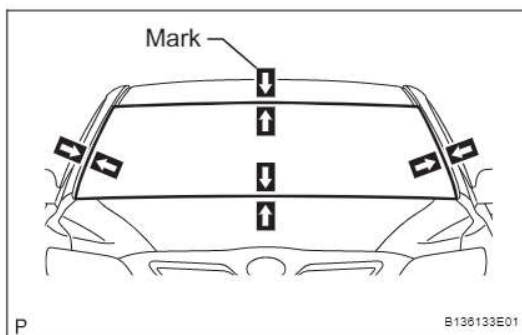


P

B136138E01



WS



## 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.

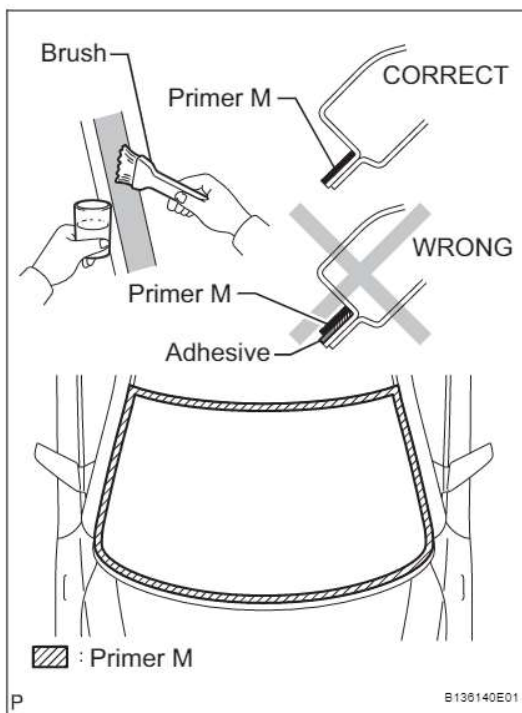
- (c) Using a brush or sponge, coat the application area of adhesive with Primer G.

**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.



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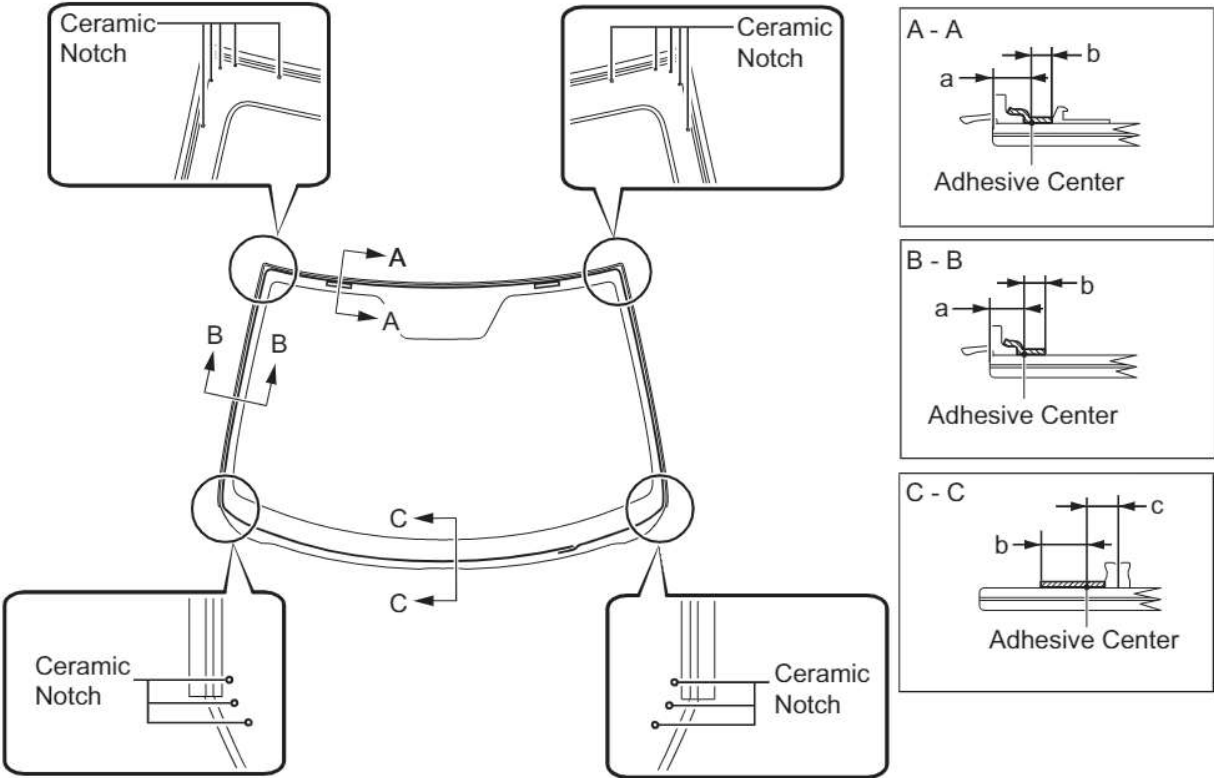
WINDSHIELD / WINDOWGLASS – WINDSHIELD GLASS

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:



P

B136141E01

- (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.

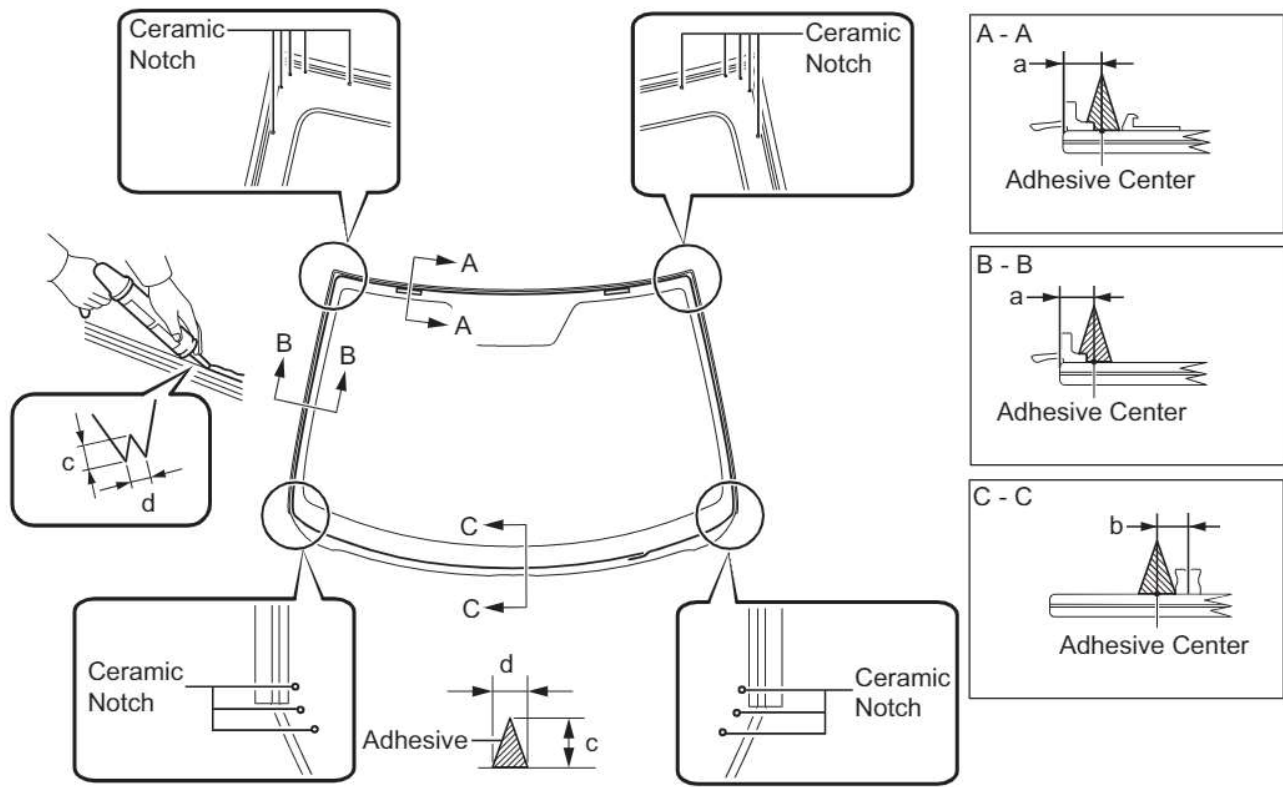
**HINT:**  
Apply adhesive onto the ceramic notches.

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.)  |

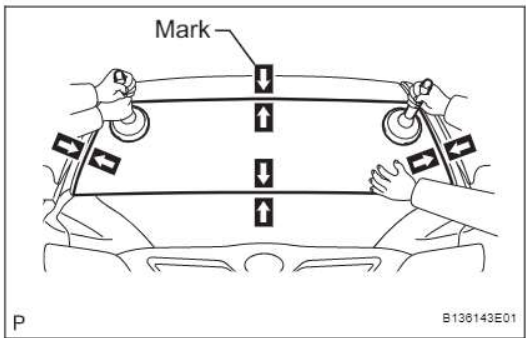
WS

Back Side:



P

B136142E01

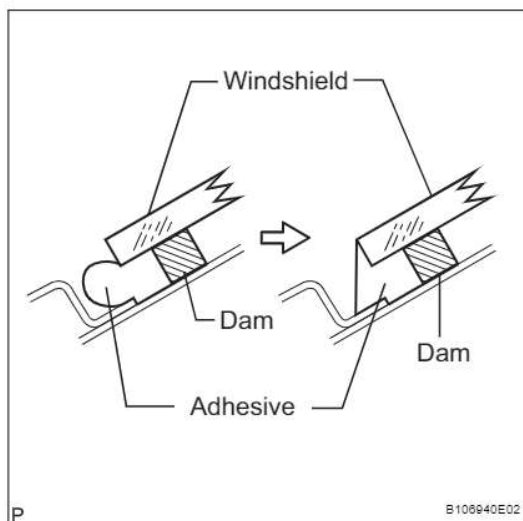


B136143E01

- (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.

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## WINDSHIELD / WINDOWGLASS – WINDSHIELD GLASS



- (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**

- After the adhesive has hardened, apply water from the outside of the vehicle. Check that no water leaks into the cabin.
- If water leaks into the cabin, allow the water to dry and add adhesive.
- 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**

## WS-74

## WINDSHIELD / WINDOWGLASS – BACK WINDOW GLASS

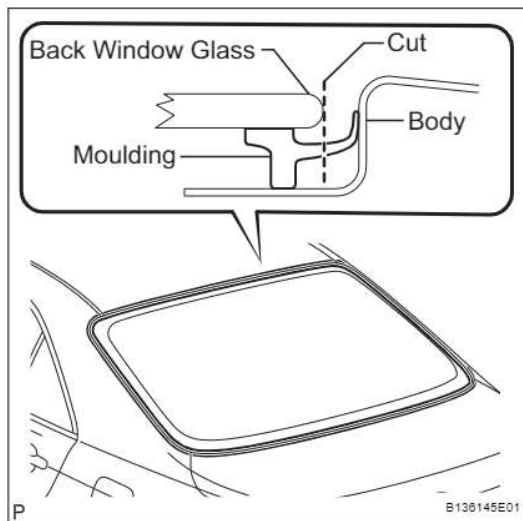
**REMOVAL**

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](#)).

