

LAMPS

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LAMP DIAGNOSIS

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DESCRIPTION AND OPERATION

HEADLAMP LEVELING MOTOR

DESCRIPTION

Vehicles equipped with a remote headlamp leveling system use two leveling motors attached to each headlamp mounting bracket. They are located just behind the headlamp assemblies and must be accessed from underneath the vehicle.

OPERATION

This system allows the driver to adjust the vertical headlamp aim from the interior of the vehicle to compensate for passenger or cargo load. A headlamp leveling switch is located in the instrument panel and controls the headlamp leveling motor function.

DIAGNOSIS AND TESTING

DIAGNOSTIC PROCEDURES

When a vehicle experiences problems with the headlamp system, verify the condition of the battery connections, fuses, charging system, headlamp bulbs, wire connectors, relay, high beam switch, dimmer switch, and headlamp switch. Refer to Group 8W, Wiring Diagrams for component locations and circuit information.

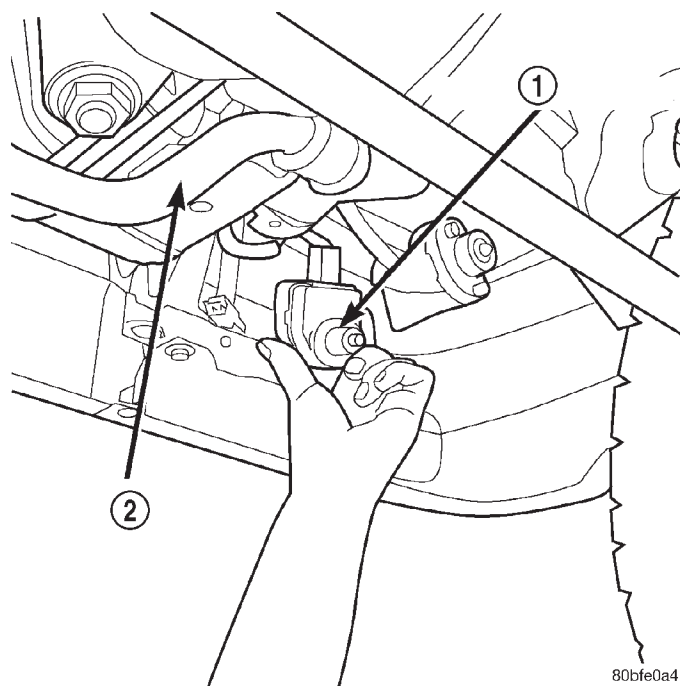


Fig. 1 Headlamp Leveling Motor Position & Orientation

- 1 – HEADLAMP LEVELING MOTOR
- 2 – FRONT STABILIZER BAR

DIAGNOSIS AND TESTING (Continued)

DIAGNOSIS AND TESTING

HEADLAMP LEVELING MOTOR DIAGNOSIS

CONDITION	POSSIBLE CAUSES	CORRECTION
ONE MOTOR DOES NOT OPERATE	1. Poor connection at motor. 2. No voltage at motor. 3. Defective motor.	1. Secure connector on motor. 2. Repair circuit. Refer to Group 8W, Wiring. 3. Replace motor.
BOTH MOTORS DO NOT OPERATE	1. No voltage at headlamp leveling switch. 2. No voltage at both motors. 3. Poor connection at motors. 4. Both motors defective.	1. Repair circuit or replace fuse. Refer to Group 8W, Wiring. 2. Repair circuit or replace fuse. Refer to Group 8W, Wiring. 3. Secure connectors on motors. 4. Replace motors.

HEADLAMP AND FOG LAMP ALIGNMENT

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SERVICE PROCEDURES

HEADLAMP ALIGNMENT PREPARATION

- Verify headlamp are on low beam setting.
- Verify that the headlamp leveling switch is in the "0" position.
- Inspect and correct damaged or defective components that could interfere with proper headlamp alignment.
- Verify proper tire inflation.
- Clean headlamp lenses.
- Verify that luggage area is loaded as the vehicle is routinely used.
- Fuel tank should be FULL. Add 2.94 kg (6.5 lbs.) of weight over the fuel tank for each estimated gallon of missing fuel.

