

2002 ACCESSORIES & EQUIPMENT

Power Window Control System - RAV4

BODY ELECTRICAL SYSTEM

PRECAUTION

NOTE: Take care to observe the following precautions when performing inspections or removal and replacement of body electrical related parts.

1. Headlight System

Halogen bulbs have pressurized gas inside and require special handling. They can burst if scratched or dropped. Hold a bulb only by its plastic or metal case.

Don't touch the glass part of a bulb with bare hands.

2. SRS (Supplemental Restraint System)

The RAV4 is equipped with an SRS (Supplemental Restraint System) such as the driver airbag and front passenger airbag, failure to carry out service operation in the correct sequence could cause the SRS to unexpectedly deploy during servicing, possibly leading to a serious accident. Before servicing (including removal or installation of parts, inspection or replacement), be sure to read the precautionary notices in **AIR BAG SAFETY PRECAUTIONS** .

3. Audio System

If the negative (-) terminal cable is disconnected from the battery, the preset AM, FM1 and FM2 stations stored in memory are erased, so be sure to note the stations and reset them after the battery terminal is reconnected.

4. Mobile Communication System

If the vehicle is equipped with a mobile communication system, refer to precautions in **IF VEHICLE IS EQUIPPED WITH MOBILE COMMUNICATION SYSTEM** .

TROUBLESHOOTING

PROBLEM SYMPTOMS

POWER WINDOW CONTROL SYSTEM

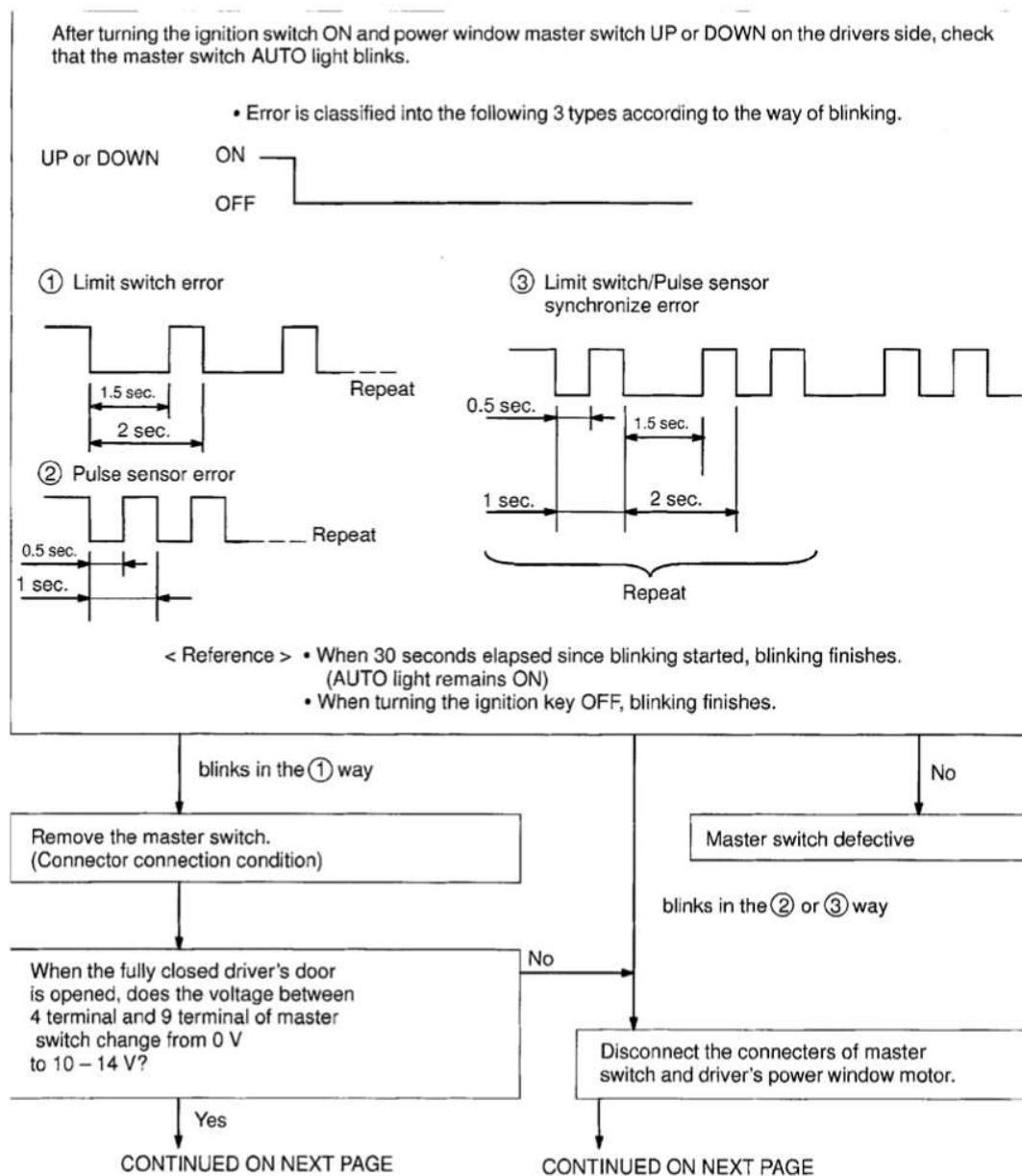
Symptom/Suspected Area	See
Power Window Does Not Operate	
Ignition Switch	FUSES & CIRCUIT BREAKERS

Power Window Control Switch	Step 1 under INSPECTION
Wire Harness	
One Touch Power Window System Does Not Operate	
Power Window Control System	POWER WINDOW CONTROL SYSTEM
Only One Window Glass Does Not Move	
Power Window Control Switch	Step 1 under INSPECTION
Power Window Motor	Steps 5 & 6 under INSPECTION
Wire Harness	
Window Lock System Does Not Operate	
Power Window Control Switch	Step 1 under INSPECTION
Illumination Does Not Light Up	
Power Window Control Switch	Step 1 under INSPECTION

POWER WINDOW CONTROL SYSTEM

TROUBLESHOOTING

1. One touch power window does not move up and down. (Prepare normal master switch) .



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Fig. 1: Displaying Troubleshooting Flow Chart 1 (1 Of 2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

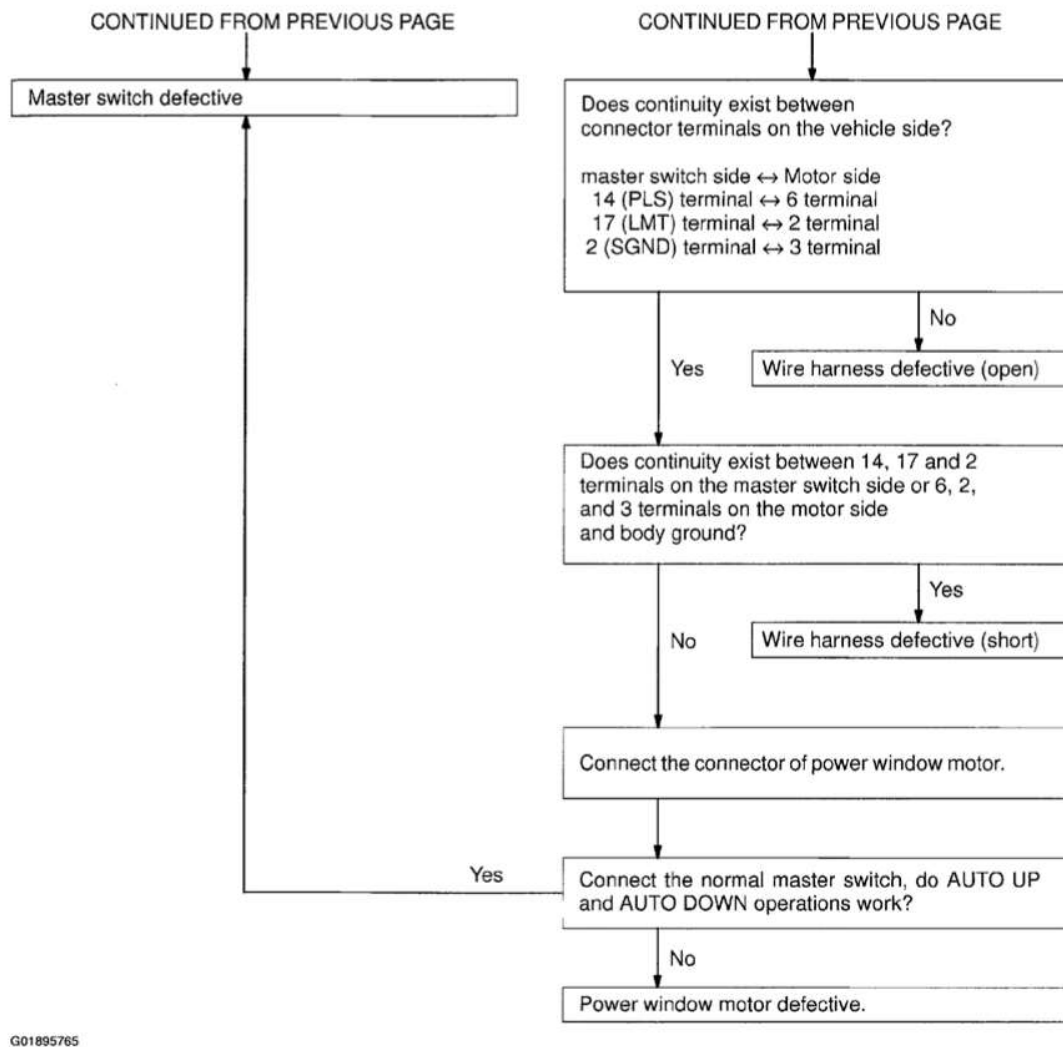


Fig. 2: Displaying Troubleshooting Flow Chart 1 (2 Of 2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. During AUTO UP operation, the power window moves down .