## WS-76

## WINDSHIELD / WINDOWGLASS – BACK WINDOW GLASS



## 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.

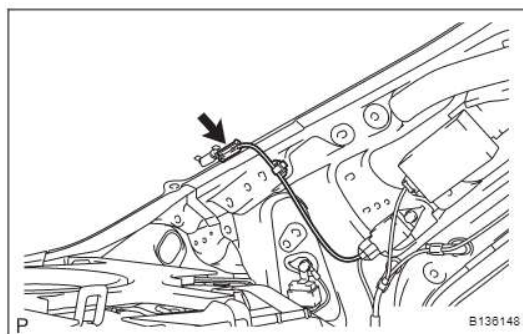
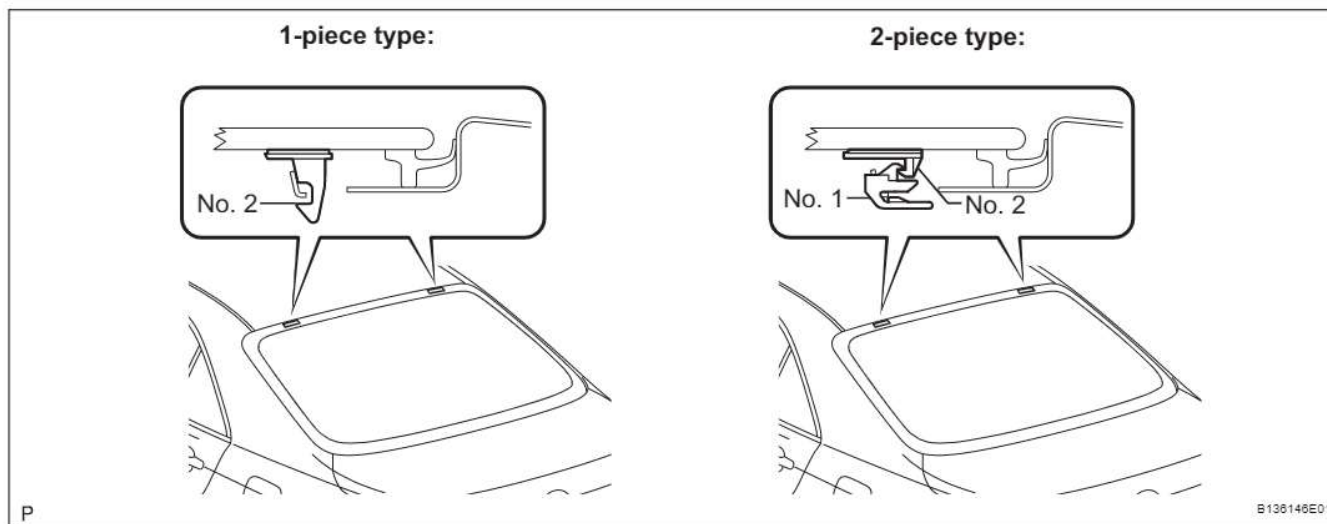
## 37. REMOVE BACK WINDOW GLASS ASSEMBLY

**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.

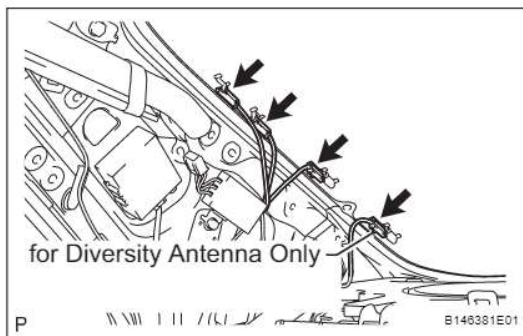


- (a) Disconnect the connector.

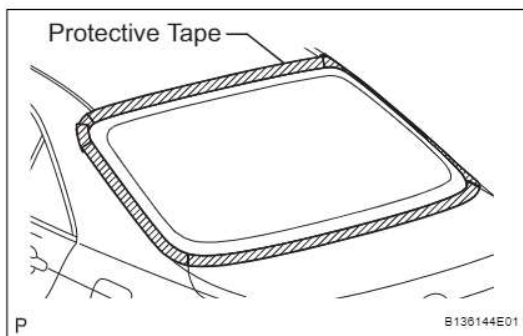
## WINDSHIELD / WINDOWGLASS – BACK WINDOW GLASS

WS-77

WS



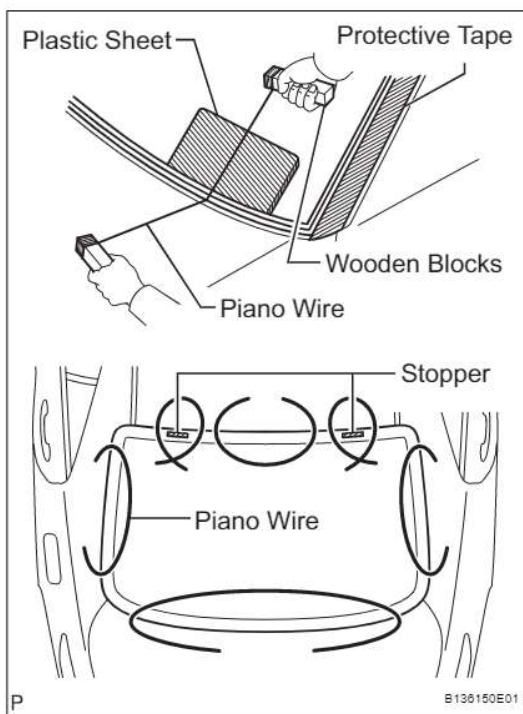
- (b) Disconnect the connectors.



- (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.



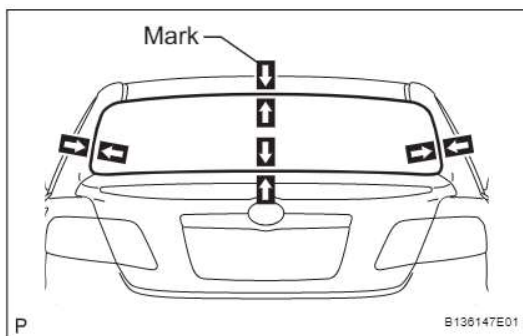
- (d) Pass a piano wire between the vehicle body and glass from the interior.

- (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.

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## WINDSHIELD / WINDOWGLASS – BACK WINDOW GLASS

- 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:**

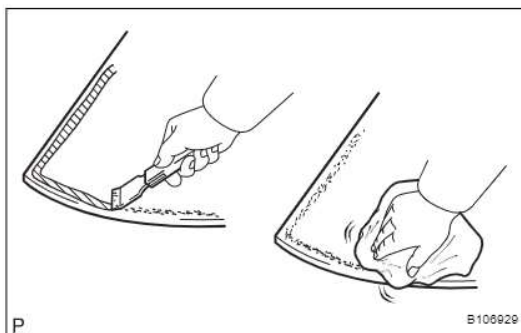
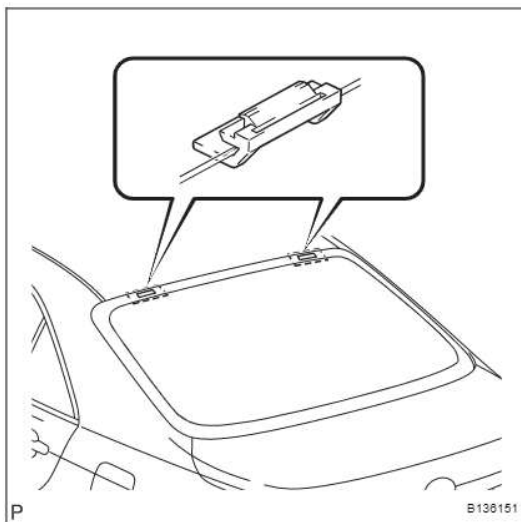
- Be careful not to damage the back window glass.
- Be sure to replace the No. 2 stoppers with new ones.

## 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.

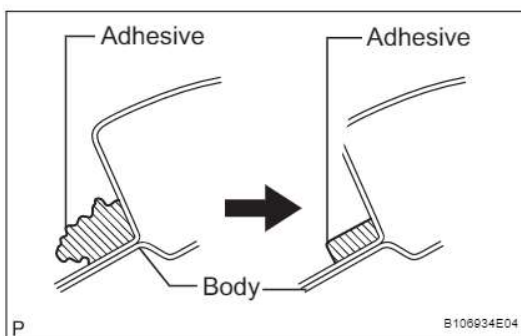
- (1) Using a knife, cut away any rough adhesive on the contact surface of the vehicle body to ensure the appropriate surface shape.

**NOTICE:**

- Be careful not to damage the vehicle body.

**HINT:**

- Leave as much adhesive on the vehicle body as possible.