ADJUSTMENTS

HEADLAMP/FOG LAMP ADJUSTMENT USING ALIGNMENT SCREEN

ALIGNMENT SCREEN PREPARATION

- Position vehicle on a level surface perpendicular to a flat wall 10 meters (32.8 ft.) away from front of headlamp lens (Fig. 1).
- Place 75 kg in the driver's seat to simulate the ride height of the vehicle when driven.
- If necessary, tape a line on the floor 10 meters (32.8 ft) away from and parallel to the wall.
- From the floor up 1.27 meters (5 ft), tape a line on the wall at the centerline of the vehicle. Sight along the centerline of the vehicle (from rear of vehicle forward) to verify accuracy of the line placement.

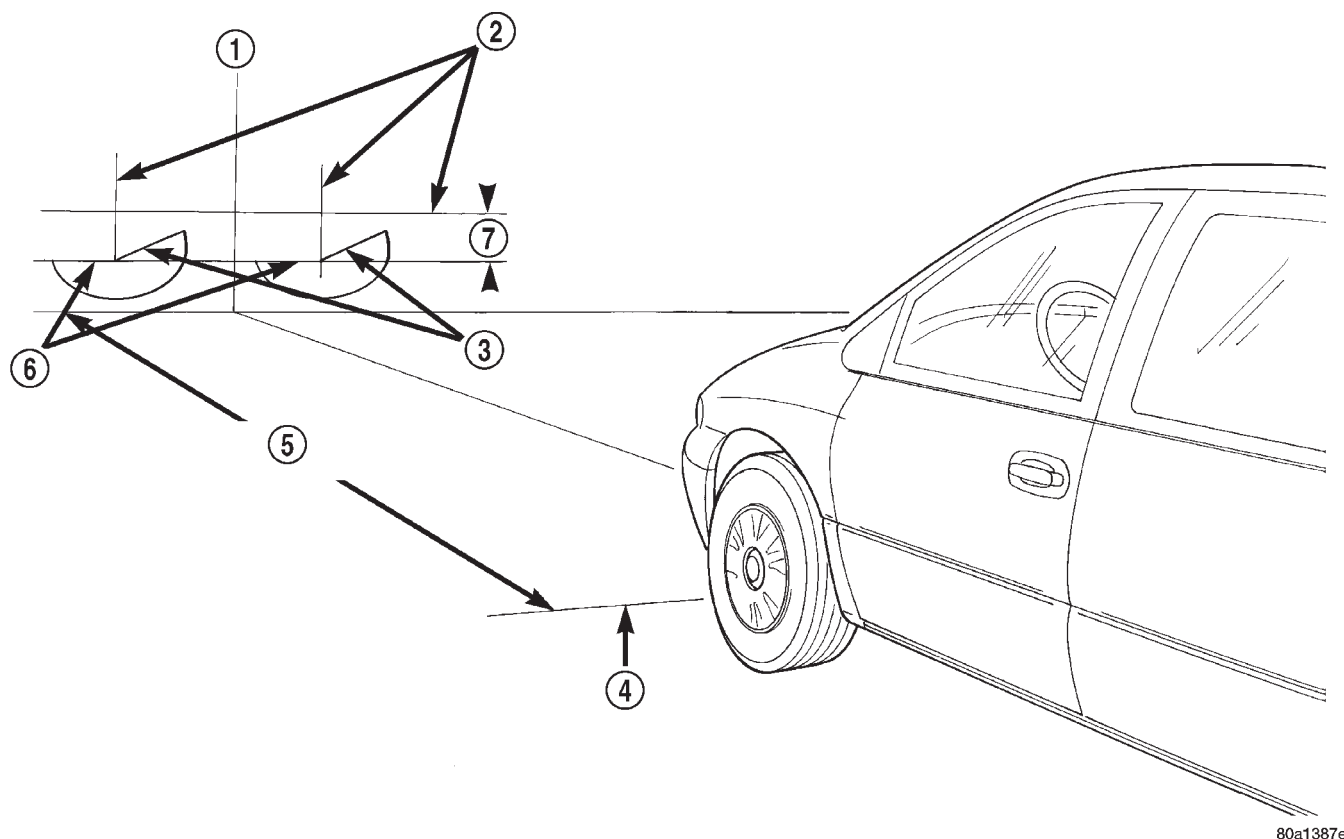
- Rock vehicle side-to-side three times and allow suspension to stabilize.
- Jounce front suspension three times by pushing downward on front bumper and releasing.
- Measure the distance from the center of headlamp lens to the floor. Transfer measurement to the alignment screen (with tape). Use this line for up/down adjustment reference.
- Place a tape line 130 mm below and parallel to the center of headlamp line.
- Measure distance from the centerline of the vehicle to the center of each headlamp being aligned. Transfer measurements to screen (with tape) to each side of vehicle centerline. Use these lines for left/right adjustment reference.