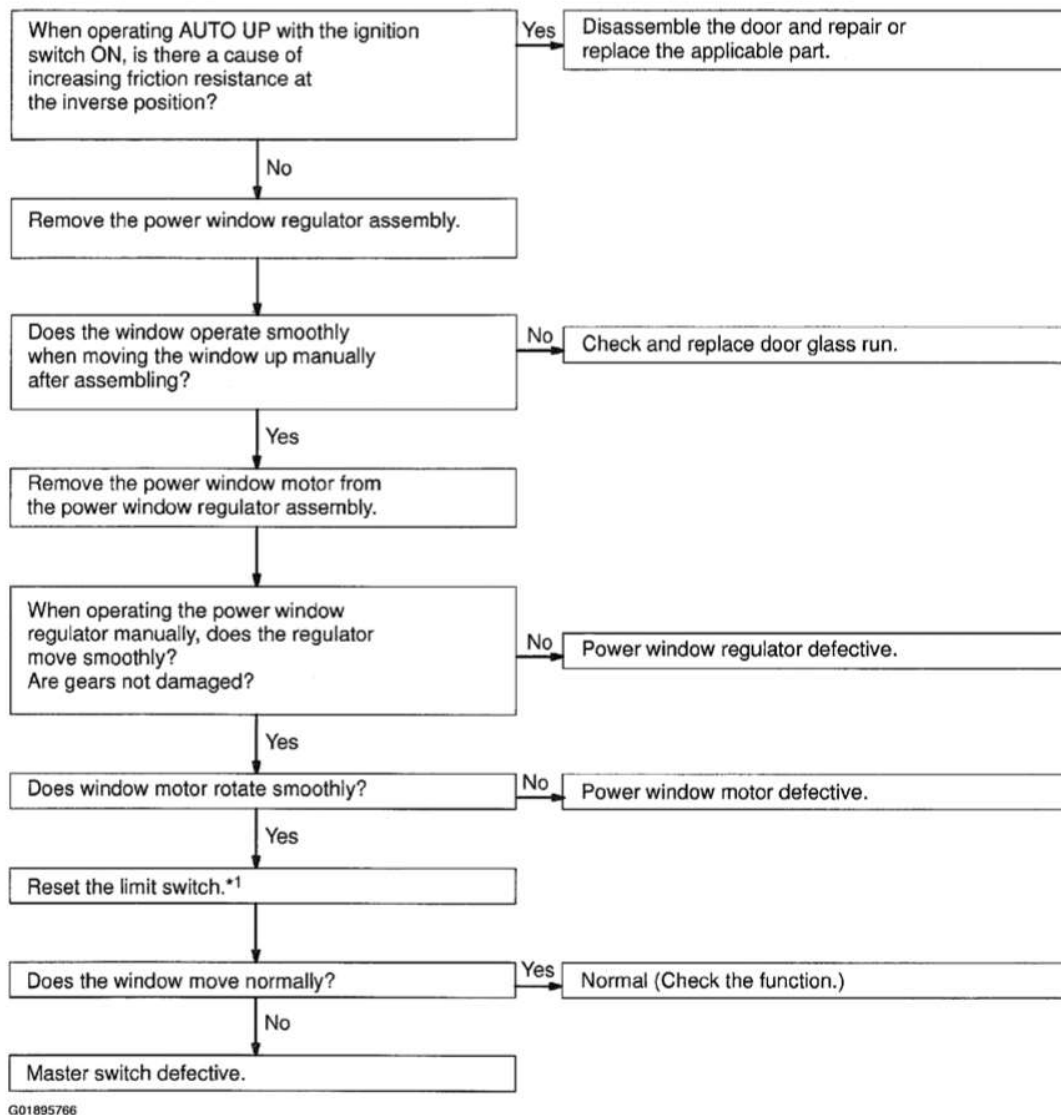


Fig. 3: Displaying Troubleshooting Flow Chart 2
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

* 1 Resetting method of the motor for jam protection.

3. The DOWN function does not work though some other objects are caught in the power window glass.

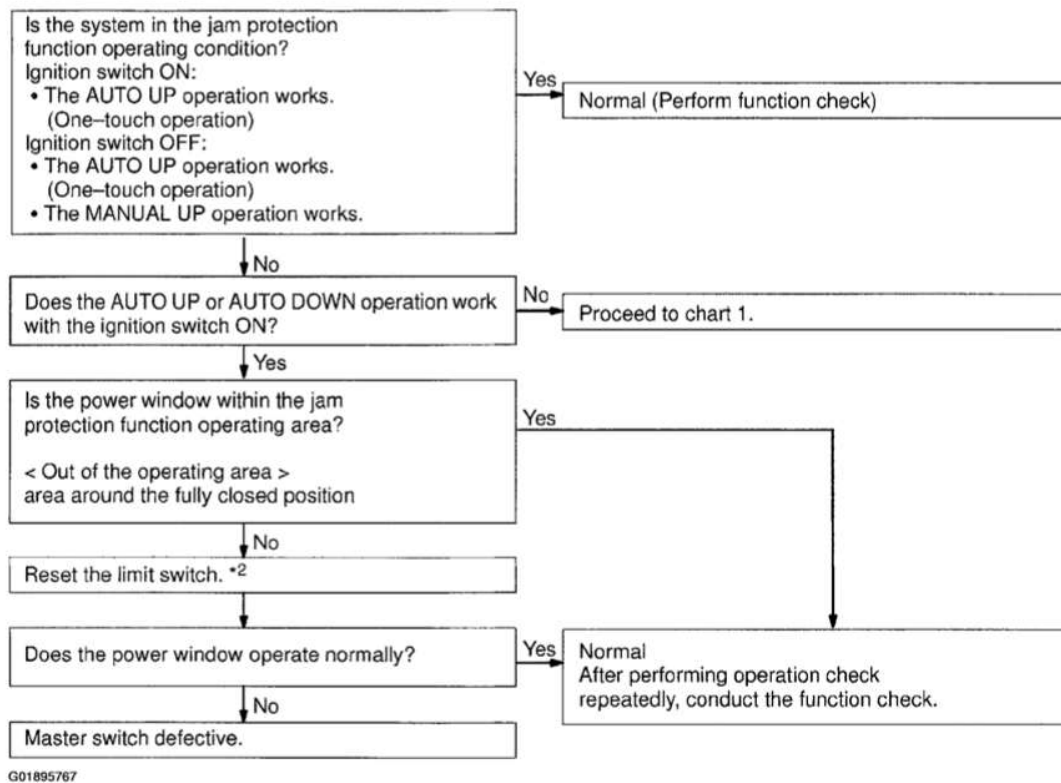


Fig. 4: Displaying Troubleshooting Flow Chart 3
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

*2 Resetting method of the motor for jam protection.

NOTE:

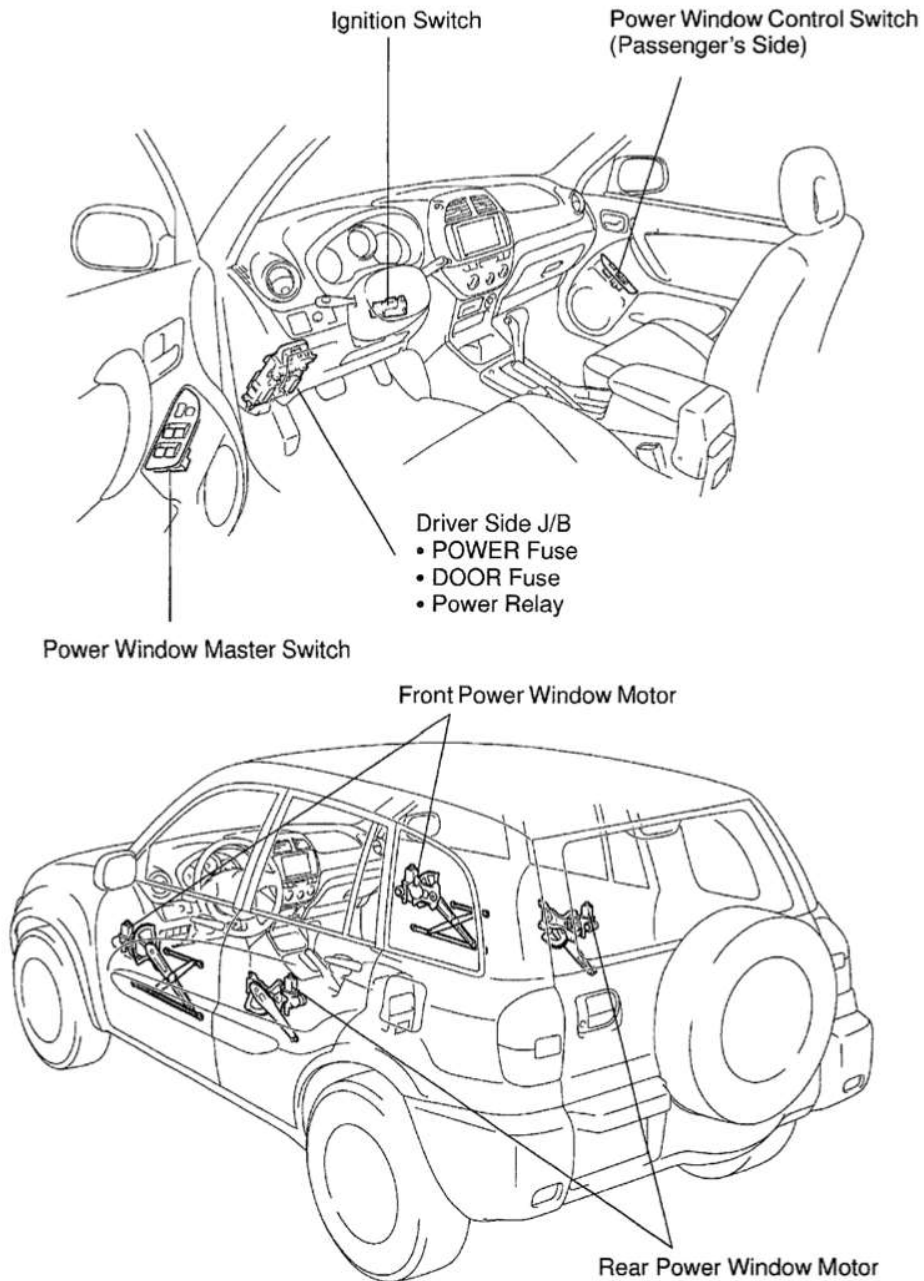
- When cutting the motor away from the regulator or raising the motor, make sure to rest the motor.
- This is the operation to set limit switch at "OFF".
 1. Connect the motor to the vehicle side harness.
 2. Rotate the motor to the rising direction for 4 - 5 sec.

