INSTRUMENT PANEL SYSTEMS

CONTENTS

GENERAL INFORMATION

INTRODUCTION

This group is responsible for covering the vehicle instrument panel. However, because the instrument panel serves as the command center of the vehicle, it is a very complex unit. The instrument panel is designed to house the controls and monitors for standard and optional powertrains, climate control systems, audio systems, lighting systems, safety systems and many other comfort or convenience items. It is also designed so that all of the controls and monitors can be safely reached and viewed by the vehicle operator, while still allowing relative ease of access to these items for service.

Complete service information coverage for all of the systems and components housed in the instrument panel in this section of the service manual would not be practical. It would result in a great deal of duplication and make this group too large for the information to be easily accessed and used. Therefore, the information found in this group has been limited as follows:

- General Information - Covers non-electrical components and features of the instrument panel that are not related to other systems.
- Description and Operation - Covers gauges and their sending units, warning lamps and their switches, and instrument panel illumination lamps.
- Diagnosis and Testing - Covers gauges and their sending units, warning lamps and their switches, and instrument panel illumination lamps.
- Removal and Installation - Covers all components installed on or in the instrument panel that require removal for diagnosis or service of any other instrument panel components covered in this group.

For more information on components or systems not covered above, refer to the proper group in this manual. If you are uncertain as to the proper group, refer to the Component and System Index at the back of this manual. Refer to Group 8W - Wiring Diagrams for complete circuit descriptions and diagrams.

INSTRUMENT PANEL

Modular construction allows all of the gauges and controls to be serviced from the front of the instrument panel. In addition, most of the instrument electrical or heating and air conditioning components can be accessed without complete instrument panel removal. If necessary, the instrument panel can be rolled-down and removed from the vehicle as an assembly.

Removal of the switch pod bezels allows access to most of the switches and the heating and air conditioning controls. Removal of the instrument cluster bezel allows access to the cluster assembly and the radio. Removal of the cluster assembly allows access to the individual gauges, the cluster illumination and indicator lamp bulbs, and much of the instrument panel wiring.

Removal of the steering column opening cover/knee blocker provides access to the steering column mounts, the Body Control Module (BCM), the gearshift interlock mechanism, and additional instrument panel and steering column wiring. Removal of the glove box module and center bezel unit allows access to the Vehicle Information Center (VIC), the Graphic Display Module (GDM), the in-vehicle temperature sensor, additional instrument panel wiring, and many of the heating and air conditioning components.

Removal of the instrument panel cowl top trim panel allows access to the instrument panel speakers, the solar sensor, and the automatic headlamp light sensor/vehicle theft security system lamp. Removal of the instrument panel top pad allows access to the passenger side airbag module.

Instrument panel removal is required for service of most internal components of the heating and air conditioning housing.

INSTRUMENT CLUSTER

One basic instrument cluster option is offered on Grand Cherokee models. This cluster is an electromechanical unit that utilizes integrated circuitry and information carried on the Chrysler Collision Detection (CCD) data bus network for control of all gauges and many of the indicator lamps. This cluster also incorporates a vacuum fluorescent display tube for the digital odometer/trip odometer display functions. Some variations of the cluster exist due to optional equipment and regulatory requirements.

The cluster includes the following analog gauges:

- Coolant temperature gauge
- Fuel gauge
- Oil pressure gauge
- Speedometer
- Tachometer
- Voltmeter.

This cluster includes provisions for the following indicator lamps:

- Airbag indicator lamp
- Anti-lock brake system lamp
- Brake warning lamp
- Check gauges lamp
- Cruise-on indicator lamp
- Headlamp high beam indicator lamp
- Low fuel warning lamp
- Malfunction indicator (Check Engine) lamp
- Seat belt reminder lamp
- Turn signal indicator lamps.

GENERAL INFORMATION (Continued)

This instrument cluster features circuitry that has an actuator test mode, which can be entered using a DRB scan tool. The actuator test mode will test each of the CCD bus message-controlled functions of the cluster by lighting the appropriate indicator lamps and positioning the gauge needles at several predetermined locations on the gauge faces in a prescribed sequence. For more information on this test, refer to the proper Diagnostic Procedures manual.