HEADLAMP ADJUSTMENT

A properly aimed low beam headlamp will project a high intensity light pattern on the screen with the horizontal cut-off line aligned with the tape line 130 mm (5.12 in.) below the headlamp centerline (Fig. 1). The intersection of the horizontal and 15 degree cut-off lines in the projected pattern should align to the intersection of the headlamp centerline vertical tape line and the tape line 130 mm (5.12 in.) below the headlamp horizontal centerline. The high beams on a vehicle with aero headlamps cannot be aligned. The high beam pattern should be correct when the low beams are aligned properly.

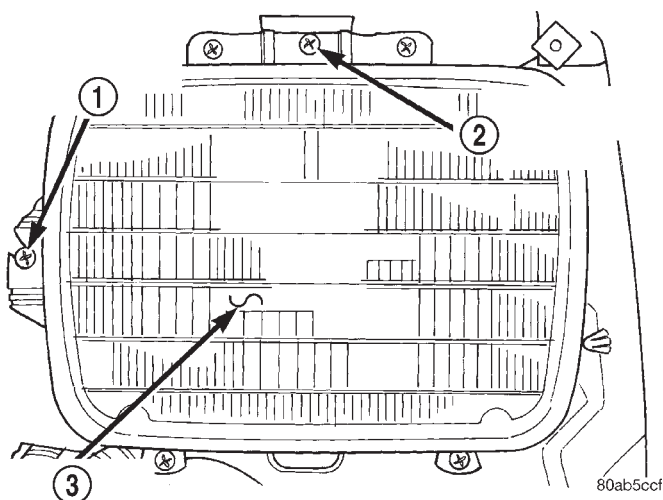
To adjust headlamp alignment, rotate alignment screws (Fig. 2) to achieve the specified low beam hot spot pattern.

ADJUSTMENTS (Continued)

