

LAMPS

TABLE OF CONTENTS

	page		page
LAMPS/LIGHTING - EXTERIOR	1	LAMPS/LIGHTING - INTERIOR	33

LAMPS/LIGHTING - EXTERIOR

TABLE OF CONTENTS

	page		page
LAMPS/LIGHTING - EXTERIOR		FOG LAMP	
DESCRIPTION - TURN SIGNAL & HAZARD WARNING SYSTEM	2	DIAGNOSIS AND TESTING - FOG LAMP	10
OPERATION - TURN SIGNAL & HAZARD WARNING SYSTEM	2	REMOVAL	11
DIAGNOSIS AND TESTING - TURN SIGNAL & HAZARD WARNING SYSTEM	3	INSTALLATION	11
SPECIFICATIONS		FOG LAMP UNIT	
EXTERIOR LAMPS	4	REMOVAL	12
SPECIAL TOOLS		INSTALLATION	12
HEADLAMP ALIGNMENT	4	ADJUSTMENTS	13
BRAKE LAMP SWITCH		HEADLAMP	
DESCRIPTION	4	DESCRIPTION	13
OPERATION	4	OPERATION	13
DIAGNOSIS AND TESTING - BRAKE LAMP SWITCH	5	DIAGNOSIS AND TESTING - HEADLAMP	14
REMOVAL	5	REMOVAL	16
INSTALLATION	6	INSTALLATION	16
CENTER HIGH MOUNTED STOP LAMP		HEADLAMP RELAY	
REMOVAL	6	DESCRIPTION	17
INSTALLATION	6	OPERATION	17
CENTER HIGH MOUNTED STOP LAMP UNIT		DIAGNOSIS AND TESTING - HEADLAMP RELAY	17
REMOVAL	6	REMOVAL	18
INSTALLATION	6	INSTALLATION	18
CLEARANCE LAMP		HEADLAMP SWITCH	
REMOVAL	7	DESCRIPTION	18
INSTALLATION	7	OPERATION	18
COMBINATION FLASHER		DIAGNOSIS AND TESTING - HEADLAMP SWITCH	19
DESCRIPTION	7	REMOVAL	19
OPERATION	7	INSTALLATION	20
REMOVAL	8	HEADLAMP UNIT	
INSTALLATION	9	REMOVAL	20
DAYTIME RUNNING LAMP MODULE		INSTALLATION	21
DESCRIPTION	9	ADJUSTMENTS	21
OPERATION	9	LICENSE PLATE LAMP	
REMOVAL	9	REMOVAL	22
INSTALLATION	9	INSTALLATION	22
		LICENSE PLATE LAMP UNIT	
		REMOVAL	22

INSTALLATION	22
MARKER LAMP	
REMOVAL	23
INSTALLATION	23
MULTI-FUNCTION SWITCH	
DESCRIPTION	23
OPERATION	24
DIAGNOSIS AND TESTING - MULTI-FUNCTION SWITCH	25
REMOVAL	27
INSTALLATION	28
OUTBOARD IDENTIFICATION LAMP	
REMOVAL	28
INSTALLATION	29
PARK/TURN SIGNAL LAMP	
REMOVAL	29
INSTALLATION	29
PARK/TURN SIGNAL LAMP UNIT	
REMOVAL	29

INSTALLATION	29
TAIL LAMP	
DESCRIPTION	29
OPERATION	29
REMOVAL	29
INSTALLATION	30
TAIL LAMP UNIT	
REMOVAL	30
INSTALLATION	30
TURN SIGNAL CANCEL CAM	
DESCRIPTION	31
OPERATION	31
UNDERHOOD LAMP	
REMOVAL	31
INSTALLATION	32
UNDERHOOD LAMP UNIT	
REMOVAL	32
INSTALLATION	32

LAMPS/LIGHTING - EXTERIOR

DESCRIPTION - TURN SIGNAL & HAZARD WARNING SYSTEM

A turn signal and hazard warning system is standard factory-installed safety equipment on this model. The turn signal and hazard warning system includes the following major components, which are described in further detail elsewhere in this service information:

- **Combination Flasher** - The electronic combination flasher is installed in the Junction Block (JB), which is located behind the fuse access panel on the left outboard end of the instrument panel.

- **Hazard Warning Switch** - The hazard warning switch is integral to the multi-function switch on the left side of the steering column. The hazard warning switch button protrudes from a dedicated opening in the shroud on the top of the steering column, just below the steering wheel.

- **Turn Signal Cancel Cam** - The turn signal cancel cam is integral to the clockspring, which is located beneath the steering column shrouds at the top of the steering column, just below the steering wheel.

- **Turn Signal Indicators** - The two turn signal indicators, one right and one left, are integral to the ElectroMechanical Instrument Cluster (EMIC) located in the instrument panel.

- **Turn Signal Lamps** - The front turn signal lamps are integral to the lower front outboard ends of the headlamp modules, located just outboard of the two sides of the radiator grille opening. The rear turn signal lamps are integral to the taillamp modules located on either side of the vehicle. For pickup models the taillamp modules are secured to the rear of the quarter panels at each side of the tailgate

opening. For cab and chassis models the taillamp modules are secured by a stamped steel bracket on the outboard side of each frame rail near the rear of the vehicle.

- **Turn Signal Switch** - The turn signal switch is integral to the multi-function switch on the left side of the steering column. The multi-function switch control stalk that actuates the turn signal switch protrudes from a dedicated opening in the steering column shrouds on the left side of the column, just below the steering wheel.

Hard wired circuitry connects the turn signal and hazard warning system components to each other through 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 turn signal and hazard warning 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, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

OPERATION - TURN SIGNAL & HAZARD WARNING SYSTEM

The turn signal system operates on battery current received on a fused ignition switch output (run-acc) circuit so that the turn signals will only operate with the ignition switch in the On or Accessory positions. The hazard warning system operates on non-

LAMPS/LIGHTING - EXTERIOR (Continued)

switched battery current received on a fused B(+) circuit so that the hazard warning remains operational regardless of the ignition switch position. When the turn signal (multi-function) switch control stalk is moved up (right turn) or down (left turn), the turn signal system is activated. When the turn signal system is activated, the circuitry of the turn signal switch and the combination flasher will cause the selected (right or left) turn signal indicator, front park/turn signal lamp, and rear tail/stop/turn signal lamp to flash on and off. With the hazard warning (multi-function) switch in the On position, the hazard warning system is activated. When the hazard warning system is activated, the circuitry of the hazard warning switch and the combination flasher will cause both the right side and the left side turn signal indicators, front park/turn signal lamps, and rear tail/stop/turn signal lamps to flash on and off.

Refer to the owner's manual in the vehicle glove box for more information on the features, use and operation of the turn signal and hazard warning system.

DIAGNOSIS AND TESTING - TURN SIGNAL & HAZARD WARNING SYSTEM

When diagnosing the turn signal and hazard warning circuits, remember that high generator output can burn out bulbs rapidly and repeatedly. If this is a problem on the vehicle being diagnosed, be certain to diagnose and repair the charging system as required. If the problem being diagnosed is related to a failure of the turn signals to automatically cancel following completion of a turn, inspect the multi-function switch for a faulty or damaged cancel actuator and inspect the turn signal cancel cam on the clockspring for damaged lobes or improper installation. 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.

WARNING: ON VEHICLES EQUIPPED WITH AIRBAGS, DISABLE THE AIRBAG SYSTEM BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. DISCONNECT AND ISOLATE THE BATTERY NEGATIVE (GROUND) CABLE, THEN WAIT TWO MINUTES FOR THE AIRBAG SYSTEM CAPACITOR TO DISCHARGE BEFORE PERFORMING FURTHER DIAGNOSIS OR SERVICE. THIS IS THE ONLY SURE WAY TO DISABLE THE AIRBAG SYSTEM. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIR-

BAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.

(1) Turn the ignition switch to the On position. Actuate the turn signal switch or the hazard warning switch. Observe the turn signal indicator lamp(s) in the instrument cluster. If the flash rate is very high, check for a turn signal bulb that is not lit or is very dimly lit. Repair the circuits to that lamp or replace the faulty bulb, as required. If the turn signal indicator(s) fail to light, go to Step 2.

(2) Turn the ignition switch to the Off position. Check the fused ignition switch output (run-acc) fuse (Fuse 10 - 10 ampere) in the Junction Block (JB) and the fused B(+) fuse (Fuse 4 - 20 ampere) in the Power Distribution Center (PDC). If OK, go to Step 3. If not OK, repair the shorted circuit or component as required and replace the faulty fuse(s).

(3) Check for battery voltage at the fused B(+) fuse (Fuse 4 - 20 ampere) in the PDC. If OK, go to Step 4. If not OK, repair the open fused B(+) circuit between the PDC and the battery as required.

(4) Turn the ignition switch to the On position. Check for battery voltage at the fused ignition switch output (run-acc) fuse (Fuse 10 - 10 ampere) in the JB. If OK, go to Step 5. If not OK, repair the open fused ignition switch output (run-acc) circuit between the JB and the ignition switch as required.

(5) Turn the ignition switch to the Off position. Disconnect and isolate the battery negative cable. Remove the combination flasher from the JB and replace it with a known good unit. Reconnect the battery negative cable. Test the operation of the turn signal and hazard warning systems. If OK, discard the faulty combination flasher. If not OK, remove the test flasher and go to Step 6.

(6) Turn the ignition switch to the On position. Check for battery voltage at the fused ignition switch output (run-acc) circuit cavity in the JB receptacle for the combination flasher. If OK, go to Step 7. If not OK, repair the open fused ignition switch output (run-acc) circuit between the combination flasher and the fused ignition switch output (run-acc) fuse (Fuse 10 - 10 ampere) in the JB as required.

(7) Turn the ignition switch to the Off position. Check for battery voltage at the fused B(+) circuit cavity of the JB receptacle for the combination flasher. If OK, go to Step 8. If not OK, repair the open fused B(+) circuit between the combination flasher and the fused B(+) fuse (Fuse 4 - 20 ampere) in the PDC as required.

(8) Disconnect and isolate the battery negative cable. Check for continuity between the ground circuit cavity of the JB receptacle for the combination flasher and a good ground. There should be continuity. If OK, go to Step 9. If not OK, repair the open ground circuit to ground (G201) as required.

LAMPS/LIGHTING - EXTERIOR (Continued)

(9) Disconnect the instrument panel wire harness connector for the multi-function switch from the switch connector receptacle. Check for continuity between the hazard flasher signal circuit cavities in the JB receptacle for the combination flasher and the instrument panel wire harness connector for the multi-function switch. There should be continuity. If OK, go to Step 10. If not OK, repair the open hazard flasher signal circuit between the JB and the multi-function switch as required.

(10) Check for continuity between the flasher output circuit cavities of the JB receptacle for the combination flasher and in the instrument panel wire harness connector for the multi-function switch. There should be continuity. If OK, test the multi-function switch. (Refer to 8 - ELECTRICAL/LAMPS/LIGHTING - EXTERIOR/MULTI-FUNCTION SWITCH - DIAGNOSIS AND TESTING). If not OK, repair the open flasher output circuit between the JB and the multi-function switch as required.

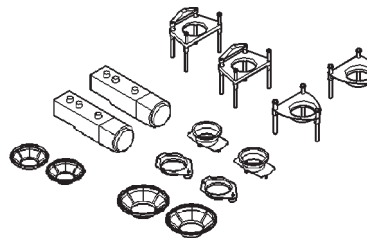
SPECIFICATIONS

EXTERIOR LAMPS

LAMP	BULB
Back-up	3157
Cargo	921
Center High Mounted Stop	921
Clearance Roof Mounted	168
Fog Lamps	896
Headlamp - SLT	9004LL
Headlamp - Sport Low Beam	9007
Headlamp - Sport High Beam	9004LL
License Plate w/o Bumper	1155
License Plate -Step Bumper	168
Park/Turn Signal	3157NA
Snow Plow Control	161
Tail/Brake/Turn Signal	3157
Tail/Brake/Cab - Chassis	1157
Underhood	105

SPECIAL TOOLS

HEADLAMP ALIGNMENT



Headlamp Aiming Kit C-4466-A

BRAKE LAMP SWITCH

DESCRIPTION

The plunger type brake lamp switch is mounted on a bracket attached to the brake pedal support under the instrument panel.

CAUTION: The switch can only be adjusted during initial installation. If the switch is not adjusted properly a new switch must be installed.

OPERATION

The brake lamp switch is used for the brake lamp, speed control brake sensor circuits and electronic brake distribution (EBD). The brake lamp circuit is open until the plunger is depressed. The speed control and brake sensor circuits are closed until the plunger is depressed.

When the brake light switch is activated, the Powertrain Control Module (PCM) receives an input indicating that the brakes are being applied. After receiving this input, the PCM maintains idle speed to a scheduled rpm through control of the Idle Air Control (IAC) motor. The brake switch input is also used to disable vent and vacuum solenoid output signals to the speed control servo.

Vehicles equipped with the speed control option use a dual function brake lamp switch. The PCM monitors the state of the dual function brake lamp switch. Refer to the Brake section for more information on brake lamp switch service and adjustment procedures.

BRAKE LAMP SWITCH (Continued)

The brake switch is equipped with three sets of contacts, one normally open and the other two normally closed (brakes disengaged). The PCM sends a 12 volt signal to one of the normally closed contacts in the brake switch, which is returned to the PCM as a brake switch state signal. With the contacts closed, the 12 volt signal is pulled to ground causing the signal to go low. The low voltage signal, monitored by the PCM, indicates that the brakes are not applied. When the brakes are applied, the contacts open, causing the PCM's output brake signal to go high, disengaging the speed control, cutting off PCM power to the speed control solenoids.

The second set of normally closed contacts supplies 12 volts from the PCM any time speed control is turned on. Through the brake switch, current is routed to the speed control servo solenoids. The speed control solenoids (vacuum, vent and dump) are provided this current any time the speed control is ON and the brakes are disengaged.

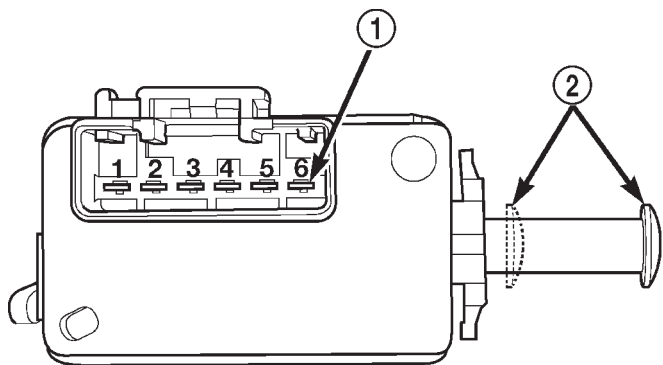
When the driver applies the brakes, the contacts open and current is interrupted to the solenoids. The normally open contacts are fed battery voltage. When the brakes are applied, battery voltage is supplied to the brake lamps.

DIAGNOSIS AND TESTING - BRAKE LAMP SWITCH

The brake lamp switch can be tested with an ohmmeter. The ohmmeter is used to check continuity between the pin terminals (Fig. 1).

SWITCH CIRCUIT IDENTIFICATION

- Terminals 1 and 2: brake lamp circuit
- Terminals 3 and 4: RWAL/ABS module and Powertrain Control Module (PCM) circuit
- Terminals 5 and 6: speed control circuit



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Fig. 1 Brake Lamp Switch Terminal Identification

- 1 - TERMINAL PINS
- 2 - PLUNGER TEST POSITIONS

SWITCH CONTINUITY TEST

NOTE: Disconnect switch harness before testing switch continuity.

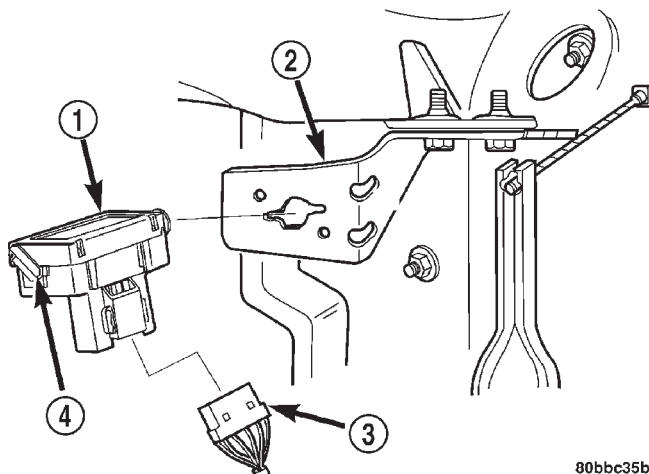
With switch plunger extended, attach test leads to pins 1 and 2. Replace switch if meter indicates no continuity.

With switch plunger retracted, attach test leads to pins 3 and 4. Replace switch if meter indicates no continuity.

With switch plunger retracted, attach test leads to pins 5 and 6. Replace switch if meter indicates no continuity.

REMOVAL

- (1) Remove knee bolster for access to brake lamp switch and pedal.
- (2) Disconnect switch harness (Fig. 2) .
- (3) Press and hold brake pedal in applied position.
- (4) Rotate switch counterclockwise about 30° to align switch lock tabs with notch in bracket.
- (5) Pull switch rearward out of mounting bracket and release brake pedal.



