

POWER SYSTEMS

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POWER LOCKS

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POWER LOCKS

DESCRIPTION

DESCRIPTION - POWER LOCKS

Two different power lock systems are offered as optional factory-installed equipment on this model. Both power lock systems are offered only on models that are also equipped with power windows. On models without the optional Remote Keyless Entry (RKE) system, a base version of the Central Timer Module (CTM) is used. In this version of the power lock system, the power lock switches provide the only control

over the operation of the power lock motors. On models with the optional RKE system, a high-line or premium version of the CTM is used to provide many electronic features and conveniences that are not possible with the base version CTM. In this power lock system, the power lock motors are controlled by the microprocessor-based high-line or premium version of the CTM based upon the CTM programming and electronic message inputs received from other electronic modules in the vehicle over the Chrysler Collision Detection (CCD) data bus network, Radio Frequency (RF) inputs received from the RKE transmitters, as well as many hard wired inputs.

POWER LOCKS (Continued)

Both versions of the power lock system include the following major components, which are described in further detail elsewhere in this service manual:

- **Power Lock Motors** - A reversible electric motor integral to the door latch of each front door locks or unlocks the front door latch when provided with the appropriate electrical inputs.

- **Power Lock Switches** - A power lock switch integral to the power window/lock switch unit located near the forward end of the arm rest on each front door trim panel allows the power door lock system to be operated by either the driver or the front seat passenger.

On those models equipped with the optional RKE system, the power lock system also includes the following components, which are described in further detail elsewhere in this service manual:

- **Central Timer Module** - The high-line or premium Central Timer Module (CTM) is located under the driver side end of the instrument panel, inboard of the instrument panel steering column opening. The high-line or premium CTM contains a microprocessor and software that allow it to provide the many electronic functions and features not available with base version of the power lock system.

- **Door Cylinder Lock Switches** - A resistor-multiplexed switch located on the back of each front door lock cylinder allows the power door lock system to be operated using a key inserted in either the driver or passenger front door lock cylinder.

Some of the additional features of the power lock system found in vehicles with the RKE system option include:

- **Automatic Door Lock** - The high-line/premium CTM provides an optional automatic door lock feature (also known as rolling door locks). This is a programmable feature.

- **Central Locking** - The high-line/premium CTM provides an optional central locking/unlocking feature.

- **Door Lock Inhibit** - The high-line/premium CTM provides a door lock inhibit feature.

- **Enhanced Accident Response** - The high-line/premium CTM provides an optional enhanced accident response feature. This is a programmable feature.

Hard wired circuitry connects the power lock system components to the electrical system of the vehicle. These hard wired circuits are integral to several wire harnesses, which are routed throughout the vehicle and retained by many different methods. These circuits may be connected to each other, to the vehicle electrical system and to the power lock system components through the use of a combination of soldered splices, splice block connectors, and many different types of wire harness terminal connectors

and insulators. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, further details on wire harness routing and retention, as well as pin-out and location views for the various wire harness connectors, splices and grounds.

Many of the electronic features in the vehicle controlled or supported by the high-line or premium versions of the CTM are programmable using the DRBIII® scan tool. In addition, the high-line/premium CTM software is Flash compatible, which means it can be reprogrammed using Flash reprogramming procedures. However, if any of the CTM hardware components are damaged or faulty, the entire CTM unit must be replaced. The power lock system components and the hard wired inputs or outputs of the CTM can be diagnosed using conventional diagnostic tools and methods; however, for diagnosis of the high-line or premium versions of the CTM or the CCD data bus, the use of a DRBIII® scan tool is required. Refer to the appropriate diagnostic information.

DESCRIPTION - REMOTE KEYLESS ENTRY SYSTEM

A Remote Keyless Entry (RKE) system is an available option on this model. The Remote Keyless Entry (RKE) system is a Radio Frequency (RF) system that allows the remote operation of the power lock system and, if the vehicle is so equipped, the Vehicle Theft Security System (VTSS). (Refer to 8 - ELECTRICAL/VEHICLE THEFT SECURITY - DESCRIPTION). The RKE system includes the following major components, which are described in further detail elsewhere in this service manual:

- **Central Timer Module** - The high-line or premium Central Timer Module (CTM) is located under the driver side end of the instrument panel, inboard of the instrument panel steering column opening. The high-line or premium CTM contains a microprocessor, an RF receiver, and the software that allow it to provide the many electronic functions and features of the RKE system.

- **Keyless Entry Transmitter** - The keyless entry transmitter is a small, battery-powered, RF transmitter that is contained within a molded plastic case that is designed to also serve as a convenient key fob.

Some additional features of the RKE system include:

- **Horn Chirp** - This feature provides a short, sharp chirp of the vehicle horn to give an audible confirmation that a valid Lock signal has been received from the RKE transmitter. This feature can be enabled or disabled and, if enabled, one of two

POWER LOCKS (Continued)

optional horn chirp durations (twenty or forty milliseconds) can also be selected.

- **Illuminated Entry** - This feature turns on the courtesy lamps in the vehicle for a timed interval (about thirty seconds) each time a valid Unlock signal has been received from the RKE transmitter.

- **Panic Mode** - This feature allows the vehicle operator to cause the vehicle horn to pulse, the headlights to flash, and the courtesy lamps to illuminate for about three minutes by depressing a Panic button on the RKE transmitter. Pressing the Panic button a second time will cancel the Panic mode. A vehicle speed of about 24 kilometers-per-hour (15 miles-per-hour) will also cancel the panic mode.

OPERATION

OPERATION - POWER LOCKS

All versions of the power lock system allow both doors to be locked or unlocked electrically by operating the power lock switch on either front door trim panel. On vehicles that are also equipped with the optional Remote Keyless Entry (RKE) system, both doors may also be locked or unlocked using a key in either front door lock cylinder, or by using the RKE transmitter. On vehicles with the RKE system, if certain features have been electronically enabled, the locks may also be operated automatically by the high-line or premium Central Timer Module (CTM) based upon various other inputs. Those features and their inputs are:

- **Automatic Door Lock** - If enabled, the high-line/premium CTM will automatically lock the doors when it receives a message from the Powertrain Control Module (PCM) indicating that the vehicle speed is about 24 kilometers-per-hour (15 miles-per-hour) or greater. The CTM also monitors the door ajar switches, and will not activate the automatic door lock feature until both doors have been closed for at least five seconds. If this feature is enabled and a door is opened after the vehicle is moving, the CTM will also lock the doors five seconds after both doors are closed.

- **Central Locking** - Vehicles equipped with a high-line/premium CTM also have a resistor-multiplexed door cylinder lock switch mounted to the back of the door lock cylinder within each front door. The CTM continually monitors the input from these switches to provide the central locking/unlocking feature. The CTM will automatically lock or unlock both front doors when either front door is locked or unlocked using a key.

- **Door Lock Inhibit** - The high-line/premium CTM receives inputs from the key-in ignition switch,

the headlamp switch, and the door ajar switches. The logic within the CTM allows it to monitor these inputs to provide a door lock inhibit feature. The door lock inhibit feature prevents the power lock system from being energized with a power lock switch input if the driver door is open with the headlamps on or the key still in the ignition switch. However, the locks can still be operated with the manual door lock button or with a key in the door lock cylinder, and the power locks will still operate using the RKE transmitter while the driver door is open with the headlamps on or a key in the ignition.

- **Enhanced Accident Response** - If enabled, the high-line/premium CTM provides an enhanced accident response feature. This feature uses electronic message inputs received by the CTM from the Airbag Control Module (ACM) to determine when an airbag has been deployed. The CTM also monitors the state of the power lock system and the vehicle speed messages from the PCM in order to provide this feature. If the airbag has been deployed and the vehicle has stopped moving, the CTM will automatically unlock the doors, prevent the doors from being locked, and turn on the courtesy lamps inside the vehicle. Of course, these responses are dependent upon a functional battery and electrical circuitry following the impact.

All versions of the power lock system operate on battery current received through a fused B(+) circuit from a fuse in the Junction Block (JB) so that the system remains functional, regardless of the ignition switch position. Also, in both versions of the power lock system, each power lock switch receives battery current independent of the other. In vehicles with the base version of the power lock system, the driver side power lock switch receives ground through the body wire harness. A single wire take out of the body wire harness with an eyelet terminal connector is secured by a ground screw to the lower left B-pillar (regular cab, extended cab) or lower left quarter inner panel (quad cab). The passenger side power lock switch receives ground through the driver side power lock switch in the base version of the power lock system. The base version power lock switches direct the appropriate battery current and ground feeds to the power lock motors. In the power lock system for vehicles with the RKE system, the power lock switches direct a battery current Lock or Unlock request signal to the high-line or premium CTM, and the CTM energizes internal relays to direct the appropriate battery current and ground feeds to the power lock motors.

POWER LOCKS (Continued)

OPERATION - REMOTE KEYLESS ENTRY SYSTEM

On vehicles with the Remote Keyless Entry (RKE) system, the power locks can be operated remotely using the RKE transmitter. If the vehicle is so equipped, the RKE transmitter also arms and disarms the factory-installed Vehicle Theft Security System (VTSS). Three small, recessed buttons on the outside of the transmitter case labelled Lock, Unlock, and Panic allow the user to choose the function that is desired. The RKE transmitter then sends the appropriate Radio Frequency (RF) signal. An RF receiver that is integral to the high-line or premium version of the Central Timer Module (CTM) receives the transmitted signal, then uses its internal electronic programming to determine whether the received signal is valid and what function has been requested. If the signal is valid, the CTM provides the programmed features.

Besides operating the power lock system and arming or disarming the VTSS, the RKE system also controls the following features:

- **Horn Chirp** - If this feature is enabled, the CTM provides a horn chirp by internally pulling the control coil of the horn relay to ground through a hard wired circuit output.
- **Illuminated Entry** - The CTM provides illuminated entry by internally controlling the current flow to the courtesy lamps in the vehicle through a hard wired output circuit.
- **Panic Mode** - The CTM provides the horn pulse and headlight flash by internally pulling the control coils of the horn relay and headlamp relay to ground through hard wired circuit outputs. The CTM controls the current flow to the courtesy lamps in the vehicle through a hard wired output circuit. The CTM also monitors the vehicle speed through electronic messages it receives from the Powertrain Control Module (PCM) over the Chrysler Collision Detection (CCD) data bus network.