NOTE:

Rotating the motor for 4-5 secs. sets the limit switch at "OFF". (Top dead center of the door glass).

1. Move the window to the fully closed position. (perform this by manual operation).
2. Using the bar with 2mm, press the reset switch.
3. With the reset switch pressed, move the window to the fully opened position with the master switch. (Perform this by manual operation).
4. Remove the bar from the reset switch, move the window to the fully closed position.

LOCATION



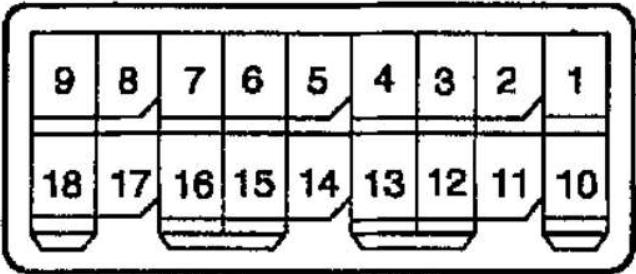
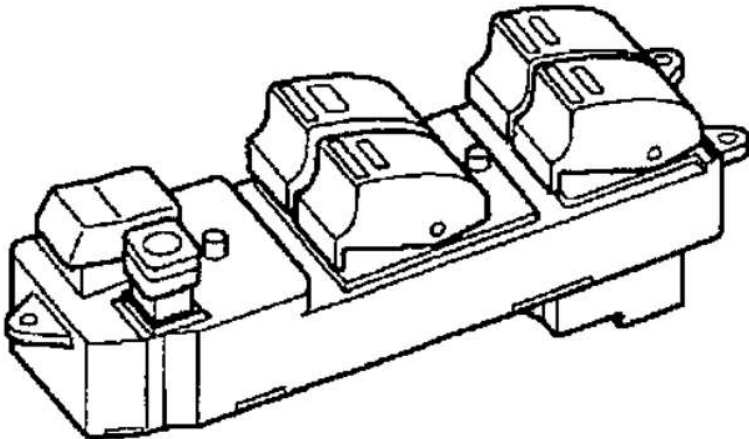
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Fig. 5: Displaying Power Window Control System Location
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION

1. **Inspect power window master switch continuity .**



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Fig. 6: Displaying Power Window Master Switch
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Front driver's switch (Window unlock and lock)

Switch position	Tester connection	Specified condition
UP	4 - 7 1 - 3 - 9	Continuity
OFF	1 - 3 - 4 1 - 3 - 9	Continuity
DOWN	7 - 9 1 - 3 - 4	Continuity

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Fig. 7: Displaying Front Driver's Switch Window Unlock Specifications
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Front passenger's switch (Window unlock):

Switch position	Tester connection	Specified condition
UP	6 - 13 1 - 3 - 15	Continuity
OFF	1 - 3 - 13 1 - 3 - 15	Continuity
DOWN	6 - 15 1 - 3 - 13	Continuity

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Fig. 8: Displaying Front Passenger's Switch Window Unlock Specifications
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Front passenger's switch (Window lock):

Switch position	Tester connection	Specified condition
UP	6 – 13	Continuity
OFF	13 – 15	Continuity
DOWN	6 – 15	Continuity

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Fig. 9: Displaying Front Passenger's Switch Window Lock Specifications
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Rear left switch (Window unlock):

Switch position	Tester connection	Specified condition
UP	6 – 12 1 – 3 – 10	Continuity
OFF	1 – 3 – 12 1 – 3 – 10	Continuity
DOWN	6 – 10 1 – 3 – 12	Continuity

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Fig. 10: Displaying Rear Passenger's Switch Windows
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Rear left switch (Window lock):

Switch position	Tester connection	Specified condition
UP	6 – 12	Continuity
OFF	10 – 12	Continuity
DOWN	6 – 10	Continuity

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Fig. 11: Displaying Rear Left Switch Window Lock Specifications
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Rear right switch (Window unlock):

Switch position	Tester connection	Specified condition
UP	6 – 18 1 – 3 – 16	Continuity
OFF	1 – 3 – 18 1 – 3 – 16	Continuity
DOWN	6 – 16 1 – 3 – 18	Continuity

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Fig. 12: Displaying Rear Right Switch Window Unlock Specifications
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Rear right switch (Window lock):

Switch position	Tester connection	Specified condition
UP	6 – 18	Continuity
OFF	16 – 18	Continuity
DOWN	6 – 16	Continuity

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Fig. 13: Displaying Rear Right Switch Window Lock
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

If continuity and voltage is not as specified, replace the master switch.

2. **Using an ammeter: Inspect one touch power window system/current of circuit .**
 - a. Disconnect the connector from the master switch.
 - b. Connect the positive (+) lead from the ammeter to terminal 4 on the wire harness side connector and the negative (-) lead to negative (-) terminal of the battery.
 - c. Connect the positive (+) lead from the battery to terminal 9 on the wire harness side connector.
 - d. As the window goes down, check that the current flow is approximately 7 A.

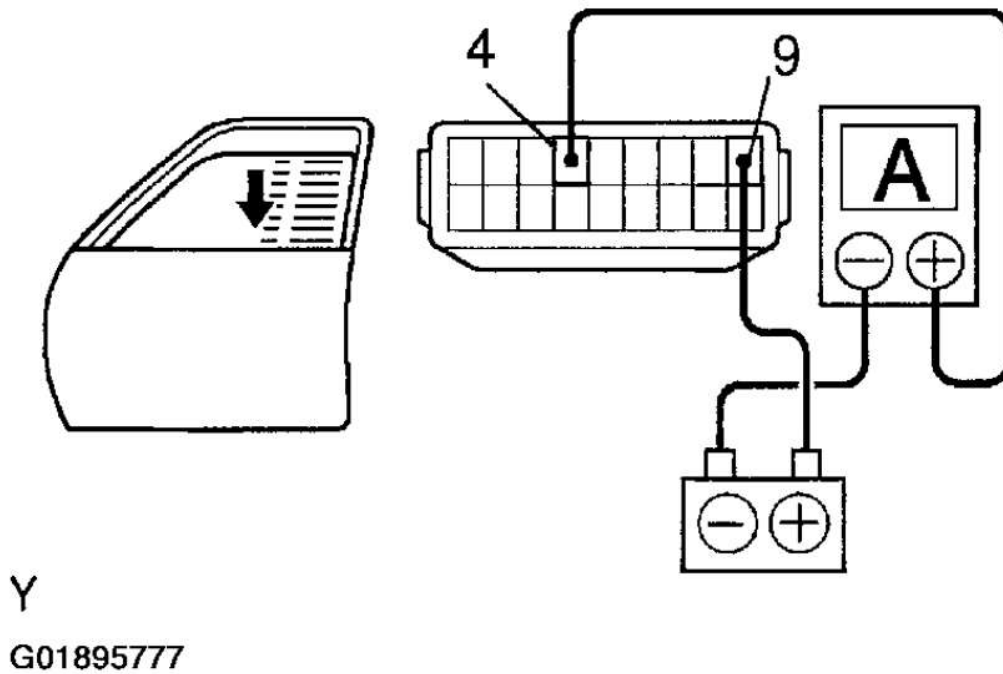


Fig. 14: Checking Current Flow As Windows Goes Down
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. Check that the current increases up to approximately 14.5 A or more when the window stops going down.

