POWER WINDOW SYSTEMS

CONTENTS

GENERAL INFORMATION

INTRODUCTION

Power windows are available as factory-installed optional equipment on this model. The power lock system and power mirror system are included on vehicles equipped with the power window option. This group covers diagnosis and service of only the electrical components in the power window system. For service of mechanical components, such as the regulator, lift plate, window tracks, or glass refer to Group 23 - Body.

Following are general descriptions of the major components in the power window system. Refer to 8W-60 - Power Windows in Group 8W - Wiring Diagrams for complete circuit descriptions and diagrams. Refer to the owner's manual for more information on the features and use of this system.

NOTE: This group covers both Left-Hand Drive (LHD) and Right-Hand Drive (RHD) versions of this model. Whenever required and feasible, the RHD versions of affected vehicle components have been constructed as mirror-image of the LHD versions. While most of the illustrations used in this group represent only the LHD version, the diagnostic and service procedures outlined can generally be applied to either version. Exceptions to this rule have been clearly identified as LHD or RHD, if a special illustration or procedure is required.

DESCRIPTION AND OPERATION

POWER WINDOW SWITCH

The individual power windows are controlled by a two-way momentary switch mounted on the trim panel of the passenger side front door trim panel and, on four-door models, on each of the rear door trim panels. Two-way momentary master switches on the driver side front door trim panel control all of the power windows in the vehicle. The driver side front door trim panel also has a two-position power window lockout switch.

The front door power window switches and the power window lockout switch are integral to the Driver Door Module (DDM) or Passenger Door Module (PDM), respectively. The rear door power window switches are stand-alone units.

Each power window switch controls its power window motor by switching battery current and ground between the terminals of the power window motor. The passenger side front door and, on four-door models, both rear door power window switches receive their battery feed through the power window lockout switch or through the master switches in the DDM. Also, each of the individual power window switches receives its ground through the DDM. When the lockout switch is placed in the Lock position, the individual power window switches become inoperative because they have no battery current available to them. However, the master switches are unaffected by the lockout switch position.

Each power window switch, except the lockout switch, is illuminated by a Light-Emitting Diode (LED) when the ignition switch is turned to the On position. However, when the lockout switch is placed in the Lock position, the LED for the locked-out passenger side front and, on four-door models, the rear passenger door power window switches is turned off.

The front door power window switches and their lamps cannot be repaired and, if faulty or damaged, the entire door module must be replaced. The rear door power window switches and their lamps cannot be repaired but, if faulty or damaged, only the affected switch unit must be replaced.

DESCRIPTION AND OPERATION (Continued)

DOOR MODULE

A Driver Door Module (DDM) and a Passenger Door Module (PDM) are used on all models equipped with power locks and power windows. Each door module houses both the front door power lock and power window switches. The DDM also houses individual switches for each passenger door power window, a power window lockout switch, a power mirror switch, and circuitry to support the one-touch down feature of the driver side front door power window. The PDM also houses the control circuitry and the power lock and unlock relays for the power lock system.

The DDM and the PDM are mounted to their respective front door trim panels. The DDM and PDM are serviced individually and cannot be repaired. If the DDM or PDM, or any of the switches and circuitry they contain are faulty or damaged, the complete module must be replaced.

POWER WINDOW MOTOR

A permanent magnet reversible motor moves the window regulator through an integral gearbox mechanism. A positive and negative battery connection to the two motor terminals will cause the motor to rotate in one direction. Reversing current through these same two connections will cause the motor to rotate in the opposite direction.

In addition, each power window motor is equipped with an integral self-resetting circuit breaker to protect the motor from overloads. The power window motor and gearbox assembly cannot be repaired and, if faulty or damaged, the entire power window regulator assembly must be replaced.

CIRCUIT BREAKER

An automatic resetting circuit breaker in the junction block is used to protect the power window system circuit. The circuit breaker can protect the system from a short circuit, or from an overload condition caused by an obstructed or stuck window glass or regulator.