**Fig. 1 Headlamp Alignment Screen—Typical**

- 1 - CENTER OF VEHICLE
- 2 - CENTER OF HEADLAMPS
- 3 - 15° CUT-OFF LINE
- 4 - FRONT OF HEADLAMP

- 5 - 10 METERS (32.8 ft.)
- 6 - HORIZONTAL CUT-OFF LINE
- 7 - 130mm

**Fig. 2 Headlamp Beam Adjustment Screws**

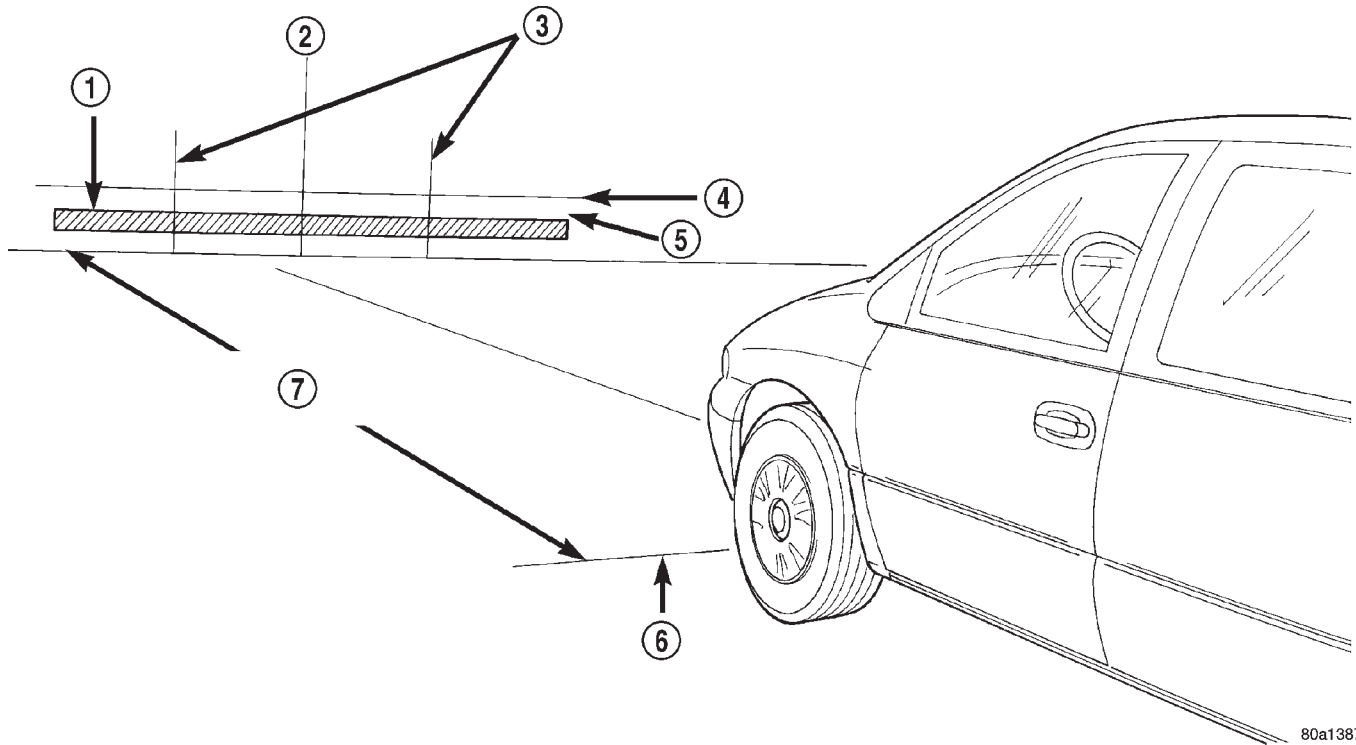
- 1 - LEFT/RIGHT ADJUSTMENT SCREW
- 2 - UP/DOWN ADJUSTMENT SCREW
- 3 - HEADLAMP

FOG LAMP ALIGNMENT

Prepare an alignment screen. Refer to the Alignment Screen Preparation paragraph in this section. A properly aligned fog lamp will project a pattern on the alignment screen 200 mm (8 in.) below the fog lamp centerline and straight ahead (Fig. 3). To improve visual interpretation of the fog lamp pattern on the alignment screen, disable the headlamps by disengaging the wire connectors from the headlamp bulbs.

To adjust fog lamp alignment, rotate alignment screws (Fig. 4) to achieve the specified pattern.

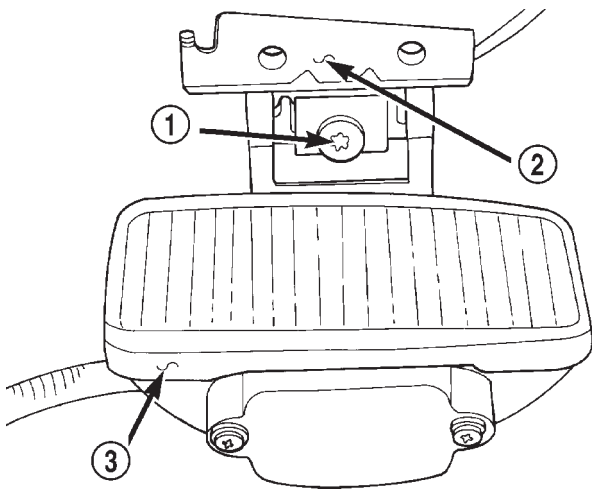
ADJUSTMENTS (Continued)



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Fig. 3 Fog Lamp Alignment-Typical

- | | |
|-----------------------------------|--------------------------|
| 1 - HIGH INTENSITY AREA | 5 - 200mm (8 in.) |
| 2 - CENTER OF VEHICLE | 6 - FRONT OF FOG LAMP |
| 3 - VERTICAL CENTER OF FOG LAMP | 7 - 10 METERS (32.8 ft.) |
| 4 - HORIZONTAL CENTER OF FOG LAMP | |



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Fig. 4 Fog Lamp Beam Adjustment Screws

- | |
|----------------------|
| 1 - ADJUSTMENT SCREW |
| 2 - MOUNTING BRACKET |
| 3 - FOG LAMP |

LAMP BULB SERVICE

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REMOVAL AND INSTALLATION

FRONT POSITION LAMP BULB

REMOVAL

(1) Remove the 2 screws holding the headlamp bezel in place and remove bezel (Fig. 1).