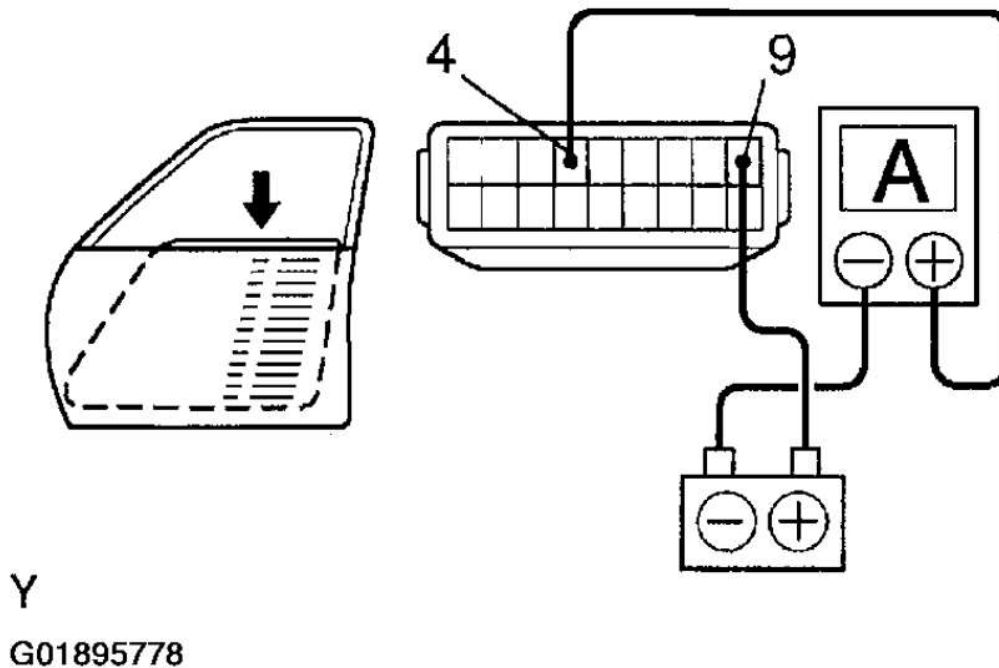
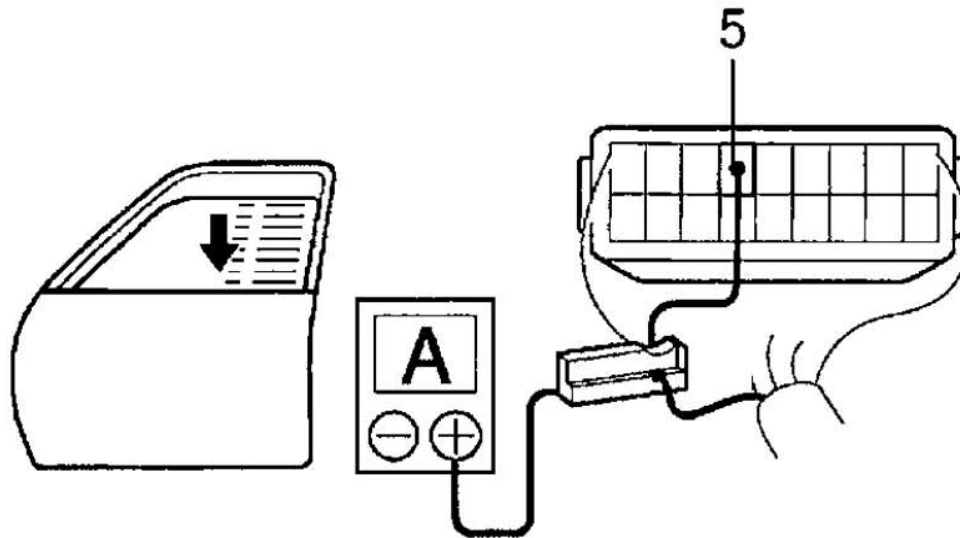


Fig. 15: Checking Current Flow As Windows Is Down
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: The circuit breaker opens some 4 - 40 seconds after the window stops going down, so that check must be made before the circuit breaker operates.

If the operation is not as specified, replace the master switch.

3. **Using an ammeter with a current-measuring probe: Inspect one touch power window system/current of circuit**
 - a. Remove the master switch with connector connected.
 - b. Attach a current-measuring probe to terminal 5 of the wire harness.
 - c. Turn the ignition switch ON and set the power window switch in the down position.
 - d. As the window goes down, check that the current flow is approximately 7 A.

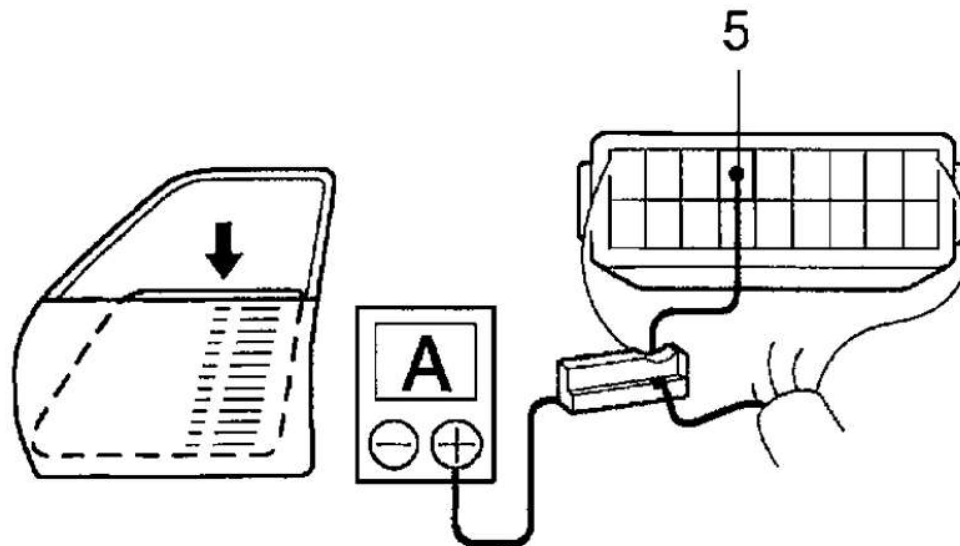


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Fig. 16: Checking Current Flow With A Current-Measuring Probe As Window Goes Down
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. Check that the current increases up to approximately 14.5 A or more when the window stops going down.



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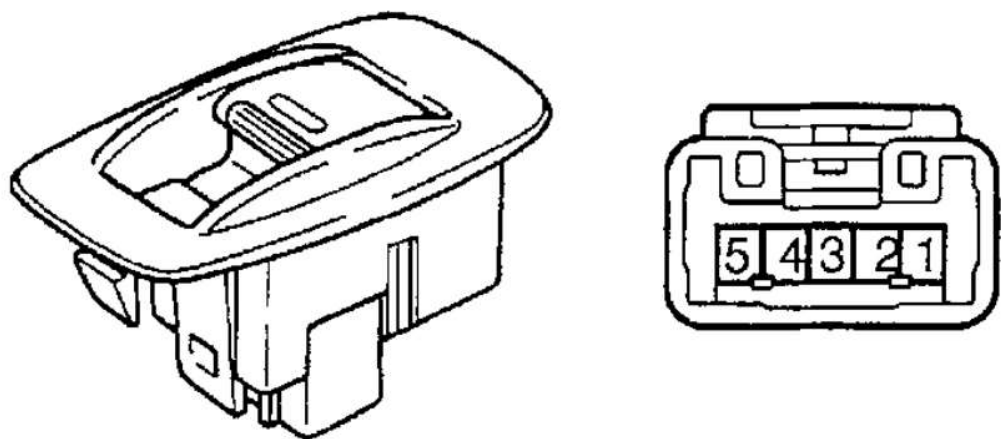
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Fig. 17: Checking Current Increases When Window Is Down
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: The circuit breaker opens some 4 - 40 seconds after the window stops going down, so that check must be made before the circuit breaker operates.

If the operation is not as specified, replace the master switch.

4. **Passenger's and rear switch:** Inspect passenger's and rear power window switch continuity



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Fig. 18: Displaying Passenger's & Rear Power Window Switch
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

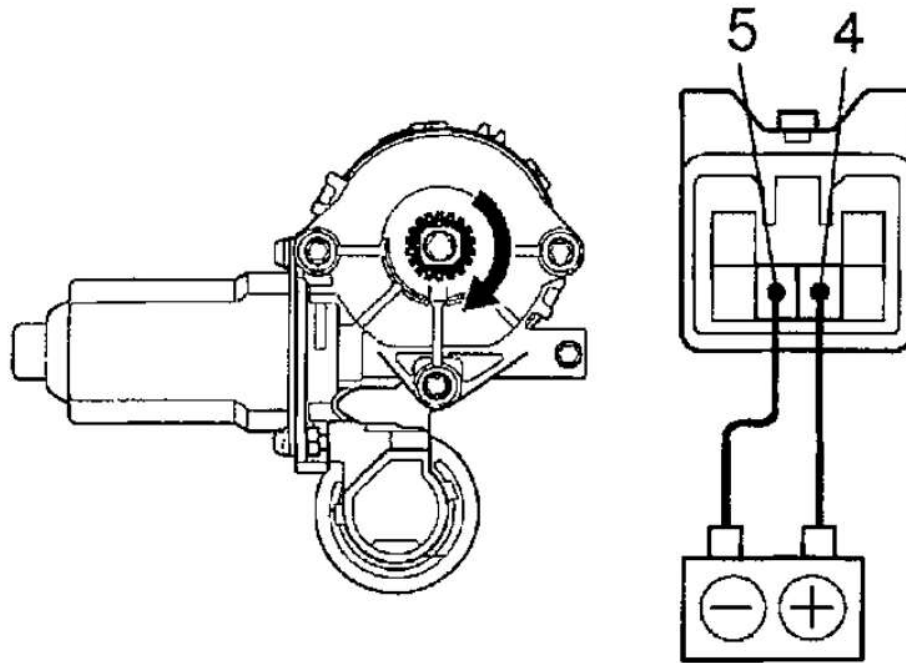
Switch position	Tester connection	Specified condition
UP	1 – 2	Continuity
	3 – 4	
OFF	1 – 2	Continuity
	3 – 5	
DOWN	1 – 4	Continuity
	3 – 5	

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Fig. 19: Displaying Passenger's & Rear Power Window Switch Continuity Specifications
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

If continuity is not as specified, replace the switch.