The circuit breaker cannot be repaired and, if faulty, it must be replaced.

DIAGNOSIS AND TESTING

POWER WINDOW SYSTEM

For circuit descriptions and diagrams, refer to 8W-60 - Power Windows in Group 8W - Wiring Diagrams.

ALL WINDOWS INOPERATIVE

(1) Check the circuit breaker in the junction block, as described in this group. If OK, go to Step 2. If not OK, replace the faulty circuit breaker.

(2) Remove the Driver Door Module (DDM) as described in this group. Check for continuity between the ground circuit cavity of the switch wire harness connector and a good ground. If OK, go to Step 3. If not OK, repair the circuit to ground as required.

(3) Turn the ignition switch to the On position. Check for battery voltage at the fused ignition switch output circuit cavity of the DDM wire harness connector. If OK, see the diagnosis for the Door Module in this group. If not OK, repair the open circuit to the circuit breaker in the junction block as required.

ONE WINDOW INOPERATIVE

The window glass must be free to slide up and down for the power window motor to function properly. If the glass is not free to move up and down, the motor will overload and trip the integral circuit breaker. To determine if the glass is free, disconnect the regulator plate from the glass. Then slide the window up and down by hand.

There is an alternate method to check if the glass is free. Position the glass between the up and down stops. Then, shake the glass in the door. Check that the glass can be moved slightly from side to side, front to rear, and up and down. Then check that the glass is not bound tight in the tracks. If the glass is free, proceed with the diagnosis that follows. If the glass is not free, refer to Group 23 - Body for the door window glass and hardware service and adjustment procedures.

(1) Check the power window switch continuity as described in the diagnosis for the Door Module (front doors) or Power Window Switch (rear doors) in this group. If OK and the driver side front window is inoperative, see the Power Window Motor diagnosis in this group. If OK and the inoperative window is other than the driver side front, go to Step 2. If not OK, replace the faulty door module or switch.

(2) Refer to the circuit diagrams in 8W-60 - Power Windows in Group 8W - Wiring Diagrams. Check the continuity in each circuit between the inoperative Passenger Door Module (PDM) or power window switch wire harness connector cavities and the corresponding Driver Door Module (DDM) wire harness connector cavities. If OK, see the diagnosis for the Power Window Motor in this group. If not OK, repair the open circuit(s) as required.

NOTE: All individual power window switches receive their battery and ground feeds through the Driver Door Module (DDM) and wire harness connectors.

DIAGNOSIS AND TESTING (Continued)

CIRCUIT BREAKER

For circuit descriptions and diagrams, refer to 8W-60 - Power Windows in Group 8W - Wiring Diagrams.

(1) Locate the circuit breaker in the junction block. Pull out the circuit breaker slightly, but be sure that the terminals still contact the terminals in the junction block cavities.

(2) Connect the negative lead of a 12-volt DC voltmeter to a good ground.

(3) With the voltmeter positive lead, check both terminals of the circuit breaker for battery voltage.

If only one terminal has battery voltage, the circuit breaker is faulty and must be replaced. If neither terminal has battery voltage, repair the open circuit from the Power Distribution Center (PDC) as required.

DOOR MODULE

The Driver Door Module (DDM) contains the master switches and the lockout switch in the power window system. The DDM also contains an integrated circuit to support the one-touch down feature of the driver side front door power window. Remember that the passenger side front door power window switch and, on four-door models, the rear door power window switches get their battery current through the power window lockout switch in the Driver Door Module (DDM). In addition, each individual power window switch gets its ground through the master switch in the DDM.

The one-touch down feature circuitry within the DDM will not operate the power window motor if the door glass, window regulator, or gearbox mechanism are stuck, obstructed, or binding. If the driver side front door power window operates as designed, but the one-touch down feature is inoperative, replace the faulty DDM.

If the problem being diagnosed is an inoperative power window switch illumination lamp, but the power window switch operates as designed, replace the faulty door module. For circuit descriptions and diagrams, refer to 8W-60 - Power Windows in Group 8W - Wiring Diagrams.