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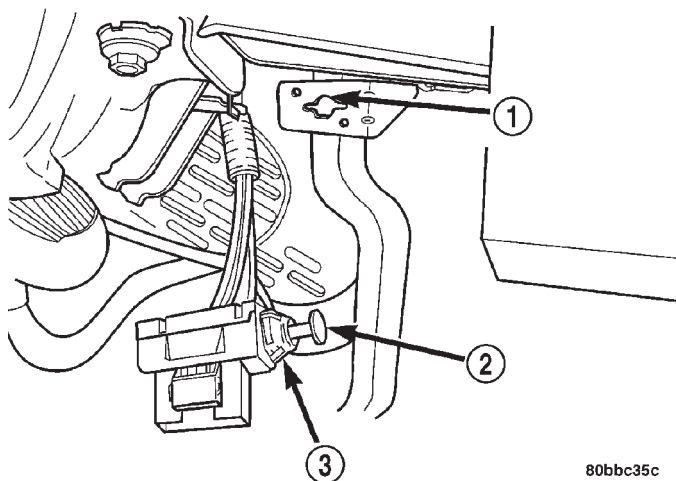
Fig. 2 Brake Lamp Switch & Harness Connector

- 1 - BRAKE LIGHT SWITCH
- 2 - SWITCH BRACKET
- 3 - HARNESS CONNECTOR
- 4 - SWITCH LEVER

BRAKE LAMP SWITCH (Continued)

INSTALLATION

- (1) Connect harness wires to **new** switch.
- (2) Press and hold brake pedal down.
- (3) Align tabs on switch with notches in switch bracket, install the switch and rotate it in bracket clockwise approximately 30° to lock it in place. (Fig. 3). Make sure the switch lever is in the 45° position as illustrated in figure 2.

**Fig. 3 Brake Lamp Switch**

- 1 - TAB NOTCH (IN BRACKET)
 2 - SWITCH PLUNGER
 3 - SWITCH TAB

- (4) Release brake pedal. Without moving the pedal, move the lever so that it is parallel with the connector. The switch is now adjusted and can not be adjusted again.
- (5) Install the knee bolster.

CENTER HIGH MOUNTED STOP LAMP**REMOVAL**

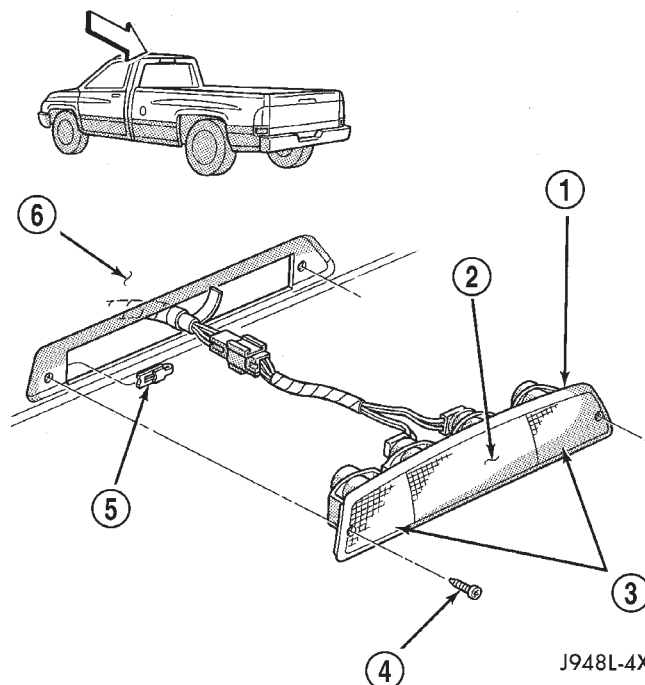
- (1) Disconnect and isolate the battery negative cable.
- (2) Remove the CHMSL from the roof panel.
- (3) Rotate sockets 1/4 turn clockwise and remove from lamp. (The two center bulbs light the stoplamp and the outside bulbs light the cargo lamp, if equipped.)
- (4) Pull bulb from socket.

INSTALLATION

- (1) Push bulb into socket.
- (2) Position socket in lamp and rotate socket 1/4 turn counterclockwise.
- (3) Install the CHMSL.
- (4) Connect the battery negative cable.

CENTER HIGH MOUNTED STOP LAMP UNIT**REMOVAL**

- (1) Disconnect and isolate the battery negative cable.
- (2) Remove screws holding CHMSL to roof panel (Fig. 4).
- (3) Separate CHMSL from roof.
- (4) Disengage wire connector from body wire harness.
- (5) Separate CHMSL from vehicle.

**Fig. 4 Center High Mounted Stop Lamp**

- 1 - CHMSL CARGO LAMP HOUSING
 2 - CHMSL
 3 - CARGO LAMPS
 4 - SCREW
 5 - CLIP
 6 - CAB

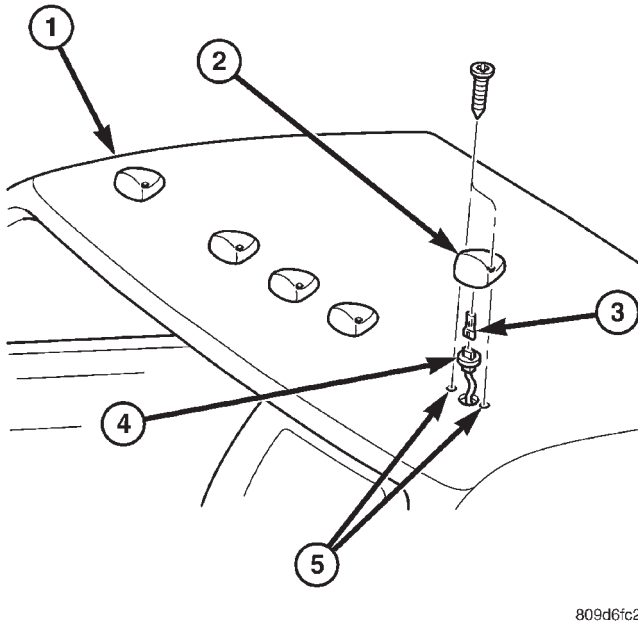
INSTALLATION

- (1) Position lamp at cab roof and connect wire connector.
- (2) Install screws holding CHMSL to roof panel. Tighten securely.
- (3) Connect the battery negative cable.

CLEARANCE LAMP

REMOVAL

- (1) Disconnect and isolate the battery negative cable.
- (2) Remove screws holding clearance lamp lens to roof panel (Fig. 5).
- (3) Rotate socket 1/4 turn counterclockwise and separate socket from lamp.



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Fig. 5 Roof Clearance Lamps

- 1 - ROOF
- 2 - LAMP LENS
- 3 - BULB
- 4 - SOCKET
- 5 - PLASTIC NUTS

INSTALLATION

- (1) Install socket in lamp and rotate socket 1/4 turn clockwise.
- (2) Position clearance lamp on roof.
- (3) Install screws holding clearance lamp lens to roof panel. Tighten to 1 N·m (13 in. lbs.).
- (4) Connect the battery negative cable.

COMBINATION FLASHER

DESCRIPTION

The combination flasher is located in the Junction Block (JB) behind the fuse access panel on the left outboard end of the instrument panel. The combination flasher is a smart relay that functions as both the turn signal system and the hazard warning system flasher. The combination flasher contains active electronic Integrated Circuitry (IC) elements. This flasher is designed to handle the current flow requirements of the factory-installed lighting. If supplemental lighting is added to the turn signal lamp circuits, such as when towing a trailer with lights, the combination flasher will automatically try to compensate to keep the flash rate the same.

The combination flasher has five blade-type terminals that connect it to the vehicle electrical system through five matching cavities in the receptacle of the JB. While the combination flasher has a International Standards Organization (ISO)-type relay terminal configuration or footprint, the internal circuitry is much different. The combination flasher does not use standard ISO-relay inputs or provide ISO-relay type outputs or functions. The combination flasher should never be substituted for an ISO-relay or replaced with an ISO-relay, or else component and vehicle damage may occur.

The combination flasher cannot be repaired or adjusted and, if faulty or damaged, it must be replaced.

OPERATION

The combination flasher has five blade-type terminals intended for the following inputs and outputs: fused B(+), fused ignition switch output, ground, turn signal circuit, and hazard warning circuit. Constant battery voltage and ground are supplied to the flasher so that it can perform the hazard warning function, and ignition switched battery voltage is supplied for the turn signal function.

COMBINATION FLASHER (Continued)

The Integrated Circuitry (IC) within the combination flasher (Fig. 6) contains the logic that controls the flasher operation and the flash rate. Pin 6 of the IC receives a sense voltage from the hazard warning circuit of the multi-function switch. When the hazard warning switch is turned on, the "hazard on sense" voltage will become low due to the circuit being grounded through the turn signal bulbs. This low voltage sense signals the IC to energize the flash control Positive-Negative-Positive (PNP) transistor at a pre-calibrated flash rate or frequency. Each time the PNP transistor energizes the hazard warning circuit, the pin 6 "hazard on sense" voltage will become high and the IC signals the PNP transistor to de-energize the circuit. This cycling will continue until the hazard warning switch is turned off.

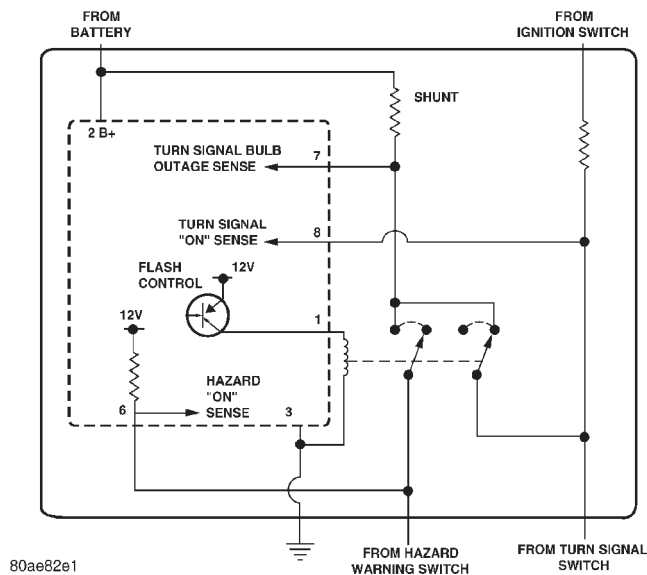


Fig. 6 Combination Flasher - Typical

Likewise, pin 8 of the IC receives a sense voltage from the turn signal circuits of the multi-function switch. When the left or right turn signal switch is turned on, the "turn signal on sense" voltage will become low due to the circuit being grounded through the turn signal bulbs. This low voltage sense signals the IC to energize the flash control PNP transistor at a pre-calibrated flash rate or frequency. Each time the PNP transistor energizes the turn signal circuit, the pin 8 "turn signal on sense" voltage will become high and the IC signals the PNP transistor to de-energize the circuit. This cycling will continue until the right or left turn signal switch is turned off.

A special design feature of the combination flasher allows it to "sense" that a turn signal circuit or bulb is not operating, and provide the driver an indication of the condition by flashing the remaining bulbs in the affected circuit at a higher rate (120 flashes-per-minute or higher). Conventional flashers either continue flashing at their typical rate (heavy-duty type), or discontinue flashing the affected circuit entirely (standard-duty type). During turn signal operation, the combination flasher IC compares normal battery voltage input on pin 2 with the shunt resistor voltage input on pin 7. If the IC "senses" that the voltage difference between pin 2 and pin 7 is different than the pre-calibrated value of the IC, it will increase the rate at which it signals the PNP transistor to energize the pin 1 output. Thus, the inoperative half (left or right side) of the turn signal circuit will flash faster.

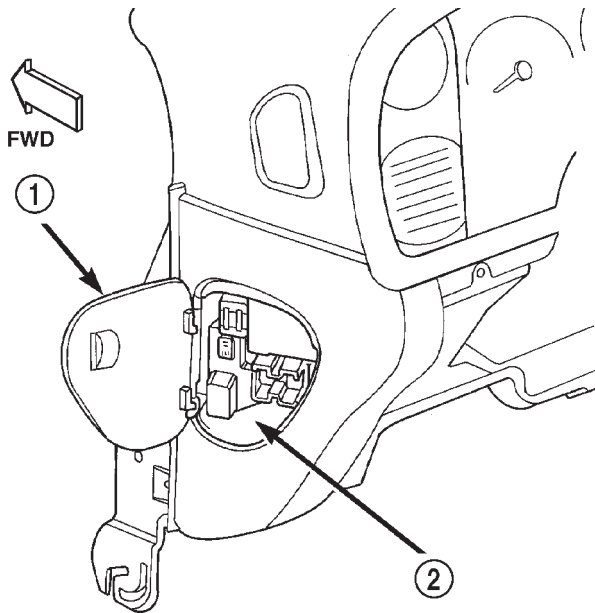
Because of the active electronic elements within the combination flasher, it cannot be tested with conventional automotive electrical test equipment. If the combination flasher is believed to be faulty, test the turn signal system and hazard warning system. Then replace the combination flasher with a known good unit to confirm system operation. (Refer to 8 - ELECTRICAL/LAMPS/LIGHTING - EXTERIOR/TURN SIGNAL & HAZARD WARNING SYSTEM - DIAGNOSIS AND TESTING).

REMOVAL

WARNING: ON VEHICLES EQUIPPED WITH AIRBAGS, DISABLE THE AIRBAG SYSTEM BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. DISCONNECT AND ISOLATE THE BATTERY NEGATIVE (GROUND) CABLE, THEN WAIT TWO MINUTES FOR THE AIRBAG SYSTEM CAPACITOR TO DISCHARGE BEFORE PERFORMING FURTHER DIAGNOSIS OR SERVICE. THIS IS THE ONLY SURE WAY TO DISABLE THE AIRBAG SYSTEM. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.

- (1) Disconnect and isolate the battery negative cable.
- (2) Remove the fuse access panel by unsnapping it from the left outboard end of the instrument panel.
- (3) Remove the combination flasher from the Junction Block (JB) (Fig. 7).

COMBINATION FLASHER (Continued)



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Fig. 7 Junction Block

- 1 - JUNCTION BLOCK
2 - FUSE ACCESS PANEL

INSTALLATION

WARNING: ON VEHICLES EQUIPPED WITH AIRBAGS, DISABLE THE AIRBAG SYSTEM BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. DISCONNECT AND ISOLATE THE BATTERY NEGATIVE (GROUND) CABLE, THEN WAIT TWO MINUTES FOR THE AIRBAG SYSTEM CAPACITOR TO DISCHARGE BEFORE PERFORMING FURTHER DIAGNOSIS OR SERVICE. THIS IS THE ONLY SURE WAY TO DISABLE THE AIRBAG SYSTEM. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.

- (1) Position the combination flasher in the proper receptacle of the Junction Block (JB).
- (2) Align the terminals of the combination flasher with the terminal cavities in the JB receptacle for the flasher.
- (3) Push in firmly and evenly on the combination flasher until the terminals are fully seated in the terminal cavities of the JB receptacle for the flasher.
- (4) Reinstall the fuse access panel by snapping it onto the left outboard end of the instrument panel.
- (5) Reconnect the battery negative cable.

DAYTIME RUNNING LAMP MODULE**DESCRIPTION**

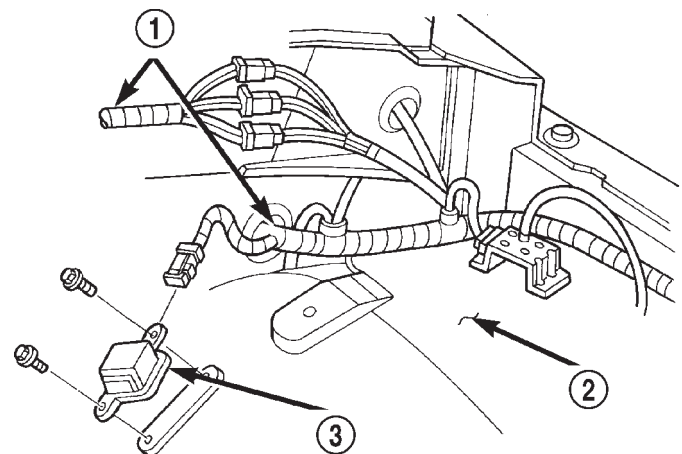
The Daytime Running Lights (Headlamps) System is installed on vehicles manufactured for sale in Canada only. A separate module, mounted on the cowl, controls the DRL.

OPERATION

The headlamps are illuminated when the ignition switch is turned to the ON position. The DRL module receives a vehicle-moving signal from the vehicle speed sensor. This provides a constant **head-lamps-on** condition as long as the vehicle is moving. The lamps are illuminated at less than 50 percent of normal intensity.

REMOVAL

- (1) Disconnect and isolate the battery negative cable.
- (2) Disengage wire connector from DRLM (Fig. 8).
- (3) Remove screws attaching DRLM to left front inner fender panel.
- (4) Separate DRLM from fender.



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Fig. 8 Daytime Running Lamp Module (DRLM)

- 1 - HEADLAMP AND DASH WIRING HARNESS
2 - LEFT FENDER SIDE SHIELD
3 - DAYTIME RUNNING LAMP MODULE

INSTALLATION

- (1) Position DRLM on fender.
- (2) Install screws attaching DRLM to left front inner fender panel.
- (3) Engage wire connector to DRLM.
- (4) Connect the battery negative cable.