**WINDSHIELD / WINDOWGLASS – BACK WINDOW GLASS****WS-79**

- (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**

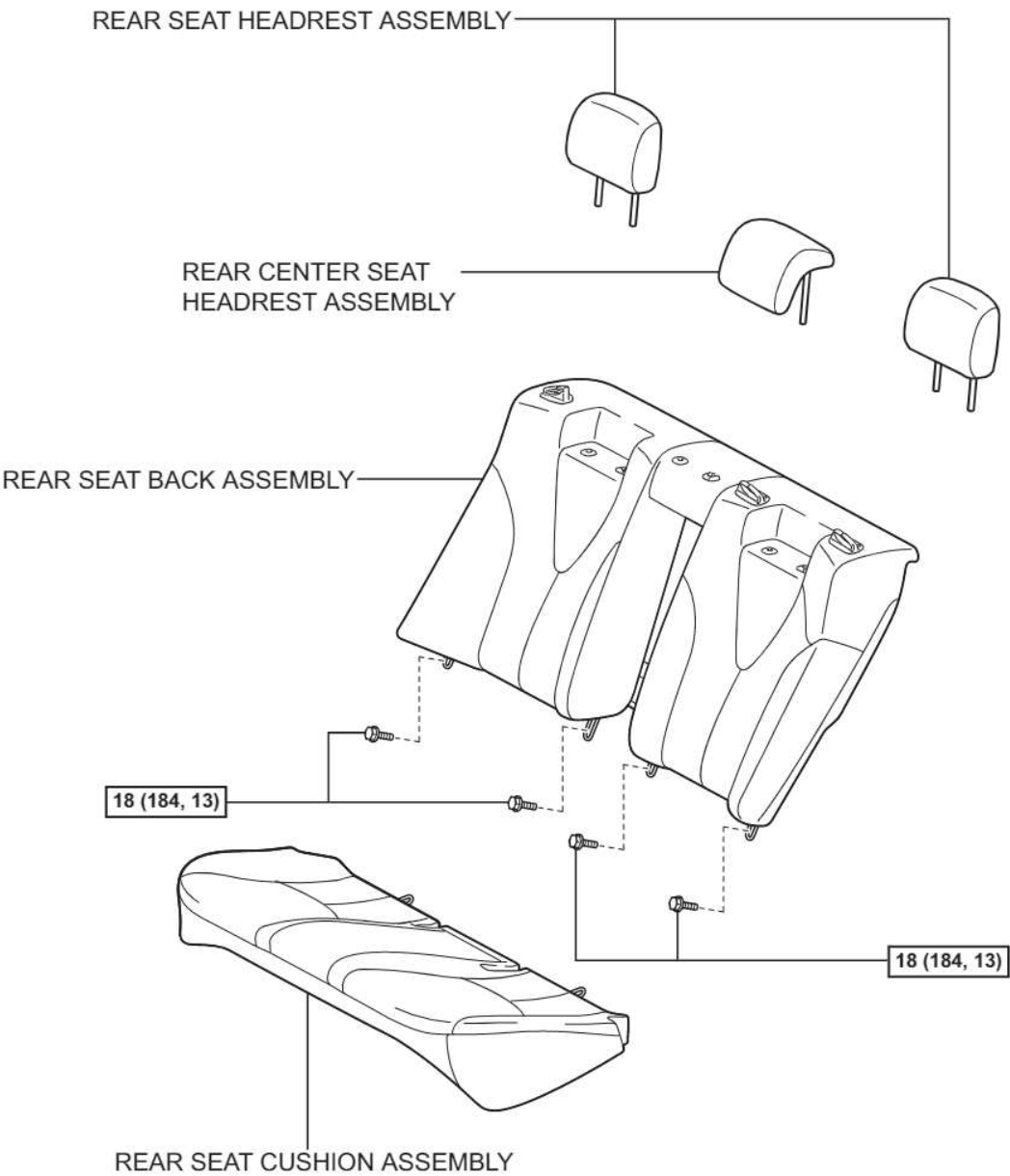
WS-66

WINDSHIELD / WINDOWGLASS – BACK WINDOW GLASS

BACK WINDOW GLASS  
COMPONENTS

WS

for Fixed Seat Type:



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

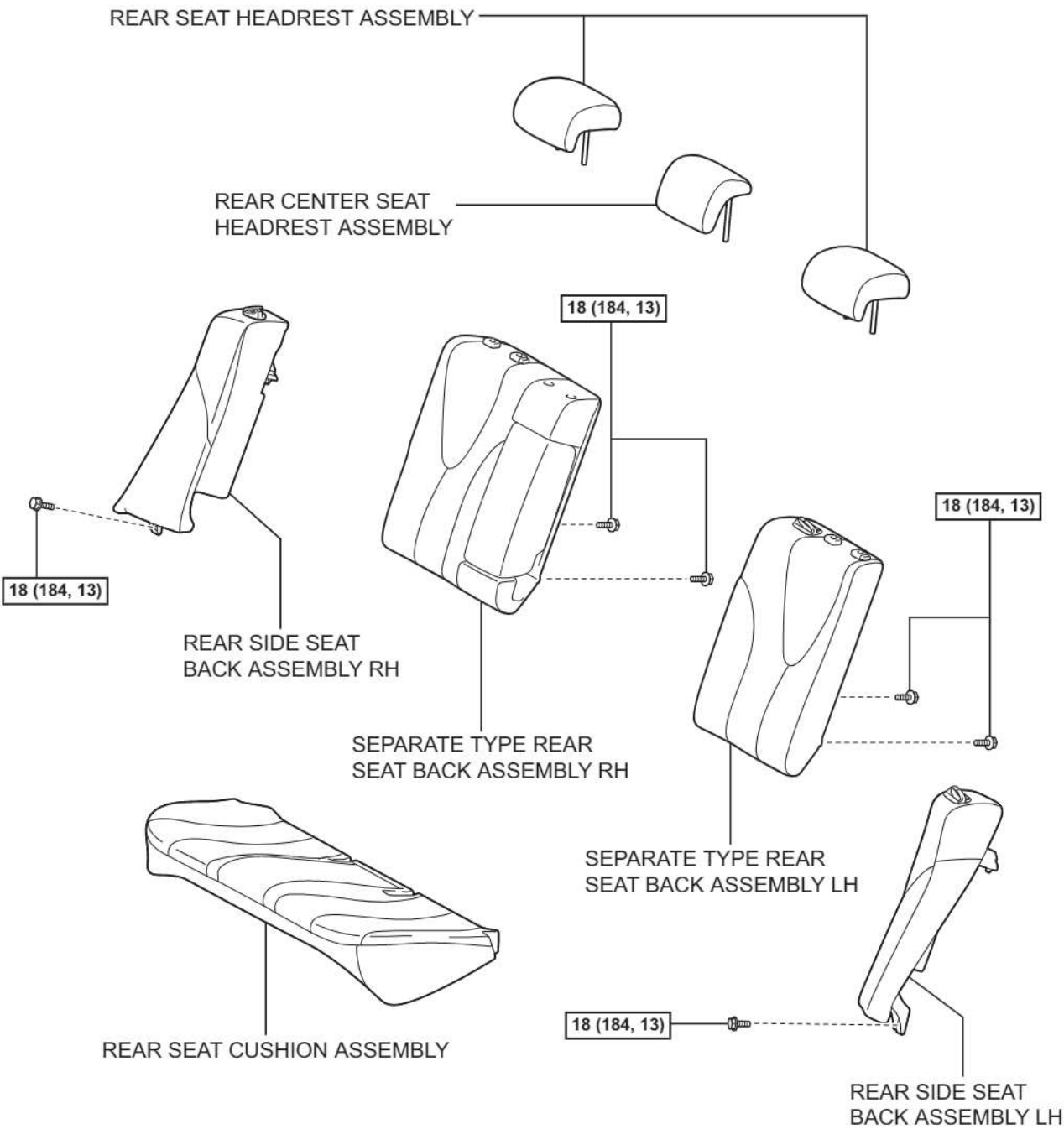
P

B136589E02

WINDSHIELD / WINDOWGLASS – BACK WINDOW GLASS

WS

for Fold Down Seat Type:



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

P

B136564E02

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WINDSHIELD / WINDOWGLASS – BACK WINDOW GLASS

for Reclining Seat Type:

REAR SEAT HEADREST ASSEMBLY



REAR CENTER SEAT  
HEADREST ASSEMBLY

18 (184, 13)

REAR SEAT  
BACK COVER

CENTER SEAT BACK  
ASSEMBLY

18 (184, 13)

18 (184, 13)

SEPARATE TYPE REAR SEAT BACK  
ASSEMBLY RH

REAR SEAT  
BACK COVER

18 (184, 13)

18 (184, 13)

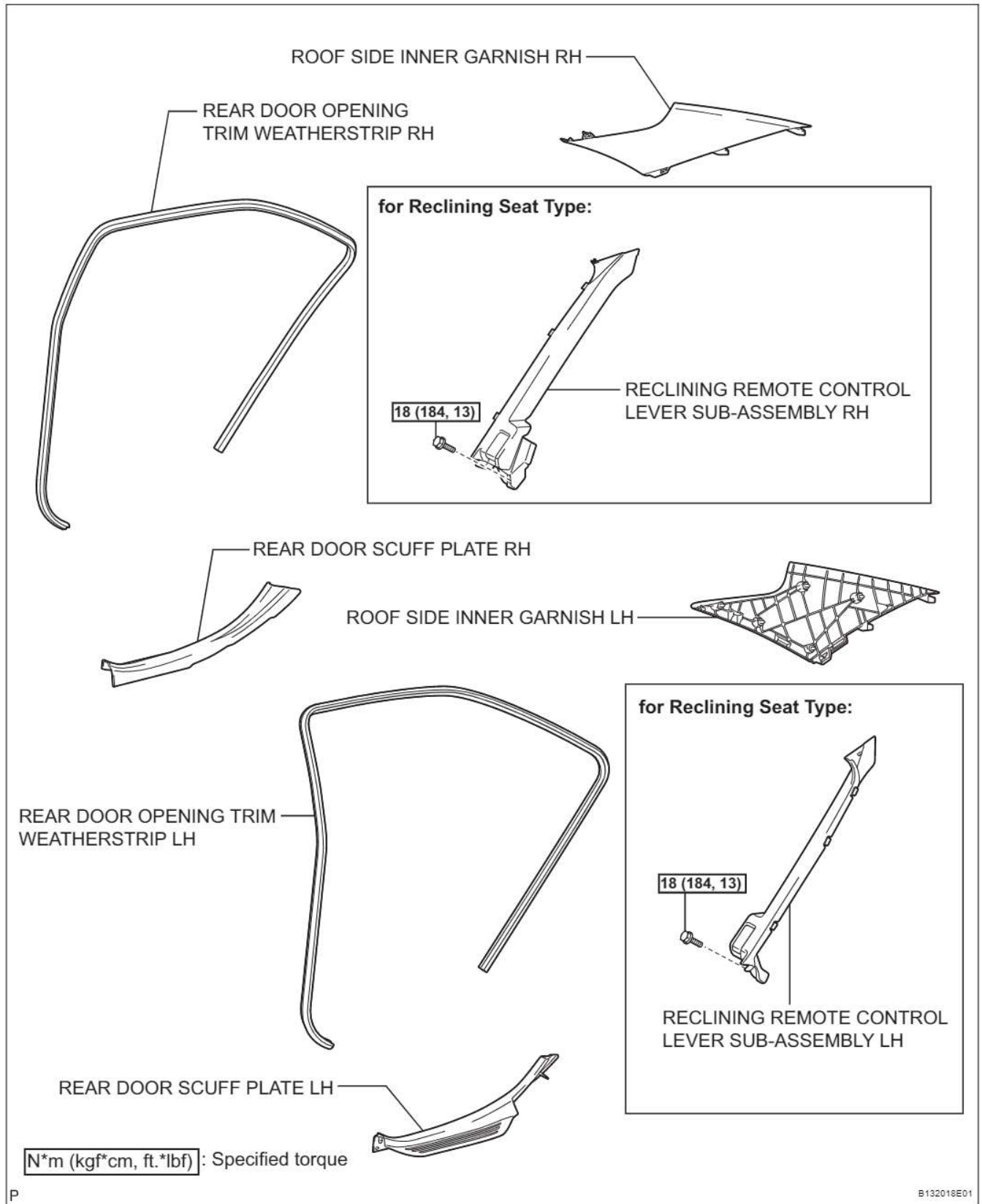
SEPARATE TYPE REAR  
SEAT BACK ASSEMBLY LH

REAR SEAT CUSHION ASSEMBLY

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

P

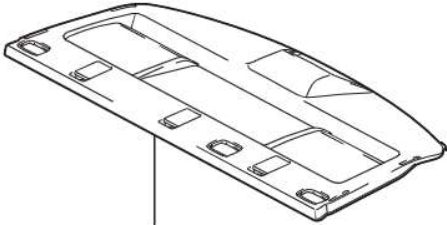
B139095E03



WS-70

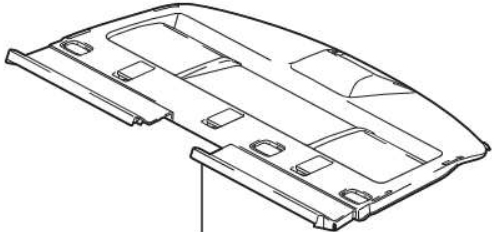
WINDSHIELD / WINDOWGLASS – BACK WINDOW GLASS

for TMC made:



PACKAGE TRAY TRIM PANEL ASSEMBLY

for Reclining Seat Type:



PACKAGE TRAY TRIM PANEL ASSEMBLY



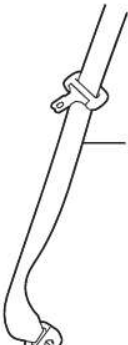
REAR SEAT SHOULDER BELT COVER

REAR SEAT SHOULDER  
BELT HOLE COVER



REAR SEAT SHOULDER  
BELT COVER

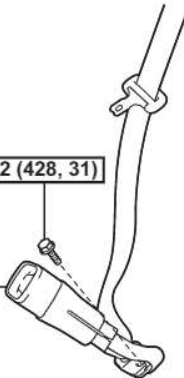
REAR SEAT OUTER BELT ASSEMBLY



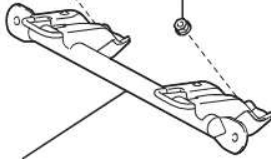
42 (428, 31)

42 (428, 31)

REAR SEAT INNER WITH  
CENTER BELT ASSEMBLY LH

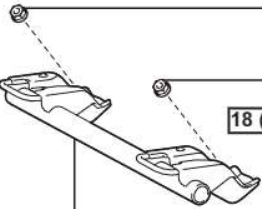


18 (184, 13)



CHILD RESTRAINT SEAT  
ANCHOR BRACKET  
SUB-ASSEMBLY LH

for Fold Down Seat Type:

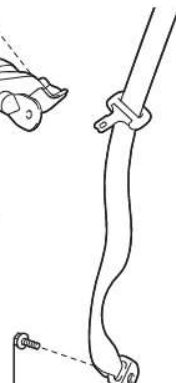


18 (184, 13)

CHILD RESTRAINT SEAT ANCHOR BRACKET SUB-ASSEMBLY LH

42 (428, 31)

REAR SEAT OUTER  
BELT ASSEMBLY



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

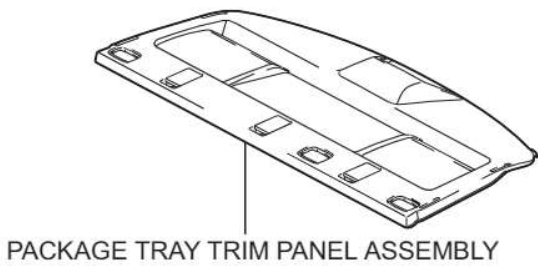
P

B132113E03

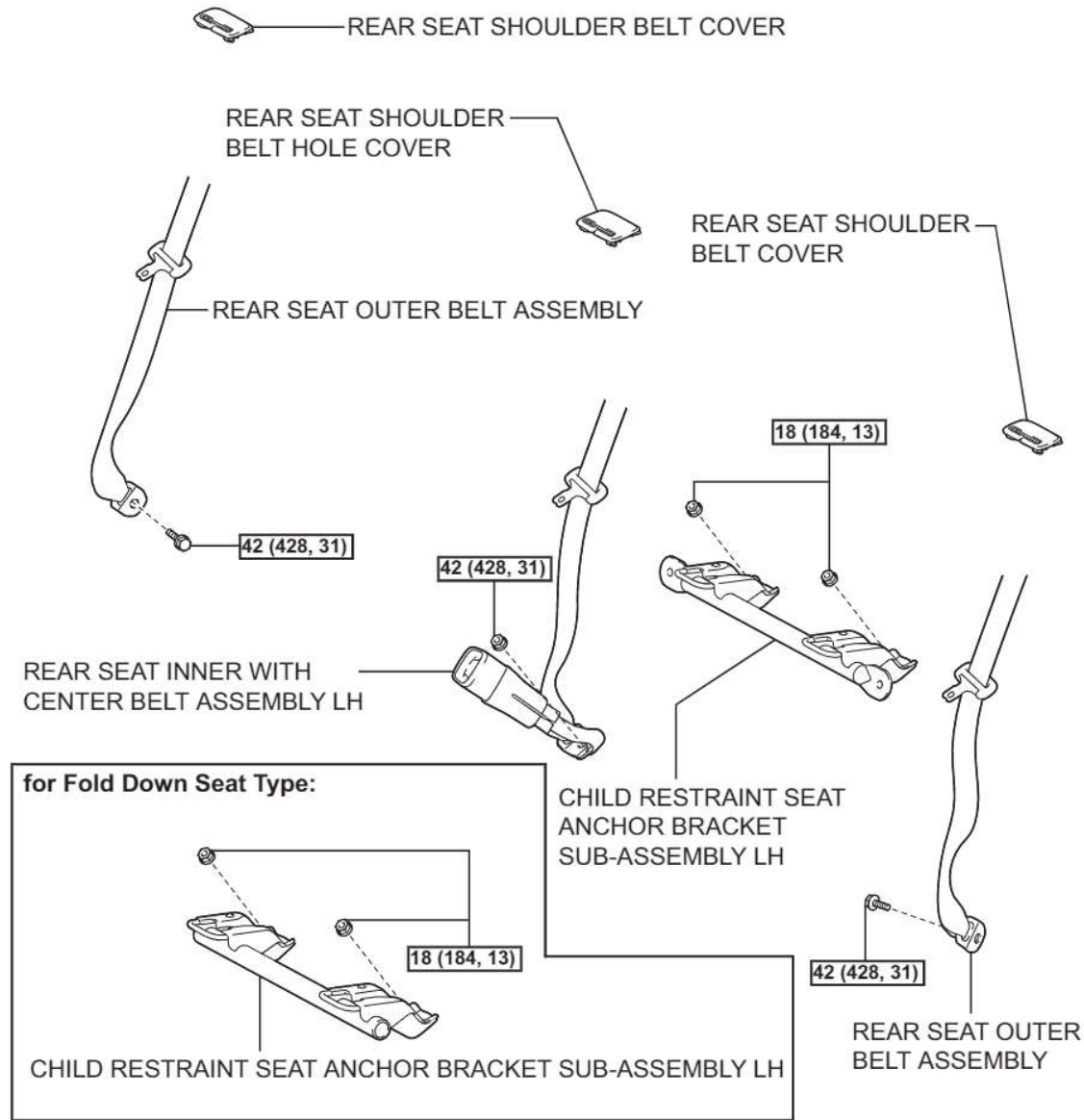
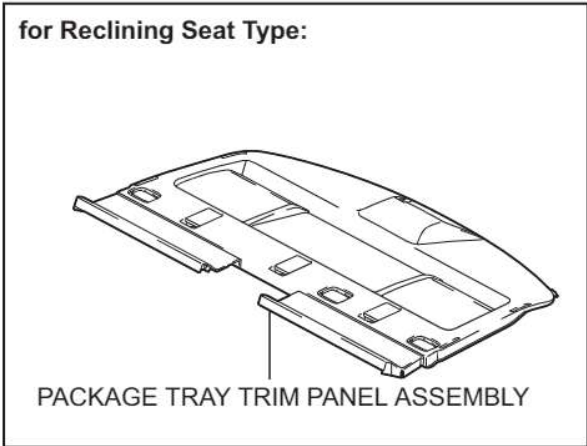
WINDSHIELD / WINDOWGLASS – BACK WINDOW GLASS

WS

for TMMK made:



for Reclining Seat Type:



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

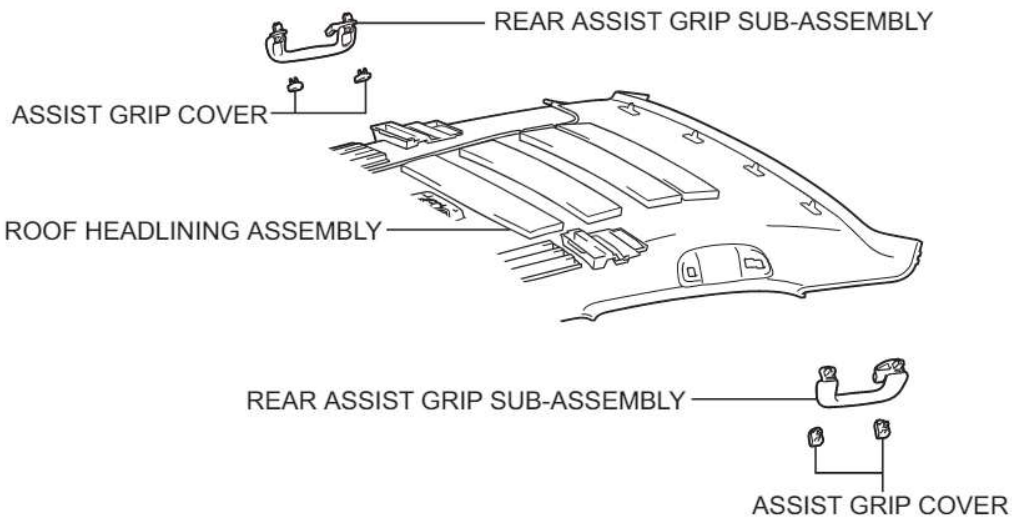
P

B142742E02

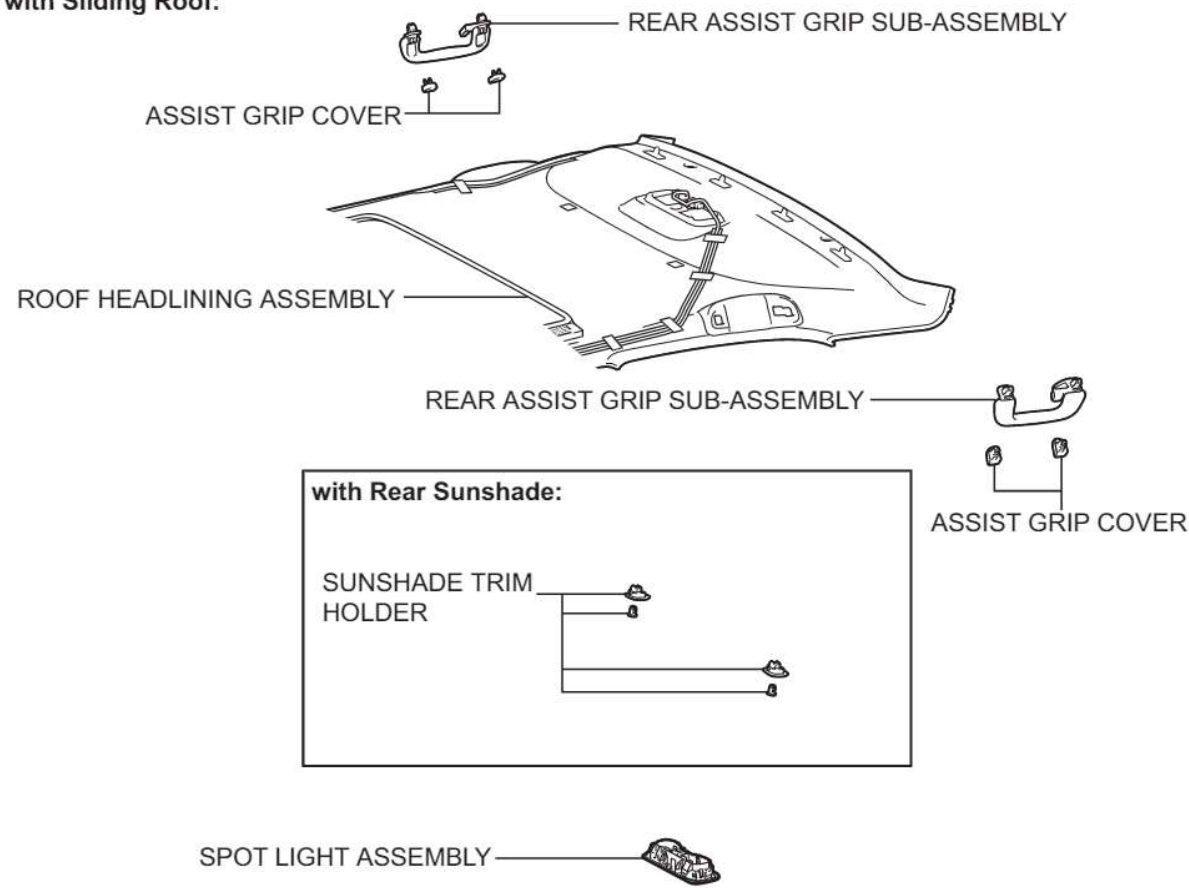
WS-72

WINDSHIELD / WINDOWGLASS – BACK WINDOW GLASS

without Sliding Roof:



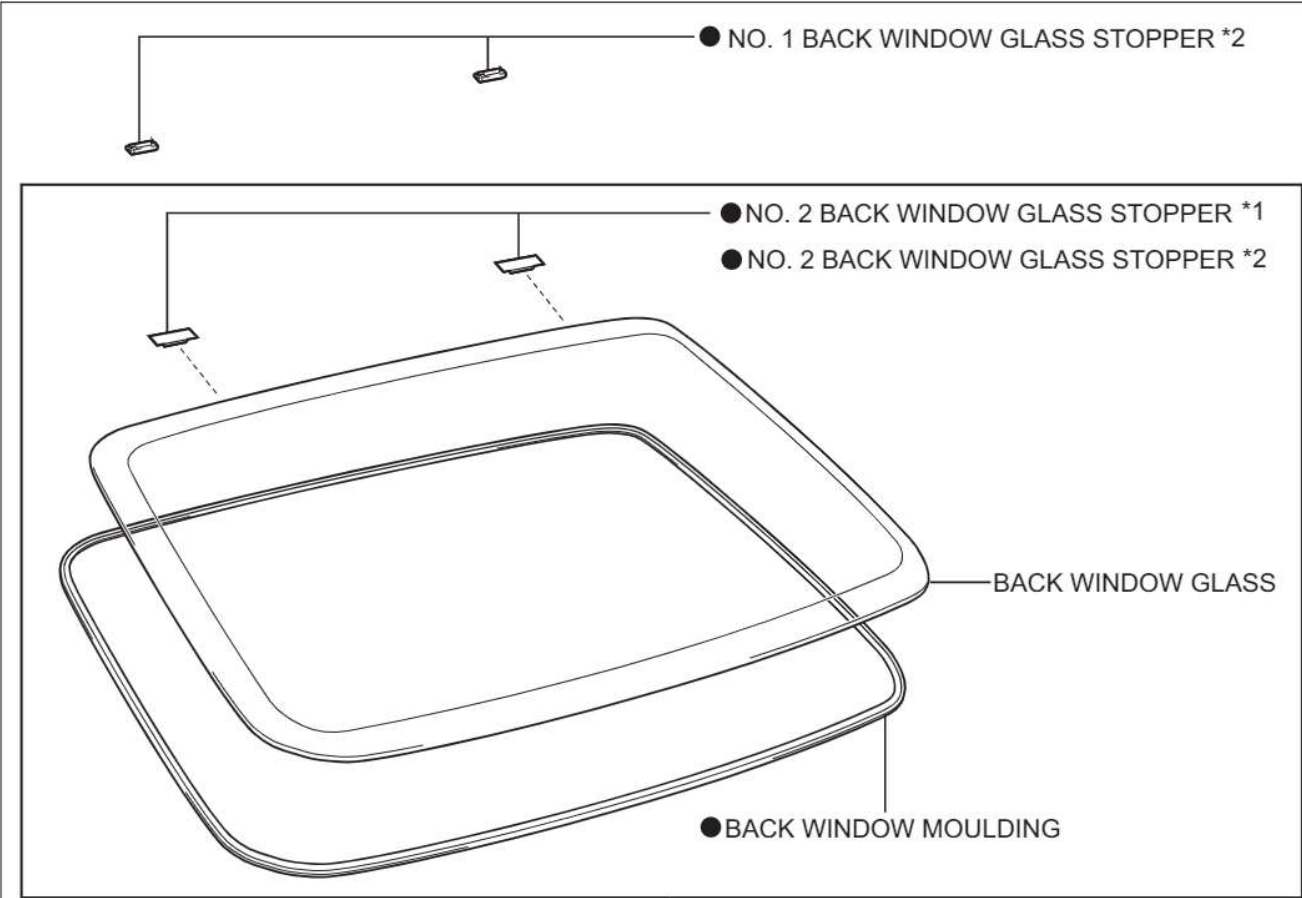
with Sliding Roof:



WINDSHIELD / WINDOWGLASS – BACK WINDOW GLASS

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WS



- \*1: 1-Piece type
- \*2: 2-Piece type
- Non-reusable part

P

B136129E01

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.

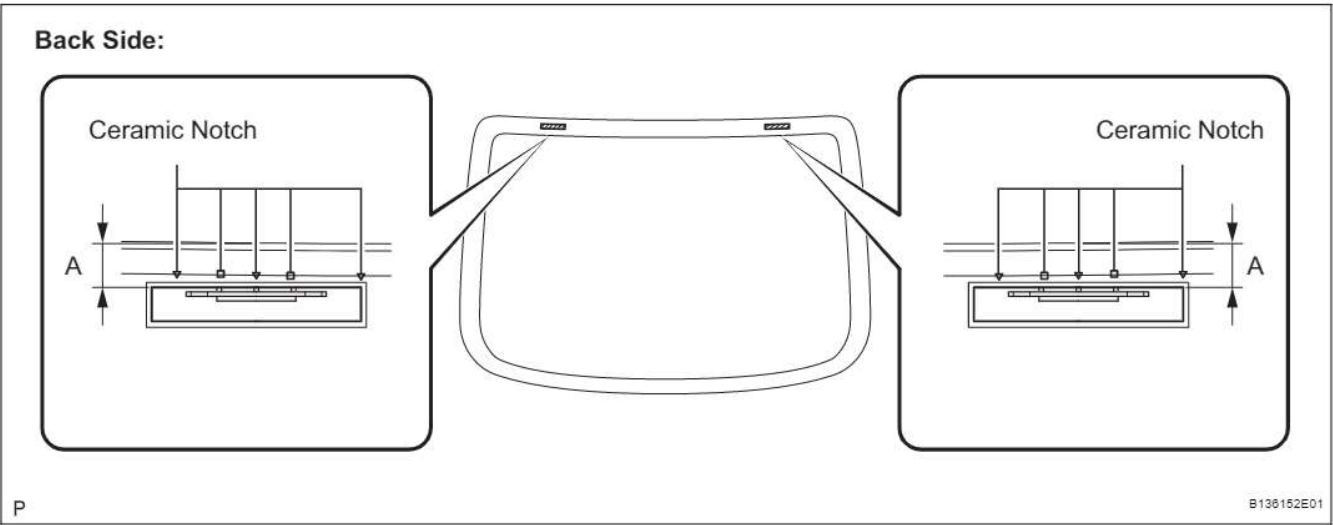
- (b) Install 2 new No. 2 stoppers onto the windshield glass, as shown in the illustration.

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.) |



## WINDSHIELD / WINDOWGLASS – BACK WINDOW GLASS

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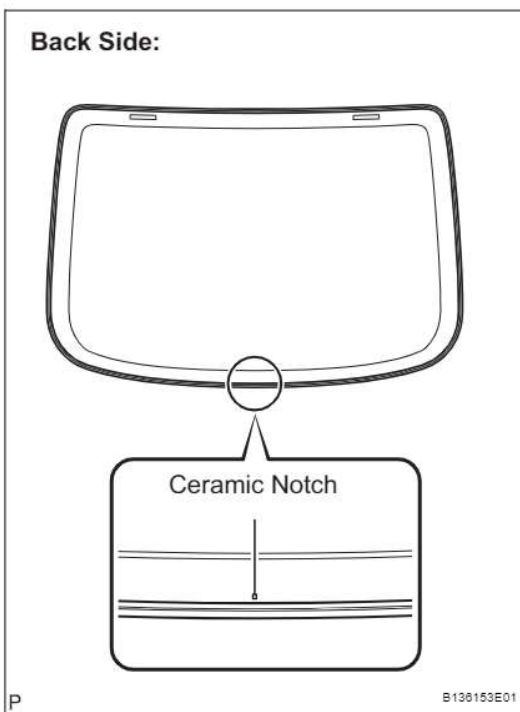


## 2. INSTALL NO. 1 BACK WINDOW GLASS STOPPER

- (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.

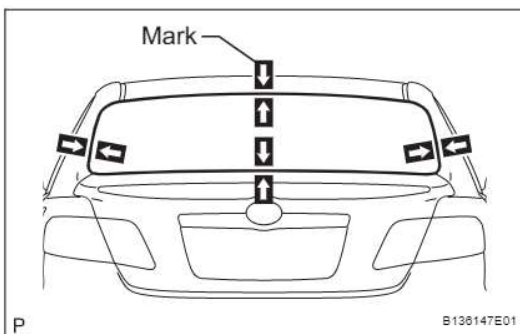
**HINT:**

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.

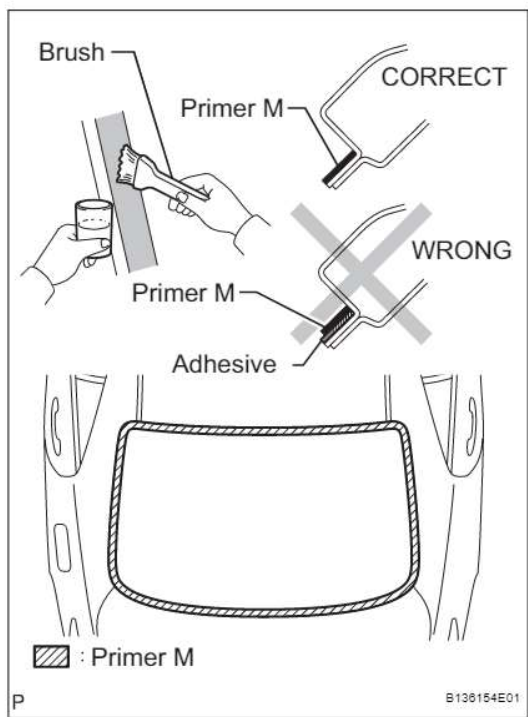
**NOTICE:**

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

- (4) Remove the back window glass assembly.