(1) Remove the door module from the door trim panel as described in this group.

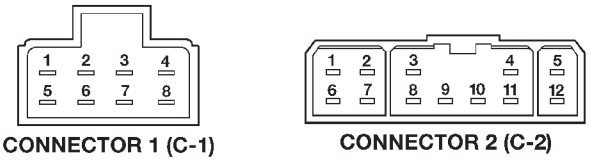
(2) Check the door module power window switch and/or power window lockout switch continuity in each position, as shown in the proper chart (Fig. 1) or (Fig. 2). If OK, see the Power Window Motor diagnosis in this group. If not OK, replace the faulty door module.

POWER WINDOW SWITCH

The diagnosis found here applies only to the rear door power window switches. For diagnosis of the front door switches, see Door Module in this group. If the problem being diagnosed is an inoperative power window switch illumination lamp, but the power window switch operates as designed, replace the faulty switch. For circuit descriptions and diagrams, refer to 8W-60 - Power Windows in Group 8W - Wiring Diagrams.

(1) Remove the power window switch from the rear door trim panel as described in this group.

(2) Check the power window switch continuity in each position as shown in the Rear Door Power Window Switch Continuity chart (Fig. 3). If OK, see the Power Window Motor diagnosis in this group. If not OK, replace the faulty switch.



POWER WINDOWS
CONNECTOR 2 (C2)

SWITCH POSITION	CONTINUITY BETWEEN
OFF (NORMAL)	1&8, 2&8, 3&8, 4&8, 5&8, 6&8, 10&8, 12&8
RIGHT REAR DOWN	1&9
RIGHT REAR UP	2&9
RIGHT FRONT UP	3&9
LEFT REAR UP	4&9
LEFT FRONT UP	5&9
RIGHT FRONT DOWN	6&9
LEFT REAR DOWN	10&9
LEFT FRONT DOWN	12&9

WINDOW LOCKOUT
CONNECTOR 1 (C1), CONNECTOR 2 (C2)

SWITCH POSITION	CONTINUITY BETWEEN
LOCKOUT OFF (UP)	C1 PIN 8 & C2 PIN 9
LOCKOUT ON (DOWN)	NO CONTINUITY BETWEEN C1 PIN 8 & C2 PIN 9

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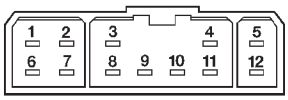
Fig. 1 DDM Power Window Switch Continuity



POWER WINDOWS	
OFF (NORMAL)	C2 PIN 2 & C2 PIN 3
	C2 PIN 4 & C2 PIN 9
UP	C2 PIN 2 & C2 PIN 3
	C2 PIN 9 & C2 PIN 10
DOWN	C2 PIN 2 & C2 PIN 10
	C2 PIN 4 & C2 PIN 9

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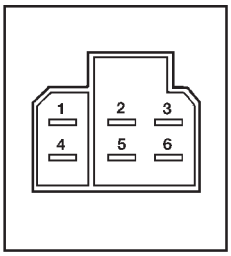
Fig. 2 PDM Power Window Switch Continuity

DIAGNOSIS AND TESTING (Continued)



SWITCH POSITION	CONTINUITY BETWEEN
OFF (NORMAL)	1&4
	2&5
UP	1&6
	2&5
DOWN	1&4
	5&6

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Fig. 3 Rear Door Power Window Switch Continuity

POWER WINDOW MOTOR

For circuit descriptions and diagrams, refer to 8W-60 - Power Windows in Group 8W - Wiring Diagrams. Before you proceed with this diagnosis, confirm proper switch operation. See the Door Module and/or Power Window Switch diagnosis in this group.

(1) Remove the door trim panel as described in Door Module (front door) or Power Window Switch (rear door) in this group.