FOG LAMP

DIAGNOSIS AND TESTING - FOG LAMP

CONDITION	POSSIBLE CAUSES	CORRECTION
FOG LAMPS ARE DIM WITH ENGINE IDLING OR IGNITION TURNED OFF.	1. Loose or corroded battery cables. 2. Loose or worn generator drive belt. 3. Charging system output too low. 4. Battery has insufficient charge. 5. Battery is sulfated or shorted. 6. Poor lighting circuit Z33-ground.	1. Clean and secure battery cable clamps and posts. 2. Adjust or replace generator drive belt. 3. Test and repair charging system. 4. Test battery state-of -charge. 5. Load test battery. 6. Test for voltage drop across Z33-ground locations.
FOG LAMP BULBS BURN OUT FREQUENTLY	1. Charging system output too high. 2. Loose or corroded terminals or splices in circuit.	1. Test and repair charging system. 2. Inspect and repair all connectors and splices.
FOG LAMPS ARE DIM WITH ENGINE RUNNING ABOVE IDLE	1. Charging system output too low. 2. Poor lighting circuit Z33-ground. 3. High resistance in fog lamp circuit.	1. Test and repair charging system. 2. Test for voltage drop across Z33-ground locations. 3. Test amperage draw of fog lamp circuit.
FOG LAMPS FLASH RANDOMLY	1. Poor lighting circuit Z33-ground. 2. High resistance in fog lamp circuit. 3. Faulty fog lamp switch. 4. Loose or corroded terminals or splices in circuit.	1. Test for voltage drop across Z33-ground locations. 2. Test amperage draw of fog lamp circuit. 3. Replace fog lamp switch. 4. Inspect and repair all connectors and splices.
FOG LAMPS DO NOT ILLUMINATE	1. Blown fuse for fog lamp. 2. No Z33-ground at fog lamps. 3. Faulty fog lamp switch. 4. Broken connector terminal or wire splice in fog lamp circuit. 5. Defective or burned out bulb.	1. Trace short and replace fuse. 2. Repair circuit ground. 3. Replace fog lamp switch. 4. Repair connector terminal or wire splice. 5. Replace bulb.
FOG LAMPS ARE INOPERATIVE AND FOG LAMP INDICATOR LIGHT ALWAYS STAYS ON.	1. Fog lamp/DRL* feed shorted to ground.	1. Check wiring circuit from fog lamp/DRL* fuse to fog lamp. Trace short circuit in wiring and repair.
FOG LAMPS ARE INOPERATIVE AND FOG LAMP INDICATOR LIGHT IS ILLUMINATED.	1. Fog lamp/DRL* fuse defective. 2. Open circuit from fog lamp fuse to fog lamp.	1. Trace short circuit and replace fuse. 2. Check wiring circuit from fog lamp/DRL* fuse to fog lamp. Trace open circuit in wiring and repair.

FOG LAMP (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
PARK LAMPS ARE INOPERATIVE. FOG LAMP INDICATOR IS ON WHEN ALL SWITCHES ARE OFF AND FUNCTIONS OPPOSITE TO FOG LAMPS.	1. Park lamp feed is shorted.	1. Check wiring circuit from park lamp fuse to headlamp switch. Trace short circuit in wiring and repair.
PARK LAMPS ARE INOPERATIVE. FOG LAMP INDICATOR FUNCTIONS OPPOSITE TO FOG LAMPS.	1. Park lamp fuse is defective. 2. Open circuit from park lamp fuse to headlamp switch.	1. Trace short circuit and replace fuse. 2. Check wiring circuit from park lamp fuse to headlamp switch. Trace open circuit in wiring and repair.
*Canada vehicles use Daytime Running Lamps (DRL).		

Additional fog lamp diagnostic procedures listed are for vehicles equipped with quad headlamps and the DRL option.

CONDITION	POSSIBLE CAUSES	CORRECTION
FOG LAMPS ARE INOPERATIVE AND FOG LAMP INDICATOR STAYS ALWAYS ON.	1 Fog lamp/DRL* feed shorted to ground.	1. Check wiring circuit from fog lamp/DRL* fuse to fog lamp. Trace short circuit in wiring and repair.
FOG LAMP INDICATOR COMES ON WITH OUT ILLUMINATING THE FOG LAMPS	1. Fog lamp/DRL* fuse defective.	1. Trace short circuit and replace fuse.
FOG LAMPS INOPERATIVE WITH IGNITION OFF.	Open circuit from fog lamp fuse to fog lamp.	1. Check wiring circuit from fog lamp/DRL* fuse to fog lamp. Trace open circuit in wiring and repair.

REMOVAL

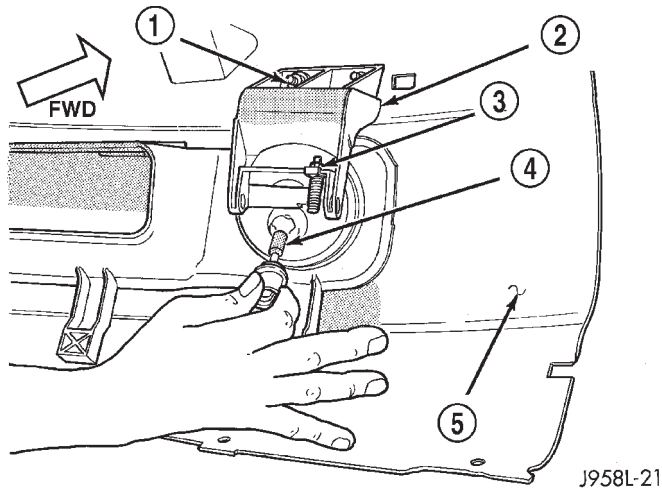
- (1) Disconnect and isolate the battery negative cable.
- (2) Disengage fog lamp harness connector.
- (3) Rotate bulb assembly counterclockwise and pull from lamp to separate (Fig. 9).

INSTALLATION

CAUTION: Do not touch the bulb glass with fingers or other oily surfaces. Reduced bulb life will result.

- (1) Position bulb assembly in lamp and rotate clockwise.
- (2) Connect fog lamp harness connector.
- (3) Connect the battery negative cable.

FOG LAMP (Continued)

**Fig. 9 Fog Lamp**

- 1 - NUT
- 2 - FOG LAMP ASSEMBLY
- 3 - UP/DOWN ADJUSTER
- 4 - BULB
- 5 - BUMPER

FOG LAMP UNIT

REMOVAL

SLT

The fog lamps are serviced from the rearward side of the front bumper.

- (1) Disconnect and isolate the battery negative cable.
- (2) Disengage fog lamp harness connector.
- (3) Remove fog lamp to bumper attaching nuts (Fig. 10).
- (4) Separate fog lamp from bumper.

SPORT

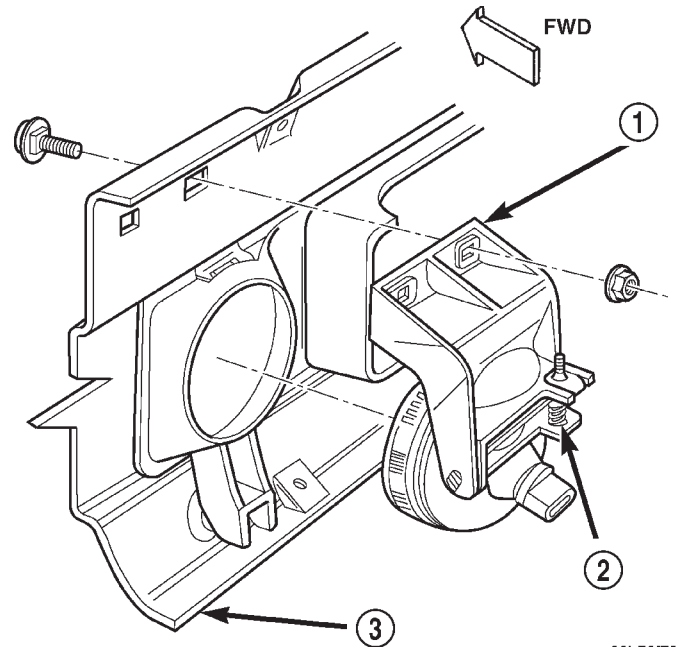
The fog lamps are serviced from the rearward side of the front fascia.

- (1) Disconnect and isolate the battery negative cable.
- (2) Disengage fog lamp harness connector.
- (3) Remove fog lamp to fascia attaching nuts (Fig. 11).
- (4) Separate fog lamp from fascia.

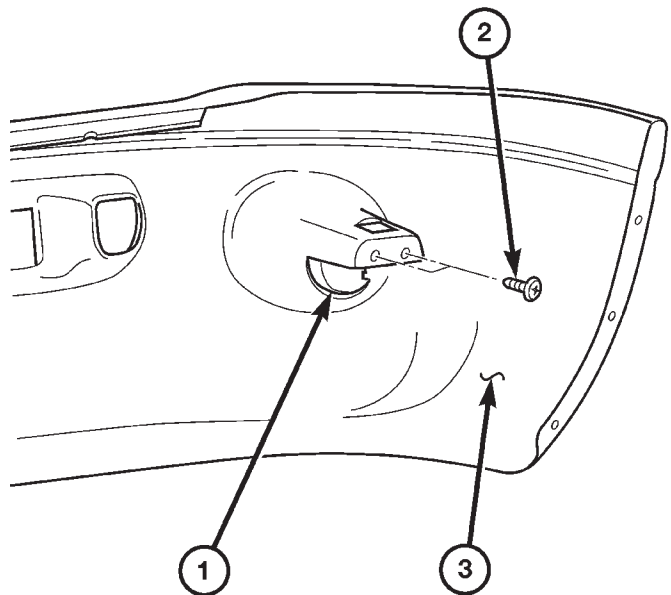
INSTALLATION

SLT

- (1) Position fog lamp in bumper.
- (2) Install fog lamp to bumper attaching nuts.
- (3) Connect fog lamp harness connector.
- (4) Connect the battery negative cable.
- (5) Check for proper operation and beam alignment.

**Fig. 10 Fog Lamp — SLT**

- 1 - FOG LAMP
- 2 - BEAM ADJUSTER
- 3 - BUMPER

**Fig. 11 Fog Lamp — SPORT**

- 1 - FOG LAMP
- 2 - ADJUSTMENT SCREW
- 3 - FASCIA

FOG LAMP UNIT (Continued)

SPORT

- (1) Position fog lamp in fascia.
- (2) Install screws attaching fog lamp to fascia.
- (3) Connect wire connector to fog lamp.
- (4) Connect the battery negative cable.
- (5) Check for proper operation and beam alignment.

ADJUSTMENTS

Prepare an alignment screen. (Refer to 8 - ELECTRICAL/LAMPS/LIGHTING - EXTERIOR/HEADLAMP UNIT - ADJUSTMENTS)

A properly aligned fog lamp will project a pattern on the alignment screen 100 mm (4 in.) below the fog lamp centerline and straight ahead (Fig. 12).

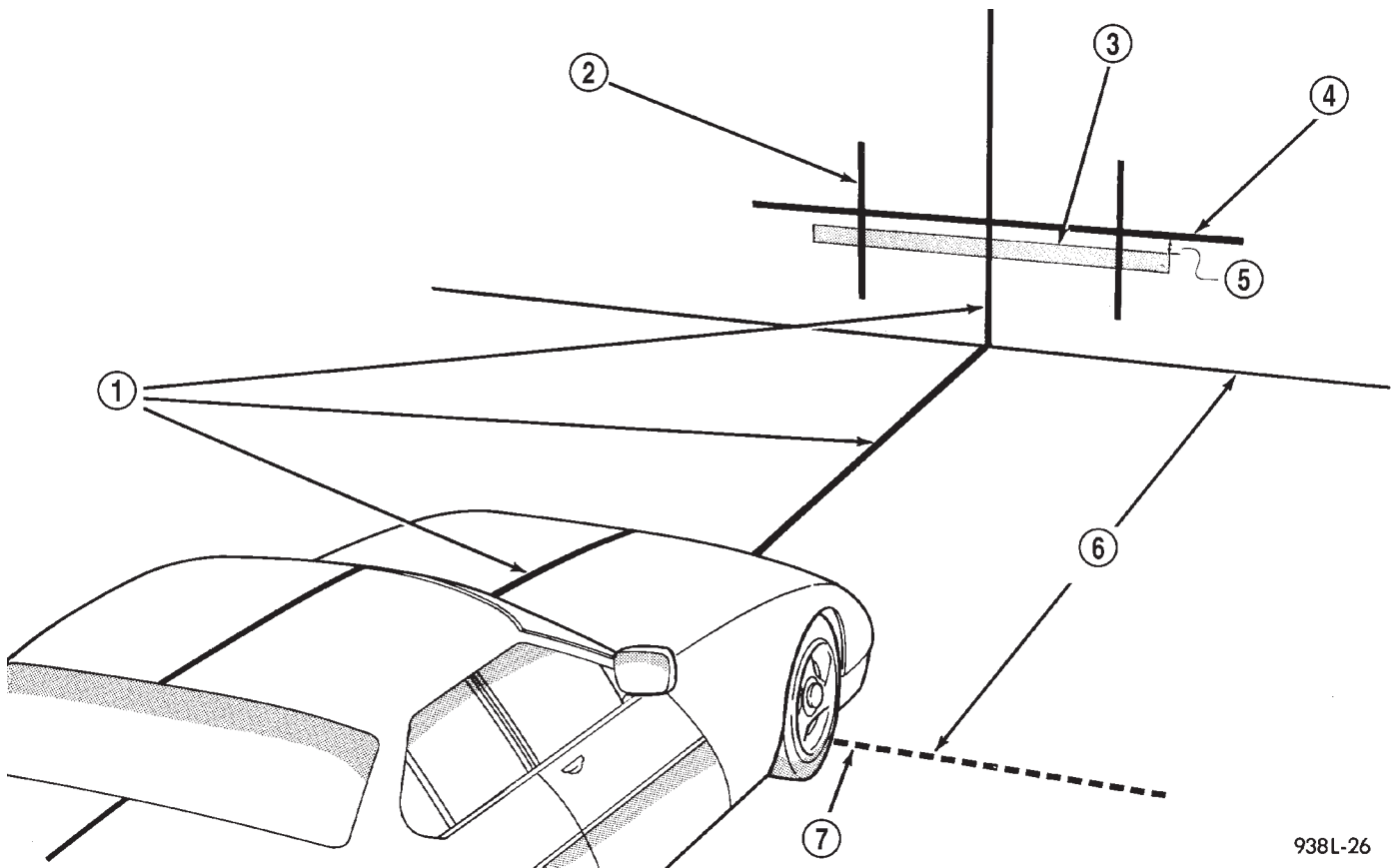
To adjust fog lamp aim, rotate adjustment screw on the rear of fog lamp to achieve the specified height.

HEADLAMP**DESCRIPTION**

Headlamps on the Ram Pick-Up are modular in design. The turn/park lamp module is incorporated into the headlamp module. The module contains two bulbs; a dual filament headlamp bulb, and a dual filament turn/park bulb. The Sport headlamp module has two separate bulbs for the headlamp illumination.

OPERATION

Headlamps and parking lamps are controlled by the headlamp switch. The multifunction switch mounted on the steering column controls the high beam function, and the turn signal function.



938L-26

Fig. 12 Fog Lamp Alignment

- | | |
|--|---------------------------|
| 1 - VEHICLE CENTERLINE | 5 - 100 mm (4 in.) |
| 2 - CENTER OF VEHICLE TO CENTER OF FOG LAMP LENS | 6 - 7.62 METERS (25 FEET) |
| 3 - HIGH-INTENSITY AREA | 7 - FRONT OF FOG LAMP |
| 4 - FLOOR TO CENTER OF FOG LAMP LENS | |

HEADLAMP (Continued)

DIAGNOSIS AND TESTING - HEADLAMP

A good ground is necessary for proper lighting operation. Grounding is provided by the lamp socket when it comes in contact with the metal body, or through a separate ground wire.

Always begin any diagnosis by testing all of the fuses and circuit breakers in the system. For com-

plete circuit 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.