The RKE system operates on battery current received through a fused B(+) circuit from a fuse in the Junction Block (JB) so that the system remains functional, regardless of the ignition switch position. The RKE system can retain the vehicle access codes of up to four RKE transmitters. The transmitter codes are retained in RKE system memory, even if the battery is disconnected. If a transmitter is faulty or is lost, new transmitter vehicle access codes can be programmed into the system using a DRBIII® scan tool. Refer to the appropriate diagnostic information. Many of the electronic features in the vehicle controlled or supported by the high-line or premium versions of the CTM are programmable using the DRBIII® scan tool. In addition, the high-line/premium CTM software is Flash compatible, which

means it can be reprogrammed using Flash reprogramming procedures. However, if any of the CTM hardware components are damaged or faulty, the entire CTM unit must be replaced. The hard wired inputs or outputs of the CTM can be diagnosed using conventional diagnostic tools and methods; however, for diagnosis of the high-line or premium versions of the CTM or the CCD data bus, the use of a DRBIII® scan tool is required. Refer to the appropriate diagnostic information.

DIAGNOSIS AND TESTING**DIAGNOSIS AND TESTING - POWER LOCKS**

The following tests provide a preliminary diagnosis for the power lock system used **only** on vehicles equipped with a base version of the Central Timer Module (CTM). These tests **do not** apply to the diagnosis of the power lock system used on vehicles equipped with the optional Remote Keyless Entry (RKE) system, which includes a high-line or premium CTM. (Refer to 8 - ELECTRICAL/POWER LOCKS - DIAGNOSIS AND TESTING - POWER LOCK & REMOTE KEYLESS ENTRY SYSTEM). Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

PRELIMINARY TESTS

To begin this test, note the system operation while you actuate both the Lock and Unlock functions with the power lock switches. Then, proceed as follows:

- If the entire power lock system fails to function with both of the power lock switches, check the fused B(+) fuse in the Junction Block (JB). If the fuse is OK, check the ground circuit between the driver side power lock switch and ground (G301). If the ground circuit is OK, proceed to the diagnosis of the power lock motors. (Refer to 8 - ELECTRICAL/POWER LOCKS/POWER LOCK MOTOR - DIAGNOSIS AND TESTING).
- If the entire power lock system fails to function with only one of the power lock switches, proceed to diagnosis of the power lock switches. (Refer to 8 - ELECTRICAL/POWER LOCKS/POWER LOCK SWITCH - DIAGNOSIS AND TESTING).
- If only one power lock motor fails to operate with both power lock switches, proceed to diagnosis of the power lock motor. (Refer to 8 - ELECTRICAL/POWER LOCKS/POWER LOCK MOTOR - DIAGNOSIS AND TESTING).

POWER LOCKS (Continued)

DIAGNOSIS AND TESTING - POWER LOCK & REMOTE KEYLESS ENTRY SYSTEM

The following tests include a preliminary diagnosis for the power lock system used **only** on vehicles equipped with the optional Remote Keyless Entry (RKE) system, which includes a high-line or premium Central Timer Module (CTM). These tests **do not** apply to the diagnosis of the power lock system on vehicles equipped with a base version of the CTM. (Refer to 8 - ELECTRICAL/POWER LOCKS - DIAGNOSIS AND TESTING - POWER LOCK SYSTEM).

These tests will help to diagnose the hard wired components and circuits of the power lock system. However, these tests may not prove conclusive in the diagnosis of this system. In order to obtain conclusive testing of the power lock and RKE system, the Chrysler Collision Detection (CCD) data bus network and all of the electronic modules that provide inputs to, or receive outputs from the power lock and RKE system components must be checked.

The most reliable, efficient, and accurate means to diagnose the power lock and RKE system requires the use of a DRBIII® scan tool. The DRBIII® scan tool can provide confirmation that the CCD data bus is functional, that all of the electronic modules are sending and receiving the proper messages on the CCD data bus, that the CTM is receiving the proper hard wired inputs, and that the power lock motors are being sent the proper hard wired outputs by the CTM.

Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

PRELIMINARY TESTS

To begin this test, note the system operation while you actuate both the Lock and Unlock functions with the power lock switches, the door cylinder lock switches, and the RKE transmitter. Then, proceed as follows:

- If the entire power lock system fails to function with the power lock switches, the door cylinder lock switches, or the RKE transmitter, check the fused B(+) fuse in the Junction Block (JB). If the fuse is OK, proceed to the diagnosis of the power lock motors. (Refer to 8 - ELECTRICAL/POWER LOCKS/POWER LOCK MOTOR - DIAGNOSIS AND TESTING).
- If the power lock system functions with both power lock switches, and both door cylinder lock switches, but not with the RKE transmitter, proceed to the diagnosis of the transmitter. (Refer to 8 - ELECTRICAL/POWER LOCKS/REMOTE KEYLESS

ENTRY TRANSMITTER - DIAGNOSIS AND TESTING).

- If the entire power lock system functions with the RKE transmitter, and both door cylinder lock switches, but not with one or both of the power lock switches, proceed to diagnosis of the power lock switches. (Refer to 8 - ELECTRICAL/POWER LOCKS/POWER LOCK SWITCH - DIAGNOSIS AND TESTING).

- If the entire power lock system functions with the RKE transmitter, and both power lock switches, but not with one or both of the door cylinder lock switches, proceed to diagnosis of the door cylinder lock switches. (Refer to 8 - ELECTRICAL/POWER LOCKS/DOOR CYLINDER LOCK SWITCH - DIAGNOSIS AND TESTING).

- If one power lock motor fails to operate with both of the power lock switches, both of the door cylinder lock switches and/or the RKE transmitter, proceed to diagnosis of the power lock motor. (Refer to 8 - ELECTRICAL/POWER LOCKS/POWER LOCK MOTOR - DIAGNOSIS AND TESTING).

If the problem being diagnosed is related to one or more of the electronic features (automatic locks, door lock inhibit, enhanced accident response, illuminated entry, panic mode, or RKE horn chirp), further diagnosis should be performed using a DRBIII® scan tool. Refer to the appropriate diagnostic information.

DOOR CYLINDER LOCK SWITCH**DESCRIPTION**

A door cylinder lock switch is snapped onto the back of the key lock cylinder inside each front door of vehicles equipped with a high-line or premium Central Timer Module (CTM). The door cylinder lock switch is a resistor multiplexed momentary switch that is hard wired in series between a body ground and the CTM through the front door wire harness. The door cylinder lock switches are driven by the key lock cylinders and contain three internal resistors. One resistor is used for the neutral switch position, one for the Lock position, and one for the Unlock position.

The door cylinder lock switches cannot be adjusted or repaired and, if faulty or damaged, they must be replaced.

OPERATION

The door cylinder lock switches are actuated by the key lock cylinder when the key is inserted in the lock cylinder and turned to the lock or unlock positions. The door cylinder lock switch closes a path to ground through one of three internal resistors for the Cen-

DOOR CYLINDER LOCK SWITCH (Continued)

tral Timer Module (CTM) when the front door key lock cylinder is in the Lock, Unlock, or Neutral positions. The CTM reads the switch status through an internal pull-up, then uses this information as an input for both power lock system and Vehicle Theft Security System (VTSS) operation.

The door cylinder lock switches and circuits can be diagnosed using conventional diagnostic tools and methods.

DIAGNOSIS AND TESTING - DOOR CYLINDER LOCK SWITCH

Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

(1) Disconnect the door cylinder lock switch pigtail wire connector from the door wire harness connector.

(2) Using an ohmmeter, perform the switch resistance checks between the two cavities of the door cylinder lock switch pigtail wire connector. Actuate the switch by rotating the key in the door lock cylinder to test for the proper resistance values in each of the three switch positions, as shown in the Door Cylinder Lock Switch chart.

DOOR CYLINDER LOCK SWITCH		
Switch Position		Resistance
Driver Side	Passenger Side	
Neutral	Neutral	12 Kilohms
Lock (Clockwise)	Lock (Counter Clockwise)	644 Ohms
Unlock (Counter Clockwise)	Unlock (Clockwise)	1565 Ohms

(3) If a door cylinder lock switch fails any of the resistance tests, replace the faulty switch as required.

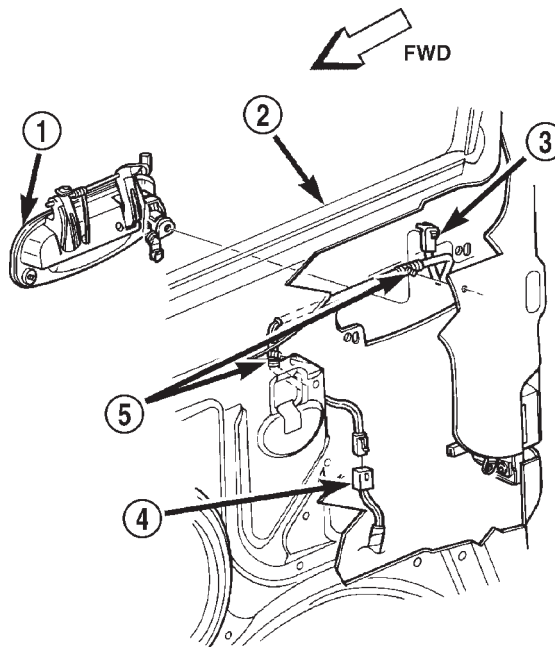
REMOVAL

(1) Disconnect and isolate the battery negative cable.

(2) Remove the door outside latch handle mounting hardware and linkage from the inside of the door. (Refer to 23 - BODY/DOOR - FRONT/EXTERIOR HANDLE - REMOVAL).

(3) From the outside of the door, pull the door outside latch handle out from the door far enough to access the door cylinder lock switch (Fig. 1).

(4) Disengage the door cylinder lock switch from the back of the lock cylinder.



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Fig. 1 Door Cylinder Lock Switch - Typical

- 1 - DOOR OUTSIDE LATCH HANDLE
- 2 - DOOR
- 3 - DOOR CYLINDER LOCK SWITCH
- 4 - CONNECTOR
- 5 - RETAINERS

(5) Disconnect the door cylinder lock switch pigtail wire connector from the door wire harness connector.

(6) Disengage the retainers that secure the door cylinder lock switch pigtail wire harness to the inner door panel.

(7) Remove the door cylinder lock switch from the door.

INSTALLATION

(1) Position the door cylinder lock switch into the door (Fig. 1).

(2) Engage the retainers that secure the door cylinder lock switch pigtail wire harness to the inner door panel.

(3) Reconnect the door cylinder lock switch pigtail wire connector to the door wire harness connector.

(4) Reinstall the door cylinder lock switch onto the back of the lock cylinder.

(5) Reinstall the door outside latch handle mounting hardware and linkage on the inside of the door. (Refer to 23 - BODY/DOOR - FRONT/EXTERIOR HANDLE - INSTALLATION).

(6) Reconnect the battery negative cable.

