

# POWER DISTRIBUTION SYSTEMS

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## DESCRIPTION AND OPERATION

### POWER DISTRIBUTION SYSTEM

#### DESCRIPTION

This group covers the various standard and optional power distribution components used on this model. Refer to Group 8W - Wiring Diagrams for complete circuit diagrams of the various power distribution components.

The power distribution system for this vehicle is designed to provide safe, reliable, and centralized distribution of the electrical current required to operate all of the many standard and optional factory-installed electrical and electronic powertrain, chassis, safety, comfort and convenience systems. At the same time, these systems were designed to provide convenient to access centralized locations for conducting diagnosis of faulty circuits, and for sourcing the additional current requirements of many aftermarket vehicle accessory and convenience items.

These power distribution systems also incorporate various types of circuit control and protection features, including:

- Blade-type fuses
- Cartridge fuses
- Fusible links
- Automatic resetting circuit breakers
- Relays
- Flashers
- Circuit splice blocks.

The power distribution system for this vehicle consists of the following components:

- Power Distribution Center (PDC)
- Junction Block (JB)
- Rear Power Outlet.

Following are general descriptions of the major components in the power distribution system. See the owner's manual in the vehicle glove box for more information on the features, use and operation of all of the power distribution system components.

## POWER DISTRIBUTION CENTER

#### DESCRIPTION

All of the electrical current distributed throughout this vehicle is directed through the standard equipment Power Distribution Center (PDC) (Fig. 1). The molded plastic PDC housing is located in the right front corner of the engine compartment, between the battery and the right front inner fender shield. The PDC housing has a molded plastic cover that includes two integral latches at the front and a pivot hook at the back. The PDC cover is easily opened or removed for service access and has a convenient fuse and relay layout map integral to the inside surface of the cover to ensure proper component identification.

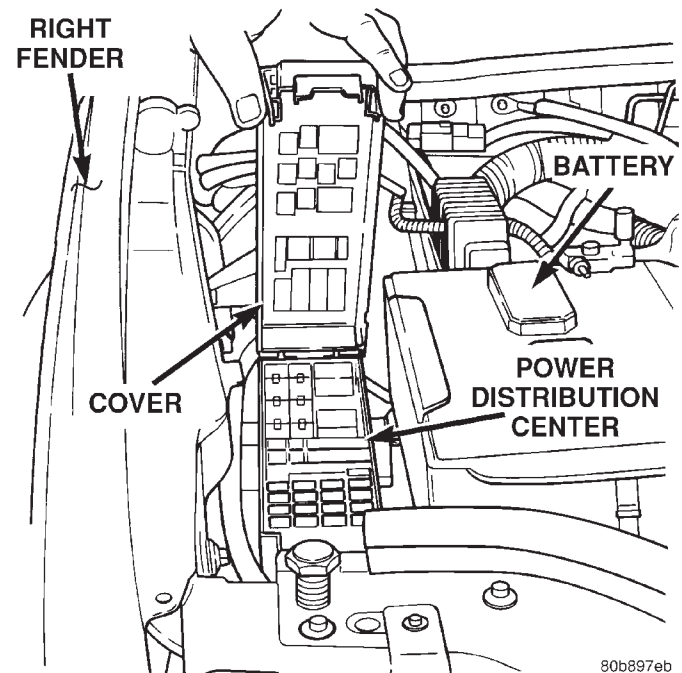


Fig. 1 Power Distribution Center

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## DESCRIPTION AND OPERATION (Continued)

The PDC housing is secured in the engine compartment at three points. Integral mounts on both sides of the PDC housing engage and latch to stanchions that are integral to the molded plastic battery tray. The PDC cover is unlatched and opened to access the battery/generator cable connection studs. The PDC is integral to the right headlamp and dash wire harness, which exits from the bottom of the PDC housing.

All of the current from the battery/generator cable connections enters the PDC through a single two-holed eyelet that is secured with two nuts to the two PDC studs just inside the front end of the PDC housing. The PDC houses up to fifteen maxi-type cartridge fuses, which replace all in-line fusible links. The PDC also houses up to thirteen blade-type mini fuses, and up to ten International Standards Organization (ISO) relays (two standard-type and eight micro-type). Internal connection of all of the PDC circuits is accomplished by an intricate combination of hard wiring and bus bars. Refer to **Power Distribution** in the Contents of Group 8W - Wiring Diagrams for complete circuit diagrams.