The instrument cluster component parts for this model are available for service. The cluster lens, the hood and mask, the gauge sets, the cluster housing with electronic circuit board and the odometer reset knob are available for service. Also, the individual cluster lamp bulbs with bulb holders can be serviced.

GRAPHIC DISPLAY MODULE

A Graphic Display Module (GDM) is standard equipment on all four-wheel drive Grand Cherokee models, unless the vehicle is equipped with the optional Vehicle Information Center (VIC). The GDM is mounted in the lower center stack area of the instrument panel, above the ash receiver and below the heater and air conditioner controls. Two-wheel drive Grand Cherokee models have a storage bin installed in place of the GDM as standard equipment.

The GDM display consists of a back-lit screen with an outline of the vehicle. The two rear wheels of the vehicle outline are illuminated by a lamp when the transfer case is engaged in any two-wheel drive operating mode. The two front wheels are also illuminated when the transfer case is engaged in any four-wheel drive operating mode.

The GDM also has up to three indicator lamps, which indicate to the driver whether the four-wheel drive mode selected is Lo, Part-Time, or Full-Time. The number of operational indicator lamps may vary, depending upon the optional four-wheel drive transfer case in the vehicle. A switch on the transfer case is hard-wired to the GDM so as to illuminate the proper wheels and indicator lamps.

The GDM bulbs and the transfer case switch can be serviced. However, if any other part of the GDM is damaged or faulty, the entire GDM must be replaced. Refer to Group 21 - Transmission and Transfer Case for the transfer case switch service procedures.

VEHICLE INFORMATION CENTER

The Vehicle Information Center (VIC) is an available option on Grand Cherokee models. The VIC module replaces the standard equipment Graphic Display Module (GDM). The VIC is mounted in the lower center stack area of the instrument panel, above the ash receiver and below the heater and air conditioner controls.

The VIC consists of a multicolored vacuum fluorescent display screen with an outline of the vehicle. The VIC is able to display four functions in a choice of five languages. The display functions include:

- Current time (12 or 24 hour clock), day, and date
- Monitor specific vehicle operating systems and alert the driver of a malfunction in a monitored system
- Provide service reminders or the distance to the next service interval
- The current transfer case mode of operation (four-wheel drive models).

The VIC display language choices include:

- English
- French
- German
- Italian
- Spanish.

The VIC receives input from hard-wired sensors and over the Chrysler Collision Detection (CCD) data bus network. In response to these inputs the VIC offers a combination of graphic and message displays, and provides requests for audible chime alerts to the Body Control Module (BCM) on the CCD data bus network.

Refer to the owner's manual for more information on the VIC controls, operation, and setting procedures. For diagnosis of the VIC module or the CCD data bus, refer to the proper Diagnostic Procedures manual. The VIC module cannot be repaired. If damaged or faulty, the entire module must be replaced.

GAUGE

With the ignition switch in the On or Start positions, voltage is supplied to all gauges through the instrument cluster electronic circuit board. With the ignition switch in the Off position, voltage is not supplied to the gauges. The gauges do not accurately indicate any vehicle condition unless the ignition switch is in the On or Start positions.

All of the instrument cluster gauges, except the odometer, are air core magnetic units. Two fixed electromagnetic coils are located within the gauge. These coils are wrapped at right angles to each other around a movable permanent magnet. The movable magnet is suspended within the coils on one end of a shaft. The gauge needle is attached to the other end of the shaft.

One of the coils has a fixed current flowing through it to maintain a constant magnetic field strength. Current flow through the second coil changes, which causes changes in its magnetic field strength. The current flowing through the second coil is changed by the instrument cluster electronic circuitry in response to messages received on the Chrysler Collision Detection (CCD) data bus network.

GENERAL INFORMATION (Continued)

The gauge needle moves as the movable permanent magnet aligns itself to the changing magnetic fields created around it by the electromagnets. These gauges also feature a small fixed permanent magnet which will move all of the gauge needles back to the low end of their respective scales after the ignition switch is turned to the Off position.

INDICATOR LAMP

Indicator lamps are located in the instrument cluster, and in the Graphic Display Module (GDM) or the Vehicle Information Center (VIC). Those lamps within the instrument cluster are served by the cluster circuit board and wire harness connectors. Those lamps located in the GDM or VIC modules are served by the GDM or VIC circuit board and wire harness connectors.