- 5. **Front left side door and rear right side door: Inspect power window motor operation**
 - a. Connect the positive (+) lead from the battery to terminal 4 and the negative (-) lead to terminal 5, check that the motor turns clockwise.



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Fig. 20: Displaying Power Window Motor Operation
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Reverse the polarity, check that the motor turns counterclockwise.

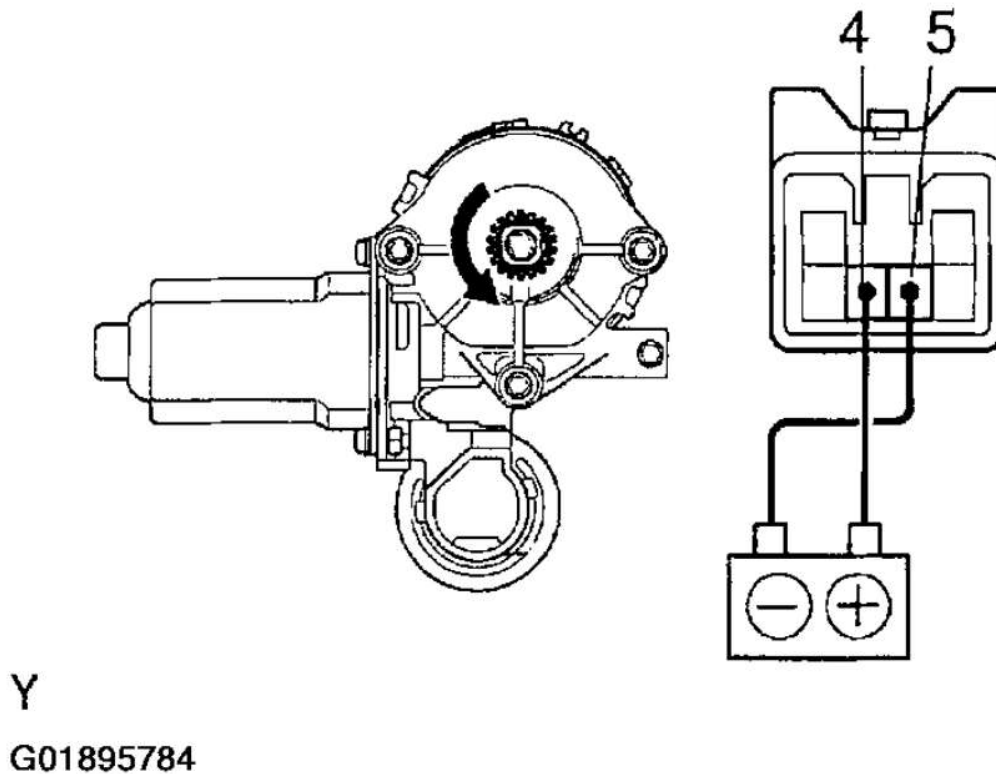


Fig. 21: Checking Motor Turns Counterclockwise
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

If operation is not as specified, replace the motor.

6. Front right side door and rear left side door: Inspect power window motor operation

- a. Connect the positive (+) lead from the battery to terminal 5 and the negative (-) lead to terminal 4, check that the motor turns clockwise.

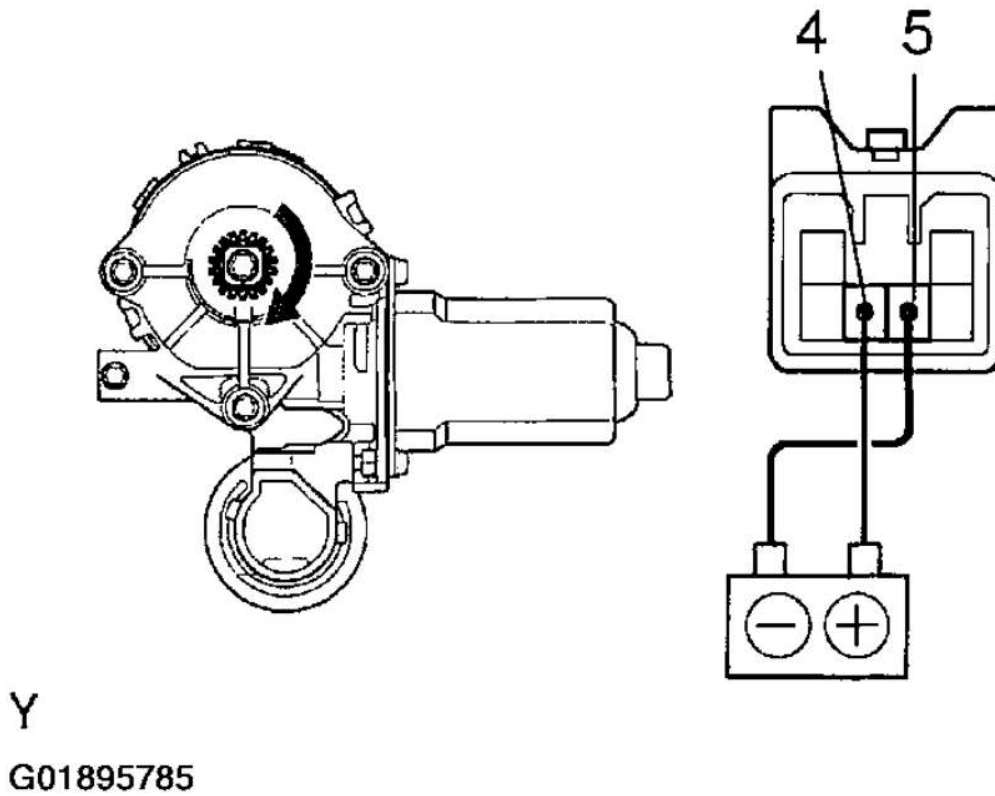


Fig. 22: Displaying Power Window Motor Operation
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Reverse the polarity, check that the motor turns counterclockwise.

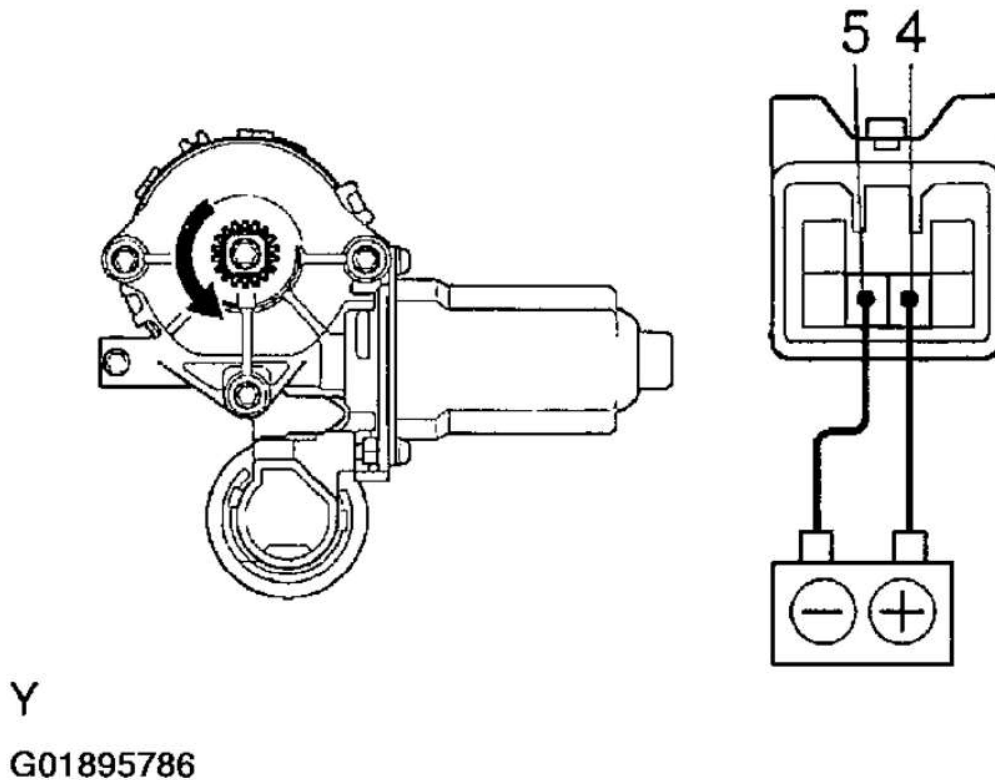


Fig. 23: Checking Motor Turns Counterclockwise
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

If operation is not as specified, replace the motor.

7. Driver's door: Inspect power window motor PTC operation

- a. Connect the positive (+) lead from the battery to terminal 4 and the negative (-) lead to terminal 9 on the wire harness side connector, and raise the window to fully closed position.