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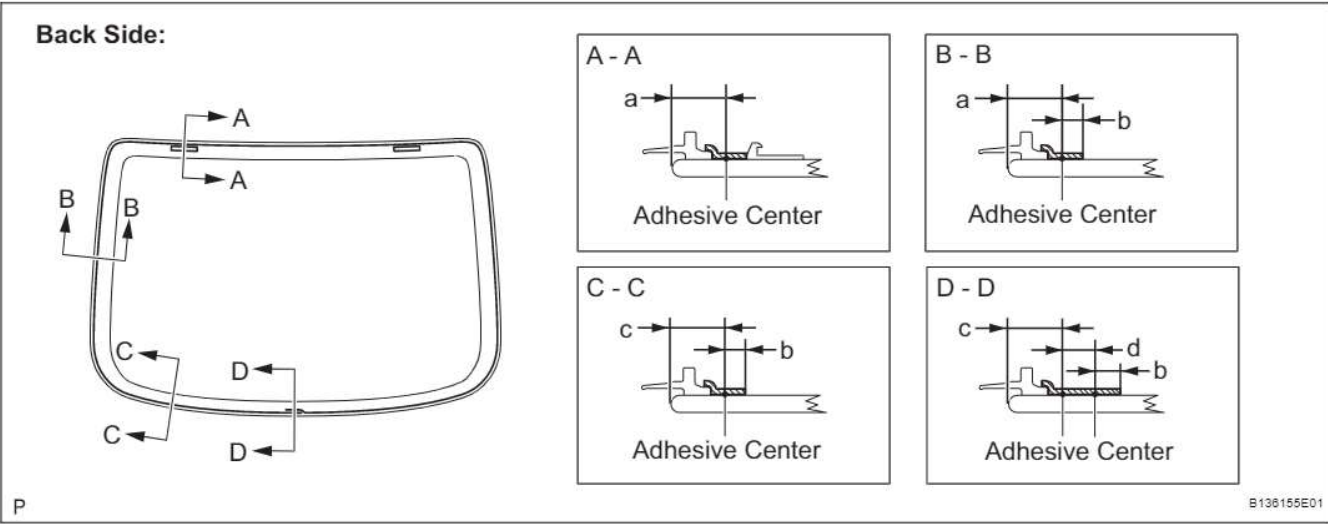
WINDSHIELD / WINDOWGLASS – BACK WINDOW GLASS



- (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.)   |



WINDSHIELD / WINDOWGLASS – BACK WINDOW GLASS

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- (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

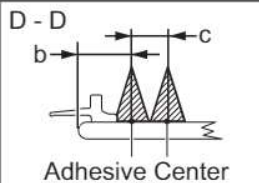
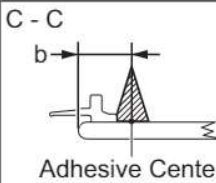
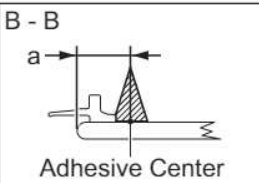
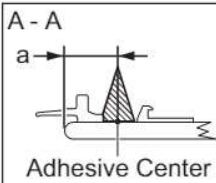
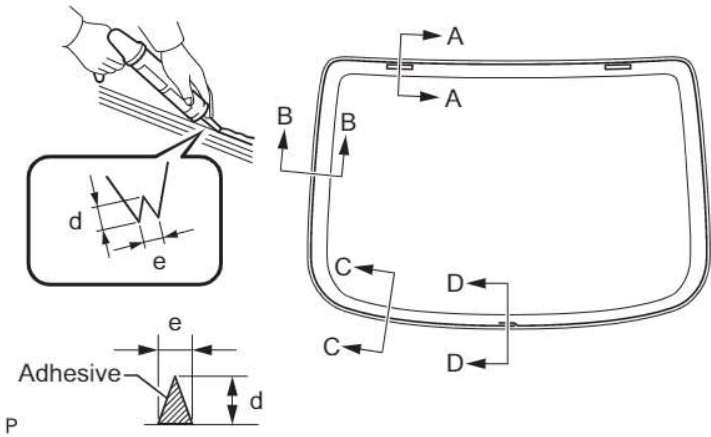
| Temperature | Tack-free Time        |
|-------------|-----------------------|
| 35°C (95°F) | 15 minutes            |
| 20°C (68°F) | 1 hour and 40 minutes |
| 5°C (41°F)  | 8 hours               |

- (2) Load the sealer gun with cartridge.
- (3) Apply adhesive to the back window glass, as shown in the illustration.
- Standard dimension

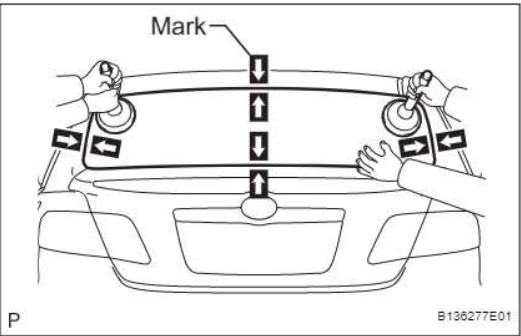
| Area | Dimension            |
|------|----------------------|
| a    | 10.75 mm (0.423 in.) |
| b    | 10.25 mm (0.403 in.) |
| c    | 8.0 mm (0.315 in.)   |
| d    | 12.0 mm (0.472 in.)  |
| e    | 8.0 mm (0.315 in.)   |

WS

Back Side:



B136156E01



- (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.

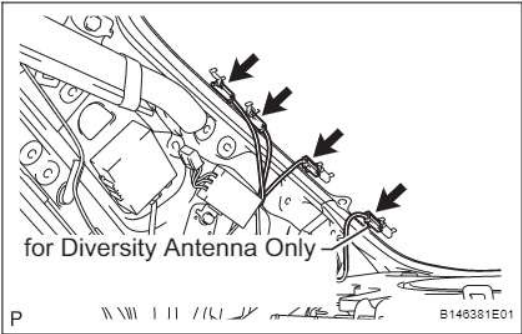
WS

- (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](#))**

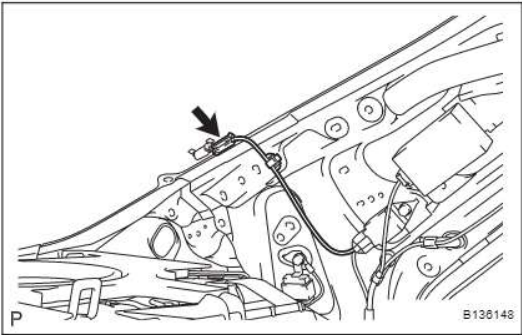
**8. INSTALL SUNSHADE TRIM HOLDER (w/ Rear Sunshade) (See page [IR-47](#))**

**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)

**WS-86****WINDSHIELD / WINDOWGLASS – BACK WINDOW GLASS**

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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](#))