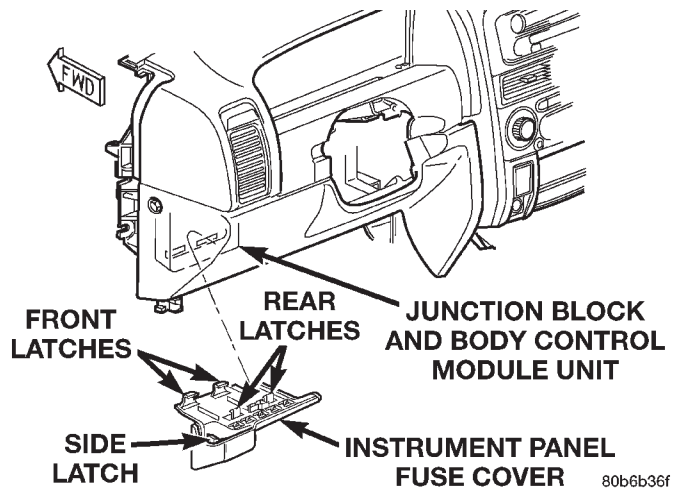
The cartridge fuses, blade-type fuses and relays are available for service replacement. The PDC unit cannot be repaired and is only serviced as a unit with the right headlamp and dash wire harness. If the internal circuits or the PDC housing are faulty or damaged, the right headlamp and dash wire harness unit must be replaced.

## JUNCTION BLOCK

### DESCRIPTION

An electrical Junction Block (JB) is concealed beneath the driver side of the instrument panel in the passenger compartment of the vehicle. The molded plastic JB housing has integral mounting brackets that are secured with two screws and two snap retainers to the instrument panel steering column support bracket behind the instrument panel steering column opening cover. A molded plastic instrument panel fuse cover is secured to the bottom of the junction block and the 16-way data link connector tab of the steering column support bracket by five integral latches. The instrument panel fuse cover can be removed for service of the junction block fuses and has a fuse puller and spare fuses located on the back of the cover (Fig. 2). Refer to **Instrument Panel Fuse Cover** in the Removal and Installation section of Group 8E - Instrument Panel Systems for more information on this component.

The JB combines the functions previously provided by a separate fuseblock module and relay center,



**Fig. 2 Junction Block**

serves to simplify and centralize numerous electrical components, as well as to distribute electrical current to many of the accessory systems in the vehicle. It also eliminates the need for numerous splice connections. The JB also incorporates an integral connector and mounting for the Body Control Module (BCM). The BCM is secured with four screws directly to the dash panel side of the JB. Refer to **Body Control Module** in the Description and Operation section of Group 8E - Instrument Panel Systems for more information on this component.

All of the circuits entering and leaving the JB do so through up to five wire harness connectors, which are connected to the JB through integral connector receptacles molded into the JB housing. There are also two separate wire harness connections to connector receptacles that are integral to the BCM. The JB houses up to thirty-three blade-type mini fuses, up to two blade-type automatic resetting circuit breakers, the electronic combination flasher, the Daytime Running Lamp (DRL) module (Canada only) and up to twelve International Standards Organization (ISO) relays (three standard-type and nine micro-type). Internal connection of all of the JB circuits is accomplished by a printed circuit board. Refer to **Junction Block** in the Contents of Group 8W - Wiring Diagrams for complete circuit diagrams.

The fuses, circuit breakers, flasher, DRL module and relays are available for service replacement. The BCM is also available for separate service replacement. The JB unit cannot be repaired and is only serviced as an assembly. If any internal circuit or if the JB housing is faulty or damaged, the entire JB unit must be replaced.

## DESCRIPTION AND OPERATION (Continued)

## REAR POWER OUTLET

## DESCRIPTION

A rear accessory power outlet is optional equipment on this model. The power outlet is installed in the lower right quarter trim panel near the right lift-gate opening pillar in the cargo area of the vehicle. The power outlet base and mount are secured by a snap fit within the quarter trim panel. A plastic protective cap snaps into the power outlet base when the power outlet is not being used, and hangs from the power outlet base mount by an integral bail strap while the power outlet is in use.