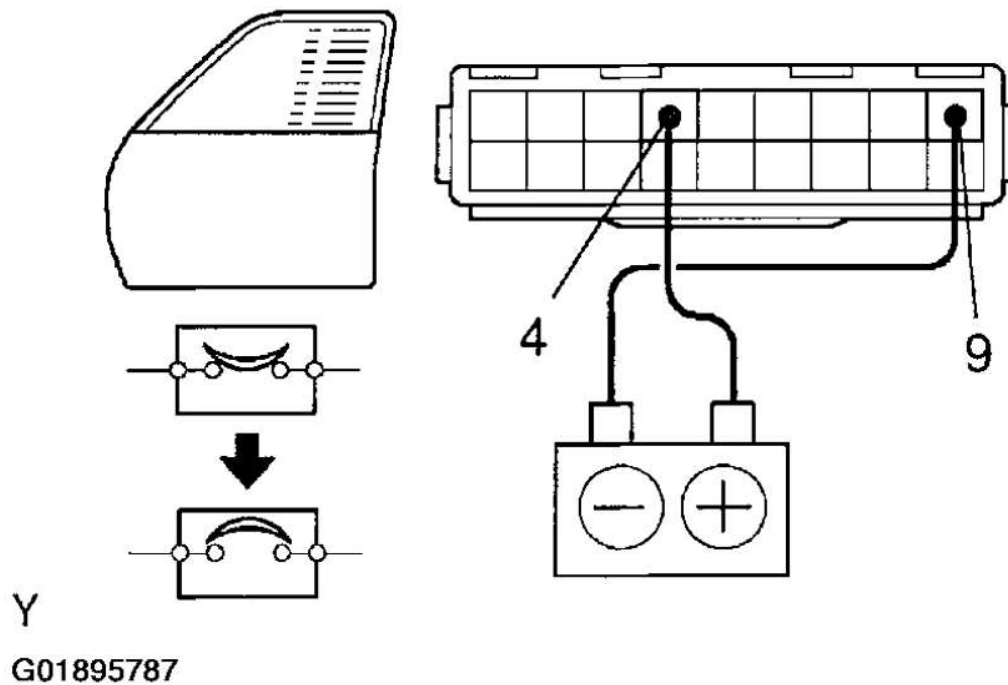


Fig. 24: Inspecting Driver's Power Window Motor PTC Operation
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Continue to apply voltage, check that a circuit breaker operation noise is heard within approximately 4 to 90 seconds.

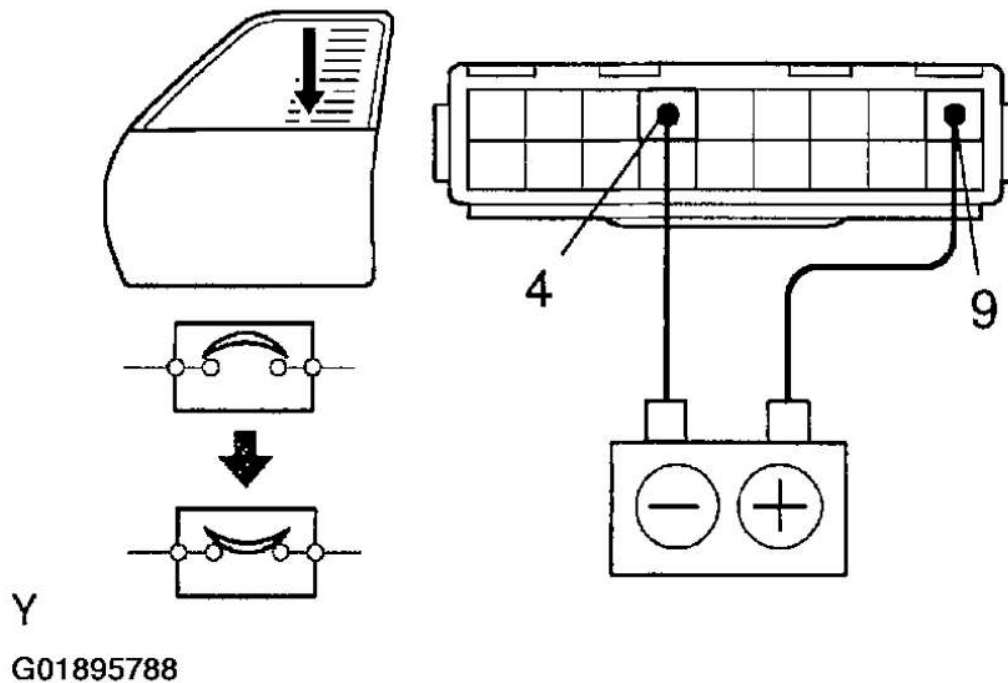


Fig. 25: Checking Circuit Breaker Operation

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

- c. Reverse the polarity, check that the window begins to descend within approximately 60 seconds.

If operation is not as specified, replace the motor.

8. Passenger's door and rear door: Inspect power window motor PTC operation

- a. Disconnect the connector from the power window switch.
- b. Connect the positive (+) lead from the battery to terminal 3 and the negative (-) lead to terminal 1 on the wire harness side connector, and raise the window to fully closed position.

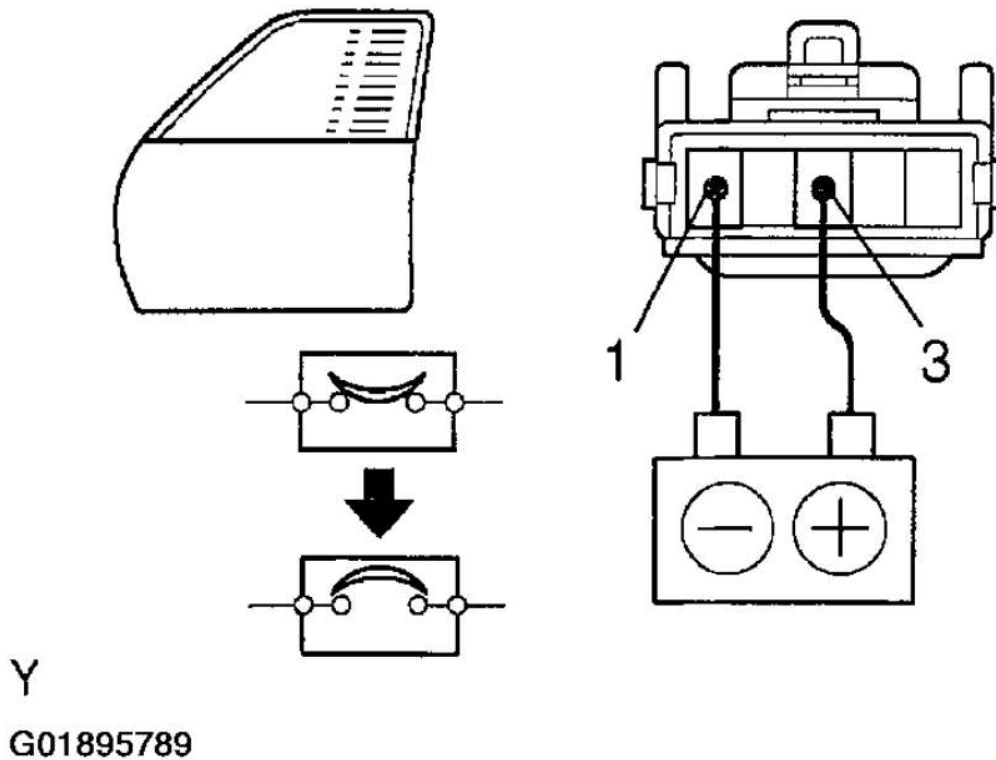


Fig. 26: Inspecting Passenger's & Rear Power Window Motor PTC Operation
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Continue to apply voltage, check that circuit breaker operation noise is heard within approximately 4 to 90 seconds.
- d. Reverse the polarity, check that the window begins to descend within approximately 60 seconds.

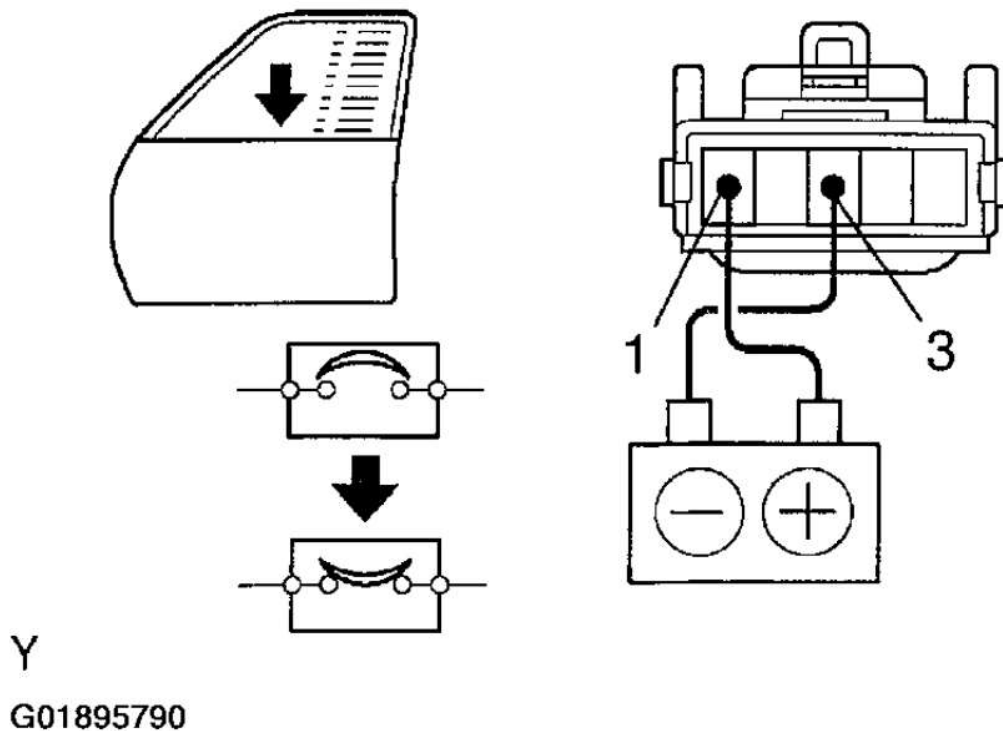


Fig. 27: Checking Window Begins To Descend
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

If operation is not as specified, replace the motor.

9. Window up: Inspect front window jam protection limit switch operation

- a. Disconnect the connector from the master switch.
- b. Connect the positive (+) lead from the ohmmeter to terminal 17 and the negative (-) lead to terminal 2.
- c. Connect the positive (+) lead from the battery to terminal 4 and the negative (-) lead to terminal 9.
- d. Check that the continuity exists when the window goes up.