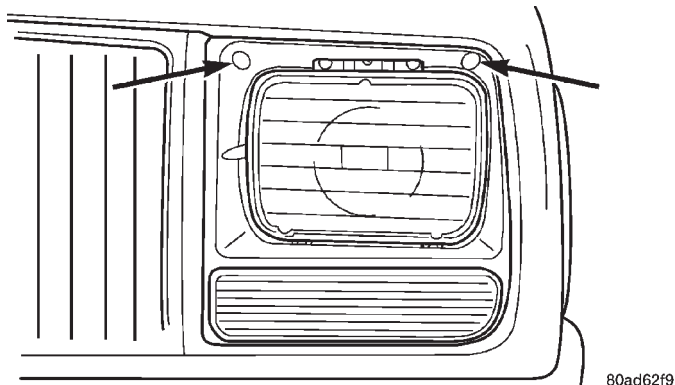


Fig. 1 Headlight Bezel Retaining Screws

(2) Remove the 4 screws holding the headlamp (Fig. 2).

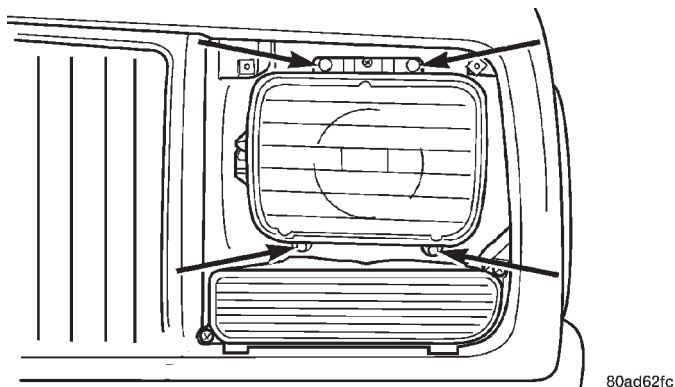


Fig. 2 Headlamp Retaining Screws

(3) Pull the front position lamp straight from headlamp (Fig. 3).

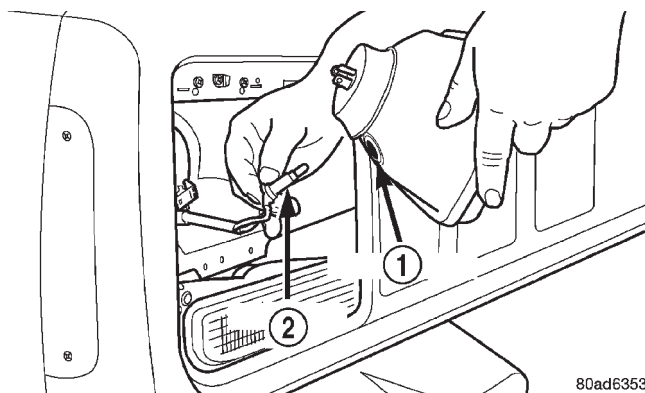


Fig. 3 Front Position Lamp Grommet & Socket Location

- 1 - GROMMET
- 2 - SOCKET

(4) Remove the front position lamp bulb from socket.

INSTALLATION

(1) Install the front position lamp bulb in lamp socket.

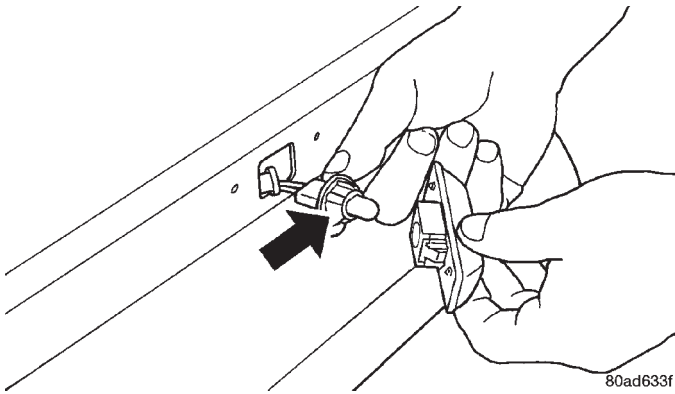
- (2) Verify lamp operation.
- (3) Install front position lamp in headlamp.
- (4) Connect headlamp electrical connector.
- (5) Position the headlamp, headlamp retaining ring and install the retaining screws.
- (6) Position the headlamp bezel and install retaining screws.