The power outlet receptacle unit and the accessory power outlet protective cap are available for service. The power outlet receptacle cannot be repaired and, if faulty or damaged, it must be replaced.

## OPERATION

The power outlet base or receptacle shell is connected to ground, and an insulated contact in the bottom of the shell is connected to battery current. The power outlet receives battery voltage from a fuse in the Junction Block (JB) at all times.

While the power outlet is very similar to a cigar lighter base unit, it does not include the two small spring-clip retainers inside the bottom of the receptacle shell that are used to secure the cigar lighter heating element to the insulated contact.

## DIAGNOSIS AND TESTING

## REAR POWER OUTLET

For complete circuit diagrams, refer to **Horn/Cigar Lighter** in the Contents of Group 8W - Wiring Diagrams.

**WARNING: ON VEHICLES EQUIPPED WITH AIRBAGS, REFER TO GROUP 8M - PASSIVE RESTRAINT SYSTEMS BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.**

(1) Check the fused B(+) fuse in 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.

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

(3) Remove the plastic protective cap from the power outlet receptacle. Check for continuity between the inside circumference of the power outlet receptacle and a good ground. There should be continuity. If OK, go to Step 4. If not OK, go to Step 5.

(4) Check for battery voltage at the insulated contact located at the back of the power outlet receptacle. If not OK, go to Step 5.

(5) Disconnect and isolate the battery negative cable. Remove the rear power outlet from the right quarter trim panel. Check for continuity between the ground circuit cavity of the power outlet wire harness connector and a good ground. There should be continuity. If OK, go to Step 6. If not OK, repair the open ground circuit to ground as required.

(6) Connect the battery negative cable. Check for battery voltage at the fused B(+) circuit cavity of the power outlet wire harness connector. If OK, replace the faulty power outlet receptacle base. If not OK, repair the open fused B(+) circuit to the junction block fuse as required.

## REMOVAL AND INSTALLATION

## POWER DISTRIBUTION CENTER

The Power Distribution Center (PDC) is serviced as a unit with the right headlamp and dash wire harness. If any internal circuit of the PDC or if the PDC housing is faulty or damaged, the entire PDC and the right headlamp and dash wire harness unit must be replaced.

## REMOVAL

(1) Disconnect and isolate the battery negative cable.

(2) Disconnect each of the right headlamp and dash wire harness connectors. Refer to **Connector Locations** in the Contents of Group 8W - Wiring Diagrams for more information on the locations of the affected connectors.

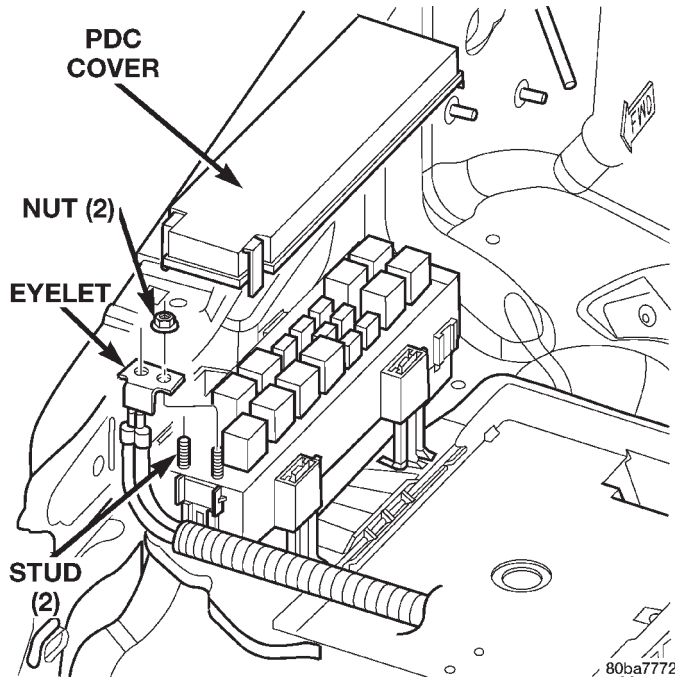
(3) Remove all of the fasteners that secure each of the right headlamp and dash wire harness ground eyelets to the vehicle body and chassis components. Refer to **Connector Locations** in the Contents of Group 8W - Wiring Diagrams for more information on the ground eyelet locations.