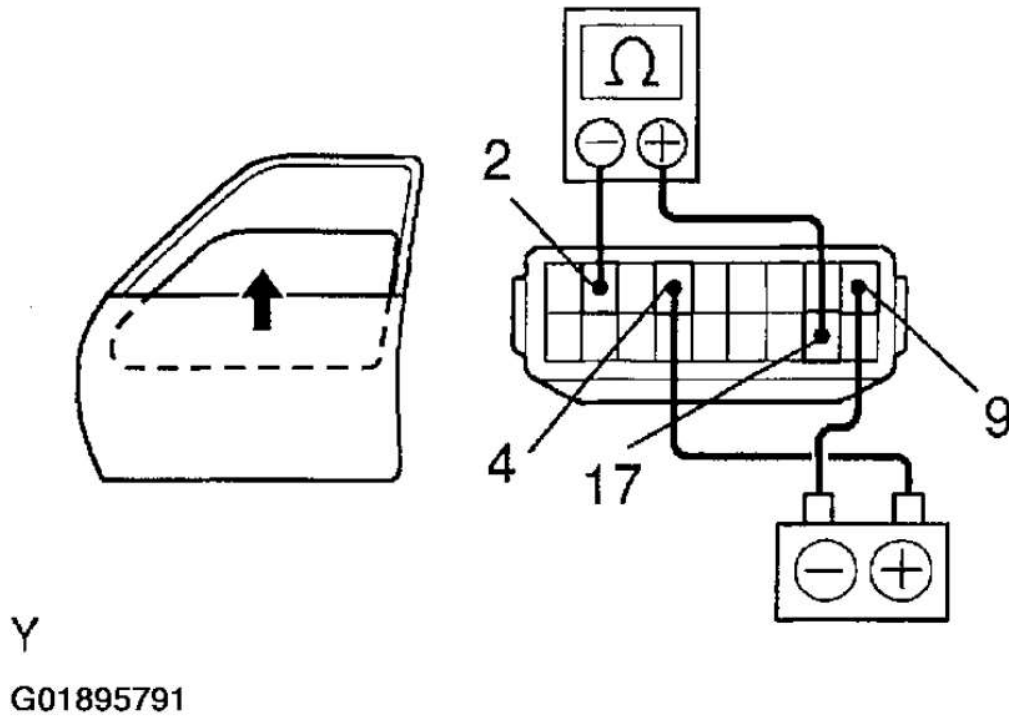


Fig. 28: Checking Continuity Exists When Window Goes Up
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. Check that the no continuity exists when the window is in the fully closed position.

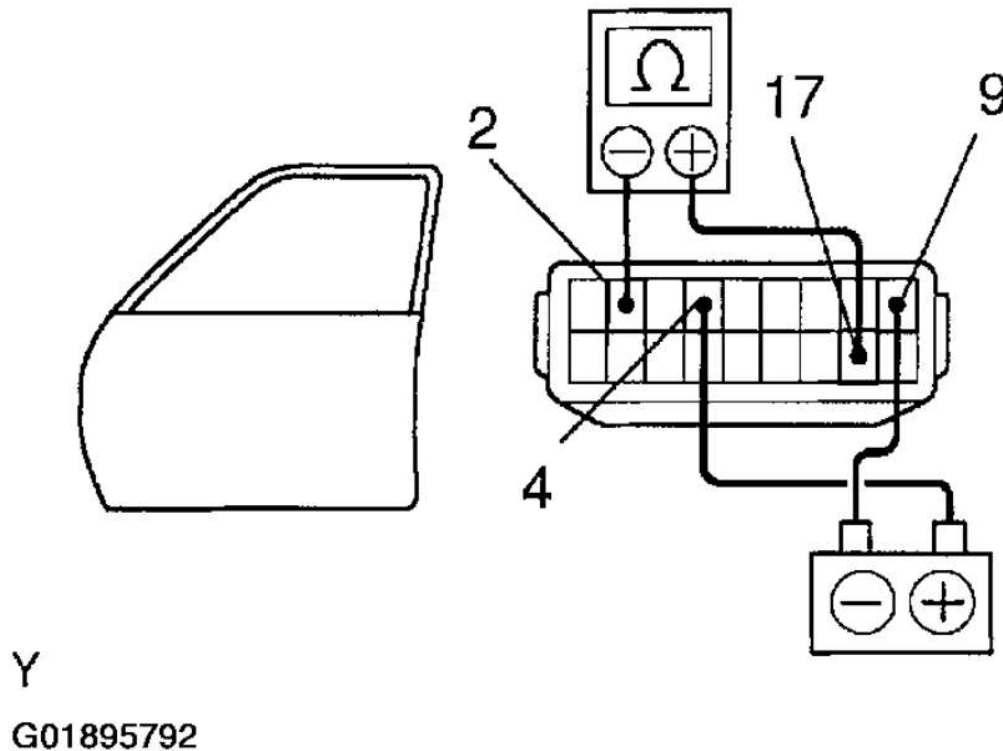


Fig. 29: Checking No Continuity Exists When Window Is Fully Closed
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

If operation is not as specified, replace the motor.

10. Window down: Inspect front window jam protection limit switch operation

- a. Connect the positive (+) lead from the ohmmeter to terminal 17 and the negative (-) lead to terminal 2.
- b. Connect the positive (+) lead from the battery to terminal 9 and the negative (-) lead to terminal 4.
- c. Check that the continuity exists when the window goes up.

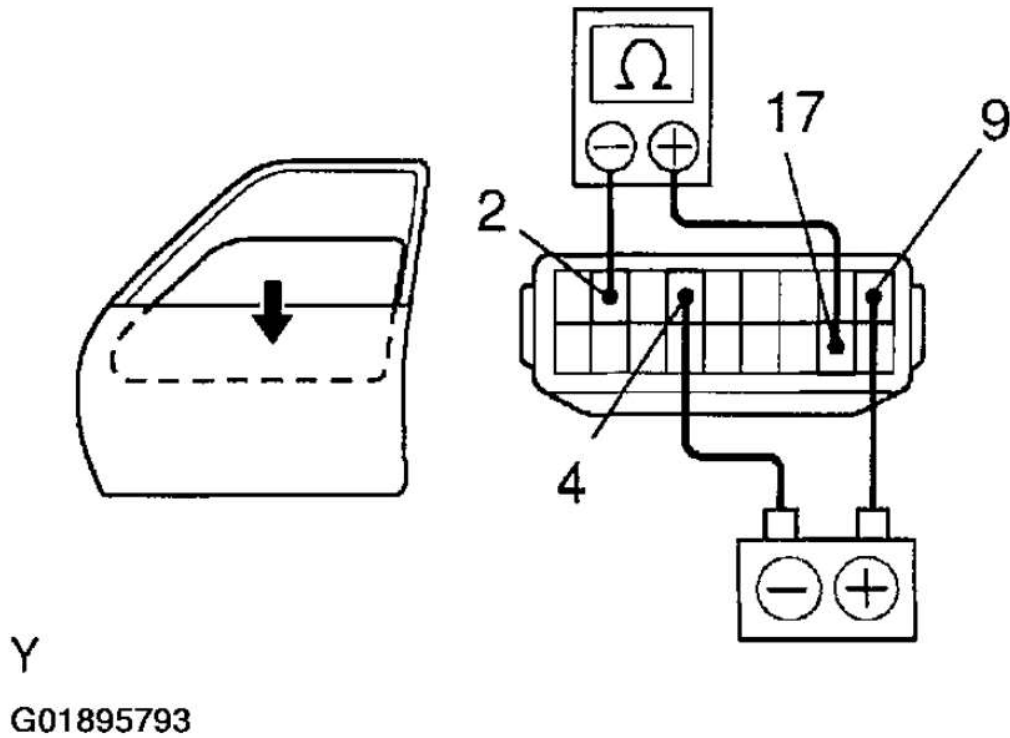


Fig. 30: Inspecting Front Window Continuity When Going Up
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Check that the no continuity exists when the window is in the fully opened position.

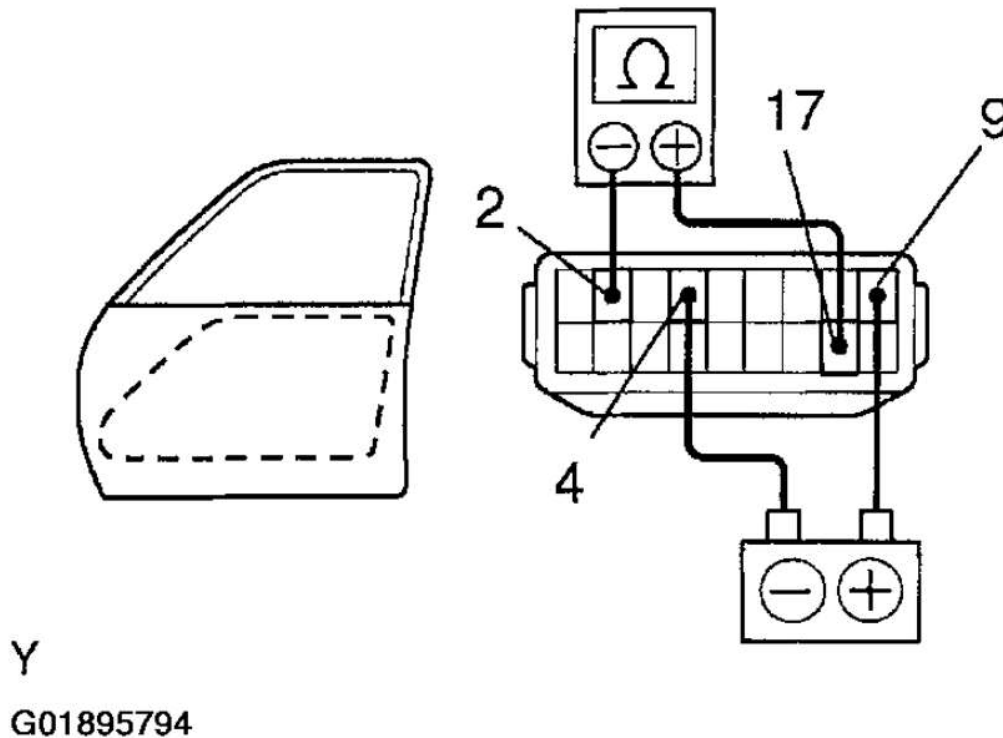


Fig. 31: Inspecting Front Window Continuity When Fully Open
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: If connecting the wire harness wrongly, the sensor might be damaged so caution is necessary.