POWER LOCK MOTOR

DESCRIPTION

Models equipped with the optional power lock system have a power operated door locking mechanism located within each front door. The lock mechanisms are actuated by a reversible electric power lock motor that is integral to the door latch unit within each front door. A single short pigtail wire with a molded plastic connector insulator connects the door lock motor to the vehicle electrical system through a take out and connector of each front door wire harness.

The power lock motors cannot be adjusted or repaired and, if faulty or damaged, the entire door latch unit must be replaced.

OPERATION

On models with a base version of the Central Timer Module (CTM), the power lock motor is controlled by the battery and ground feeds from the power lock switches. On models with the high-line or premium versions of the CTM, the power lock motor is controlled by the battery and ground feeds from the power lock and unlock relays, which are integral and internal to the high-line and premium versions of the CTM. A positive and negative battery connection to the two motor terminals will cause the power lock motor plunger to move in one direction. Reversing the current through these same two connections will cause the power lock motor plunger to move in the opposite direction.

The power lock motors and circuits can be tested using conventional diagnostic tools and methods.

DIAGNOSIS AND TESTING - POWER LOCK MOTOR

On models with a base version of the Central Timer Module (CTM), confirm proper power lock switch operation before you proceed with this diagnosis. On models with a high-line or premium version of the CTM, confirm proper power lock switch, power lock switch output circuit, and CTM operation before you proceed with this diagnosis. Remember, the power lock switch controls the output to the power lock motors on models with a base CTM, while the CTM controls the output to the power lock motors on models with a high-line or premium CTM. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

(1) Check each power lock motor for correct operation while moving the power lock switch to both the

Lock and Unlock positions. If both of the power lock motors are inoperative, go to Step 2. If one power lock motor is inoperative, go to Step 3.

(2) If both of the power lock motors are inoperative, the problem may be caused by one shorted motor. Disconnecting a shorted power lock motor from the power lock circuit will allow the good power lock motors to operate. Disconnect the wire harness connector from each power lock motor, one at a time, and recheck both the lock and unlock functions by operating the power lock switch. If both power lock motors are still inoperative after the above test, check for a short or open circuit between the power lock motors and either the power lock switch (base CTM) or the CTM (high-line or premium CTM). If disconnecting one power lock motor causes the other motor to become functional, go to Step 3 to test the disconnected motor.

(3) Once it is determined which power lock motor is inoperative, that motor can be tested as follows. Disconnect the door wire harness connector from the inoperative power lock motor. Apply 12 volts to the lock and unlock driver circuit cavities of the power lock motor pigtail wire connector to check its operation in one direction. Reverse the polarity to check the motor operation in the opposite direction. If OK, repair the shorted or open circuits between the power lock motor and the power lock switch (base CTM) or the CTM (high-line or premium CTM) as required. If not OK, replace the faulty power lock motor.

REMOTE KEYLESS ENTRY TRANSMITTER

DESCRIPTION

The Remote Keyless Entry (RKE) system Radio Frequency (RF) transmitter is equipped with three buttons, labeled Lock, Unlock, and Panic. It is also equipped with a key ring and is designed to serve as a key fob. The operating range of the transmitter radio signal is up to 7 meters (23 feet) from the RKE receiver. The RKE receiver is integral to the high-line or premium Central Timer Module (CTM) in this vehicle.

Each RKE transmitter has a different vehicle access code, which must be programmed into the memory of the RKE receiver in the vehicle in order to operate the RKE system. The RKE receiver can retain the access codes for up to four transmitters in its memory. (Refer to 8 - ELECTRICAL/POWER LOCKS/REMOTE KEYLESS ENTRY TRANSMITTER - STANDARD PROCEDURE - RKE TRANSMITTER PROGRAMMING).

REMOTE KEYLESS ENTRY TRANSMITTER (Continued)

The RKE transmitter operates on two Duracell DL2016, Panasonic CR2016 (or equivalent) batteries. Typical battery life is from one to two years. The RKE transmitter cannot be repaired and, if faulty or damaged, it must be replaced.

OPERATION

See the owner's manual in the vehicle glove box for more information on the features, use and operation of the Remote Keyless Entry (RKE) transmitters.

DIAGNOSIS AND TESTING - REMOTE KEYLESS ENTRY TRANSMITTER

(1) Replace the Remote Keyless Entry (RKE) transmitter batteries. (Refer to 8 - ELECTRICAL/POWER LOCKS/REMOTE KEYLESS ENTRY TRANSMITTER - STANDARD PROCEDURE - RKE TRANSMITTER BATTERIES). Test each of the RKE transmitter functions. If OK, discard the faulty batteries. If not OK, go to Step 2.

(2) Program the suspect RKE transmitter and another known good transmitter into the RKE receiver. (Refer to 8 - ELECTRICAL/POWER LOCKS/REMOTE KEYLESS ENTRY TRANSMITTER - STANDARD PROCEDURE - RKE TRANSMITTER PROGRAMMING).

(3) Test the RKE system operation with both transmitters. If both transmitters fail to operate the power lock system, a DRBIII® scan tool is required for further diagnosis of the RKE system. Refer to the appropriate diagnostic information. If the known good RKE transmitter operates the power locks and the suspect transmitter does not, replace the faulty RKE transmitter.

NOTE: Be certain to perform the RKE Transmitter Programming procedure again following this test. This procedure will erase the access code of the test transmitter from the RKE receiver.

STANDARD PROCEDURE**STANDARD PROCEDURE - RKE TRANSMITTER PROGRAMMING**

To program the Remote Keyless Entry (RKE) transmitter access codes into the RKE receiver in the high-line or premium Central Timer Module (CTM) requires the use of a DRBIII® scan tool. Refer to the appropriate diagnostic information.

STANDARD PROCEDURE - REMOTE KEYLESS ENTRY TRANSMITTER BATTERIES

The Remote Keyless Entry (RKE) transmitter case snaps open and shut for battery access. To replace the RKE transmitter batteries:

(1) Using a trim stick or a thin coin, gently pry at the notch in the center seam of the RKE transmitter case halves located near the key ring until the two halves unsnap.

(2) Lift the back half of the transmitter case off of the RKE transmitter.

(3) Remove the two batteries from the RKE transmitter.

(4) Replace the two batteries with new Duracell DL2016, or their equivalent. Be certain that the batteries are installed with their polarity correctly oriented.

(5) Align the two RKE transmitter case halves with each other, and squeeze them firmly and evenly together using hand pressure until they snap back into place.

POWER LOCK SWITCH**DESCRIPTION**

The power lock system can be controlled by a two-way momentary switch integral to the power window and lock switch and bezel unit on the trim panel of each front door. Each power lock switch is illuminated by a Light-Emitting Diode (LED) that is integral to the switch paddle. The LED of each switch is illuminated whenever the ignition switch is in the On position.

The power lock switches and their LEDs cannot be adjusted or repaired and, if faulty or damaged, the entire power window and lock switch and bezel unit must be replaced.

OPERATION

On models with a base version of the Central Timer Module (CTM), the power lock switches are hard-wired to the power lock motors. The power lock switch provides the correct battery and ground feeds to the power lock motors to lock or unlock the door latches.

On models with a high-line or premium version of the CTM, the power lock switch controls battery current signals to the lock and unlock sense inputs of the CTM. The CTM then relays the correct battery and ground feeds to the power lock motors to lock or unlock the door latches.

POWER LOCK SWITCH (Continued)

DIAGNOSIS AND TESTING - POWER LOCK SWITCH

The Light-Emitting Diode (LED) illumination lamps for all of the power window and lock switch and bezel unit switch paddles receive battery current through the power window circuit breaker in the Junction Block (JB). If all of the LEDs are inoperative in either or both power window and lock switch and bezel units, be certain to diagnose the power window system before replacing the switch unit. (Refer to 8 - ELECTRICAL/POWER WINDOWS - DIAGNOSIS AND TESTING). If only one LED in a power window and lock switch and bezel unit is inoperative, replace the faulty switch and bezel unit. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

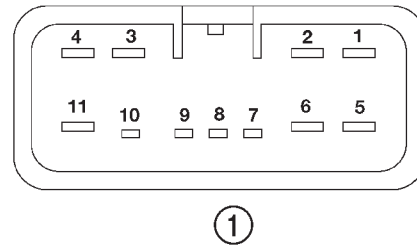
(1) Check the fused B(+) fuse (Fuse 13 - 10 ampere) in the Junction Block (JB). If OK, go to Step 2. If not OK, repair the shorted circuit or component as required and replace the faulty fuse.

(2) Check for battery voltage at the fused B(+) fuse (Fuse 13 - 10 ampere) in the JB. If OK, go to Step 3. If not OK, repair the open fused B(+) circuit between the JB and the Power Distribution Center (PDC) as required.

(3) Disconnect and isolate the battery negative cable. Remove the power window and lock switch and bezel unit from the door trim panel. Disconnect the door wire harness connector for the power window and lock switch unit from the switch connector receptacle.

(4) Reconnect the battery negative cable. Check for battery voltage at the fused B(+) circuit cavity of the door wire harness connector for the power window and lock switch unit. If OK, go to Step 5. If not OK, repair the open fused B(+) circuit between the power window and lock switch unit and the JB as required.

(5) Test the power lock switch continuity. See the Power Lock Switch Continuity charts to determine if the continuity is correct in the Neutral, Lock, and Unlock switch positions (Fig. 2) or (Fig. 3). If OK, repair the door lock switch output (lock and/or unlock) circuit(s) between the power window and lock switch unit and the power lock motors (base Central Timer Module [CTM]) or the CTM (high-line or premium CTM) as required. If not OK, replace the faulty power window and lock switch and bezel unit.



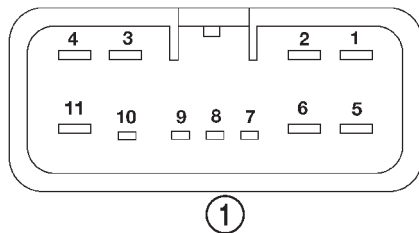
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Fig. 2 Power Lock Switch Continuity - Driver Side

1 - VIEW OF SWITCH CONNECTOR RECEPTACLE

DRIVER SIDE LOCK SWITCH	
SWITCH POSITION	CONTINUITY BETWEEN
NEUTRAL	7 & 9, 8 & 9
LOCK	7 & 9, 8 & 10
UNLOCK	7 & 10, 8 & 9
LAMP	3 & 5

POWER LOCK SWITCH (Continued)



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Fig. 3 Power Lock Switch Continuity - Passenger Side

1 - VIEW OF SWITCH CONNECTOR RECEPTACLE

PASSENGER SIDE LOCK SWITCH	
SWITCH POSITION	CONTINUITY BETWEEN
NEUTRAL	6 & 7, 9 & 10
LOCK	5 & 7, 9 & 10
UNLOCK	5 & 9, 6 & 7
LAMP	8 & 11

POWER MIRRORS

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POWER MIRRORS

DESCRIPTION

AUTOMATIC DAY / NIGHT MIRROR

The automatic day/night mirror system is able to automatically change the reflectance of the inside rear view mirror in order to reduce the glare of headlamps approaching the vehicle from the rear. The automatic day/night rear view mirror receives battery current through a fuse in the junction block only when the ignition switch is in the On position.