(4) Disengage each of the retainers that secure the right headlamp and dash wire harness to the vehicle body and chassis components. Refer to **Connector Locations** in the Contents of Group 8W - Wiring Diagrams for more information on the retainer locations.

(5) Unlatch and open the PDC cover.

## REMOVAL AND INSTALLATION (Continued)

(6) Remove the two nuts that secure the two-hole eyelet of the battery wire harness PDC take outs to the studs on the PDC (Fig. 3).



**Fig. 3 Power Distribution Center Connections**

(7) Remove the battery wire harness PDC take out eyelet from the PDC studs.

(8) Disengage the latches on the PDC housing mounts from the tabs on the PDC mounting stanchions on the battery tray, and pull the PDC housing upward to disengage the mounts from the stanchions (Fig. 4).

(9) Remove the PDC and the headlamp and dash wire harness from the engine compartment as a unit.

## INSTALLATION

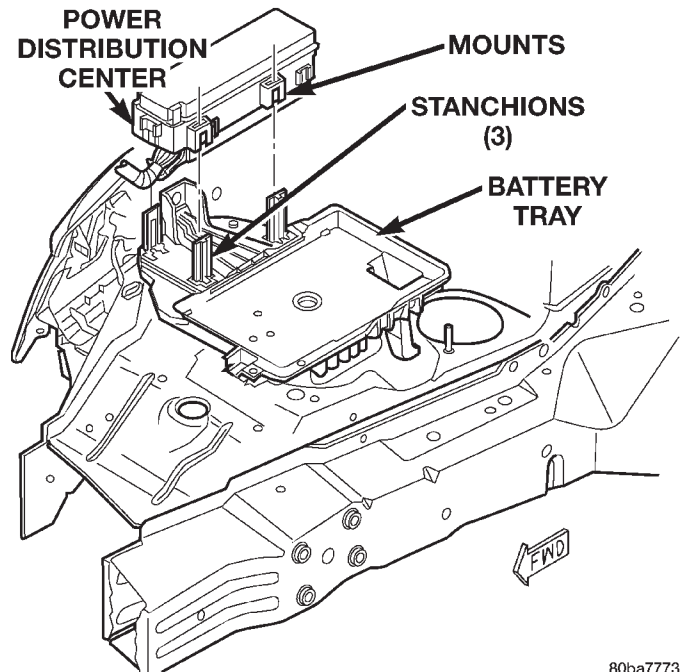
(1) Position the PDC and the headlamp and dash wire harness unit in the engine compartment.

(2) Engage the mounts on the PDC housing with the stanchions of the battery tray and push the unit downward until the mount latches engage the mounting tabs on the stanchions.

(3) Install the eyelet of the battery wire harness PDC take outs onto the two PDC studs.

(4) Install and tighten the nuts that secure the eyelet of the battery wire harness PDC take outs onto the PDC studs. Tighten the nuts to 11.3 N·m (100 in. lbs.).

(5) Engage each of the retainers that secure the right headlamp and dash wire harness to the vehicle body and chassis components. Refer to **Connector Locations** in the Contents of Group 8W - Wiring Diagrams for more information on the retainer locations.



**Fig. 4 Power Distribution Center Remove/Install**

(6) Install all of the fasteners that secure each of the right headlamp and dash wire harness ground eyelets to the vehicle body and chassis components. Refer to **Connector Locations** in the Contents of Group 8W - Wiring Diagrams for more information on the ground eyelet locations.

(7) Reconnect each of the right headlamp and dash wire harness connectors. Refer to **Connector Locations** in the Contents of Group 8W - Wiring Diagrams for more information on the locations of the affected connectors. For connectors with screws, tighten the screws to 4.3 N·m (38 in. lbs.).

(8) Reconnect the battery negative cable.

## JUNCTION BLOCK

**WARNING: ON VEHICLES EQUIPPED WITH AIRBAGS, REFER TO GROUP 8M - PASSIVE RESTRAINT SYSTEMS BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.**

## REMOVAL

(1) Disconnect and isolate the battery negative cable.