Most of the indicator lamps in the instrument cluster and VIC module are controlled by the instrument cluster or VIC module electronic circuitry in response to messages received over the Chrysler Collision Detection (CCD) data bus network from the Body Control Module (BCM), Powertrain Control Module (PCM), and Airbag Control Module (ACM). Only the anti-lock brake system lamp, four-wheel drive indicator lamps, lamp outage warning lamp, low coolant level warning lamp, low washer fluid warning lamp, and turn signal indicator lamps are hard-wired.

BODY CONTROL MODULE

A Body Control Module (BCM) is used on this model to control and integrate many of the electronic functions and features included on the vehicle. The BCM contains a central processing unit and interfaces with other modules in the vehicle on the Chrysler Collision Detection (CCD) data bus network.

The CCD data bus network allows the sharing of sensor information. This helps to reduce wire harness complexity, reduce internal controller hardware, and reduce component sensor current loads. At the same time, this system provides increased reliability, enhanced diagnostics, and allows the addition of many new feature capabilities.

Some of the functions and features that the BCM supports or controls, include:

- Chimes
- Automatic headlamp control
- Headlamp delay
- Headlamps on with ignition off and driver door open warning
- Key in ignition with ignition off and driver door open warning
- Automatic funeral or parade mode
- Panel lamp dimming
- Vehicle Theft Security System (VTSS)
- Illuminated entry
- Heated rear window and heated outside mirror control
- Intermittent wipe control
- Monitoring and transmitting door, liftgate, and liftglass ajar data
- Monitoring and transmitting outside ambient temperature data
- Monitoring and transmitting air conditioning select switch data
- Courtesy lamp time-out
- Door lock inhibit
- Electronic odometer and trip odometer
- Brake warning lamp
- Check gauges lamp
- High beam indicator lamp
- Seatbelt reminder lamp and chime
- Speed sensitive intermittent wipe
- Fog lamp control
- Electromechanical instrument cluster
- BCM diagnostic support
- Vehicle Information Center (VIC) support
- Rolling door locks
- Horn chirp upon door lock with Remote Keyless Entry (RKE)(programmable)
- Low fuel warning chime (programmable)
- Headlights on with wipers (programmable - with automatic headlamps only)

The BCM is mounted under the driver side outboard end of the instrument panel, behind the instrument panel support armature and below the outboard switch pod. For diagnosis of the BCM or the CCD data bus, the use of a DRB scan tool and the proper Diagnostic Procedures manual are recommended. The BCM can only be serviced by an authorized electronic repair station. Refer to the latest Warranty Policies and Procedures manual for a current listing of authorized electronic repair stations.

JUNCTION BLOCK

The junction block is mounted on the right cowl side inner panel below the right end of the instrument panel. It is concealed behind the right cowl side trim panel. The junction block serves to simplify and centralize numerous electrical components.

The junction block combines the functions previously provided by a separate fuseblock module and relay center. It contains fuses, circuit breakers and relays. It also eliminates the need for numerous splice connections and serves in place of a bulkhead connector between many of the engine compartment, instrument panel, and body wire harnesses.

The right cowl side trim panel has a snap-fit fuse access cover that can be removed for service of the junction block fuses. A fuse puller and spare fuse holders are located on the back of the fuse access

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panel. The right cowl side trim panel must be removed to access the relays in the junction block.

The junction block cannot be repaired and, if faulty or damaged, it must be replaced.

DESCRIPTION AND OPERATION

COOLANT TEMPERATURE GAUGE

The coolant temperature gauge gives an indication of the engine coolant temperature. The instrument cluster circuitry controls the gauge pointer position. The instrument cluster circuitry calculates the proper gauge pointer position based upon an engine coolant temperature message received from the Powertrain Control Module (PCM) on the Chrysler Collision Detection (CCD) data bus.

The PCM uses an input from the engine coolant temperature sensor and internal programming to decide what engine coolant temperature message is required. The PCM then sends the proper message to the instrument cluster and the Body Control Module (BCM) on the CCD data bus.