OUTSIDE REAR VIEW MIRROR

The heated mirror option includes an electric heating grid behind the mirror glass in each outside mirror, which can clear the mirror glass of ice, snow, or fog. The heating grid receives fused battery current through the heated mirror relay in the heater and air conditioner control only when the ignition switch is in the On position, and the heated mirror system is turned on. (Refer to 8 - ELECTRICAL/HEATED MIRRORS - DESCRIPTION) for more information.

Refer to the owner's manual in the vehicle glove box for more information on the features, use and operation of the power mirror system.

OPERATION

AUTOMATIC DAY / NIGHT MIRROR

A switch located on the bottom of the automatic day/night mirror housing allows the vehicle operator to select whether the automatic dimming feature is operational. When the automatic day/night mirror is

turned on, the mirror switch is lighted by an integral Light-Emitting Diode (LED). The mirror will automatically disable its self-dimming feature whenever the vehicle is being driven in reverse.

Refer to the owner's manual in the vehicle glove box for more information on the features, use and operation of the automatic day/night mirror system.

OUTSIDE REAR VIEW MIRROR

The heated mirror option includes an electric heating grid behind the mirror glass in each outside mirror, which can clear the mirror glass of ice, snow, or fog. The heating grid receives fused battery current through the heated mirror relay in the heater and air conditioner control only when the ignition switch is in the On position, and the heated mirror system is turned on. (Refer to 8 - ELECTRICAL/HEATED MIRRORS - OPERATION) for more information.

Refer to the owner's manual in the vehicle glove box for more information on the features, use and operation of the power mirror system.

AUTOMATIC DAY / NIGHT MIRROR

DESCRIPTION

The automatic day/night mirror uses a thin layer of electrochromic material between two pieces of conductive glass to make up the face of the mirror. When the mirror switch is in the On position, two photocell sensors are used by the mirror circuitry to monitor external light levels and adjust the reflectance of the mirror.

AUTOMATIC DAY / NIGHT MIRROR (Continued)

OPERATION

The ambient photocell sensor is located on the forward-facing (windshield side) of the rear view mirror housing, and detects the ambient light levels outside of the vehicle. The headlamp photocell sensor is located inside the rear view mirror housing behind the mirror glass and faces rearward, to detect the level of the light being received at the rear window side of the mirror. When the circuitry of the automatic day/night mirror detects that the difference between the two light levels is too great (the light level received at the rear of the mirror is much higher than that at the front of the mirror), it begins to darken the mirror.

The automatic day/night mirror circuitry also monitors the transmission using an input from the backup lamp circuit. The mirror circuitry is programmed to automatically disable its self-dimming feature whenever it senses that the transmission backup lamp circuit is energized.

The automatic day/night mirror is a completely self-contained unit and cannot be repaired. If faulty or damaged, the entire mirror assembly must be replaced.

DIAGNOSIS AND TESTING - AUTOMATIC DAY/NIGHT MIRROR

For circuit descriptions and diagrams, refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

(1) Check the fuse in the junction block. If OK, go to Step 2. If not OK, repair the shorted circuit or component as required replace the faulty fuse.

(2) Turn the ignition switch to the On position. Check for battery voltage at the fuse in the junction block. If OK, go to Step 3. If not OK, repair the open circuit to the ignition switch as required.

(3) Turn the ignition switch to the Off position. Disconnect and isolate the battery negative cable. Unplug the wire harness connector from the automatic day/night mirror (Fig. 1). Connect the battery negative cable. Turn the ignition switch to the On position. Check for battery voltage at the fused ignition switch output (run/start) circuit cavity of the automatic day/night mirror wire harness connector. If OK, go to Step 4. If not OK, repair the open circuit to the junction block as required.

(4) Turn the ignition switch to the Off position. Disconnect and isolate the battery negative cable. Check for continuity between the ground circuit cavity

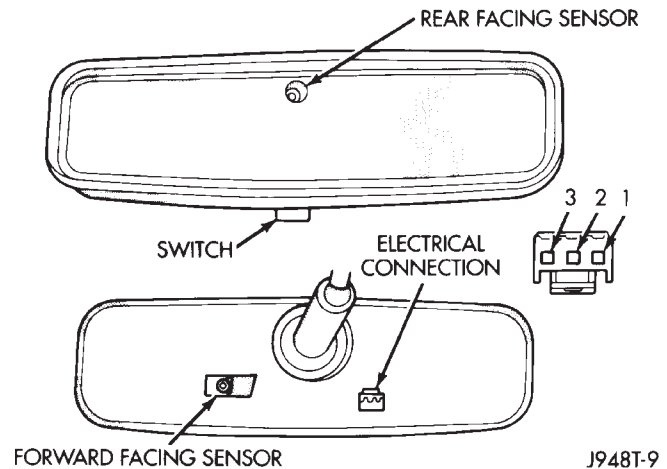


Fig. 1 Automatic Day/Night Mirror

ity of the automatic day/night mirror wire harness connector and a good ground. There should be continuity. If OK, go to Step 5. If not OK, repair the circuit to ground as required.

(5) Connect the battery negative cable. Turn the ignition switch to the On position. Set the parking brake. Place the transmission gear selector lever in the Reverse position. Check for battery voltage at the backup lamp switch output circuit cavity of the automatic day/night mirror wire harness connector. If OK, go to Step 6. If not OK, repair the open circuit as required.

(6) Turn the ignition switch to the Off position. Disconnect the battery negative cable. Plug in the automatic day/night mirror wire harness connector. Connect the battery negative cable. Turn the ignition switch to the On position. Place the transmission gear selector lever in the Neutral position. Place the mirror switch in the On (LED in the mirror switch is lighted) position. Cover the forward facing ambient photocell sensor to keep out any ambient light.

NOTE: The ambient photocell sensor must be covered completely, so that no light reaches the sensor. Use a finger pressed tightly against the sensor, or cover the sensor completely with electrical tape.

(7) Shine a light into the rearward facing headlamp photocell sensor. The mirror glass should darken. If OK, go to Step 8. If not OK, replace the faulty automatic day/night mirror unit.

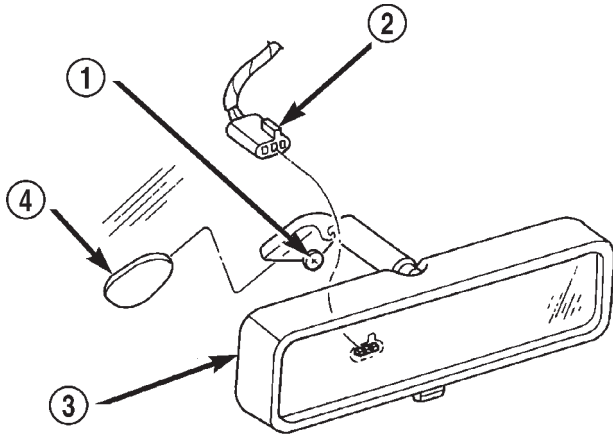
(8) With the mirror glass darkened, place the transmission gear selector lever in the Reverse position. The mirror should return to its normal reflectance. If not OK, replace the faulty automatic day/night mirror unit.

AUTOMATIC DAY / NIGHT MIRROR (Continued)

REMOVAL

(1) Disconnect and isolate the battery negative cable.

(2) Unplug the wire harness connector from the automatic day/night mirror (Fig. 2).



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Fig. 2 AUTOMATIC DAY/NIGHT MIRROR REMOVE

- 1 - SCREW
- 2 - WIRE HARNESS CONNECTOR
- 3 - AUTOMATIC DAY/NIGHT MIRROR
- 4 - SUPPORT BUTTON

(3) Remove the set screw that secures the automatic day/night mirror to the windshield support button.

(4) Push the automatic day/night mirror upwards far enough for the mounting bracket to clear the support button and remove the mirror from the windshield.

INSTALLATION

- (1) Install the mirror to the support button.
- (2) Tighten the set screw.
- (3) Reconnect the harness connector to the mirror.
- (4) Reconnect the negative battery cable.

POWER MIRROR SWITCH**DESCRIPTION**

Both the right and left power outside mirrors are controlled by a single multi-function switch unit located on and mounted to the upper flag area of the driver side door trim panel.

OPERATION

The switch knob is rotated clockwise (right mirror control), or counterclockwise (left mirror control) to

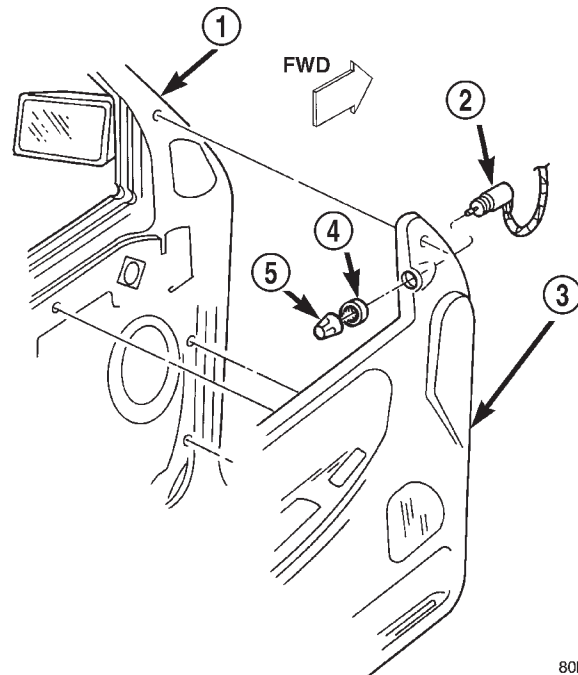
select the mirror to be adjusted. The switch knob is then moved in a joystick fashion to control movement of the selected mirror up, down, right, or left.

The power mirror switch cannot be repaired and, if faulty or damaged, it must be replaced. The power mirror switch knob is available for service replacement.

REMOVAL

(1) Disconnect and isolate the battery negative cable.

(2) Pull the control knob rearward to remove it from the power mirror switch stem (Fig. 3).