CONDITION	POSSIBLE CAUSES	CORRECTION
HEADLAMPS ARE DIM WITH ENGINE IDLING OR IGNITION TURNED OFF	1. Loose or corroded battery cables. 2. Loose or worn generator drive belt. 3. Charging system output too low. 4. Battery has insufficient charge. 5. Battery is sulfated or shorted. 6. Poor lighting circuit Z3-ground. 7. Both headlamp bulbs defective.	1. Clean and secure battery cable clamps and posts. 2. Adjust or replace generator drive belt. 3. Test and repair charging system. 4. Test battery state-of-charge. 5. Load test battery. 6. Test for voltage drop across Z3-ground locations. 7. Replace both headlamp bulbs.
HEADLAMP BULBS BURN OUT FREQUENTLY	1. Charging system output too high. 2. Loose or corroded terminals or splices in circuit.	1. Test and repair charging system. 2. Inspect and repair all connectors and splices.
HEADLAMPS ARE DIM WITH ENGINE RUNNING ABOVE IDLE*	1. Charging system output too low. 2. Poor lighting circuit Z3-ground. 3. High resistance in headlamp circuit. 4. Both headlamp bulbs defective.	1. Test and repair charging system. 2. Test for voltage drop across Z3-ground locations. 3. Test amperage draw of headlamp circuit. 4. Replace both headlamp bulbs.
HEADLAMPS FLASH RANDOMLY	1. Poor lighting circuit Z3-ground. 2. High resistance in headlamp circuit. 3. Faulty headlamps switch circuit breaker. 4. Loose or corroded terminals or splices in circuit.	1. Test for voltage drop across Z3-ground locations. 2. Test amperage draw of headlamp circuit. Should not exceed 30 amps. 3. Replace headlamp switch. 4. Inspect and repair all connectors and splices.
HEADLAMPS (HIGH & LOW) DO NOT ILLUMINATE	1. No voltage at either headlamp.	1. Voltage should always be present. Trace short circuit and replace BOTH headlamp fuses. Check wiring circuit from Right headlamp fuse to headlamp. (Repeat for Left side)

HEADLAMP (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
	2. No ground for high and low beam circuit. 3. Headlamp bulb(s) defective. 4. Faulty headlamp switch. 5. Faulty headlamp dimmer (Multifunction) switch. 6. Broken connector terminal or wire splice in headlamp circuit.	2. Ground should always be present according to switch position. Check ground at headlamp switch. Check wiring circuit from headlamp switch to Multifunction switch. Check headlamp switch and Multifunction switch continuity. Repair circuit ground. 3. Replace bulb(s). 4. Replace headlamp switch. 5. Replace Multifunction switch. 6. Repair connector terminal or wire splice.
HEADLAMPS (LOW BEAM) DO NOT ILLUMINATE.	1. No ground for low beam circuit.	1. Ground should be present according to Multifunction switch position. Check wiring circuit from Multifunction switch to headlamp. Trace open circuit in wiring and repair. Check Multifunction Switch for continuity.
HEADLAMPS (HIGH BEAM) DO NOT ILLUMINATE.	1. No ground for high beam circuit.	1. Ground should be present according to Multifunction switch position. Check wiring circuit from Multifunction switch to headlamp . Trace open circuit in wiring and repair. Check Multifunction Switch for continuity.
HEADLAMPS (LOW BEAM) ALWAYS ILLUMINATE AND CAN NOT BE SHUT OFF.	1. Low beam circuit from bulb to Multifunction switch is shorted to ground.	1. Ground should be present according to Multifunction switch position. Check wiring circuit from Multifunction switch to headlamp. Trace short circuit in wiring and repair.
HEADLAMPS (HIGH BEAM) ALWAYS ILLUMINATE AND CAN NOT BE SHUT OFF.	1. High beam circuit from bulb to Multifunction switch is shorted to ground.	1. Ground should be present according to Multifunction switch position. Check wiring circuit from Multifunction switch to headlamp. Trace short circuit in wiring and repair.
QUAD LAMPS DO NOT ILLUMINATE AND HIGH BEAMS ILLUMINATE.	1. No voltage at either headlamp. 2. No ground for Quad beam circuit. 3. If voltage and ground are present, bulb(s) is defective.	1. Voltage should always be present. Check Quad lamp fuse. Check wiring circuit from Quad lamp fuse to Quad lamp. Repeat for left side 2. Ground should be present according to Multifunction switch position. Check ground at quad lamp relay. Check for battery voltage at quad lamp relay. Check quad lamp relay. Check relay control circuit (relay coil to high beam). 3. Replace bulb(s).

HEADLAMP (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
HEADLAMP SWITCH OFF HEADLAMPS AND HIGHBEAM INDICATOR REMAIN ON AND ARE DIM.	1. Headlamp switch feed circuit shorted to ground.	1. Check wiring circuit from right headlamp fuse to headlamp. Repeat for left side. Trace short circuit in wiring and repair.
HEADLAMP SWITCH ON (LOW BEAMS ON), ONE LOW BEAM ON AND BOTH HIGH BEAMS DIM.	1. Headlamp feed circuit shorted to ground.	1. Check wiring circuit from right headlamp fuse to headlamp. Repeat for left side. Trace short circuit in wiring and repair.
HEADLAMP SWITCH ON (HIGH BEAMS ON), ONE HIGH BEAM ON AND BOTH LOW BEAMS DIM.	1. Headlamp feed circuit shorted to ground.	1. Check wiring circuit from right headlamp fuse to headlamp. Repeat for left side. Trace short circuit in wiring and repair.
HEADLAMP SWITCH ON, ONE HEADLAMP FILAMENT WILL BE AT FULL INTENSITY AND ALL OTHER FILAMENTS ARE ON AND DIM.	1. Blown headlamp fuse. 2. Open circuit from headlamp fuse to headlamp.	1. Trace short circuit and replace fuse. 2. Repair open headlamp circuit.
1. HEADLAMPS STAY ON WITH KEY OUT (DRLM EQUIPPED VEHICLES).	1. Failed DRLM	1. Replace DRLM.
*Canada vehicles must have lamps ON.		

REMOVAL

On the driver side, the battery and battery tray must be removed to service the headlamp bulb.

(1) Disconnect and isolate the battery negative cable.

(2) Remove the battery tray (Refer to 8 - ELECTRICAL/BATTERY SYSTEM/TRAY - REMOVAL).

(3) Disengage wire connector from headlamp bulb(s).

(4) Remove retaining ring holding bulb(s) to headlamp (Fig. 13).

(5) Pull bulb(s) from headlamp.

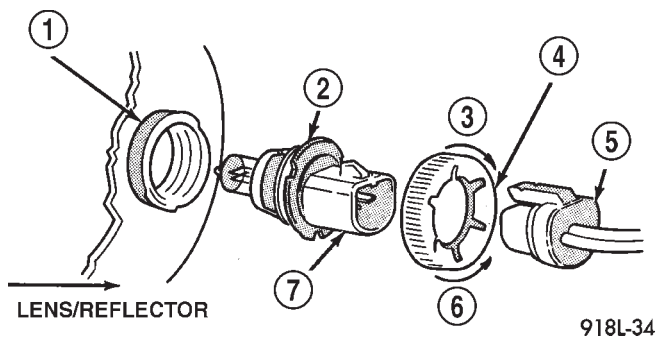
INSTALLATION

CAUTION: Do not touch the bulb glass with fingers or other oily surfaces. Reduced bulb life will result.

(1) Position bulb(s) in headlamp.

(2) Install retaining ring holding bulb(s) to headlamp.

(3) Connect wire connector to headlamp bulb(s).



918L-34

Fig. 13 Headlamp Bulb

- 1 - BULB SOCKET
- 2 - BULB ASSEMBLY
- 3 - LOCK
- 4 - BULB RETAINING RING
- 5 - ELECTRICAL CONNECTOR
- 6 - UNLOCK
- 7 - PLASTIC BASE

(4) Install battery tray, if removed (Refer to 8 - ELECTRICAL/BATTERY SYSTEM/TRAY - INSTALLATION).

(5) Connect battery negative cable.

HEADLAMP RELAY

DESCRIPTION

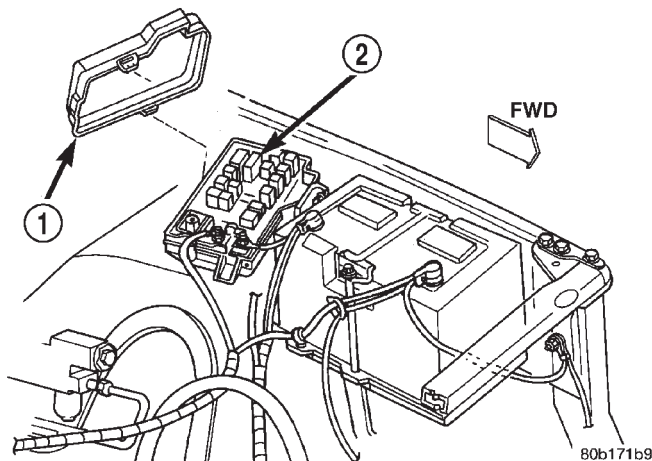


Fig. 14 Power Distribution Center

1 - COVER

2 - POWER DISTRIBUTION CENTER

The headlamp (or security) relay is located in the Power Distribution Center (PDC) near the battery in the engine compartment (Fig. 14). See the fuse and relay layout label affixed to the inside surface of the PDC cover for headlamp relay identification and location. The headlamp relay is a conventional International Standards Organization (ISO) micro relay. Relays conforming to the ISO specifications have common physical dimensions, current capacities, terminal patterns, and terminal functions. The relay is contained within a small, rectangular, molded plastic housing. The relay is connected to all of the required inputs and outputs through its PDC receptacle by five male spade-type terminals that extend from the bottom of the relay base. The ISO designation for each terminal is molded into the base adjacent to the terminal. The ISO terminal designations are as follows:

- **30 (Common Feed)** - This terminal is connected to the movable contact point of the relay.
- **85 (Coil Ground)** - This terminal is connected to the ground feed side of the relay control coil.
- **86 (Coil Battery)** - This terminal is connected to the battery feed side of the relay control coil.
- **87 (Normally Open)** - This terminal is connected to the normally open fixed contact point of the relay.
- **87A (Normally Closed)** - This terminal is connected to the normally closed fixed contact point of the relay.

The headlamp relay cannot be adjusted or repaired. If the relay is damaged or faulty, it must be replaced.

OPERATION

The headlamp (or security) relay is an electromechanical switch that uses a low current input from the high-line or premium Central Timer Module (CTM) to control a high current output to the headlamps. The movable common feed contact point is held against the fixed normally closed contact point by spring pressure. When the relay coil is energized, an electromagnetic field is produced by the coil windings. This electromagnetic field draws the movable relay contact point away from the fixed normally closed contact point, and holds it against the fixed normally open contact point. When the relay coil is de-energized, spring pressure returns the movable contact point back against the fixed normally closed contact point. A resistor or diode is connected in parallel with the relay coil in the relay, and helps to dissipate voltage spikes and electromagnetic interference that can be generated as the electromagnetic field of the relay coil collapses.

The headlamp relay terminals are connected to the vehicle electrical system through a connector receptacle in the Power Distribution Center (PDC). The inputs and outputs of the headlamp relay include:

- The common feed terminal (30) is connected to ground at all times through a take out and eyelet terminal connector of the right headlamp and dash wire harness that is secured by a ground screw to the left fender inner shield near the PDC in the engine compartment.
- The coil ground terminal (85) is connected to the Central Timer Module (CTM) through the security relay control circuit. The CTM energizes the headlamp relay control coil by internally pulling this circuit to ground.
- The coil battery terminal (86) is connected to battery current at all times through a fused B(+) circuit that is internal to the PDC.
- The normally open terminal (87) is connected to the headlamps at all times through the beam select switch low beam output circuit. This circuit provides a path to ground for the headlamps through the common feed terminal when the headlamp relay control coil is energized by the CTM.
- The normally closed terminal (87A) is not connected to any circuit in this application, but is grounded through the common feed terminal when the headlamp relay control coil is de-energized.

The headlamp relay can be diagnosed using conventional diagnostic tools and methods.

DIAGNOSIS AND TESTING - HEADLAMP RELAY

The headlamp (or security) relay (Fig. 15) is located in the Power Distribution Center (PDC) near the battery in the engine compartment. See the fuse and relay layout label affixed to the inside surface of

HEADLAMP RELAY (Continued)

the PDC cover for headlamp relay identification and location. 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) Remove the headlamp relay from the PDC. (Refer to 8 - ELECTRICAL/LAMPS/LIGHTING - EXTERIOR/HEADLAMP RELAY - REMOVAL).

(2) A relay in the de-energized position should have continuity between terminals 87A and 30, and no continuity between terminals 87 and 30. If OK, go to Step 3. If not OK, replace the faulty relay.

(3) Resistance between terminals 85 and 86 (electromagnet) should be 75 ± 5 ohms. If OK, go to Step 4. If not OK, replace the faulty relay.

(4) Connect a battery to terminals 85 and 86. There should now be continuity between terminals 30 and 87, and no continuity between terminals 87A and 30. If OK, test the relay input and output circuits. If not OK, replace the faulty relay.

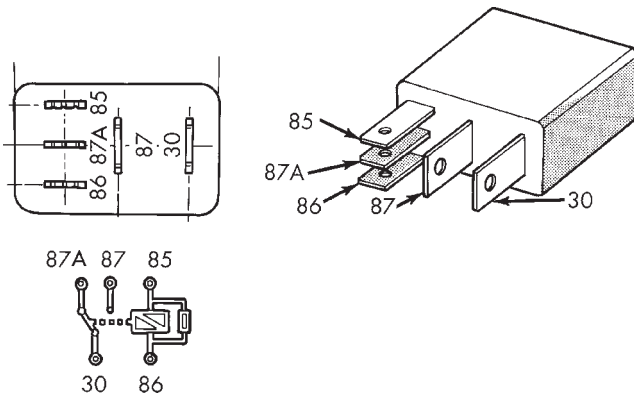


Fig. 15 Headlamp Relay

- 30 - COMMON FEED
- 85 - COIL GROUND
- 86 - COIL BATTERY
- 87 - NORMALLY OPEN
- 87A - NORMALLY CLOSED

REMOVAL

(1) Disconnect and isolate the battery negative cable.

(2) Unlatch and remove the cover from the Power Distribution Center (PDC) (Fig. 16).

(3) See the fuse and relay layout label affixed to the underside of the PDC cover for headlamp (or security) relay identification and location.

(4) Remove the headlamp relay by grasping it firmly and pulling it straight out from the receptacle in the PDC.

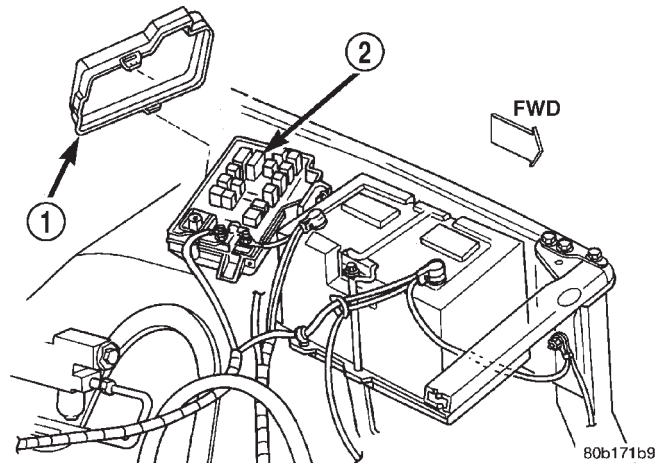


Fig. 16 Power Distribution Center

- 1 - COVER
- 2 - POWER DISTRIBUTION CENTER

INSTALLATION

(1) See the fuse and relay layout label affixed to the underside of the PDC cover for the proper headlamp (or security) relay location.

(2) Position the headlamp relay in the proper receptacle in the PDC.

(3) Align the headlamp relay terminals with the terminal cavities in the PDC receptacle.

(4) Push firmly and evenly on the top of the headlamp relay until the terminals are fully seated in the terminal cavities in the PDC receptacle.

(5) Reinstall and latch the cover onto the PDC.

(6) Connect the battery negative cable.

HEADLAMP SWITCH

DESCRIPTION

The headlamp switch module is located on the instrument panel. The headlamp switch controls the parking lamps, and the headlamps. A separate switch in the module controls the interior lamps and instrument cluster illumination. This switch also contains a rheostat for controlling the illumination level of the cluster lamps.

OPERATION

The headlamp switch has an off position, a parking lamp position, and a headlamp on position. High beams are controlled by the multifunction switch on the steering column. The headlamp switch cannot be repaired. It must be replaced.

HEADLAMP SWITCH (Continued)

DIAGNOSIS AND TESTING - HEADLAMP SWITCH

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.

WARNING: ON VEHICLES EQUIPPED WITH AIRBAGS, REFER TO ELECTRICAL, RESTRAINTS 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) Disconnect and isolate the battery negative cable. Remove the headlamp switch from the instrument panel. (Refer to 8 - ELECTRICAL/LAMPS/LIGHTING - EXTERIOR/HEADLAMP SWITCH - REMOVAL) for the procedures. Unplug the headlamp switch wire harness connectors. Check for continuity between the left door jamb switch sense circuit cavity of the headlamp switch wire harness connector and a good ground. There should be continuity with the driver door open, and no continuity with the driver door closed. If OK, go to Step 2. If not OK, repair the circuit to the driver door jamb switch as required.

(2) Remove the Central Timer Module (CTM) from its mounting bracket to access the CTM wire harness connectors. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/BODY CONTROL/CENTRAL TIMER MODUL - REMOVAL) for the procedures. Unplug the 14-way CTM wire harness connector. Remove the key from the ignition lock cylinder. Check for continuity between the key-in ignition switch sense circuit cavity of the 14-way CTM wire harness connector and a good ground. There should be no continuity. If OK, go to Step 3. If not OK, repair the short circuit as required.

(3) Check for continuity between the key-in ignition switch sense circuit cavities of the 14-way CTM wire harness connector and the headlamp switch wire harness connector. There should be continuity. If OK, go to Step 4. If not OK, repair the open circuit as required.

(4) Check for continuity between the left front door jamb switch sense circuit terminal and the key-in ignition switch sense circuit terminal of the headlamp switch. There should be no continuity with the switch in the Off position, and continuity with the switch in the park or head lamps On position. If OK, (Refer to 8 - ELECTRICAL/ELECTRONIC CON-

TROL MODULES/BODY CONTROL/CENTRAL TIMER MODUL - DIAGNOSIS AND TESTING) If not OK, replace the faulty headlamp switch.