SIDE REPEATER LAMP BULB

REMOVAL

- (1) Grip the side repeater lamp assembly and pull straight from the fender.
- (2) Rotate and pull the socket from the housing (Fig. 4).
- (3) Pull the bulb straight from the socket.

REMOVAL AND INSTALLATION (Continued)

**Fig. 4 Side Repeater Lamp****INSTALLATION**

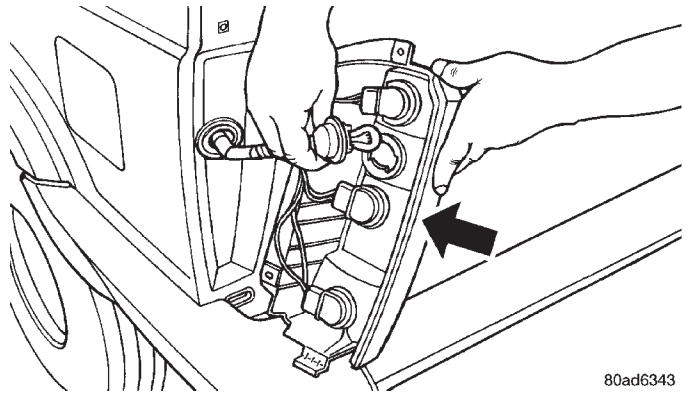
- (1) Align the side repeater lamp bulb to the socket (Fig. 4).
- (2) Push the bulb into the socket.
- (3) Verify lamp operation.
- (4) Push and rotate the socket into the housing.
- (5) Press the lamp assembly into the fender mounting hole.

REAR FOG LAMP BULB**REMOVAL**

- (1) There are 3 mounting bolts attaching the tail-light assembly. When removing, unfasten the 3 bolts located on the top and side. Lift up and out to remove the assembly.
- (2) Turn the socket assembly 1/3 turn and pull the socket from the housing (Fig. 5).
- (3) Pull the rear fog lamp straight from its socket.

INSTALLATION

- (1) Install rear fog lamp bulb in its socket.
- (2) Verify lamp operation.

**Fig. 5 Rear Lamp Replacement**

- (3) Install the remaining three lamp sockets in the taillamp assembly.
- (4) Position the taillamp assembly and install the retaining screws.

LICENSE PLATE LAMP BULB**REMOVAL**

- (1) Remove the appropriate license plate lamp retaining screws.
- (2) Pull lamp housing from rear liftgate. Lamp must be positioned properly to allow removal without removing license plate.
- (3) Rotate the lamp socket counter clockwise and pull straight from lamp housing.
- (4) Pull the lamp bulb straight from its socket.

INSTALLATION

- (1) Install bulb in lamp socket.
- (2) Verify lamp operation.
- (3) Install lamp socket in lamp housing.
- (4) Install license plate lamp assembly in liftgate and install retaining screws.

LAMP SERVICE

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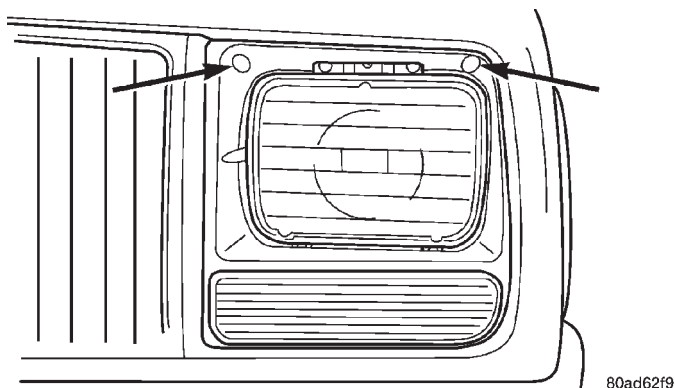
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REMOVAL AND INSTALLATION

HEADLAMP

REMOVAL

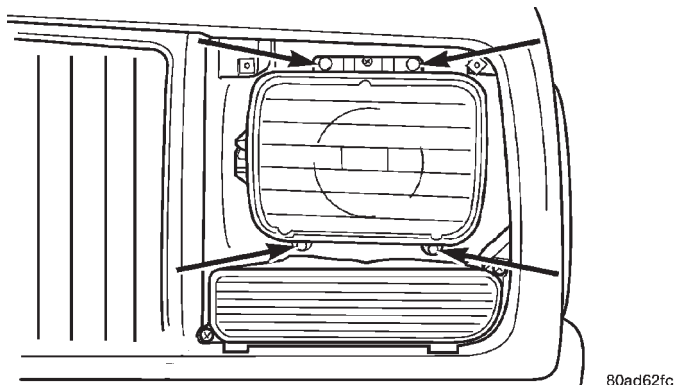
- (1) Remove the 2 screws holding the headlamp bezel in place and remove bezel (Fig. 1).