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Fig. 3 POWER MIRROR SWITCH REMOVE/INSTALL

- 1 - DOOR
- 2 - SWITCH
- 3 - DOOR TRIM PANEL
- 4 - KNOB
- 5 - NUT

(3) Remove the nut that secures the power mirror switch to the driver side front door trim panel.

(4) Remove the trim panel from the inside of the driver side front door. (Refer to 23 - BODY/DOOR - FRONT/TRIM PANEL - REMOVAL) for the procedures.

(5) Pull the trim panel away from the inner door far enough to access the power mirror switch wire harness connector.

(6) Unplug the power mirror switch wire harness connector.

(7) Remove the power mirror switch from the back of the door trim panel.

POWER MIRROR SWITCH (Continued)

INSTALLATION

- (1) Insert the power mirror switch to the back of the door trim panel.
- (2) Connect the power mirror switch to the harness connector.
- (3) Install the trim panel to the inside of the driver side door. (Refer to 23 - BODY/DOOR - FRONT/TRIM PANEL - INSTALLATION).
- (4) Install the nut that secures the power mirror switch to the driver side front door.
- (5) Push the control knob on to the power mirror switch.
- (6) Connect the battery negative cable.

SIDEVIEW MIRROR**DESCRIPTION**

Each power mirror head contains two electric motors, two drive mechanisms, and the mirror glass. One motor and drive controls mirror up-and-down movement, and the other controls right-and-left movement.

OPERATION

The power mirrors in vehicles equipped with the available heated mirror system option also include an electric heating grid located behind the mirror glass. This heating grid is energized by the heated mirror relay in the heater and air conditioner control only when the ignition switch is in the On position, and the heated mirror system is turned on. (Refer to 8 - ELECTRICAL/HEATED MIRRORS - DESCRIPTION) for more information.

The power mirror assembly cannot be repaired. If any component of the power mirror unit is faulty or damaged, the entire assembly must be replaced.

DIAGNOSIS AND TESTING - SIDEVIEW MIRROR

For circuit descriptions and diagrams, refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

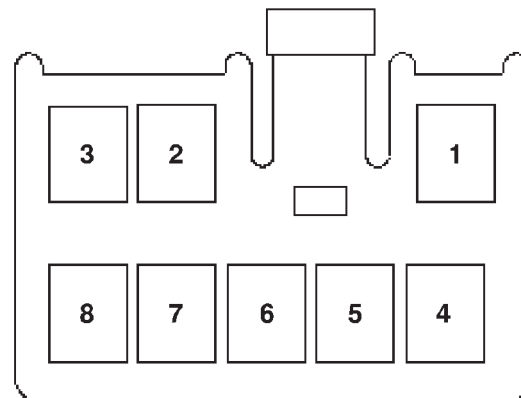
- (1) Check the fuses in the Power Distribution Center (PDC) and the junction block. If OK, go to Step 2. If not OK, repair the shorted circuit or component as required and replace the faulty fuse(s).

- (2) Check for battery voltage at the fuse in the junction block. If OK, go to Step 3. If not OK, repair the open circuit to the PDC as required.

- (3) Disconnect and isolate the battery negative cable. Remove the driver side door trim panel and unplug the wire harness connector from the power mirror switch. Connect the battery negative cable. Check for battery voltage at the fused B(+) circuit cavity in the door wire harness half of the power mirror switch wire harness connector. If OK, go to Step 4. If not OK, repair the open circuit to the junction block as required.

- (4) Disconnect and isolate the battery negative cable. Check for continuity between the ground circuit cavity in the door wire harness half of the power mirror switch wire harness connector and a good ground. There should be continuity. If OK, go to Step 5. If not OK, repair the circuit to ground as required.

- (5) Check the power mirror switch continuity as shown in (Fig. 4). If OK, go to Step 6. If not OK, replace the faulty switch.



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Fig. 4 Power Mirror Switch Continuity

MIRROR SELECTOR KNOB IN "L" POSITION

MOVE LEVER

UP
RIGHT
DOWN
LEFT

CONTINUITY BETWEEN

Pins 3 and 8, 1 and 7, 4 and 7
Pins 3 and 7, 2 and 8, 5 and 8
Pins 3 and 7, 1 and 8, 4 and 8
Pins 3 and 8, 2 and 7, 5 and 7

MIRROR SELECTOR KNOB IN "R" POSITION

MOVE LEVER

UP
RIGHT
DOWN
LEFT

CONTINUITY BETWEEN

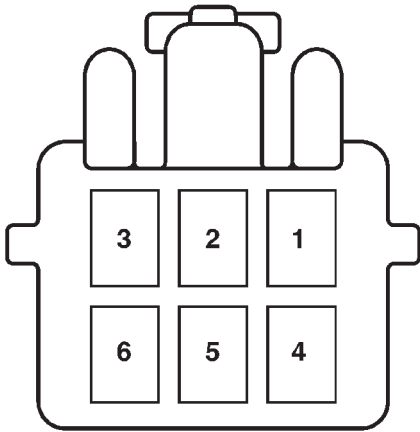
Pins 6 and 8, 1 and 7, 4 and 7
Pins 6 and 7, 2 and 8, 4 and 8
Pins 6 and 7, 1 and 8, 4 and 8
Pins 6 and 8, 2 and 7, 5 and 7

SIDEVIEW MIRROR (Continued)

(6) Unplug the wire harness connector at the inoperative power mirror. Use two jumper wires, one connected to a 12-volt battery feed, and the other connected to a good body ground. See the Power Mirror Test chart for the correct jumper wire connections to the power mirror half of the power mirror wire harness connector (Fig. 5). If the power mirror(s) do not respond as indicated in the chart, replace the faulty power mirror assembly. If the power mirror(s) do respond as indicated in the chart, repair the circuits between the power mirror and the power mirror switch for a short or open as required.

REMOVAL

For removal procedures (Refer to 23 - BODY/EXTERIOR/SIDE VIEW MIRROR - REMOVAL).



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Fig. 5 Power Mirror Test

12 Volts	Ground	Left or Right Mirror MIRROR MOVEMENT
Pin 3	Pin 1	UP
Pin 1	Pin 3	DOWN
Pin 2	Pin 1	LEFT
Pin 1	Pin 2	RIGHT

POWER SEAT SYSTEM

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POWER SEAT SYSTEM

DESCRIPTION

The power seat system option allows the driver (or passenger on SLT Plus with power seats) to electrically adjust the seat position for optimum control and comfort using the power seat switches located on the outboard seat cushion side shield. The power seat system allows the seating position to be adjusted forward, rearward, front up, front down, rear up, or rear down. The power seat system receives battery current through a fuse in the Power Distribution Center and a circuit breaker in the junction block, regardless of the ignition switch position.

The quad cab models equipped with the power seat option also feature a power operated lumbar support in the seat back. The power lumbar support allows the user to inflate or deflate a bladder located in the lower seat back to achieve optimum comfort and support in the lower lumbar region of the spinal column. The power lumbar support shares the battery feed circuit of the power seat system.

The power seat system includes the power seat adjuster and motors unit, the power lumbar support bladder and electric pump (quad cab only), the power seat switch, and the circuit breaker. Following are general descriptions of the major components in the power seat system. Refer to **Heated Seat System**

for information on the individually controlled heated front seats. Refer to the owner's manual in the vehicle glove box for more information on the features, use and operation of the power seat system.

OPERATION

The power seat system allows the driver and/or front passenger seating positions to be adjusted electrically and independently using the separate power seat switches found on the outboard seat cushion side shield of each front seat. See the owner's manual in the vehicle glove box for more information on the features, use and operation of the power seat system.

DIAGNOSIS AND TESTING - POWER SEAT SYSTEM

Before any testing of the power seat system is attempted, the battery should be fully-charged and all wire harness connections and pins cleaned and tightened to ensure proper continuity and grounds. For circuit descriptions and diagrams, refer to Wiring Diagrams.

With the dome lamp on, apply the power seat switch in the direction of the failure. If the dome lamp dims, the seat may be jamming. Check under and behind the seat for binding or obstructions. If the dome lamp does not dim, proceed with testing of the individual components and circuits.

DRIVER POWER SEAT SWITCH

DESCRIPTION

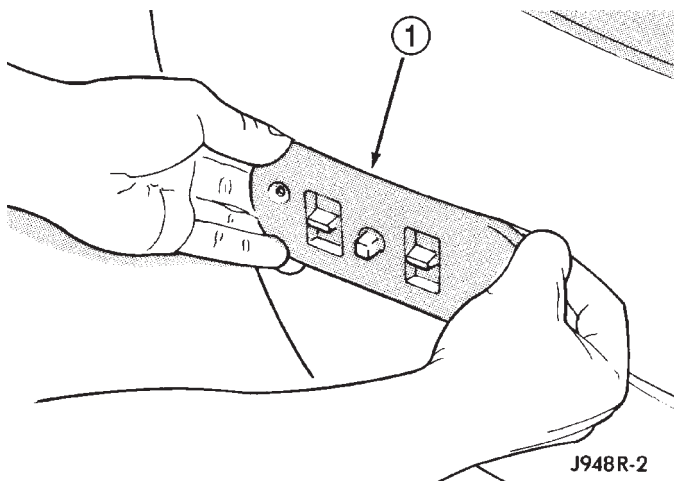


Fig. 1 Power Seat Switch - Standard Cab

1 - SEAT SWITCH BEZEL

The power seat in standard cab models can be adjusted in eight different directions, up, down, front up, front down, rear up, rear down, rearward and forward. The power seat switch for quad cab models has an additional switch knob for adjusting the power lumbar support. The switch is located on the lower outboard side of the seat cushion on the seat cushion side shield (Fig. 1) on all models. Refer to the owner's manual in the vehicle glove box for more information on the power seat switch functions and the seat adjusting procedures.

The individual switches in the power seat switch module cannot be repaired. If one switch is damaged or faulty, the entire power seat switch module must be replaced.

OPERATION

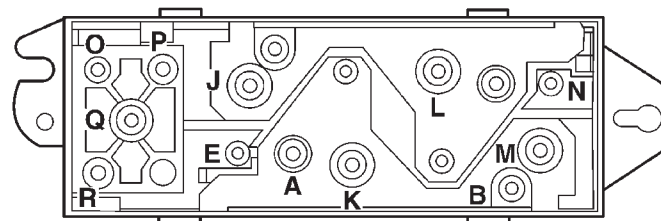
When a power switch control knob or knobs are actuated, a battery feed and a ground path are applied through the switch contacts to the power seat track or recliner adjuster motor. The selected adjuster motor operates to move the seat track or recliner through its drive unit in the selected direction until the switch is released, or until the travel limit of the adjuster is reached. When the switch is moved in the opposite direction, the battery feed and ground path to the motor are reversed through the switch contacts. This causes the adjuster motor to run in the opposite direction.