(2) Remove the fuse cover from the bottom of the junction block. Refer to **Instrument Panel Fuse Cover** in the Removal and Installation section of

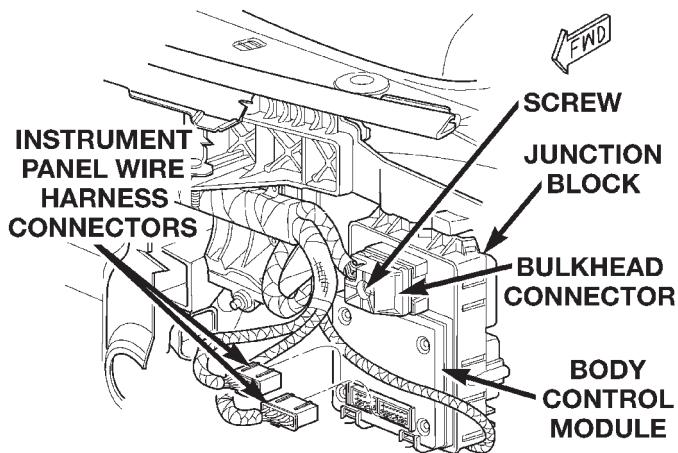


REMOVAL AND INSTALLATION (Continued)

Group 8E - Instrument Panel Systems for the procedures.

(3) Remove the steering column opening cover from the instrument panel. Refer to **Steering Column Opening Cover** in the Removal and Installation section of Group 8E - Instrument Panel Systems for the procedures.

(4) Reach behind the junction block to disconnect the two instrument panel wire harness connectors from the Body Control Module connector receptacles near the bottom of the junction block (Fig. 5).



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**Fig. 5 Junction Block Connections**

(5) Reach behind the junction block to remove the screw that secures the instrument panel wire harness bulkhead connector to the connector receptacle near the top of the junction block and disconnect the connector.

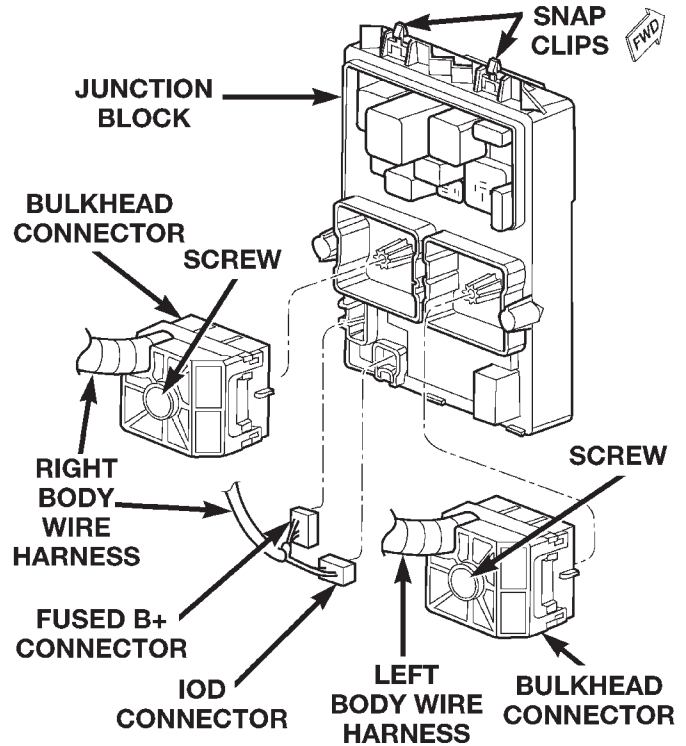
(6) Disconnect the fused B(+) and the IOD wire harness connectors from the connector receptacles near the bottom of the junction block (Fig. 6).

(7) Remove the screws that secure the right and left body wire harness bulkhead connectors to the connector receptacles near the center of the junction block and disconnect the connectors.

(8) Remove the two screws that secure the junction block to the instrument panel steering column support bracket (Fig. 7).