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Fig. 1 Headlight Bezel Retaining Screws

- (2) Remove the 4 screws holding the headlamp (Fig. 2).
- (3) Pull the front position lamp straight from headlamp.
- (4) Disconnect the headlamp electrical connector by pulling straight off.
- (5) Remove the headlamp from the vehicle.



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Fig. 2 Headlamp Retaining Screws

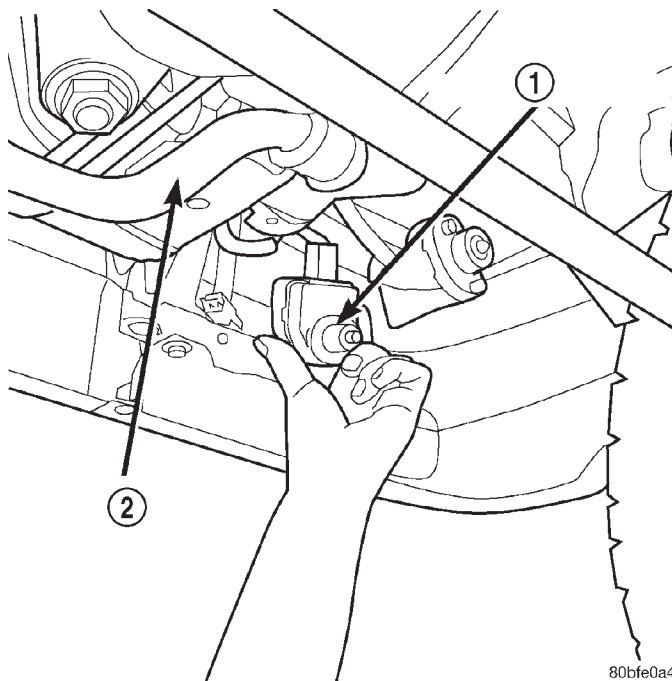
INSTALLATION

- (1) Install front position lamp in headlamp.
- (2) Connect headlamp electrical connector.
- (3) Position the headlamp, headlamp retaining ring and install the retaining screws.
- (4) Position the headlamp bezel and install retaining screws.

HEADLAMP LEVELING MOTOR

REMOVAL

- (1) Open the hood and disconnect the negative battery cable.
- (2) Raise the vehicle on a hoist or position a creeper under the front of the vehicle.
- (3) Remove the appropriate side front splash shield. Located just in front of the front wheel.



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Fig. 3 Headlamp Leveling Motor

- 1 – HEADLAMP LEVELING MOTOR
2 – FRONT STABILIZER BAR

REMOVAL AND INSTALLATION (Continued)

- (4) Disconnect the headlamp leveling motor electrical connector.
- (5) Rotate the leveling motor 90 degrees until motor is loose in mounting bracket.
- (6) Tilt motor upwards to disconnect motor push rod from the headlamp leveling linkage.
- (7) Remove the headlamp leveling motor from the vehicle (Fig. 3).

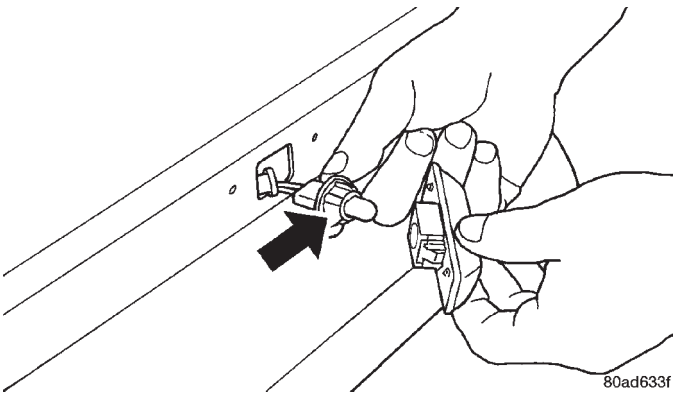
INSTALLATION

- (1) Install leveling motor push rod through hole in mounting bracket and connect push rod on leveling linkage. The proper angle must be achieved to connect the push rod onto the leveling linkage.
- (2) Once the push rod is connected, rotate motor until tabs line up with tabs in mounting bracket. Once the tabs are lined up push and rotate the motor 90 degrees to lock in place.
- (3) Connect the headlamp leveling motor electrical connector.
- (4) Position the front splash shield.
- (5) Lower the vehicle and connect the negative battery cable.