No power seat switch should be held applied in any direction after the adjuster has reached its travel limit. The power seat adjuster motors each contain a self-resetting circuit breaker to protect them from overload. However, consecutive or frequent resetting of the circuit breaker must not be allowed to continue, or the motor may be damaged.

DIAGNOSIS AND TESTING - DRIVER POWER SEAT SWITCH

The following procedure can be used to test the power seat switch on standard and quad cab models. Some quad cab trucks utilize a additional power lumbar option, if the switch being tested does not have the lumbar option simply ignore the lumbar portion of the test. For circuit descriptions and diagrams, refer to Wiring Diagrams.

- (1) Disconnect and isolate the battery negative cable.
- (2) Remove the power seat switch from the power seat.
- (3) Use an ohmmeter to test the continuity of the power seat switches in each position. See the Power Seat Switch Continuity chart (Fig. 2). If OK, see Power Seat Adjuster and Motors or Power Lumbar Adjuster and Motor in the Diagnosis and Testing section of this group. If not OK, replace the faulty power seat switch unit.



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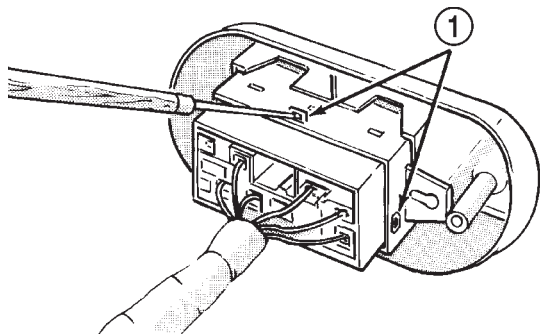
Fig. 2 Testing Driver Power Seat Switch

DRIVER POWER SEAT SWITCH (Continued)

DRIVER POWER SEAT SWITCH TEST TABLE	
DRIVER SWITCH POSITION	CONTINUITY BETWEEN
OFF	B-N, B-J, B-M B-E, B-L, B-K
VERTICAL UP	A-E, A-M, B-N, B-E
VERTICAL DOWN	A-J, A-N, B-M, B-E
HORIZONTAL FORWARD	A-L, B-K
HORIZONTAL REARWARD	A-K, B-L
FRONT TILT UP	A-M, B-N
FRONT TILT DOWN	A-N, B-M
REAR TILT UP	A-E, B-J
REAR TILT DOWN	A-J, B-E
LUMBAR OFF	O-P, O-R, P-R
LUMPAR UP (INFLATE)	O-P, Q-R
LUMBAR DOWN (DEFLATE)	O-R, P-Q

REMOVAL

- (1) Disconnect and isolate the battery negative cable.
- (2) Standard cab models, remove the two screws that secure the power seat switch and bezel unit to the seat cushion frame.
- (3) Quad cab models, remove the seat cushion side shield from the seat. Refer to Body for the procedure.
- (4) Pull the switch bezel or side shield unit out from the seat far enough to access the switch wire harness connector. Gently pry the locking tabs of the switch away from the wire harness connector and carefully unplug the connector from the power seat switch module (Fig. 3).

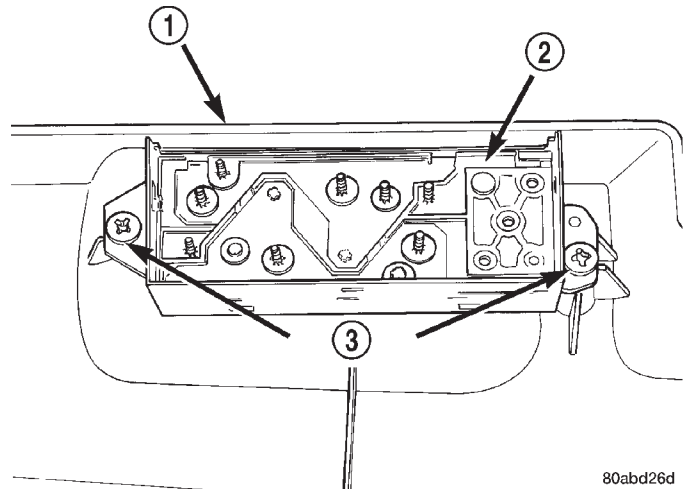


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Fig. 3 Power Seat Switch Connector Remove - Standard Cab

1 - RELEASE TABS (3)

- (5) Remove the screws that secure the power seat switch (Fig. 4).



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Fig. 4 Power Seat Switch Remove/Install - Quad Cab

- 1 - SEAT SIDE SHIELD
- 2 - POWER SEAT SWITCH
- 3 - SCREWS

INSTALLATION

- (1) Position the power seat switch on the seat cushion side shield and connect the electrical connector.
- (2) Install the screws that secure the power seat switch to seat cushion side shield.
- (3) Install the seat cushion side shield on the seat. Refer to Body for the procedure.
- (4) If equipped, install the recliner lever on the recliner mechanism release shaft.
- (5) If equipped, install the screw that secures the recliner lever to the recliner mechanism release shaft on the outboard side of the front seat.
- (6) Connect the battery negative cable.

LUMBAR CONTROL SWITCH**DESCRIPTION**

The power lumbar seat option includes an electrically operated lumbar support mechanism. A single two-way momentary power lumbar switch is integral with the power seat switches. The power lumbar switch is secured to the back of the seat cushion side shield with screws, and the switch paddle protrudes through a hole to the outside of the shield. The switch paddle is located in a shallow depression molded into the outer surface of the seat cushion side shield that helps to shroud it from unintentional actuation when entering or leaving the vehicle.

The power lumbar switches cannot be adjusted or repaired and, if faulty or damaged, the seat switch assembly must be replaced.

LUMBAR CONTROL SWITCH (Continued)

OPERATION

When the power lumbar switch paddle is actuated, a battery feed and a ground path are applied through the switch contacts to the power lumbar adjuster motor. The motor operates to move the lumbar adjuster through its drive unit in the selected direction until the switch is released, or until the travel limit of the adjuster is reached. When the switch is moved in the opposite direction, the battery feed and ground path to the motor are reversed through the switch contacts. This causes the motor to run in the opposite direction.

The power lumbar switch should not be held applied in either direction after the adjuster has reached its travel limit. The power lumbar adjuster motor contains a self-resetting circuit breaker to protect it from overload. However, consecutive or frequent resetting of the circuit breaker must not be allowed to continue, or the motor may be damaged.

REMOVAL

The power lumbar switch is integral with the other power seat switches. Refer to the appropriate driver or passenger power front seat switch removal and/or installation procedure.

LUMBAR MOTOR

DESCRIPTION

The power lumbar seat option includes an electrically operated lumbar support mechanism. The only visible evidence of this option is the separate power lumbar switch control paddle that is located on the outboard seat cushion side shield, next to the other power seat switch control knobs. The power lumbar adjuster and motor are concealed beneath the seat back trim cover and padding, where they are secured to a molded plastic back panel and to the seat back frame.

The power lumbar adjuster cannot be repaired, and is serviced only as a unit with the seat back frame. If the power lumbar adjuster or the seat back frame are damaged or faulty, the entire seat back frame unit must be replaced (Refer to 23 - BODY/SEATS/SEAT BACK - REMOVAL).

OPERATION

The power lumbar adjuster mechanism includes a reversible electric motor that is secured to the inboard side of the seat back panel and is connected to a worm-drive gearbox. The motor and gearbox operate the lumbar adjuster mechanism in the center of the seat back by extending and retracting a cable that actuates a lever. The action of this lever compresses or relaxes a grid of flexible slats. The more

this grid is compressed, the more the slats bow outward against the center of the seat back padding, providing additional lumbar support.

DIAGNOSIS AND TESTING - LUMBAR MOTOR

Actuate the power lumbar switch to move the power lumbar adjuster in each direction. The power lumbar adjuster should move in both directions. It should be noted that the power lumbar adjuster normally operates very quietly and exhibits little visible movement. If the power lumbar adjuster fails to operate in only one direction, move the adjuster a short distance in the opposite direction and test again to be certain that the adjuster is not at its travel limit. If the power lumbar adjuster still fails to operate in only one direction, (Refer to 8 - ELECTRICAL/POWER SEATS/DRIVER SEAT SWITCH - DIAGNOSIS AND TESTING). If the power lumbar adjuster fails to operate in either direction, perform the following tests. For complete circuit diagrams, refer to **Wiring Diagrams**.

(1) Check the power seat circuit breaker in the junction block. If OK, go to Step 2. If not OK, replace the faulty power seat circuit breaker.

(2) Check for battery voltage at the power seat circuit breaker in the junction block. If OK, go to Step 3. If not OK, repair the open fused B(+) circuit to the fuse in the Power Distribution Center as required.

(3) Remove the outboard seat cushion side shield from the seat. Disconnect the seat wire harness connector from the power lumbar switch connector receptacle. Check for battery voltage at the fused B(+) circuit cavity of the power seat wire harness connector for the power lumbar switch. If OK, go to Step 4. If not OK, repair the open fused B(+) circuit to the power seat circuit breaker in the junction block as required.

(4) Check for continuity between the ground circuit cavity of the power seat wire harness connector for the power lumbar switch and a good ground. There should be continuity. If OK, go to Step 5. If not OK, repair the open ground circuit to ground as required.

(5) Test the power lumbar switch. . If the switch tests OK, test the circuits of the power seat wire harness between the power lumbar adjuster motor and the power lumbar switch for shorts or opens. If the circuits check OK, replace the faulty seat back frame assembly. If the circuits are not OK, repair the power seat wire harness as required.

PASSENGER POWER SEAT SWITCH

DESCRIPTION

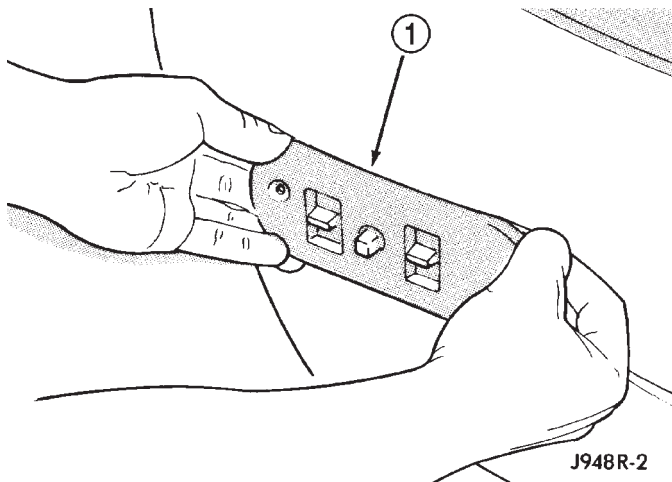


Fig. 5 Power Seat Switch - Standard Cab

1 - SEAT SWITCH BEZEL

The power seat in standard cab models can be adjusted in eight different directions, up, down, front up, front down, rear up, rear down, rearward and forward. The power seat switch for quad cab models has an additional switch knob for adjusting the power lumbar support. The switch is located on the lower outboard side of the seat cushion on the seat cushion side shield (Fig. 5) on all models. Refer to the owner's manual in the vehicle glove box for more information on the power seat switch functions and the seat adjusting procedures.