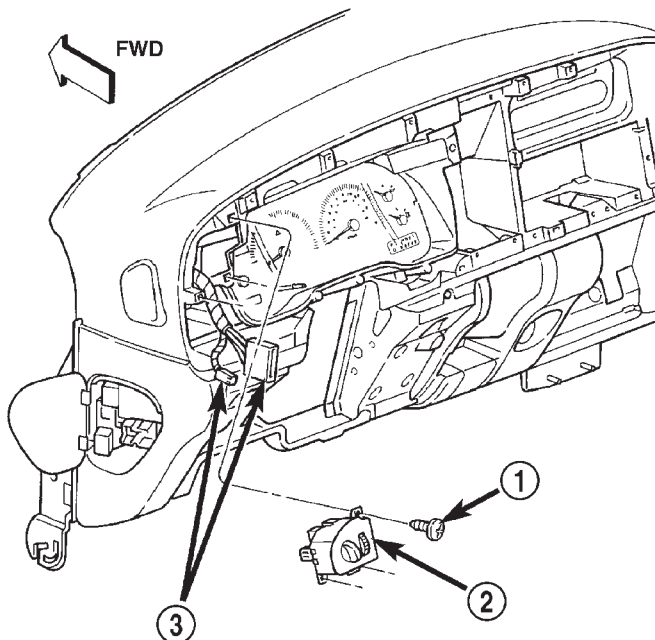
REMOVAL

WARNING: ON VEHICLES EQUIPPED WITH AIRBAGS, DISABLE THE AIRBAG SYSTEM BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. DISCONNECT AND ISOLATE THE BATTERY NEGATIVE (GROUND) CABLE, THEN WAIT TWO MINUTES FOR THE AIRBAG SYSTEM CAPACITOR TO DISCHARGE BEFORE PERFORMING FURTHER DIAGNOSIS OR SERVICE. THIS IS THE ONLY SURE WAY TO DISABLE THE AIRBAG SYSTEM. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.

(1) Disconnect and isolate the battery negative cable.

(2) Remove the cluster bezel from the instrument panel. (Refer to 23 - BODY/INSTRUMENT PANEL/CLUSTER BEZEL - REMOVAL).

(3) Remove the three screws that secure the headlamp switch to the instrument panel (Fig. 17).



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Fig. 17 Headlamp Switch Removal

- 1 - SCREWS (3)
- 2 - HEADLAMP SWITCH
- 3 - INSTRUMENT PANEL WIRE HARNESS CONNECTORS

HEADLAMP SWITCH (Continued)

(4) Pull the headlamp switch away from the instrument panel far enough to access the instrument panel wire harness connectors.

(5) Disconnect the two instrument panel wire harness connectors for the headlamp switch from the connector receptacles on the back of the switch.

(6) Remove the headlamp switch from the instrument panel.

INSTALLATION

WARNING: ON VEHICLES EQUIPPED WITH AIRBAGS, DISABLE THE AIRBAG SYSTEM BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. DISCONNECT AND ISOLATE THE BATTERY NEGATIVE (GROUND) CABLE, THEN WAIT TWO MINUTES FOR THE AIRBAG SYSTEM CAPACITOR TO DISCHARGE BEFORE PERFORMING FURTHER DIAGNOSIS OR SERVICE. THIS IS THE ONLY SURE WAY TO DISABLE THE AIRBAG SYSTEM. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.

(1) Position the headlamp switch to the instrument panel.

(2) Reconnect the two instrument panel wire harness connectors for the headlamp switch to the connector receptacles on the back of the switch.

(3) Position the headlamp switch into the instrument panel.

(4) Install and tighten the three screws that secure the headlamp switch to the instrument panel. Tighten the screws to 2.2 N·m (20 in. lbs.).

(5) Reinstall the cluster bezel onto the instrument panel. (Refer to 23 - BODY/INSTRUMENT PANEL/CLUSTER BEZEL - INSTALLATION).

(6) Connect the battery negative cable.

HEADLAMP UNIT

REMOVAL

(1) Disconnect and isolate the battery negative cable.

(2) Remove push-in fastener attaching seal to radiator closure panel.

(3) Remove park and turn signal lamp.

(4) Remove screws attaching top of headlamp module to radiator closure panel (Fig. 18).

(5) From behind front bumper, remove screws attaching bottom of headlamp module to radiator closure panel.

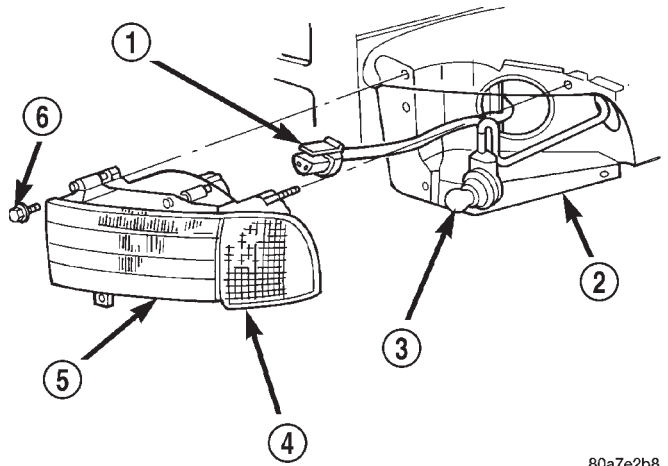
(6) From behind the bumper, loosen the bumper mounting nuts to allow the bumper to lower for

clearance. This is only necessary on the side to be removed.

(7) Separate headlamp module from radiator closure panel.

(8) Disengage wire connector from headlamp bulb(s) (Fig. 19).

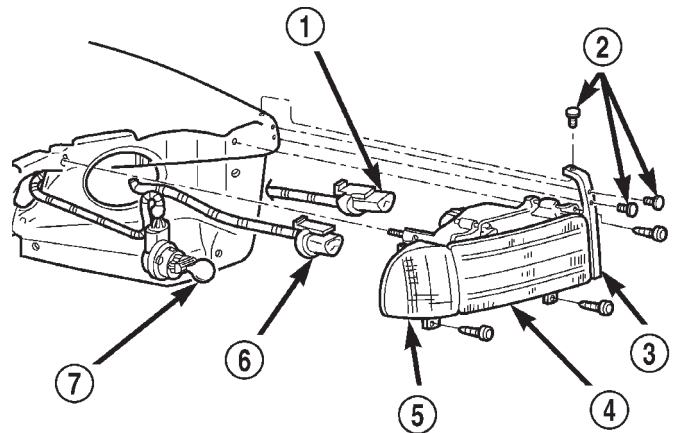
(9) Separate headlamp module from vehicle.



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Fig. 18 Headlamp — SLT

- 1 - HEADLAMP SOCKET
- 2 - CARRIER BRACKET
- 3 - TURN AND PARK LAMP BULB
- 4 - TURN AND PARK LAMP HOUSING
- 5 - HEADLAMP HOUSING
- 6 - SCREW



80b5cb8f

Fig. 19 Headlamp-Sport

- 1 - HIGH BEAM BULB SOCKET
- 2 - PUSH-IN FASTENER
- 3 - SEAL
- 4 - HEADLAMP MODULE
- 5 - TURN/PARK LAMP MODULE
- 6 - LOW BEAM BULB SOCKET
- 7 - TURN/PARK LAMP BULB

HEADLAMP UNIT (Continued)

INSTALLATION

- (1) If removed, install headlamp bulb(s).
- (2) Connect headlamp bulb wire connector(s).
- (3) Position headlamp in radiator closure panel.
- (4) From behind front bumper, install the screws attaching bottom of headlamp module to radiator closure panel.
- (5) From behind the bumper, tighten the bumper mounting nuts.
- (6) Install the screws attaching top of headlamp module to radiator closure panel.
- (7) Install park and turn signal lamp.
- (8) Install push-in fastener attaching seal to radiator closure panel.
- (9) Connect the battery negative cable.

ADJUSTMENTS**LAMP ALIGNMENT SCREEN PREPARATION**

- (1) Position vehicle on a level surface perpendicular to a flat wall 7.62 meters (25 ft) away from front of headlamp lens (Fig. 20).

(2) If necessary, tape a line on the floor 7.62 meters (25 ft) away from and parallel to the wall.

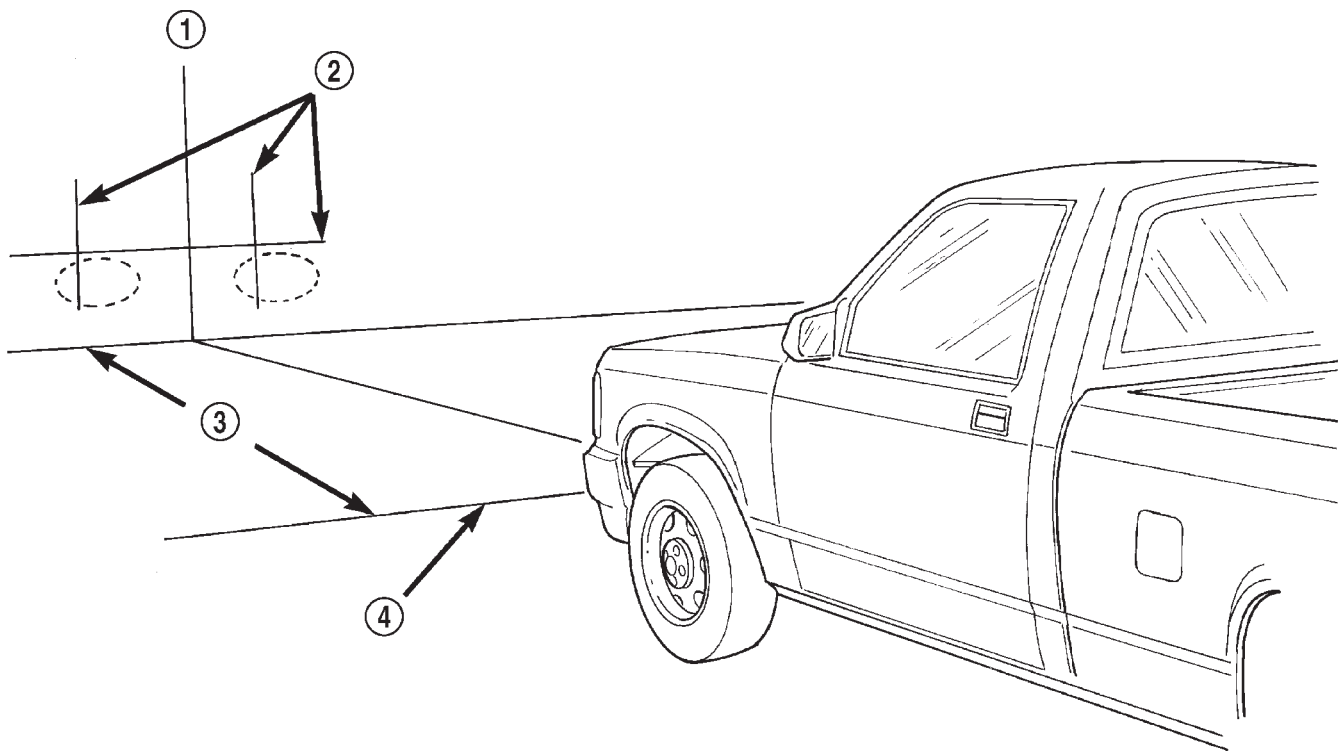
(3) Up 1.27 meters (5 feet) from the floor, tape a line on the wall at the centerline of the vehicle. Sight along the centerline of the vehicle (from rear of vehicle forward) to verify accuracy of the line placement.

(4) Rock vehicle side-to-side three times to allow suspension to stabilize.

(5) Jounce front suspension three times by pushing downward on front bumper and releasing.

(6) 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.

(7) 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.



8020cdbi

Fig. 20 Lamp Alignment Screen—Typical

1 - CENTER OF VEHICLE
2 - CENTER OF HEADLAMP

3 - 7.62 METERS (25 FT.)
4 - FRONT OF HEADLAMP

HEADLAMP UNIT (Continued)

VEHICLE PREPARATION FOR HEADLAMP ALIGNMENT

- (1) Verify headlamp dimmer switch and high beam indicator operation.
- (2) Verify headlamps are set for low beam operation.
- (3) Correct defective components that could hinder proper headlamp alignment.
- (4) Verify proper tire inflation.
- (5) Clean headlamp lenses.
- (6) Verify that luggage area is not heavily loaded.
- (7) 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.

HEADLAMP ADJUSTMENT

Headlamps can be aligned using the screen method provided or alignment tool C-4466-A or equivalent can be used. refer to the instructions provided with the tool for proper procedures.

A properly aimed low beam headlamp will project top edge of high intensity pattern on screen from 50 mm (2 in.) above to 50 mm (2 in.) below headlamp centerline. The side-to-side outboard edge of high intensity pattern should be from 50 mm (2 in.) left to 50 mm (2 in.) right of headlamp centerline. (Fig. 20) **The preferred headlamp alignment is 1" down for the up/down adjustment and 0 for the left/right adjustment.** The high beam pattern should be correct when the low beams are aligned properly.

To adjust headlamp aim, rotate alignment screws (Fig. 21) to achieve the specified high intensity pattern.

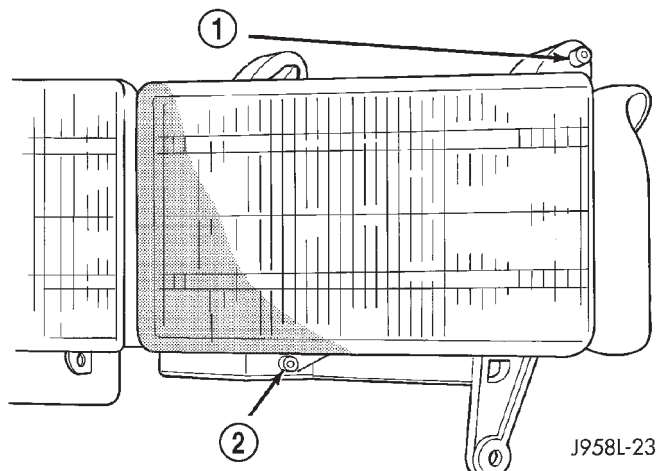


Fig. 21 Aero Headlamp Alignment

- 1 - LEFT AND RIGHT ADJUSTMENT SCREW
- 2 - UP AND DOWN ADJUSTMENT SCREW

LICENSE PLATE LAMP

REMOVAL

- (1) Disconnect and isolate the battery negative cable.
- (2) Remove license plate lamp lens.
- (3) Pull bulb from license plate lamp.

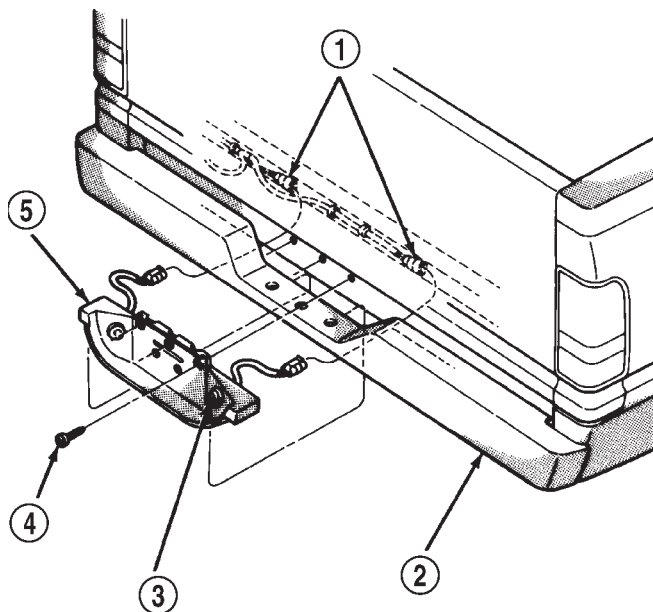
INSTALLATION

- (1) Install bulb in license plate lamp.
- (2) Install license plate lamp lens.
- (3) Connect the battery negative cable.

LICENSE PLATE LAMP UNIT

REMOVAL

- (1) Disconnect and isolate the battery negative cable.
- (2) Remove screws attaching license plate panel to cargo box.
- (3) Disengage license plate lamp wire connector from body wire harness (Fig. 22).
- (4) Separate license plate lamp from vehicle.



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Fig. 22 License Plate Lamp Panel

- 1 - LIGHTING HARNESS
- 2 - BUMPER
- 3 - LICENSE PLATE LAMP
- 4 - SCREW
- 5 - LAMP PANEL

INSTALLATION

- (1) Position license plate lamp in vehicle.

LICENSE PLATE LAMP UNIT (Continued)

- (2) Engage license plate lamp wire connector to body wire harness.
- (3) Install screws attaching license plate panel to cargo box.
- (4) Connect the battery negative cable.

MARKER LAMP

REMOVAL

Individual lamps may be replaced by removing the lamp from the light bar. Using a flat blade screwdriver, carefully pry lamp to disengage clips attaching ID lamp to retainer.

- (1) Disconnect and isolate the battery negative cable.
- (2) Remove four screws attaching rear ID lamps to tailgate (Fig. 23).
- (3) Separate ID lamps from tailgate.
- (4) Disengage ID lamp wire connector from body wire harness.
- (5) Separate ID lamp from vehicle.