**WS**

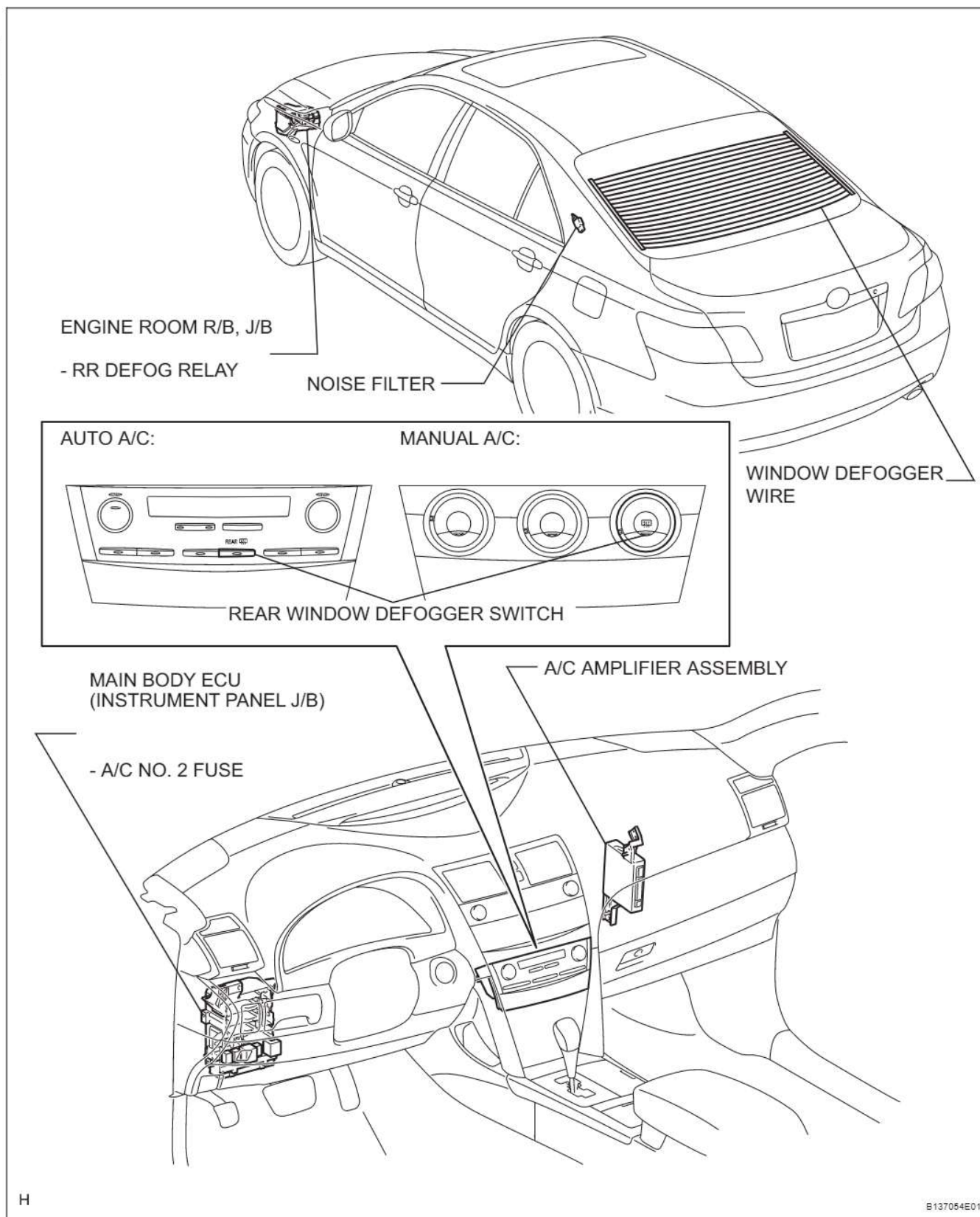
WS-86

WINDSHIELD / WINDOWGLASS – WINDOW DEFOGGER SYSTEM

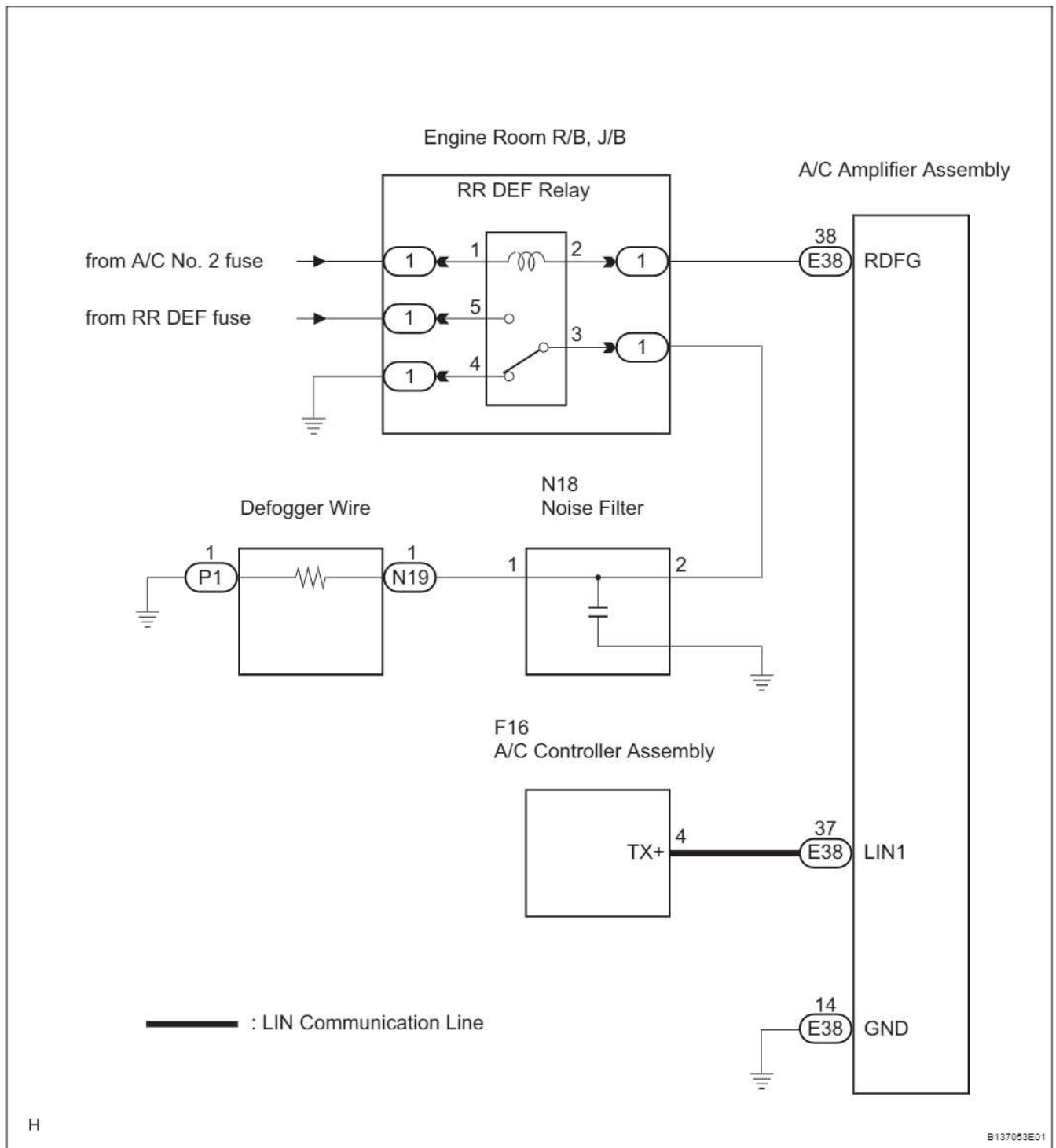
# WINDOW DEFOGGER SYSTEM

## PARTS LOCATION

WS



## SYSTEM DIAGRAM



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 | <ul style="list-style-type: none"><li>Receives rear defogger activation request signals from A/C amplifier assembly (A/C ECU) and supplies power to rear window defogger.</li><li>Receives power from DEFOG relay and heats defogger wire.</li></ul> |

## HOW TO PROCEED WITH TROUBLESHOOTING

**HINT:**

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

**WS****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**

WS-90

WINDSHIELD / WINDOWGLASS – WINDOW DEFOGGER SYSTEM

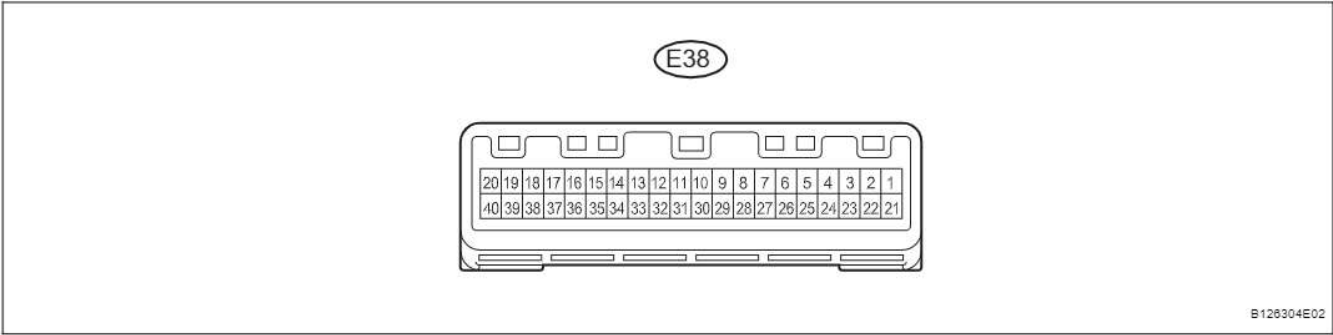
PROBLEM SYMPTOMS TABLE

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           |

## WS-92

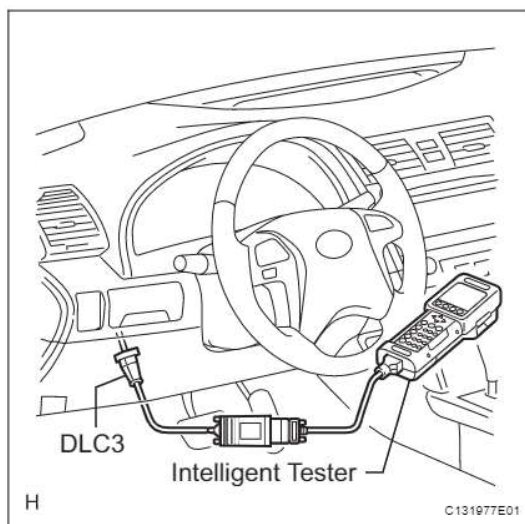
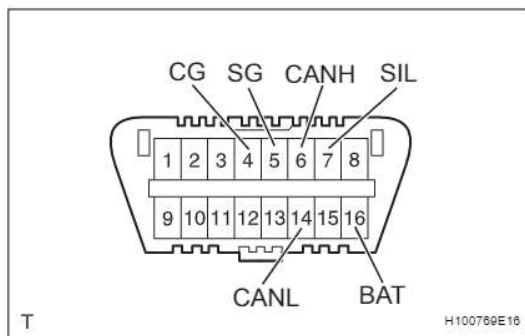
## WINDSHIELD / WINDOWGLASS – WINDOW DEFOGGER SYSTEM

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

**WINDSHIELD / WINDOWGLASS – WINDOW DEFOGGER SYSTEM****WS-93**

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.

WS

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.

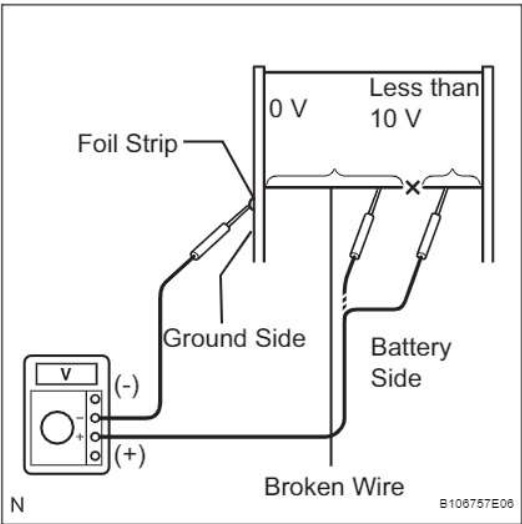
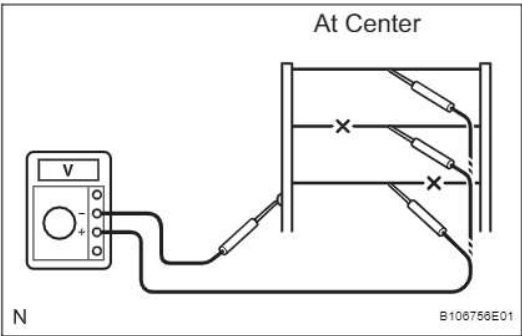
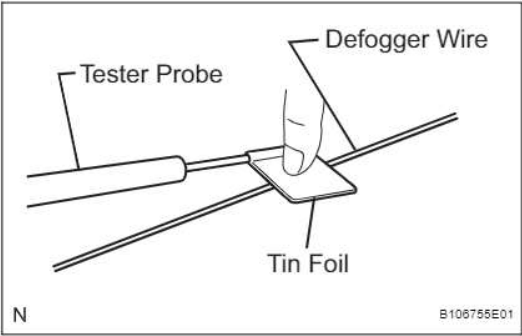
- When measuring voltage, wrap a piece of tin foil around the tip of the negative tester probe and press the foil against the wire with your finger, as shown in the illustration.
- (a) Turn the ignition switch on (IG).
- (b) Turn the defogger switch on.

- (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-96

## WINDSHIELD / WINDOWGLASS – WINDOW DEFOGGER SYSTEM

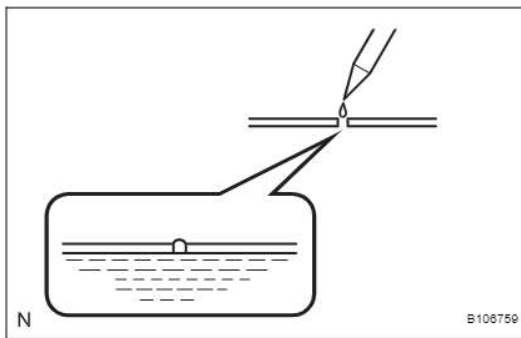
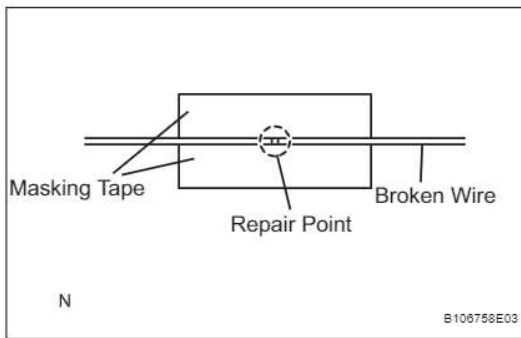
- (g) The point where the voltage drops from approximately 10 V to 0 V is the place where the defogger wire is broken.