11. Inspect front window jam protection pulse switch operation .

- a. Connect the positive (+) lead from the electrical tester to terminal 14 and the negative (-) lead to terminal 2.
- b. Connect the positive (+) lead from the battery to terminal 4 and the negative (-) lead to terminal 9.
- c. Check that pulse is generated during the motor running.

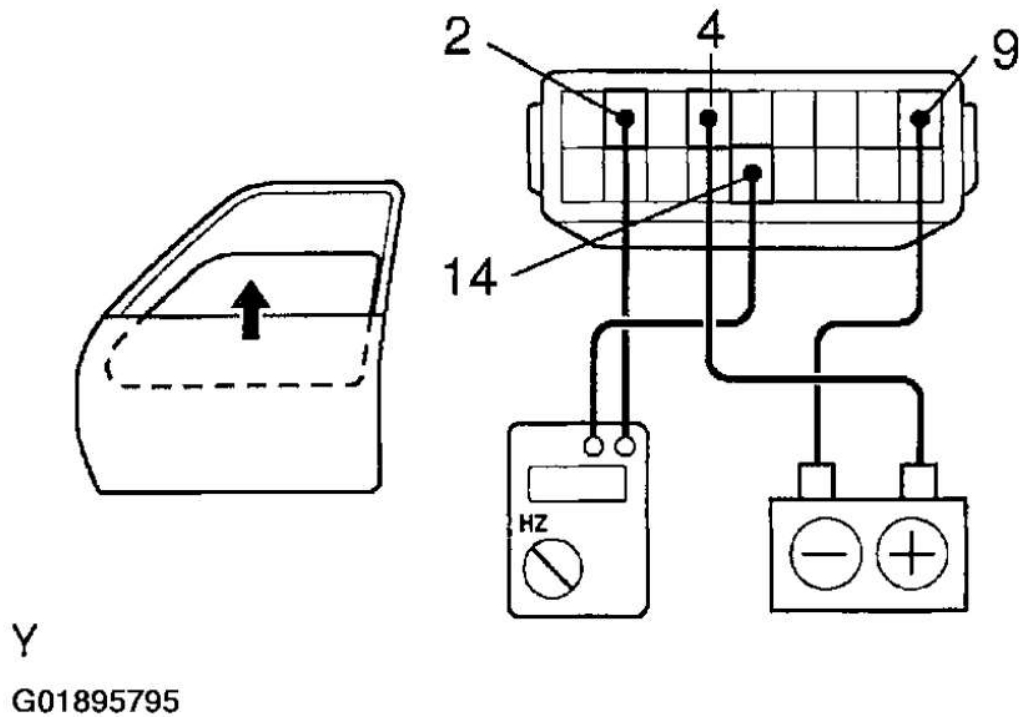


Fig. 32: Inspecting Pulse Is Generated With Window Going Up
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Reverse the polarity and check that the pulse is generated.

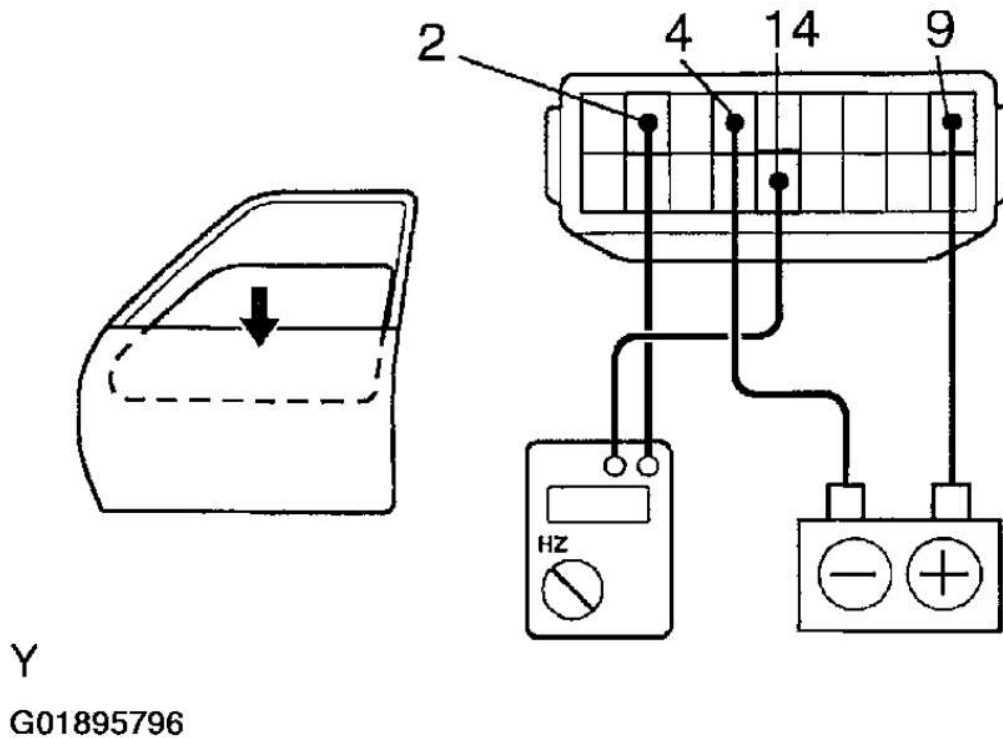


Fig. 33: Inspecting Pulse Is Generated With Window Going Down
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

If operation is not as specified, replace the motor.

NOTE: If connecting the wire harness wrongly, the sensor might be damaged so caution is necessary.

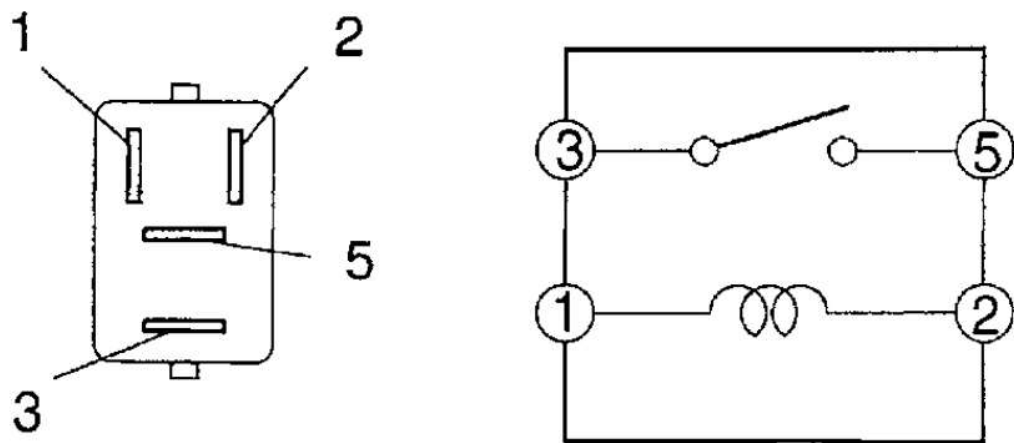
12. Inspect power relay continuity .

condition	Tester connection	Specified condition
constant	1 – 2	Continuity
Apply B+ between terminals 1 and 2.	3 – 5	Continuity

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Fig. 34: Displaying Power Relay Specifications
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

If continuity is not as specified, replace the relay.



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Fig. 35: Inspecting Power Relay Continuity
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ADJUSTMENT

How to reset power window motor (reset switch and pulse switch) .

If the jam protection is not functioned properly, perform the following procedure.

NOTE: It is necessary to reset the power window motor (in initial position for the limit

switch) when separating the window regulator from the power motor or operating the window regulator with the door glass not installed.

- a. Remove the power window motor. (See **FRONT DOOR & REAR DOOR**).

NOTE: **Place the matchmarks on the power window motor and window regulator gear.**

- b. Connect the power window motor and power window switch to wire harness of the vehicle.
c. Turn the ignition switch ON and operate the power window switch to idle the power window motor in UP side direction for more than 6 rotations or less than 10 rotates (4 seconds or more).
d. Assemble the power window motor and regulator.

NOTE:

- **Install the motor when the regulator arm is below the middle point.**
- **Align the matchmarks on the power window motor and window regulator gear when install the power window motor.**

- e. Assemble the power window regulator and door glass.

NOTE: **Never rotate the motor to the down direction until the completion of the window glass installation.**

- f. Connect power window switch to wire harness and turn the ignition switch ON.
g. Repeat UP and DOWN operation several times manually.
h. Check if AUTO UP AUTO DOWN operates in automatic operation.

NOTE:

- **Take care that the jam protection function does not operate just after resetting.**
- **Reset the regulator again when performing the reverse operating after closing the window fully by AUTO UP operation.**

- i. Check the power window function.