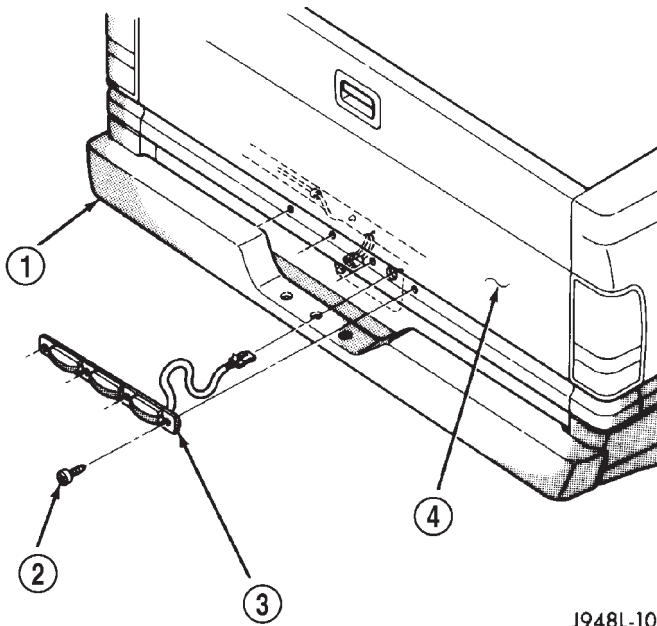


Fig. 23 Rear Identification Lamps

- 1 - BUMPER
- 2 - SCREW
- 3 - TAILGATE MARKER LAMPS
- 4 - TAILGATE

INSTALLATION

- (1) Position ID lamp on vehicle.
- (2) Engage ID lamp wire connector to body wire harness.
- (3) Install screws attaching rear ID lamps to tailgate.
- (4) Connect the battery negative cable.

MULTI-FUNCTION SWITCH

DESCRIPTION

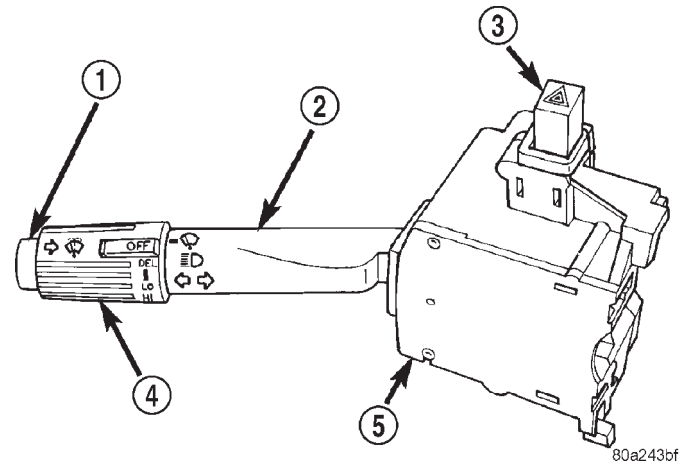


Fig. 24 Multi-Function Switch

- 1 - WINDSHIELD WASHER BUTTON
- 2 - CONTROL STALK
- 3 - HAZARD WARNING BUTTON
- 4 - WINDSHIELD WIPER CONTROL
- 5 - MULTI-FUNCTION SWITCH

The multi-function switch is secured with two screws to the left side of the upper steering column housing at the top of the steering column, just below the steering wheel (Fig. 24). The only visible parts of the multi-function switch are the control stalk that extends through a dedicated opening in the left side of the upper steering column shrouds, and the hazard warning switch push button that protrudes through an opening in the upper steering column shroud on the top of the steering column. The remainder of the switch, its mounting provisions, and its electrical connections are all concealed beneath the steering column shrouds. The multi-function switch control stalk has both nomenclature and International Control and Display Symbol graphics applied to it, which identify its many functions. An International Control and Display Symbol icon for "Hazard Warning" is applied to the top of the hazard warning switch push button.

The switch housing and its controls are constructed of molded black plastic. A single connector receptacle with up to twenty-four terminals is located on the back of the switch housing and connects the switch to the vehicle electrical system through a take out and connector of the instrument panel wire harness. The connector receptacle also has a threaded receptacle for a screw, which secures the wire harness connector to the switch connector receptacle.

The multi-function switch supports the following functions and features:

MULTI-FUNCTION SWITCH (Continued)

- **Continuous Wipe Modes** - The control knob of the multi-function switch provides two continuous wipe switch positions, low speed or high speed.

- **Hazard Warning Control** - The internal circuitry and hardware of the multi-function switch provide detent switching for activation and deactivation of the hazard warning system.

- **Headlamp Beam Selection** - The internal circuitry and hardware of the multi-function switch provide detent switching for selection of the headlamp high or low beams.

- **Headlamp Optical Horn** - The internal circuitry and hardware of the multi-function switch includes momentary switching of the headlamp high beam circuits to provide an optical horn feature (sometimes referred to as flash-to-pass), which allows the vehicle operator to momentarily flash the headlamp high beams as an optical signalling device.

- **Intermittent Wipe Mode** - The control knob of the multi-function switch provides an intermittent wipe mode with multiple delay interval positions.

- **Turn Signal Control** - The internal circuitry and hardware of the multi-function switch provide both momentary non-detent switching and detent switching with automatic cancellation for both the left and right turn signals.

- **Washer Mode** - A button on the end of the control stalk of the multi-function switch provides washer system operation when the button is depressed towards the steering column.

The multi-function switch cannot be adjusted or repaired. If any function of the switch is faulty, or if the switch is damaged, the entire switch unit must be replaced.

OPERATION

The multi-function switch uses conventionally switched outputs and a variable resistor to control the many functions and features it provides using hard wired circuitry. The switch is grounded at all times through a single wire take out with an eyelet terminal connector of the instrument panel wire harness that is secured by a nut to a ground stud located on the instrument panel armature, just above and to the left of the glove box opening. When the ignition switch is in the Accessory or On positions, battery current from a fuse in the Junction Block (JB) is provided through a fused ignition switch output (run-acc) circuit. Following are descriptions of how the multi-function switch operates to control the many functions and features it provides:

- **Continuous Wipe Modes** - When the control knob of the multi-function switch is rotated to the High or Low positions, the circuitry within the switch provides a battery current output directly to the high or low speed brush of the wiper motor. When the control knob is in the Off position, the circuitry within the switch connects the output of the wiper motor park switch to the low speed brush of the wiper motor.

- **Hazard Warning Control** - The hazard warning push button is pushed down to unlatch the switch and activate the hazard warning system, and pushed down again to latch the switch and turn the system off. When the hazard warning switch is latched (hazard warning off), the push button will be in a lowered position on the top of the steering column shroud; and, when the hazard warning switch is unlatched (hazard warning on), the push button will be in a raised position. The multi-function switch hazard warning circuitry simultaneously provides a signal to the hazard warning sense of the combination flasher to activate or deactivate the flasher output, and directs the output of the flasher to the hazard warning lamps.

- **Headlamp Beam Selection** - The multi-function switch control stalk is pulled towards the steering wheel past a detent, then released to actuate the headlamp beam selection switch. Each time the control stalk is actuated in this manner, the opposite headlamp mode from what is currently selected will be activated. The internal circuitry of the headlamp beam selection switch directs the output of the headlamp switch through hard wired circuitry to activate the selected headlamp beam.

- **Headlamp Optical Horn** - The left multi-function switch control stalk is pulled towards the steering wheel to just before a detent, to momentarily activate the headlamp high beams. The high beams will remain illuminated until the control stalk is released. The internal circuitry of the headlamp beam selection switch provides a momentary ground path to the headlamp high beams.

- **Intermittent Wipe Mode** - When the multi-function switch control knob is rotated to the Delay position, the circuitry within the switch connects the output of the wiper motor relay to the low speed brush of the wiper motor and provides a battery current signal to the Central Timer Module (CTM). If the Delay mode is selected, the control knob can then be rotated to multiple minor detent positions, which actuates a variable resistor within the switch and provides a hard wired output to the CTM that signals the desired delay interval for the intermittent wiper feature.

MULTI-FUNCTION SWITCH (Continued)

- **Turn Signal Control** - The multi-function switch control stalk actuates the turn signal switch. When the control stalk is moved in the upward direction, the right turn signal circuitry is activated; and, when the control stalk is moved in the downward direction, the left turn signal circuitry is activated. The multi-function switch turn signal circuitry simultaneously provides a signal to the turn signal sense of the combination flasher to activate or deactivate the flasher output, and directs the output of the flasher to the proper turn signal lamps. The turn signal switch has a detent position in each direction that provides turn signals with automatic cancellation, and an intermediate, momentary position in each direction that provides turn signals only until the multi-function switch control stalk is released. When the control stalk is moved to a turn signal switch detent position, the cancel actuator extends toward the center of the steering column. A turn signal cancel cam that is integral to the clockspring mechanism rotates with the steering wheel and the cam lobes contact the cancel actuator when it is extended from the multi-function switch. When the steering wheel is rotated during a turning maneuver, one of the two turn signal cancel cam lobes will contact the turn signal cancel actuator. The cancel actuator latches against the cancel cam rotation in the direction opposite that which is signaled. In other words, if the left turn signal detent is selected, the lobes of the cancel cam will ratchet past the cancel actuator when the steering wheel is rotated to the left, but will unlatch the cancel actuator as the steering wheel rotates to the right and returns to center, which will cancel the turn signal event and release the control stalk from the detent so it returns to the neutral Off position.

- **Washer Mode** - Pushing the button on the end of the multi-function switch control knob towards the steering column provides a battery current output through the momentary single pole, single throw washer switch circuitry to operate the washer pump/motor and provides a signal to the CTM. If the wipers are not operating when the washer switch is actuated, the CTM will operate the wiper motor for as long as the washer switch is depressed plus about three additional wipe cycles. If the wipers are operating in the intermittent mode when the washer switch is actuated, the CTM will operate the wiper motor at a fixed low speed for as long as the washer switch is depressed plus about three additional wipe cycles before the wipers return to the selected intermittent wipe interval.

DIAGNOSIS AND TESTING - MULTI-FUNCTION SWITCH

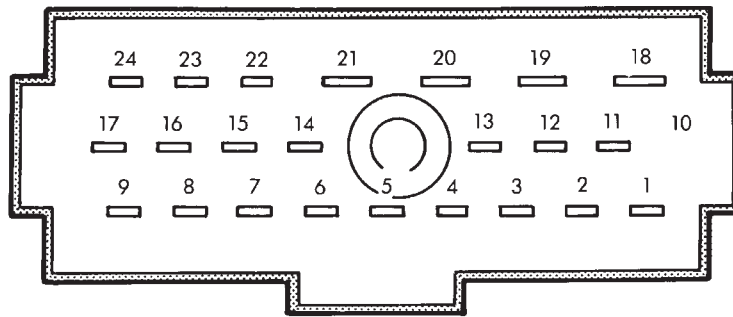
Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

WARNING: ON VEHICLES EQUIPPED WITH AIRBAGS, DISABLE THE AIRBAG SYSTEM BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. DISCONNECT AND ISOLATE THE BATTERY NEGATIVE (GROUND) CABLE, THEN WAIT TWO MINUTES FOR THE AIRBAG SYSTEM CAPACITOR TO DISCHARGE BEFORE PERFORMING FURTHER DIAGNOSIS OR SERVICE. THIS IS THE ONLY SURE WAY TO DISABLE THE AIRBAG SYSTEM. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.

(1) Disconnect and isolate the battery negative cable. Disconnect the instrument panel wire harness connector from the multi-function switch connector receptacle.

(2) Using an ohmmeter, perform the continuity and resistance tests at the terminals in the multi-function switch connector receptacle as shown in the Multi-Function Switch Tests chart (Fig. 25).

MULTI-FUNCTION SWITCH (Continued)



VIEW FROM TERMINAL CASE

Fig. 25 Multi-Function Switch Tests

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MULTI-FUNCTION SWITCH TESTS		
SWITCH POSITIONS		CONTINUITY BETWEEN
TURN SIGNAL	HAZARD WARNING	
Neutral	Off	Pins 12, 14, & 15
Left	Off	Pins 15, 16, & 17
Left	Off	Pins 12 & 14
Left	Off	*Pins 22 & 23
Right	Off	Pins 11, 12, & 17
Right	Off	Pins 14 & 15
Right	Off	*Pins 23 & 24
Neutral	On	Pins 11, 12, 13, 15, & 16
* with optional corner lamps		
WIPER & WASHER SWITCH POSITIONS		CONTINUITY BETWEEN
Off		Pins 6 & 7
**Delay		Pins 1, 2, & 4, Pins 8 & 9
Low		Pins 4 & 6
High		Pins 4 & 5
Wash		Pins 3 & 4
**Resistance between Pins 1 & 2 at Maximum delay position is between 270 and 330 kilohms, and at Minimum delay position is zero ohms.		
HEADLAMP BEAM SELECTION SWITCH POSITIONS		CONTINUITY BETWEEN
Low Beams		Pins 18 & 19
High Beams		Pins 19 & 20
Flash		Pins 19, 20, & 21

MULTI-FUNCTION SWITCH (Continued)

(3) If the multi-function switch fails any of the continuity or resistance tests, replace the faulty switch unit as required.

REMOVAL

WARNING: ON VEHICLES EQUIPPED WITH AIRBAGS, DISABLE THE AIRBAG SYSTEM BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. DISCONNECT AND ISOLATE THE BATTERY NEGATIVE (GROUND) CABLE, THEN WAIT TWO MINUTES FOR THE AIRBAG SYSTEM CAPACITOR TO DISCHARGE BEFORE PERFORMING FURTHER DIAGNOSIS OR SERVICE. THIS IS THE ONLY SURE WAY TO DISABLE THE AIRBAG SYSTEM. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.

(1) Disconnect and isolate the battery negative cable.

(2) If the vehicle is so equipped, unscrew the lever from the tilt steering column adjuster mechanism located on the left side of the column just below the multi-function switch control stalk. Turn the lever counterclockwise to unscrew it from the adjuster.

(3) From below the steering column, remove the two outboard screws that secure the upper shroud to the lower outer shroud (Fig. 26).

(4) Press carefully inward on each side of the outer shrouds to release the snap features and remove the upper outer shroud from the lower outer shroud.

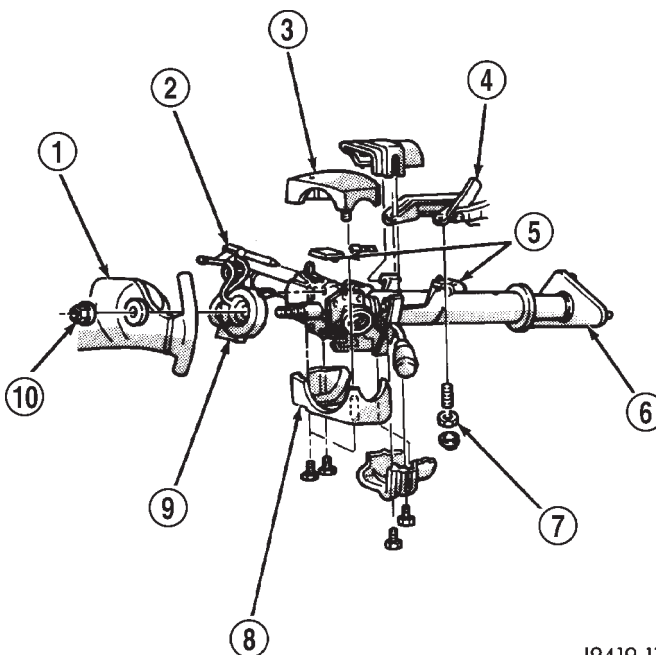
(5) From below the steering column, remove the one center screw that secures the lower outer shroud to the steering column housing.

(6) Remove the lower outer shroud from the steering column.

(7) From below the steering column, remove the two screws that secure the lower inner shroud to the steering column housing and the upper inner shroud.

(8) Press carefully inward on the gearshift lever side of the inner shrouds to release the snap features and remove the lower inner shroud from the steering column.

(9) Carefully lift the upper inner shroud upward far enough to access the multi-function switch mounting screws.



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Fig. 26 Steering Column Shrouds Remove/Install - Typical

- 1 - STEERING WHEEL
- 2 - TILT LEVER
- 3 - UPPER SHROUD
- 4 - PANEL BRACKET
- 5 - SPACER
- 6 - TOE PLATE
- 7 - NUT
- 8 - LOWER SHROUD
- 9 - CLOCK SPRING
- 10 - NUT

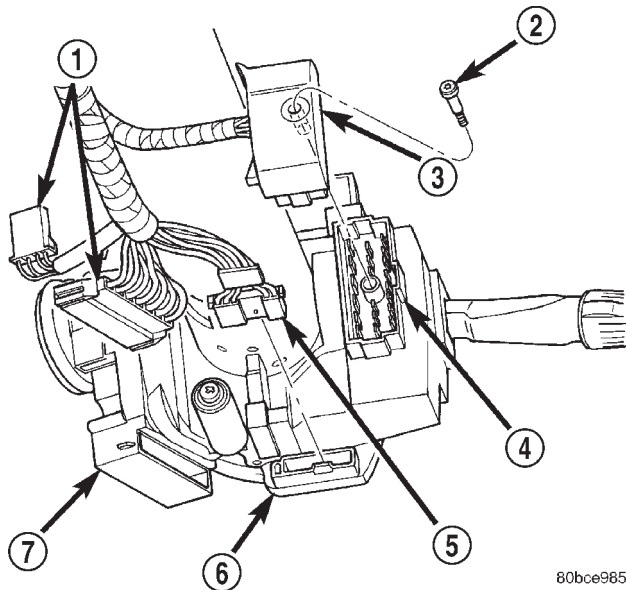
(10) Remove the two tamper proof screws (a Snap On tamper proof Torx bit TTXR20B2 or equivalent is required) that secure the multi-function switch to the steering column housing.