**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:**

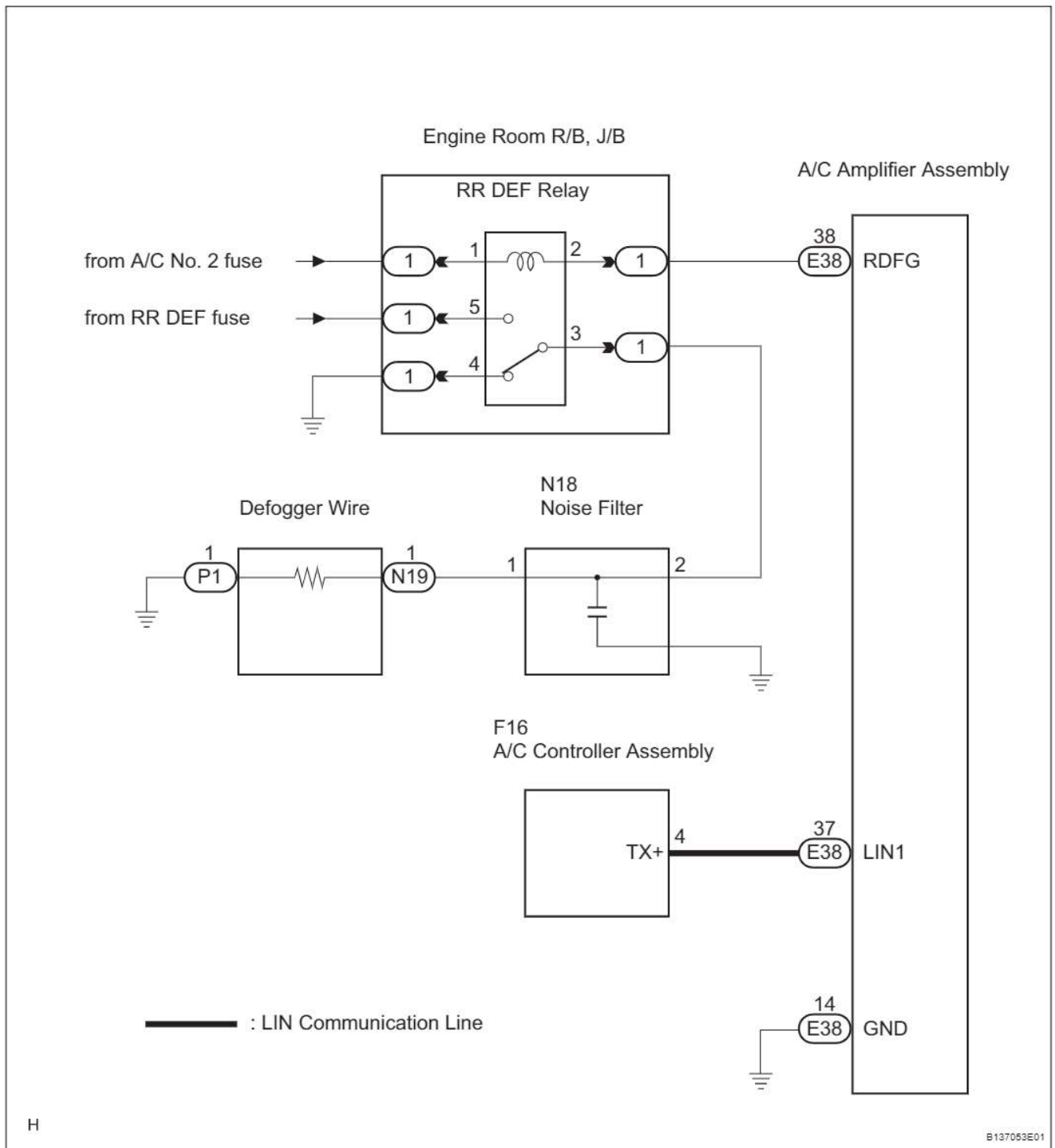
**Do not repair the defogger wire again for at least 24 hours.**

## WINDSHIELD / WINDOWGLASS – WINDOW DEFOGGER SYSTEM

WS-97

**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.

**WIRING DIAGRAM**

## WS-98

## WINDSHIELD / WINDOWGLASS – WINDOW DEFOGGER SYSTEM

## 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

## WINDSHIELD / WINDOWGLASS – WINDOW DEFOGGER SYSTEM

WS-99

**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

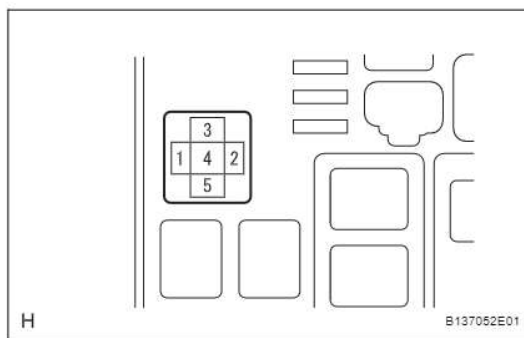
NG

**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-100

## WINDSHIELD / WINDOWGLASS – WINDOW DEFOGGER SYSTEM

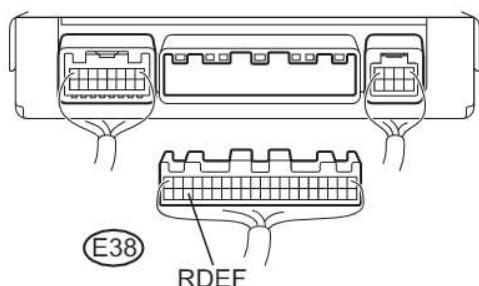
8

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

Engine Room R/B, J/B:



A/C Amplifier Assembly:



B140724E02

- (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 $\Omega$        |
| 2 - Body ground   | Always    | 10 k $\Omega$ or higher |

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

## REPLACE A/C AMPLIFIER ASSEMBLY

9

## INSPECT RR DEF RELAY

See page [WS-100](#).

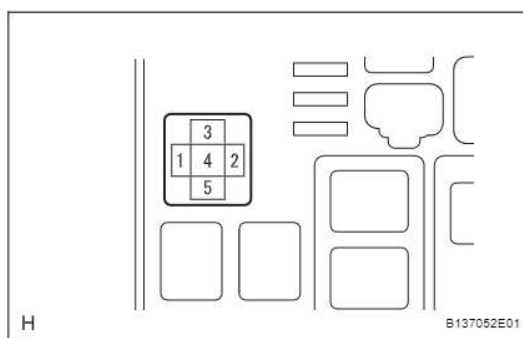
NG

REPLACE RR DEF RELAY

OK

10

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



H

B137052E01

- (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 $\Omega$    |

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

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

## WINDSHIELD / WINDOWGLASS – WINDOW DEFOGGER SYSTEM

WS-101

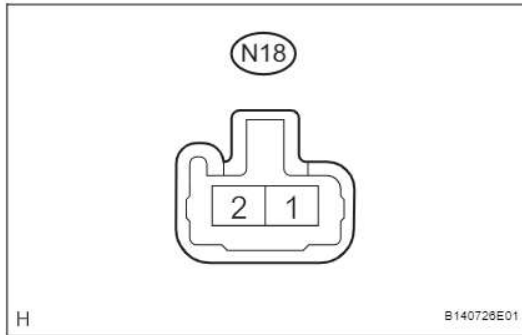
NG

REPAIR OR REPLACE RR DEF FUSE,  
HARNESS OR CONNECTOR

OK

## 11 INSPECT NOISE FILTER

WS



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

**Standard resistance**

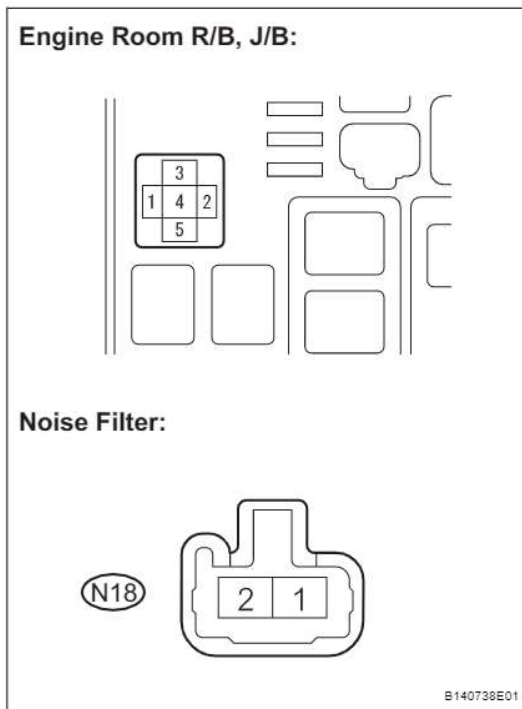
| Tester Connection   | Condition | Specified Condition     |
|---------------------|-----------|-------------------------|
| N18-1 - N18-2       | Always    | Below 1 $\Omega$        |
| N18-1 - Body ground | Always    | 10 k $\Omega$ or higher |

NG

REPLACE NOISE FILTER

OK

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



- (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 $\Omega$        |
| 3 - Body ground   | Always    | 10 k $\Omega$ or higher |

NG

REPAIR OR REPLACE HARNESS OR  
CONNECTOR

OK

WS-102

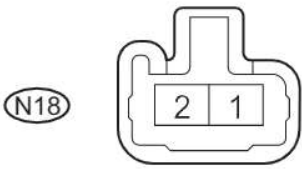
WINDSHIELD / WINDOWGLASS – WINDOW DEFOGGER SYSTEM

13

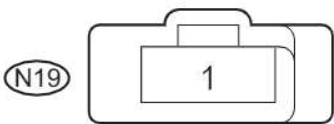
CHECK WIRE HARNESS (NOISE FILTER - DEFOGGER WIRE CONNECTOR)

WS

Noise Filter:



Defogger Wire Connector:



B140737E01

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

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

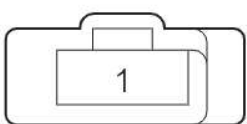
NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

14

CHECK WIRE HARNESS (DEFOGGER WIRE CONNECTOR - BODY GROUND)



H

B127529E02

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

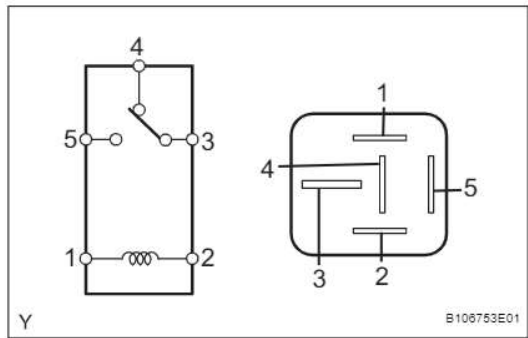
| Tester Connection  | Condition | Specified Condition |
|--------------------|-----------|---------------------|
| P1-1 - Body ground | Always    | Below 1 Ω           |

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 $\Omega$<br>(when battery voltage is not applied between terminals)        |
| 3 - 5            | 10 k $\Omega$ or higher<br>(when battery voltage is not applied between terminals) |
| 3 - 5            | Below 1 $\Omega$<br>(when battery voltage is applied to terminals 1 and 2)         |

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