(2) Unplug the power window motor wire harness connector. Apply 12 volts across the motor terminals to check its operation in one direction. Reverse the connections across the motor terminals to check the operation in the other direction. Remember, if the window is in the full up or full down position, the motor will not operate in that direction by design. If OK, repair the circuits from the motor to the door module or the switch as required. If not OK, replace the faulty motor.

(3) If the motor operates in both directions, check the operation of the window glass and lift mechanism through its complete up and down travel. There should be no binding or sticking of the window glass or lift mechanism through the entire travel range. If not OK, refer to Group 23 - Body to check the window glass, tracks, and regulator for sticking, binding, or improper adjustment.

REMOVAL AND INSTALLATION

DOOR MODULE

(1) Disconnect and isolate the battery negative cable.

(2) Remove the screws that secure the door trim panel to the inner door panel (Fig. 4).

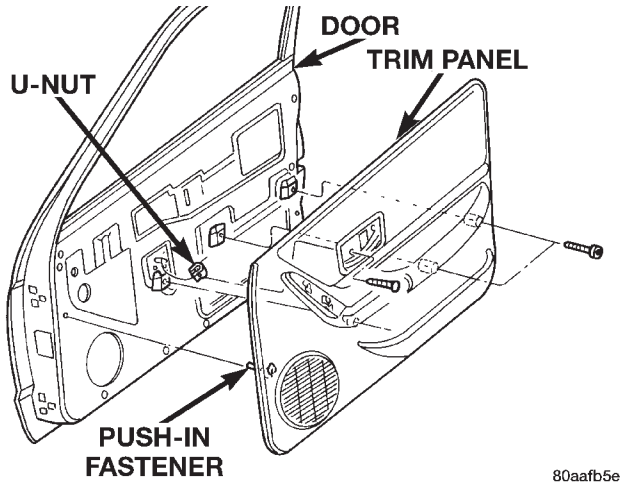

Fig. 4 Front Door Trim Panel Remove/Install

(3) Using a trim stick or another suitable wide flat-bladed tool, gently pry the trim panel away from the door around the perimeter to release the trim panel retainers.

NOTE: To aid in the removal of the trim panel, start at the bottom of the panel.

(4) Lift the door trim panel upwards and away from the door to disengage the top of the panel from the inner belt weatherstrip.

(5) Pull the door trim panel away from the inner door far enough to access the inside door latch release and lock linkage rods near the back of the inside door remote controls.

(6) Unsnap the plastic retainer clips from the inside door remote control ends of the latch release and lock linkage rods, and remove the rod ends from the inside door remote controls.

(7) Unplug the wire harness connectors from the door module.

(8) Remove the front door trim panel from the vehicle.

(9) Remove the three screws that secure the door module to the door trim panel (Fig. 5).

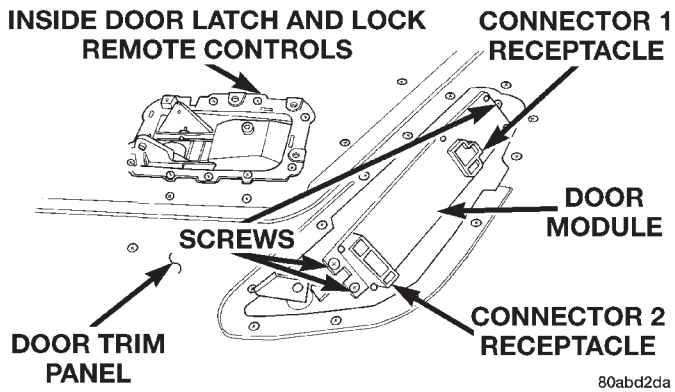

Fig. 5 Door Module Remove/Install

REMOVAL AND INSTALLATION (Continued)

(10) Remove the door module from the trim panel.
(11) Reverse the removal procedures to install. Tighten the mounting screws to 2.2 N·m (20 in. lbs.).

POWER WINDOW SWITCH

(1) Disconnect and isolate the battery negative cable.
(2) Remove the screws that secure the door trim panel to the inner door panel (Fig. 6).