(11) Gently pull the multi-function switch away from the steering column far enough to access and remove the screw that secures the instrument panel wire harness connector for the multi-function switch to the switch connector receptacle (Fig. 27).

(12) Disconnect the instrument panel wire harness connector from the multi-function switch connector receptacle.

(13) Remove the multi-function switch from the steering column.

MULTI-FUNCTION SWITCH (Continued)

**Fig. 27 Multi-Function Switch Connector**

- 1 - WIRE HARNESS CONNECTORS
- 2 - SCREW
- 3 - WIRE HARNESS CONNECTOR
- 4 - MULTI-FUNCTION SWITCH
- 5 - WIRE HARNESS CONNECTOR
- 6 - CLOCKSPRING
- 7 - IGNITION SWITCH

INSTALLATION

WARNING: ON VEHICLES EQUIPPED WITH AIRBAGS, DISABLE THE AIRBAG SYSTEM BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. DISCONNECT AND ISOLATE THE BATTERY NEGATIVE (GROUND) CABLE, THEN WAIT TWO MINUTES FOR THE AIRBAG SYSTEM CAPACITOR TO DISCHARGE BEFORE PERFORMING FURTHER DIAGNOSIS OR SERVICE. THIS IS THE ONLY SURE WAY TO DISABLE THE AIRBAG SYSTEM. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.

- (1) Position the multi-function switch next to the steering column.
- (2) Reconnect the instrument panel wire harness connector for the multi-function switch to the switch connector receptacle (Fig. 27).
- (3) Install and tighten the screw that secures the instrument panel wire harness connector for the multi-function switch to the switch connector receptacle. Tighten the screw to 2 N·m (18 in. lbs.).
- (4) Position the multi-function switch onto the steering column.

(5) Carefully lift the upper inner shroud upward far enough to access the multi-function switch mounting screws.

(6) Install and tighten the two tamper proof screws (a Snap On tamper proof Torx bit TTXR20B2 or equivalent is required) that secure the multi-function switch to the steering column housing. Tighten the screws to 2 N·m (18 in. lbs.).

(7) Position the lower inner shroud onto the steering column (Fig. 26). Be certain to insert the gearshift lever hider strip into the channel located on the inside surface of the shroud.

(8) Align the locking tabs on the gearshift lever side of the upper inner shroud with the receptacles on the lower inner shroud and apply hand pressure to snap them together.

(9) From below the steering column, install and tighten the two screws that secure the lower inner shroud to the steering column housing and the upper inner shroud. Tighten the screws to 2 N·m (18 in. lbs.).

(10) Position the lower outer shroud onto the steering column.

(11) From below the steering column, install and tighten the one center screw that secures the lower outer shroud to the steering column housing. Tighten the screw to 2 N·m (18 in. lbs.).

(12) Align the locking tabs on the upper outer shroud with the receptacles on the lower outer shroud and apply hand pressure to snap them together.

(13) From below the steering column, install and tighten the two outboard screws that secure the lower outer shroud to the upper outer shroud. Tighten the screws to 2 N·m (18 in. lbs.).

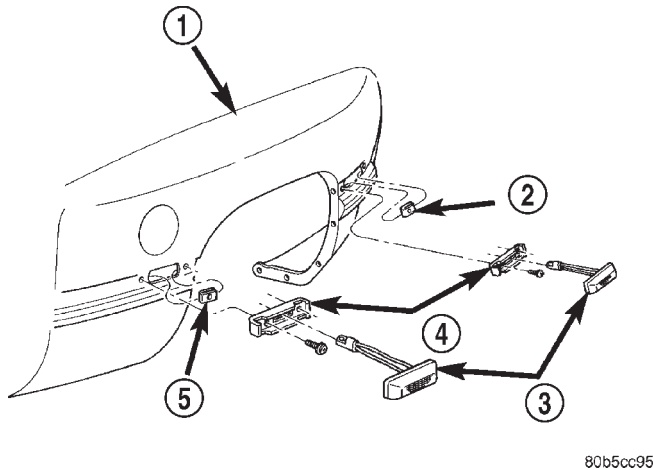
(14) If the vehicle is so equipped, reinstall the lever into the tilt steering column adjuster on the left side of the column. Turn the lever clockwise to screw it into the adjuster.

(15) Reconnect the battery negative cable.

OUTBOARD IDENTIFICATION LAMP**REMOVAL**

- (1) Disconnect and isolate the battery negative cable.
- (2) Using a flat blade screw driver, carefully pry lamp to disengage clips attaching ID lamp to retainer (Fig. 28).
- (3) Separate ID lamp from retainer.
- (4) Disengage lamp bulb socket from lamp.
- (5) Remove screws attaching lamp retainer to rear fender.
- (6) Separate retainer from rear fender.

OUTBOARD IDENTIFICATION LAMP (Continued)

**Fig. 28 Side Identification Lamps**

- 1 - FENDER
- 2 - U-NUT
- 3 - IDENTIFICATION LAMP
- 4 - RETAINER
- 5 - U-NUT

INSTALLATION

- (1) Position retainer on rear fender.
- (2) Install screws attaching lamp retainer to rear fender.
- (3) Engage lamp bulb socket to lamp.
- (4) Position and press ID lamp in retainer.
- (5) Connect the battery negative cable.

PARK/TURN SIGNAL LAMP**REMOVAL**

- (1) Disconnect and isolate the battery negative cable.
- (2) Remove park and turn signal lamp.
- (3) Rotate bulb socket 1/4 turn counterclockwise and pull turn signal lamp socket from back of lamp.
- (4) Pull park and turn signal lamp bulb from socket.

INSTALLATION

- (1) Install park and turn signal lamp bulb in socket.
- (2) Install park and turn signal lamp socket into back of lamp.
- (3) Install park/turn signal lamp.
- (4) Connect the battery negative cable.

PARK/TURN SIGNAL LAMP UNIT**REMOVAL**

- (1) Disconnect and isolate the battery negative cable.
- (2) Remove screw attaching the park lamp to headlamp module.
- (3) Grasp lamp and pull forward to disengage clip attaching park/turn lamp to headlamp module.
- (4) Separate park lamp headlamp module.
- (5) Rotate park/turn signal socket 1/4 turn counter-clockwise and remove from back of lamp.
- (6) Remove side marker socket from back of lamp.
- (7) Separate park/turn signal lamp from vehicle.

INSTALLATION

- (1) Install side marker socket from back of lamp.
- (2) Install park/turn signal socket in back of lamp.
- (3) Install park/turn signal lamp in vehicle.
- (4) Install screw attaching the park lamp to headlamp module.
- (5) Connect the battery negative cable.

TAIL LAMP**DESCRIPTION**

There are two types of tail lamp modules used on the Ram Truck. One type is integrated into the pick-up bed, The other is a bracket mounted module used on the Ram Truck Cab and Chassis. The Cab and Chassis module is made up of a housing, lens, and two bulbs. This type of module has license plate illumination built into the lens. The integrated pick up module contains a housing, lens, and two bulbs. A dual filament bulb is used for tail, stop, and turn signal operations. A separate bulb is used for back-up illumination.

OPERATION

Tail lamp functions are controlled by the headlamp switch. Turn signal operations are controlled by the multifunction switch. Stop lamp functions are controlled by the stoplamp switch. The back-up lamps are controlled by the back-up lamp switch on the transmission.

REMOVAL**CHASSIS CAB**

- (1) Disconnect and isolate the battery negative cable.
- (2) Remove screws holding tail lamp lens to lamp body.

TAIL LAMP (Continued)

- (3) Separate lens from lamp.
- (4) Grasp bulb, push in slightly and rotate 1/2 turn counter-clockwise.

PICKUP

- (1) Disconnect and isolate the battery negative cable.
- (2) Remove screws from tail lamp.
- (3) Grasp lamp, firmly pull lamp rearward to disengage retaining studs.
- (4) Remove socket from tail lamp.
- (5) Separate tail lamp from cargo box.
- (6) Pull bulb from socket.

INSTALLATION**CHASSIS CAB**

- (1) Install bulb in socket.
- (2) Install lamp lens.
- (3) Connect the battery negative cable.

PICKUP

- (1) Install bulb in socket.
- (2) Install socket in tail lamp.
- (3) Position tail lamp in cargo box, engage retaining studs and install screws.
- (4) Connect the battery negative cable.

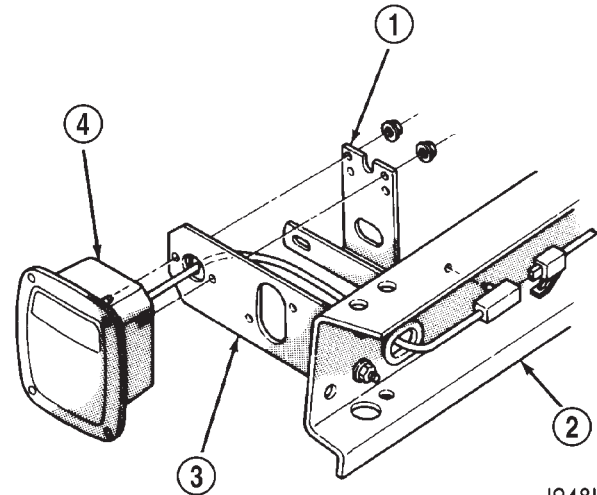
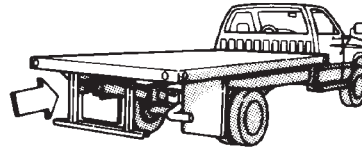
TAIL LAMP UNIT

REMOVAL**CAB CHASSIS**

- (1) Disconnect and isolate the battery negative cable.
- (2) Remove nuts attaching tail lamp to mounting bracket (Fig. 29).
- (3) Disengage tail lamp wire connector from body wire harness.
- (4) Separate tail lamp from vehicle.

PICKUP

- (1) Disconnect and isolate the battery negative cable.
- (2) Remove screws from tail lamp (Fig. 30).
- (3) Grasp lamp, firmly pull lamp rearward to disengage retaining studs.
- (4) Remove socket from tail lamp.
- (5) Separate tail lamp from cargo box.
- (6) Pull bulb from socket.



J948L-9

Fig. 29 Tail, Brake, Turn Signal and Back-up Lamps—Cab Chassis

- 1 - LICENCE PLATE BRACKET
- 2 - FRAME
- 3 - TAILLAMP MOUNTING BRACKET
- 4 - TAILLAMP-BRAKE LAMP-BACKUP LAMP HOUSING

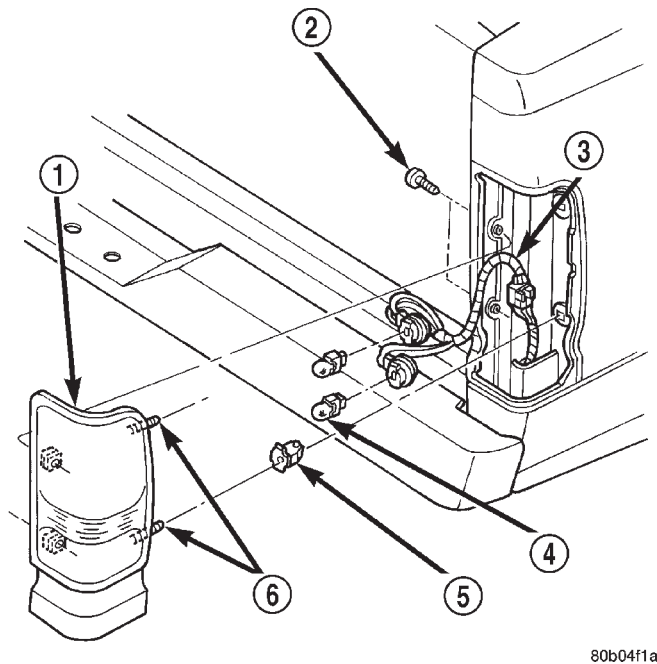
INSTALLATION**CAB CHASSIS**

- (1) Position tail lamp on vehicle.
- (2) Engage tail lamp wire connector to body wire harness.
- (3) Install nuts attaching tail lamp to mounting bracket.
- (4) Connect the battery negative cable.

PICKUP

- (1) Install bulb in socket.
- (2) Install socket in tail lamp.
- (3) Position tail lamp in cargo box, engage retaining studs and install screws.
- (4) Connect the battery negative cable.

TAIL LAMP UNIT (Continued)



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Fig. 30 Tail, Brake, Turn Signal and Back-up Lamp Bulb

- 1 - TAIL LAMP
- 2 - SCREW
- 3 - LIGHTING HARNESS
- 4 - BULB
- 5 - RETAINING CLIP
- 6 - RETAINING STUDS

TURN SIGNAL CANCEL CAM

DESCRIPTION

The turn signal cancel cam is concealed within the steering column below the steering wheel. The turn signal cancel cam consists of two lobes that are integral to the lower surface of the clockspring rotor. The clockspring mechanism provides turn signal cancellation as well as a constant electrical connection between the horn switch, driver airbag, speed control switches, and remote radio switches on the steering wheel and the instrument panel wire harness on the steering column. The housing of the clockspring is secured to the steering column and remains stationary. The rotor of the clockspring, including the turn signal cancel cam lobes rotate with the steering wheel.

The turn signal cancel cam is serviced as a unit with the clockspring and cannot be repaired. If faulty or damaged, the entire clockspring unit must be replaced. (Refer to 8 - ELECTRICAL/RESTRAINTS/CLOCKSPRING - REMOVAL).

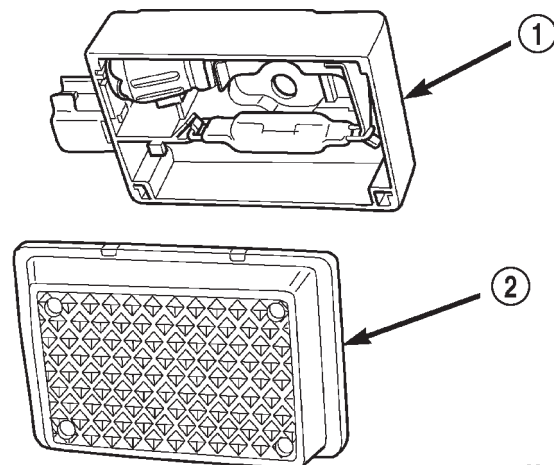
OPERATION

The turn signal cancel cam has two lobes molded into the lower surface of the clockspring rotor. When the turn signals are activated by moving the multi-function switch control stalk to a detent position, a turn signal cancel actuator is extended from the inside surface of the multi-function switch housing toward the center of the steering column and the turn signal cancel cam. When the steering wheel is rotated during a turning maneuver, one of the two turn signal cancel cam lobes will contact the turn signal cancel actuator. The cancel actuator latches against the cancel cam rotation in the direction opposite that which is signaled. In other words, if the left turn signal detent is selected, the lobes of the cancel cam will ratchet past the cancel actuator when the steering wheel is rotated to the left, but will unlatch the cancel actuator as the steering wheel rotates to the right and returns to center, which will cancel the turn signal event and release the control stalk from the detent so it returns to the neutral Off position.

UNDERHOOD LAMP

REMOVAL

- (1) Disconnect and isolate the battery negative cable.
- (2) Insert a small flat blade in the access slot between the lamp base and lamp lens.
- (3) Pry the lamp lens upward and remove the lamp lens (Fig. 31).
- (4) Depress the bulb terminal inward (Fig. 32) to release the bulb.

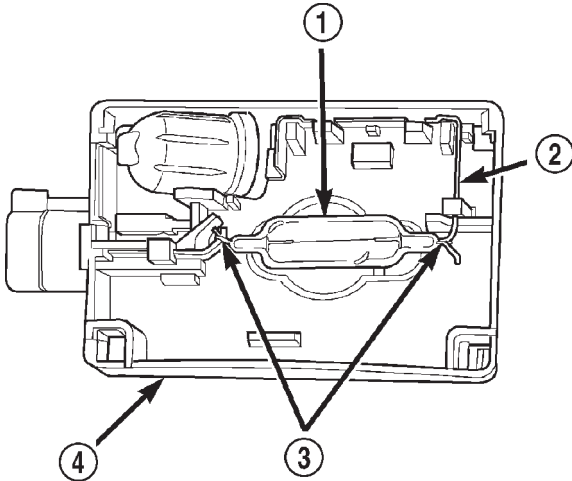


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Fig. 31 Underhood Lamp Lens

- 1 - LAMP
- 2 - LAMP LENS

UNDERHOOD LAMP (Continued)



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Fig. 32 Underhood Lamp Bulb

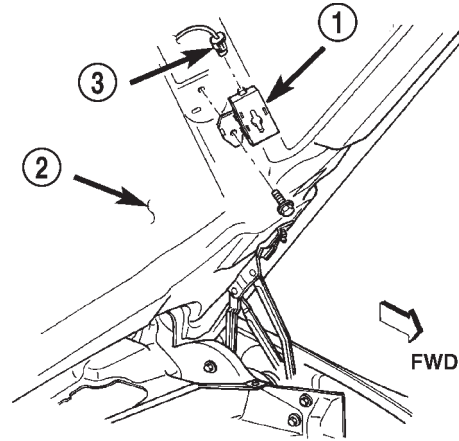
- 1 - BULB
- 2 - DEPRESS TERMINAL INWARD
- 3 - BULB WIRE LOOP
- 4 - LAMP BASE

INSTALLATION

- (1) Engage the replacement bulb wire loop to the terminal closest to the lamp base wire connector.
- (2) Depress the opposite terminal inward and engage the remaining bulb wire loop.
- (3) Position the lamp lens on the lamp base and press into place.
- (4) Connect the battery negative cable.