The individual switches in the power seat switch module cannot be repaired. If one switch is damaged or faulty, the entire power seat switch module must be replaced.

OPERATION

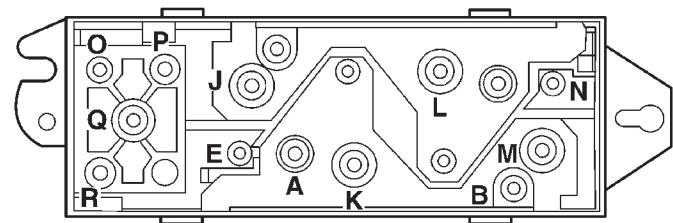
When a power switch control knob or knobs are actuated, a battery feed and a ground path are applied through the switch contacts to the power seat track or recliner adjuster motor. The selected adjuster motor operates to move the seat track or recliner through its drive unit in the selected direction until the switch is released, or until the travel limit of the adjuster is reached. When the switch is moved in the opposite direction, the battery feed and ground path to the motor are reversed through the switch contacts. This causes the adjuster motor to run in the opposite direction.

No power seat switch should be held applied in any direction after the adjuster has reached its travel limit. The power seat adjuster motors each contain a self-resetting circuit breaker to protect them from overload. However, consecutive or frequent resetting of the circuit breaker must not be allowed to continue, or the motor may be damaged.

DIAGNOSIS AND TESTING - PASSENGER POWER SEAT SWITCH

The following procedure can be used to test the power seat switch on standard and quad cab models. Some quad cab trucks utilize a additional power lumbar option, if the switch being tested does not have the lumbar option simply ignore the lumbar portion of the test. For circuit descriptions and diagrams, refer to Wiring Diagrams.

- (1) Disconnect and isolate the battery negative cable.
- (2) Remove the power seat switch from the power seat.
- (3) Use an ohmmeter to test the continuity of the power seat switches in each position. See the Power Seat Switch Continuity chart below (Fig. 6). If OK, see Power Seat Adjuster and Motors or Power Lumbar Adjuster and Motor in the Diagnosis and Testing section of this group. If not OK, replace the faulty power seat switch unit.



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Fig. 6 Testing Passenger Power Seat Switch

PASSENGER POWER SEAT SWITCH (Continued)

PASSENGER POWER SEAT SWITCH TEST TABLE	
PASSENGER SWITCH POSITION	CONTINUITY BETWEEN
OFF	B-N, B-J, B-M, B-E, B-L, B-K
VERTICAL DOWN	A-E, A-M, B-N, B-E
VERTICAL UP	A-J, A-N, B-M, B-E
HORIZONTAL FORWARD	A-L, B-K
HORIZONTAL REARWARD	A-K, B-L
FRONT TILT DOWN	A-M, B-N
FRONT TILT UP	A-N, B-M
REAR TILT DOWN	A-E, B-J
REAR TILT UP	A-J, B-E
LUMBAR OFF	O-P, O-R, P-R
LUMBAR DOWN (DEFLATE)	O-P, Q-R
LUMBAR UP (INFLATE)	O-R, P-Q

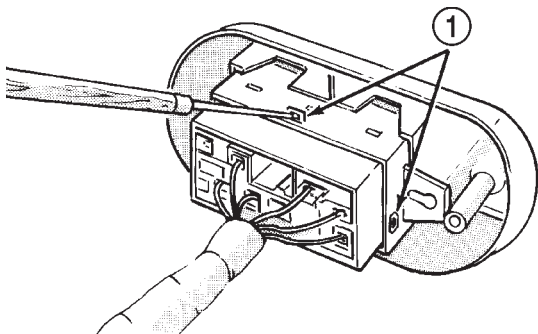
REMOVAL

(1) Disconnect and isolate the battery negative cable.

(2) Standard cab models, remove the two screws that secure the power seat switch and bezel unit to the seat cushion frame.

(3) Quad cab models, remove the seat cushion side shield from the seat. Refer to Body for the procedure.

(4) Pull the switch bezel or side shield unit out from the seat far enough to access the switch wire harness connector. Gently pry the locking tabs of the switch away from the wire harness connector and carefully unplug the connector from the power seat switch module (Fig. 7).

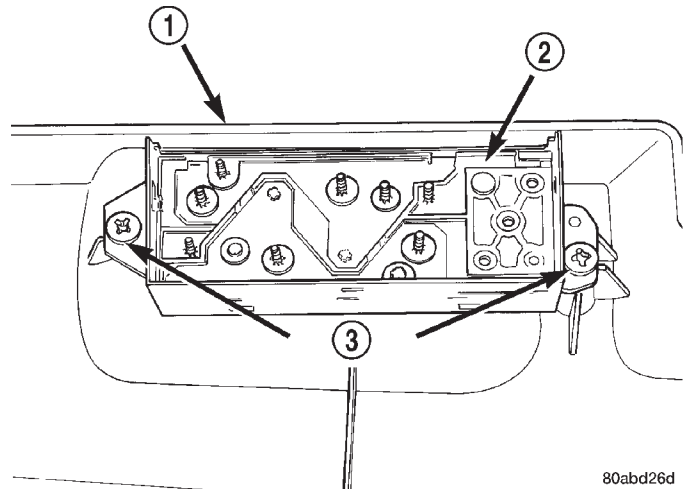


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Fig. 7 Power Seat Switch Connector Remove - Standard Cab

1 - RELEASE TABS (3)

(5) Remove the screws that secure the power seat switch (Fig. 8).



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Fig. 8 Power Seat Switch Remove/Install - Quad Cab

- 1 - SEAT SIDE SHIELD
- 2 - POWER SEAT SWITCH
- 3 - SCREWS

INSTALLATION

(1) Position the power seat switch on the seat cushion side shield and connect the electrical connector.

(2) Install the screws that secure the power seat switch to seat cushion side shield.

(3) Install the seat cushion side shield on the seat. Refer to Body for the procedure.

(4) If equipped, install the recliner lever on the recliner mechanism release shaft.

(5) If equipped, install the screw that secures the recliner lever to the recliner mechanism release shaft on the outboard side of the front seat.

(6) Connect the battery negative cable.

POWER SEAT TRACK**DESCRIPTION**

There are three reversible motors that operate the power seat adjuster. The motors are connected to worm-drive gearboxes that move the seat adjuster through a combination of screw-type drive units.

The front and rear of a seat are operated by different motors. They can be raised or lowered independently of each other. When the center seat switch is pushed in the Up or Down direction, both the front and rear motors operate in unison. On standard cab models the entire seat is moved up or down, on quad cab models the seat cushion moves independently of the seat back in the up or down directions. The forward-rearward motor is operated by pushing the center seat switch in the Forward or Rearward direction, which moves the entire seat in the selected direction on all models.

POWER SEAT TRACK (Continued)

Each motor contains a self-resetting circuit breaker to protect it from overload. Consecutive or frequent resetting of the circuit breakers must not be allowed to continue, or the motors may be damaged.

The power seat adjuster and motors cannot be repaired, and are serviced only as a complete unit. If any component in this unit is faulty or damaged, the entire power seat adjuster and motors assembly must be replaced.

OPERATION

When a power seat switch is actuated, a battery feed and a ground path are applied through the power seat switch contacts to the appropriate motor or motors. The motor and drive unit operate to move the seat in the selected direction until the switch is released, or until the travel limit of the power seat track is reached. When the switch is moved in the opposite direction, the battery feed and ground path to the motor is reversed through the switch contacts. This causes the motor to run in the opposite direction.

DIAGNOSIS AND TESTING - POWER SEAT TRACK

For complete power seat circuit descriptions and diagrams, refer to Wiring Diagrams.

Operate the power seat switch to move all three seat motors in each direction. The seat should move in each of the selected directions. If the power seat track fails to operate in only one direction, move the seat track a short distance in the opposite direction and test again to be certain that the track is not at its travel limit. If the power seat track still fails to operate in only one direction, refer to Diagnosis and Testing of the Power Seat Switch in this section. If the power seat track fails to operate in more than one direction, proceed as follows:

(1) Check the power seat fuse in the power distribution center. If OK, go to Step 2. If not OK, replace the faulty fuse.

(2) Remove the power seat switch from the seat. Check for battery voltage at the fused B(+) circuit cavity of the power seat switch wire harness connector. If OK, go to Step 3. If not OK, repair the open circuit to the power distribution center as required.

(3) Check for continuity between the ground circuit cavity of the power seat switch wire harness connector and a good ground. There should be continuity. If OK, go to Step 4. If not OK, repair the open circuit to ground as required.

(4) Test the power seat switch as described in this group. If the switch tests OK, check the wire harness between the power seat switch and the motor for shorts or opens. If the circuits check OK, replace the faulty power seat track (adjuster) assembly. If the circuits are not OK, repair the wire harness as required.

REMOVAL

(1) Disconnect and isolate the battery negative cable.

(2) Remove the seat, power seat track from the vehicle as a unit (Refer to 23 - BODY/SEATS/SEAT - REMOVAL).

(3) Unplug the power seat wire harness connectors at each of the three power seat motors.

(4) Release the power seat wire harness retainers from the seat track.

(5) Remove the fasteners that secure the center seat cushion section to the brackets on the power seat track.

(6) Remove the screws that secure the power seat track assembly to the seat cushion frame.

(7) Remove the power seat track assembly from the seat cushion frame.

INSTALLATION

(1) Position the power seat track assembly on the seat cushion frame.

(2) Install the fasteners that secure the center seat cushion section to the brackets on the power seat adjuster.

(3) Install the screws that secure the power seat track assembly to the seat cushion frame.

(4) Connect the power seat wire harness connectors at each of the three power seat motors.

(5) Install the power seat wire harness retainers on the seat track assembly.

(6) Install the seat, power seat track as a unit (Refer to 23 - BODY/SEATS/SEAT - INSTALLATION).

(7) Connect the battery negative cable.