SIDE REPEATER LAMP

REMOVAL

- (1) Grip the side repeater lamp assembly and pull straight from the fender.

**Fig. 4 Side Repeater Lamp**

- (2) Rotate and pull the socket from the housing (Fig. 4).

INSTALLATION

- (1) Push and rotate the socket into the housing.
- (2) Verify lamp operation.
- (3) Press the lamp assembly into the fender mounting hole.

FRONT FOG LAMP

REMOVAL

1. Remove the 2 screws from the bottom cover of the lamp body.
2. Disconnect the 2 wires from the lamp element.
3. Remove the lamp element from the housing.

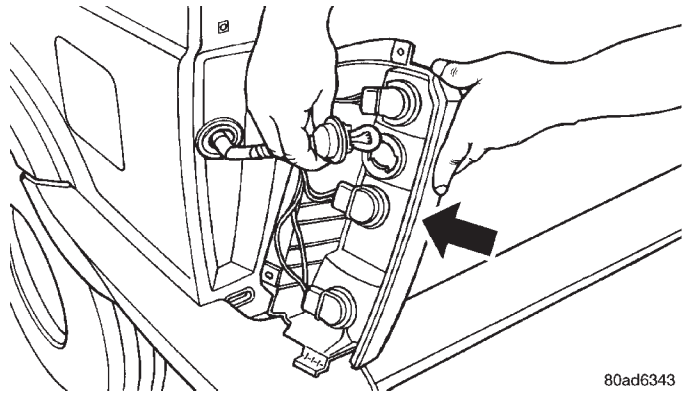
INSTALLATION

1. Install the new lamp element in the housing and reinstall the lower housing.

REAR TURN SIGNAL, BACKUP, TAILLAMP AND FOG LAMP

REMOVAL

- (1) There are 3 mounting bolts attaching the tail-light assembly. When removing, unfasten the 3 bolts located on the top and side. Lift up and out to remove the assembly.



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Fig. 5 Rear Lamp Replacement

- (2) Turn the socket assembly 1/3 turn and pull the socket from the housing (Fig. 5).

INSTALLATION

- (1) Install the four lamp sockets in the taillamp assembly.
- (2) Verify lamp operation.
- (3) Position the taillamp assembly and install the retaining screws.

LICENSE PLATE LAMP

REMOVAL

- (1) Remove the appropriate license plate lamp retaining screws.
- (2) Pull lamp housing from rear liftgate. Lamp must be positioned properly to allow removal without removing license plate.
- (3) Rotate the lamp socket counter clockwise and pull straight from lamp housing.

REMOVAL AND INSTALLATION (Continued)

INSTALLATION

- (1) Install lamp socket in lamp housing.
- (2) Verify lamp operation.
- (3) Install license plate lamp assembly in liftgate and install retaining screws.

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SPECIFICATIONS

REPLACEMENT BULBS

Exterior Lamps	Bulb Type
Headlamp	H4
Front Position	T4W
Front Turn Signal	P27/7W
Side Turn Signal	W3W
License Lamp	W5W
Rear Position and Stop	P27/7W
Rear Turn Signal	P27/7W
Reversing	P27/7W
Rear Fog	P27/7W
Underhood Lamp	W5W
Underhood Retractable Lamp	105
Front Fog	H3
CHMSL	W16W

Interior Lamps

Bulb Type

Ashtray Lamp	1891
Cigarette Lighter Lamp	53
Auto. Trans. Floor Shift Lamp	658
Cargo Lamp	561
Climate Control Lamp (2)	74
Dome Lamp	561
Dome/Reading Lamp	(1) 561 and (2) 906
Glove Box Lamp	194
Lighted Vanity Mirror (2)	74
Map Reading Light in Overhead Console (4) ...	912
Rocker Switch	37
Transfer Case Lamp	658
Underpanel Courtesy lamps (2)	168

NOTE: Numbers refer to commercial bulb types that can be purchased from your local Jeep dealer.