UNDERHOOD LAMP UNIT**REMOVAL**

- (1) Disconnect and isolate the battery negative cable.
- (2) Disconnect the wire harness connector from the lamp.
- (3) Remove lamp lens.
- (4) Remove bulb.
- (5) Remove screw attaching underhood lamp to the inner hood panel (Fig. 33).
- (6) Separate underhood lamp from vehicle.



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Fig. 33 Underhood Lamp

- 1 - UNDER HOOD LAMP
- 2 - HOOD
- 3 - CONNECTOR

INSTALLATION

- (1) Install bulb.
- (2) Install lamp lens.
- (3) Position the underhood lamp on the hood inner panel.
- (4) Install the attaching screw through the lamp and into the hood panel. Tighten the screw securely.
- (5) Fold lamp housing over and firmly press onto base to snap into place.
- (6) Connect the wire harness connector to the lamp.
- (7) Connect the battery negative cable.

LAMPS/LIGHTING - INTERIOR

TABLE OF CONTENTS

	page		page
LAMPS/LIGHTING - INTERIOR		GLOVE BOX LAMP AND SWITCH	
SPECIFICATIONS		REMOVAL	35
INTERIOR LAMPS	33	INSTALLATION	36
DOME LAMP		READING LAMP	
REMOVAL	34	DESCRIPTION	36
INSTALLATION	34	OPERATION	36
DOOR AJAR SWITCH		REMOVAL	36
DESCRIPTION	34	INSTALLATION	37
DIAGNOSIS AND TESTING - DOOR AJAR		VANITY LAMP	
SWITCH	34	REMOVAL	37
REMOVAL	35	INSTALLATION	37
INSTALLATION	35		

LAMPS/LIGHTING - INTERIOR

SPECIFICATIONS

INTERIOR LAMPS

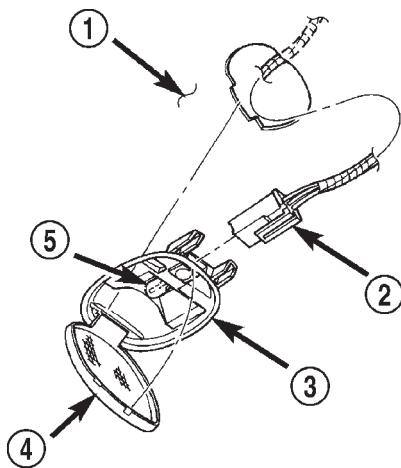
LAMP	BULB
A/C HEATER CONTROL	158
ASH RECEIVER	161
CIGAR LIGHTER	161
HEADLAMP SWITCH	158
HEATER CONTROL	158
INSTRUMENT CLUSTER	PC194
RADIO	ASC
AIRBAG HIGH LINE	PC194
AIRBAG LOW LINE	PC74
ANTI-LOCK BRAKE	PC74
BATTERY VOLTAGE	PC194
BRAKE WARNING	PC194

LAMP	BULB
CHECK ENGINE	PC74
ENGINE OIL PRESSURE	PC74
FOUR WHEEL DRIVE	PC194
HIGH BEAM	PC194
LOW FUEL	PC194
LOW WASHER FLUID	PC74
MAINTENANCE REQUIRED	PC74
MESSAGE CENTER	PC194
SEAT BELT	PC74
TURN SIGNAL	PC194
UPSHIFT	PC74
DOME	1004
GLOVE COMPARTMENT	1891
VANITY MIRROR LAMP	P/N 6501966

DOME LAMP

REMOVAL

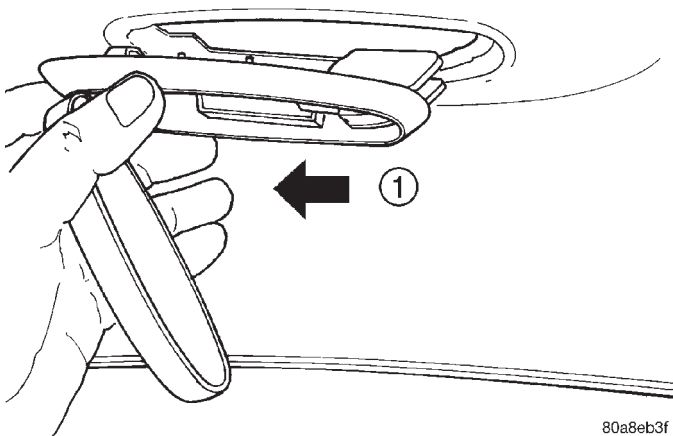
- (1) Using a small flat blade, pry the left side (driver's side) of the dome lamp lens downward from dome lamp.
- (2) Allow the lens to hang down (Fig. 1) , this will disengage the right side of the lamp (passenger's side) from the headliner.
- (3) Pull the right side of the lamp down and slide the lamp to the right (Fig. 2) .
- (4) Separate the lamp from the headliner.
- (5) Disengage dome lamp wire connector from body wire harness.
- (6) Separate dome lamp from vehicle.



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Fig. 1 Dome Lamp Lens

- 1 - HEADLINER
- 2 - CONNECTOR
- 3 - DOME LAMP
- 4 - LENS
- 5 - BULB



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Fig. 2 Dome Lamp

- 1 - SLIDE LAMP

INSTALLATION

- (1) Position dome lamp at headliner.
- (2) Connect dome lamp wire connector to body wire harness.
- (3) Position the left side of the lamp in the headliner opening and slide lamp to the left.
- (4) Push the right side of the lamp in the headliner opening and push the lamp lens up into the lamp to secure.

DOOR AJAR SWITCH

DESCRIPTION

The door ajar switches are mounted to the door hinge pillars. The switches close a path to ground for the Central Timer Module (CTM) when a door is opened, and open the ground path when a door is closed.

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

DIAGNOSIS AND TESTING - DOOR AJAR SWITCH

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.

WARNING: ON VEHICLES EQUIPPED WITH AIRBAGS, REFER TO ELECTRICAL, RESTRAINTS 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) Rotate the headlamp switch knob counterclockwise to ensure that the dome lamps are not switched off. Open the driver door and note whether the interior lamps light. They should light. If OK, (Refer to 8 - ELECTRICAL/LAMPS/LIGHTING - EXTERIOR/HEADLAMP SWITCH - DIAGNOSIS AND TESTING). If not OK, go to Step 2.

- (2) Disconnect and isolate the battery negative cable. Unplug the driver door ajar switch from its wire harness connector. Check for continuity between the ground circuit cavity of the driver door ajar switch wire harness connector and a good ground. There should be continuity. If OK, go to Step 3. If not OK, repair the circuit to ground as required.

DOOR AJAR SWITCH (Continued)

(3) Check for continuity between the door ajar switch ground circuit terminal and each of the other two terminals of the driver door ajar switch. There should be continuity with the switch plunger released, and no continuity with the switch plunger depressed. If OK, go to Step 4. If not OK, replace the faulty switch.

(4) Remove the Central Timer Module (CTM) from its mounting bracket to access the CTM wire harness connectors (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/BODY CONTROL/CENTRAL TIMER MODUL - REMOVAL). Unplug the 14-way CTM wire harness connector. Check for continuity between the driver door switch sense circuit cavity of the 14-way CTM wire harness connector and a good ground. There should be no continuity. If OK, go to Step 5. If not OK, repair the short circuit as required.

(5) Check for continuity between the driver door switch sense circuit cavities of the 14-way CTM wire harness connector and the driver door ajar switch wire harness connector. There should be continuity. If OK, (Refer to 8 - ELECTRICAL/LAMPS/LIGHTING - EXTERIOR/HEADLAMP SWITCH - DIAGNOSIS AND TESTING) If not OK, repair the open circuit as required.

REMOVAL

(1) Disconnect and isolate the battery negative cable.

(2) Grasp the body of the door ajar switch with a pair of pliers and move the switch gently back-and-forth while pulling it out of the door hinge pillar mounting hole.

(3) Pull the door ajar switch out from the pillar far enough to access the wire harness connector (Fig. 3).

(4) Unplug the door ajar switch from the wire harness connector.

INSTALLATION

(1) Install the door ajar switch to the wire harness connector.

(2) Push the door ajar switch into the pillar.

(3) Connect the battery negative cable.

GLOVE BOX LAMP AND SWITCH

REMOVAL

(1) Disconnect and isolate the battery negative cable.

(2) Remove the glove box from the instrument panel. (Refer to 23 - BODY/INSTRUMENT PANEL/GLOVE BOX - REMOVAL) for the procedures.

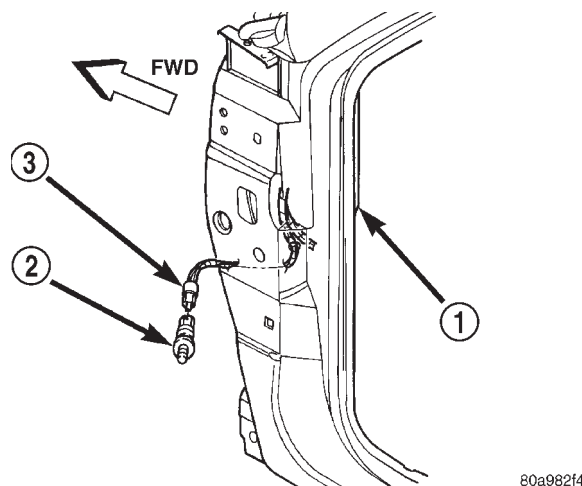


Fig. 3 Door Ajar Switch Remove/Install

- 1 - DOOR HINGE PILLAR
- 2 - DOOR AJAR SWITCH
- 3 - CONNECTOR

(3) Reach through the glove box opening and behind the glove box lamp and switch mounting bracket to access the instrument panel wire harness connector on the glove box lamp and switch (Fig. 4).

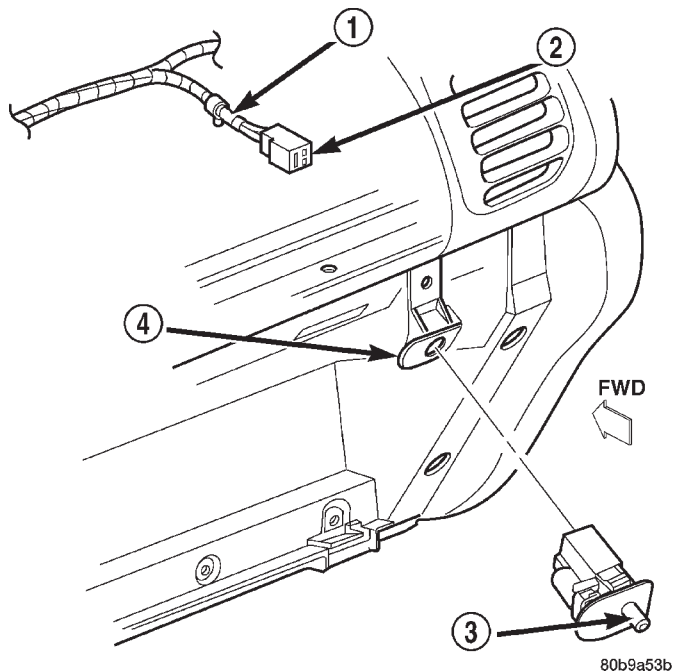


Fig. 4 Glove Box Lamp and Switch Remove/Install

- 1 - RETAINER
- 2 - WIRE HARNESS CONNECTOR
- 3 - GLOVE BOX LAMP AND SWITCH
- 4 - MOUNTING BRACKET

(4) Disconnect the instrument panel wire harness connector from the connector receptacle on the back of the glove box lamp and switch unit.

GLOVE BOX LAMP AND SWITCH (Continued)

(5) Reach through the glove box opening and behind the glove box lamp and switch mounting bracket to depress the retaining tabs on the top and bottom of the glove box lamp and switch housing.

(6) While holding the retaining tabs depressed, push the glove box lamp and switch unit out through the hole in the mounting bracket on the instrument panel glove box opening upper reinforcement.

(7) Remove the glove box lamp and switch unit from the instrument panel.

INSTALLATION

(1) Reach through the glove box opening and behind the glove box lamp and switch mounting bracket to feed the instrument panel wire harness connectors out through the hole in the glove box lamp and switch housing mounting bracket.

(2) Position the glove box lamp and switch unit to the instrument panel.

(3) Reconnect the instrument panel wire harness connector to the connector receptacle on the back of the glove box lamp and switch unit.

(4) Push the glove box lamp and switch unit into the hole in the mounting bracket on the instrument panel glove box opening upper reinforcement.

(5) Install the glove box onto the instrument panel. (Refer to 23 - BODY/INSTRUMENT PANEL/GLOVE BOX - INSTALLATION) for the procedures.

(6) Close the glove box.

(7) Reconnect the battery negative cable.

READING LAMP

DESCRIPTION

The overhead console in this vehicle is equipped with two individual reading and courtesy lamps. The lamp lenses are the only visible components of these lamps. The reading and courtesy lamp lenses are mounted in the overhead console housing between the garage door opener storage bin and the sunglasses storage bin. Each lamp has its own switch, bulb, reflector and lens; but both lamps share a common lamp housing within the overhead console.

The overhead console reading and courtesy lamps operate on battery current that is provided at all times, regardless of the ignition switch position. The ground feed for the lamps is switched through the integral reading and courtesy lamp switches or through the door jamb switches. Each lamp is designed and aimed to provide illumination that will be directed only to that side of the vehicle on which the lamp is located.

The reading and courtesy lamp lenses, bulbs and the lamp housing and reflector unit are available for service replacement. The reading and courtesy lamp switches, bulb holders and wiring are only available as part of the overhead console wire harness. If either of the lamp switches or bulb holders is faulty or damaged, the entire overhead console wire harness assembly must be replaced.

For service of the reading and courtesy lamp bulbs, 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.

OPERATION

All reading and courtesy lamps located in the overhead console are activated by the door jamb switches. When all of the doors are closed, these lamps can be individually activated by depressing the corresponding lens. When any door is open, depressing the lamp lenses to activate the lamp switches will not turn the lamps off.

See the owner's manual in the vehicle glove box for more information on the use and operation of the overhead console reading and courtesy lamps.

REMOVAL

(1) Disconnect and isolate the battery negative cable.

(2) Insert a long, narrow, flat-bladed tool between the curved (outboard) edge of the reading and courtesy lamp lens and the overhead console housing (Fig. 5).

(3) Gently pry inward and downward against the lens until the latch tab in the center of the outboard edge of the reading and courtesy lamp lens is disengaged from the overhead console housing.

(4) Pull firmly on the lens toward the outboard side of the vehicle to disengage the two pivot tabs on the inboard edge of the reading and courtesy lamp lens are disengaged from the overhead console housing.

(5) Remove the reading and courtesy lamp lens from the overhead console housing.

READING LAMP (Continued)

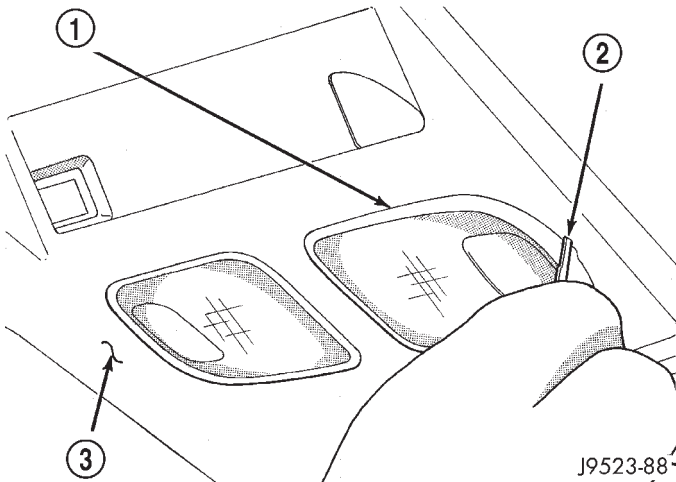


Fig. 5 Overhead Console Reading Lamp Bulb Removal

- 1 - LENS
- 2 - FLAT BLADE
- 3 - CONSOLE

INSTALLATION

- (1) Position the reading and courtesy lamp lens onto the overhead console housing.
- (2) Align the two pivot tabs on the inboard edge of the reading and courtesy lamp lens with the two pivot holes in the overhead console housing.

(3) Push firmly on the lens toward the inboard side of the vehicle to insert the two pivot tabs on the inboard edge of the reading and courtesy lamp lens into the two pivot holes in the overhead console housing.

(4) Pivot the lens back up into position and press upward firmly until the latch tab in the center of the outboard edge of the reading and courtesy lamp lens snaps back into the overhead console housing.

(5) Reconnect the battery negative cable.

VANITY LAMP

REMOVAL

- (1) Insert a flat blade into the slot at front of lens.
- (2) Rotate blade until lens pops out of lamp.
- (3) Remove lens from housing.
- (4) Remove bulb from lamp terminals.

INSTALLATION

- (1) Install bulb into lamp terminals.
- (2) Place one side of lens into housing.
- (3) Insure dim control is in place, and snap lens into housing.