POWER WINDOWS

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POWER WINDOWS

DESCRIPTION

Power windows are available as factory-installed optional equipment on this model. The power lock system is included on vehicles equipped with the power window option.

OPERATION

The power window system allows each of the front door windows to be raised and lowered electrically by actuating a switch on the trim panel of each respective door. Additionally, the master switch on the driver side door trim panel allows the driver to raise or lower the passenger side front door window. The power window system receives battery feed through a circuit breaker in the junction block, only when the ignition switch is in the On position.

The power window system includes the power window switches on each front door trim panel, the circuit breaker in the junction block, and the power window motors inside each front door. 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.

Refer to the owner's manual in the vehicle glove box for more information on the features, use and operation of the power window system.

DIAGNOSIS AND TESTING - POWER WINDOWS

For circuit descriptions and diagrams, refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness

routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

ALL WINDOWS INOPERATIVE

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

(2) Disconnect and isolate the battery negative cable. Remove the power window and lock switch and bezel unit from the driver side front door trim panel. Unplug the wire harness connector from the switch and bezel unit.

(3) Check for continuity between the ground circuit cavity of the switch and bezel unit wire harness connector and a good ground. If OK, (Refer to 8 - ELECTRICAL/POWER WINDOWS/POWER WINDOW SWITCH - DIAGNOSIS AND TESTING). If not OK, repair the circuit to ground 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 23 - BODY/DOOR - FRONT/DOOR GLASS - REMOVAL).

POWER WINDOWS (Continued)

(1) Disconnect and isolate the battery negative cable. Remove the power window and lock switch and bezel unit from the door trim panel on the side of the vehicle with the inoperative window. Unplug the wire harness connector from the switch and bezel unit.

(2) Connect the battery negative cable. Turn the ignition switch to the On position. Check for battery voltage at the fused ignition switch output (run) circuit cavity in the body half of the switch and bezel unit wire harness connector. If OK, and the inoperative power window is on the driver side, go to Step 4. If OK, and the inoperative power window is on the passenger side, go to Step 3. If not OK, repair the open circuit to the junction block as required.

(3) Disconnect and isolate the battery negative cable. Check for continuity between each of the two master window switch right up/down control circuit cavities in the body half of the passenger side switch and bezel unit wire harness connector and a good ground. In each case, there should be continuity. If OK, go to Step 4. If not OK, repair the open circuit to the driver side switch and bezel unit as required.

(4) Test the power window switch continuity. (Refer to 8 - ELECTRICAL/POWER WINDOWS/POWER WINDOW SWITCH - DIAGNOSIS AND TESTING). If OK, go to Step 5. If not OK, replace the faulty power window and lock switch and bezel unit.

(5) Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds. Check the continuity in each circuit between the inoperative power window and lock switch and bezel unit wire harness connector cavities and the corresponding power window motor wire harness connector cavities. If OK, (Refer to 8 - ELECTRICAL/POWER WINDOWS/WINDOW MOTOR - DIAGNOSIS AND TESTING). If not OK, repair the open circuit(s) as required.

NOTE: The passenger side power window switch receives the ground feed for operating the passenger side power window motor through the driver side power window switch and wire harness connector.

POWER WINDOW SWITCH

DESCRIPTION

The power windows are controlled by two-way switches integral to the power window and lock switch and bezel unit on the trim panel of each front

door. A second power window switch in the driver side switch and bezel unit allows the driver to control the passenger side window. A Light-Emitting Diode (LED) in the paddle of each switch is illuminated whenever the ignition switch is in the On position.

OPERATION

The power window switch for the driver side front door has an Auto label on it. This switch has a second detent position beyond the normal Down position that provides an automatic one-touch window down feature. This feature is controlled by an electronic circuit and a relay that are integral to the driver side front door power window and lock switch unit.

The power window switches control the battery and ground feeds to the power window motors. The passenger side power window switch receives a ground feed through the driver side power window switch for operating the passenger side power window motor.

The power window and lock switch and bezel unit cannot be repaired and, if faulty or damaged, the entire switch and bezel unit must be replaced.

DIAGNOSIS AND TESTING - POWER WINDOW SWITCH

The auto down feature of the driver side power window switch is controlled by an electronic circuit within the switch unit. The auto down circuitry is activated when the driver side power window switch is moved to the second detent in the Down direction. The outputs from the auto down circuitry are carried through the same switch pins that provide the normal down function. The auto down circuit cannot be tested. If the driver side power window switch continuity tests are passed, but the auto down feature is inoperative, replace the faulty driver side power window switch unit.

The Light-Emitting Diode (LED) illumination lamps for all of the power window and lock switch and bezel unit switch paddles receive battery current through the power window circuit breaker in the junction block. If all of the LEDs are inoperative in either or both power window and lock switch and bezel units and the power windows are inoperative, perform the diagnosis for Power Window System in this group. If the power windows operate, but any or all of the LEDs are inoperative, the power window and lock switch and bezel unit with the inoperative LED(s) is faulty and must be replaced. For circuit descriptions and diagrams, refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location

POWER WINDOW SWITCH (Continued)

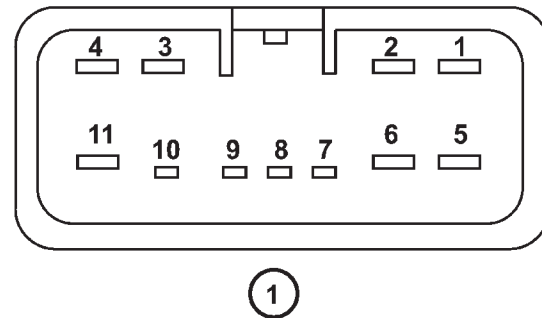
views for the various wire harness connectors, splices and grounds.

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

(2) Turn the ignition switch to the On position. Check for battery voltage at the circuit breaker in the junction block. If OK, turn the ignition switch to the Off position and go to Step 3. If not OK, repair the circuit to the ignition switch as required.

(3) Disconnect and isolate the battery negative cable. Remove the power window and lock switch and bezel unit from the door trim panel. Unplug the wire harness connector from the switch and bezel unit.

(4) Test the power window switch continuity. See the Power Window Switch Continuity charts to determine if the continuity is correct in the Neutral, Up and Down switch positions (Fig. 1) or (Fig. 2). If OK, (Refer to 8 - ELECTRICAL/POWER WINDOWS/WINDOW MOTOR - DIAGNOSIS AND TESTING) If not OK, replace the faulty switch.

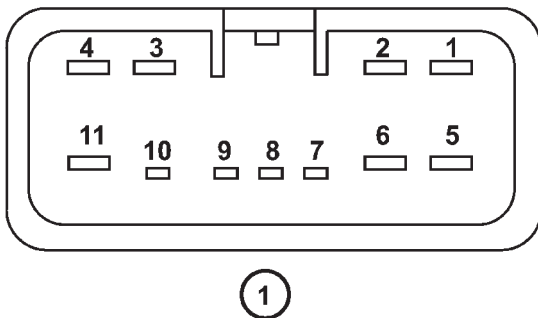


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Fig. 2 Power Window Switch Continuity - Passenger Side

PASSENGER SIDE WINDOW SWITCH

SWITCH POSITION	CONTINUITY BETWEEN
NEUTRAL	1 & 4, 2 & 3
UP	2 & 3, 4 & 11
DOWN	1 & 4, 3 & 11
LAMP	8 & 11

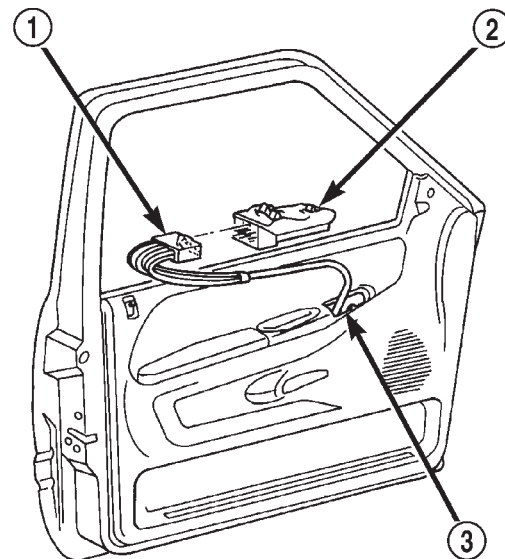


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Fig. 1 Power Window Switch Continuity — Driver Side

DRIVER SIDE WINDOW SWITCH

SWITCH POSITION	CONTINUITY BETWEEN
NEUTRAL	1 & 4, 2 & 3, 3 & 4, 3 & 6
LEFT UP	3 & 4, 5 & 6
RIGHT UP	1 & 5, 2 & 3
LEFT DOWN	3 & 6, 4 & 5
RIGHT DOWN	1 & 3, 2 & 5
LAMP	3 & 5



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Fig. 3 Power Window and Lock Switch and Bezel Unit Remove/Install

- 1 - ELECTRICAL CONNECTOR
- 2 - POWER WINDOW/LOCK SWITCH PANEL
- 3 - WIRE HARNESS

REMOVAL

(1) Disconnect and isolate the battery negative cable.

(2) Using a wide flat-bladed tool such as a trim stick, gently pry the upper edge of the switch bezel at the front and the rear to release the retainer clips that secure the switch bezel to the door trim panel opening (Fig. 3).

(3) Pull the switch and bezel unit away from the door trim panel opening far enough to access and unplug the wire harness connector.

(4) Remove the power window and lock switch and bezel unit from the door trim panel.

POWER WINDOW SWITCH (Continued)**INSTALLATION**

- (1) Connect the power window switch to the harness connector.
- (2) Insert the rear of the switch and bezel unit into the opening.
- (3) Push down on the front and rear of the switch until the retaining tabs snap into place.
- (4) Reconnect the battery negative cable.

WINDOW MOTOR**DESCRIPTION**

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 the 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.

DIAGNOSIS AND TESTING - WINDOW MOTOR

For circuit descriptions and diagrams, refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds. Before you proceed with

this diagnosis, confirm proper switch operation. (Refer to 8 - ELECTRICAL/POWER WINDOWS/POWER WINDOW SWITCH - DIAGNOSIS AND TESTING).

- (1) Disconnect and isolate the battery negative cable. Remove the trim panel from the door with the inoperative power window.

- (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 power window motor to the power window 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 23 - BODY/DOOR - FRONT/WINDOW REGULATOR - REMOVAL).

REMOVAL

The power window motor and mechanism is integral to the power window regulator unit. If the power window motor or mechanism is faulty or damaged, the entire power window regulator unit must be replaced. (Refer to 23 - BODY/DOOR - FRONT/WINDOW REGULATOR - REMOVAL) for the window regulator service procedures.