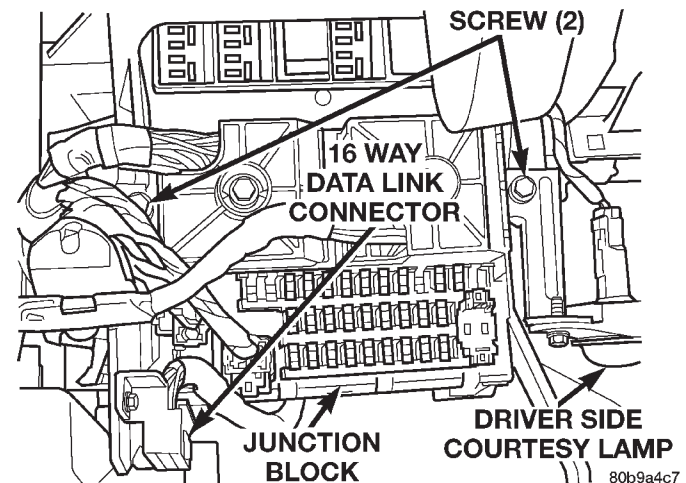
(9) To disengage the two snap clips that secure the top of the junction block to the instrument panel steering column support bracket, grasp the bottom of the junction block firmly with both hands and pull it downward sharply.

(10) Remove the junction block from the instrument panel steering column support bracket.



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**Fig. 6 Junction Block Connections**



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**Fig. 7 Junction Block Remove/Install**

**INSTALLATION**

**NOTE:** If the Junction Block (JB) is being replaced with a new unit, be certain to transfer each of the optional fuses, circuit breakers and relays from the old JB to the proper cavities of the new JB. Refer to Junction Block in the Contents of Group 8W - Wiring Diagrams for the proper JB cavity assignments. The Body Control Module (BCM) must also be transferred to the new JB. Refer to Body Control Module in the Removal and Installation section of Group 8E - Instrument Panel Systems for the procedures.

## REMOVAL AND INSTALLATION (Continued)

(1) Position the junction block into its mounting location on the instrument panel steering column support bracket.

(2) Align the snap clips at the top of the junction block with the mounting holes in the instrument panel steering column support bracket.

(3) Grasp the bottom of the junction block firmly with both hands and push it upward sharply to engage the two snap clips that secure the top of the junction block to the instrument panel steering column support bracket.

(4) Install and tighten the two screws that secure the junction block to the instrument panel steering column support bracket. Tighten the screws to 2.2 N·m (20 in. lbs.).

(5) Reconnect the right and left body wire harness bulkhead connectors to the connector receptacles near the center of the junction block.

(6) Install and tighten the screws that secure the right and left body wire harness bulkhead connectors to the connector receptacles near the center of the junction block. Tighten the screws to 2.2 N·m (20 in. lbs.).

(7) Reconnect the fused B(+) and the IOD wire harness connectors to the connector receptacles near the bottom of the junction block.

(8) Reach behind the junction block to reconnect the instrument panel wire harness bulkhead connector to the connector receptacle near the top of the junction block.

(9) Install and tighten the screw that secures the instrument panel wire harness bulkhead connector to the connector receptacle near the top of the junction block. Tighten the screw to 2.2 N·m (20 in. lbs.).

(10) Reach behind the junction block to reconnect the two instrument panel wire harness connectors to the Body Control Module connector receptacles near the bottom of the junction block.

(11) Install the steering column opening cover onto the instrument panel. Refer to **Steering Column Opening Cover** in the Removal and Installation section of Group 8E - Instrument Panel Systems for the procedures.

(12) Install the fuse cover onto the bottom of the junction block. Refer to **Instrument Panel Fuse Cover** in the Removal and Installation section of Group 8E - Instrument Panel Systems for the procedures.

(13) Reconnect the battery negative cable.