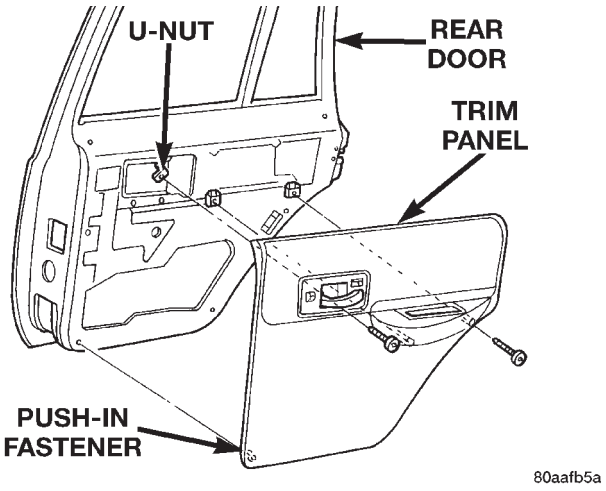

Fig. 6 Rear Door Trim Panel Remove/Install

(3) Using a trim stick or another suitable wide flat-bladed tool, gently pry the trim panel away from the door around the perimeter to release the trim panel retainers.

NOTE: To aid in the removal of the trim panel, start at the bottom of the panel.

(4) Lift the door trim panel upwards and away from the door to disengage the top of the panel from the inner belt weatherstrip.
(5) Pull the door trim panel away from the inner door far enough to access the inside door latch release and lock linkage rods near the back of the inside door remote controls.
(6) Unsnap the plastic retainer clips from the inside door remote control ends of the latch release and lock linkage rods, and remove the rod ends from the inside door remote controls.
(7) Unplug the wire harness connector from the rear door power window switch.
(8) Remove the rear door trim panel from the vehicle.
(9) Carefully pry the snap retainers at each side of the switch receptacle in the trim panel and pull the switch out of the receptacle (Fig. 7).

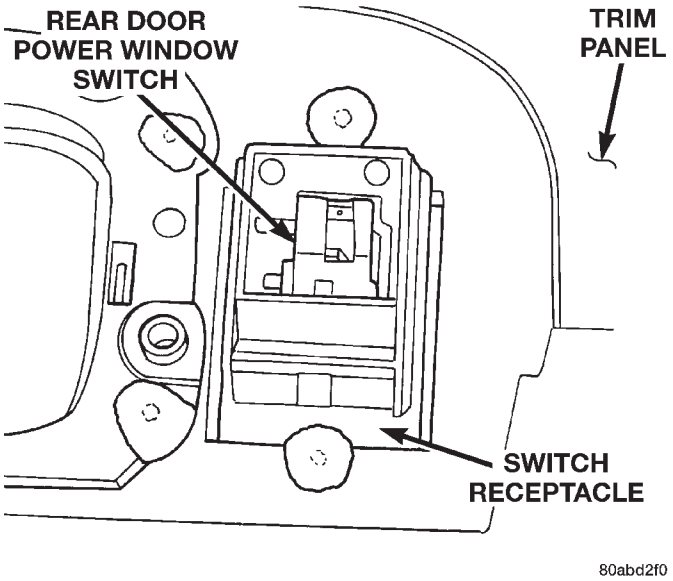

Fig. 7 Rear Door Power Window Switch Remove/ Install

(10) Reverse the removal procedures to install.

POWER WINDOW MOTOR

FRONT DOOR

The front door power window motor and mechanism is integral to the front door power window regulator unit. If the front door power window motor or mechanism is faulty or damaged, the entire power window regulator unit must be replaced. Refer to Group 23 - Body for the front door window regulator service procedures.

REAR DOOR

The rear door power window motor and mechanism is integral to the rear door power window regulator unit. If the rear door power window motor or mechanism is faulty or damaged, the entire power window regulator unit must be replaced. Refer to Group 23 - Body for the rear door window regulator service procedures.