## REAR POWER OUTLET

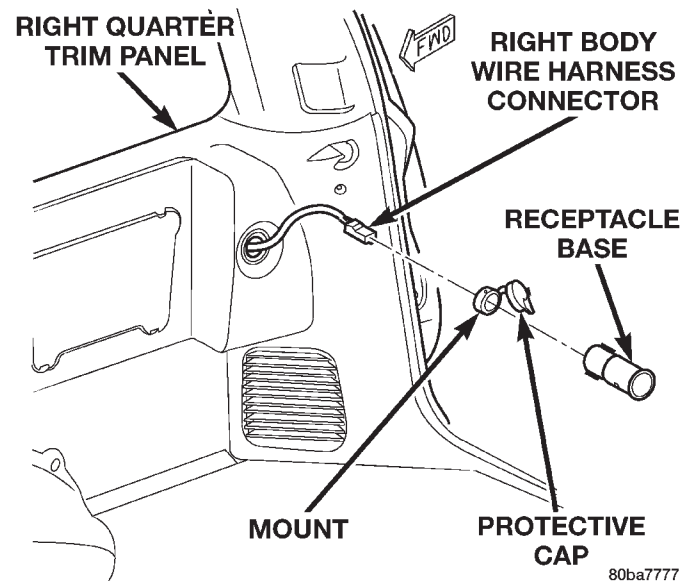
**WARNING: ON VEHICLES EQUIPPED WITH AIR-BAGS, REFER TO GROUP 8M - PASSIVE RESTRAINT SYSTEMS BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, OR**

**INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIR-BAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.**

## REMOVAL

(1) Disconnect and isolate the battery negative cable.

(2) Pull the protective cap out of the power outlet receptacle base (Fig. 8).



**Fig. 8 Rear Power Outlet Remove/Install**

(3) Look inside the power outlet receptacle base and note the position of the rectangular retaining bosses of the mount that secures the receptacle base to the right quarter trim panel (Fig. 9).

(4) Insert a pair of external snap ring pliers into the power outlet receptacle base and engage the tips of the pliers with the retaining bosses of the mount.

(5) Squeeze the pliers to disengage the mount retaining bosses from the receptacle base and, using a gentle rocking motion, pull the pliers and the receptacle base out of the mount.

(6) Pull the power outlet receptacle base away from the right quarter trim panel far enough to access the wire harness connector.

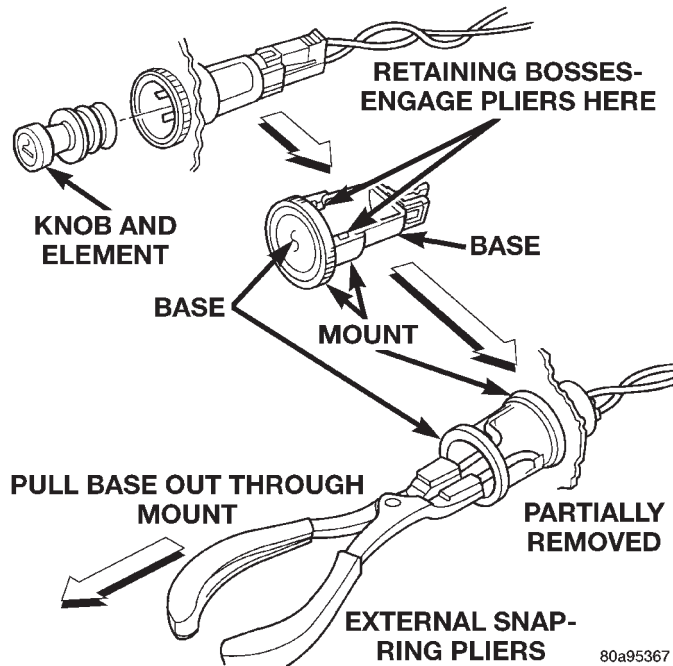
(7) Disconnect the right body wire harness connector from the power outlet receptacle base connector receptacle.

(8) Remove the power outlet mount from the right quarter trim panel.

## INSTALLATION

(1) Align the splines on the outside of the power outlet receptacle base connector receptacle with the grooves on the inside of the mount.

## REMOVAL AND INSTALLATION (Continued)



**Fig. 9 Power Outlet Remove/Install - Typical**

(2) Insert the power outlet receptacle base about half way through the mount.

(3) Reconnect the right body wire harness connector to the power outlet receptacle base connector receptacle.

(4) Insert the power outlet receptacle base and mount into the right quarter trim panel as a unit until the mount is seated flush against the trim panel.

(5) Press firmly on the power outlet receptacle base until the retaining bosses of the mount are fully engaged in their receptacles.

(6) Install the protective cap into the power outlet receptacle base.

(7) Reconnect the battery negative cable.