The BCM also monitors the PCM engine coolant temperature messages. If the PCM message indicates that coolant temperature is high or critical, the BCM sends a message to the instrument cluster to turn on the Check Gauges lamp and to move the coolant temperature gauge needle to the corresponding high or critical position of the gauge scale.

The engine coolant temperature sensor is installed in a threaded hole that penetrates a coolant passage of the engine. It is a thermistor-type sensor that changes its internal resistance with changes in engine coolant temperature. Refer to Group 14 - Fuel Systems for more information on the PCM and the coolant temperature sensor.

FUEL GAUGE

The fuel gauge gives an indication of the level of fuel in the fuel tank. The instrument cluster circuitry controls the gauge pointer position. The instrument cluster circuitry calculates the proper gauge pointer position based upon a fuel level message received from the Powertrain Control Module (PCM) on the Chrysler Collision Detection (CCD) data bus.

The PCM uses an input from the fuel gauge sending unit and internal programming to decide what fuel level message is required. The PCM then sends the proper message to the instrument cluster and the Body Control Module (BCM) on the CCD data bus.

The BCM monitors the PCM fuel level messages. If the PCM message indicates that the that the fuel level is below one-eighth of a full tank, the BCM issues a single audible low fuel chime tone and sends a message to the instrument cluster to turn on the low fuel warning lamp. If the PCM detects a short or open in the fuel level sending unit circuit, it sends a message on the CCD data bus that will cause the instrument cluster circuitry to position the fuel gauge needle at the Empty stop.

The fuel gauge sending unit is mounted to the electric fuel pump module located inside the fuel tank. The sending unit has a float attached to the end of a swing-arm. The float moves up or down within the fuel tank as the fuel level changes. As the float moves, an electrical contact on the pivot end of the swing-arm wipes across a resistor coil, which changes the internal electrical resistance of the sending unit. Refer to Group 14 - Fuel Systems for more information on the PCM and for the fuel gauge sending unit service procedures.

ODOMETER AND TRIP ODOMETER

The odometer and the trip odometer share the same vacuum fluorescent digital display tube in the instrument cluster circuit board. Each gives an indication of the distance the vehicle has travelled. However, by depressing the reset knob on the face of the instrument cluster, the display mode can be switched from odometer to trip odometer. Depressing the reset knob for longer than two seconds while in the trip odometer mode will reset the trip odometer to zero. The odometer and trip odometer display values are based on distance messages received from the Body Control Module (BCM) on the Chrysler Collision Detection (CCD) data bus.

The BCM uses a distance pulse message relayed from the Powertrain Control Module (PCM) on the CCD data bus and internal programming to decide what distance message is required. The PCM receives the distance pulse signal input from the Vehicle Speed Sensor (VSS) to relay to the BCM on the CCD data bus. The BCM stores both the odometer and trip odometer distance information and sends the proper value to the instrument cluster based upon ignition key-on and trip odometer reset knob messages received on the CCD data bus.

If the instrument cluster is not receiving distance information on the CCD data bus when the ignition switch is turned to the On position, the odometer display will remain blank. If the instrument cluster does not receive a distance message on the CCD data bus after the ignition switch has been turned to the On position, the instrument panel circuitry will insert the last normally displayed distance in the odometer display.

The VSS is a hall-effect sensor that is installed in the transmission (two-wheel drive) or transfer case (four-wheel drive), and is driven by the output shaft through a speedometer pinion gear. Incorrect tire size, incorrect axle ratio, a faulty or incorrect speedometer pinion gear, or a faulty VSS can each result

DESCRIPTION AND OPERATION (Continued)

in inaccurate odometer readings. Refer to Group 14 - Fuel Systems for more information on the PCM and the VSS. Refer to Group 21 - Transmission for more information on the speedometer pinion gear.

OIL PRESSURE GAUGE

The oil pressure gauge gives an indication of the engine oil pressure. The instrument cluster circuitry controls the gauge pointer position. The instrument cluster circuitry calculates the proper gauge pointer position based upon an engine oil pressure message received from the Powertrain Control Module (PCM) on the Chrysler Collision Detection (CCD) data bus.

The PCM uses an input from the engine oil pressure sensor and internal programming to decide what engine oil pressure message is required. The PCM then sends the proper message to the instrument cluster and the Body Control Module (BCM) on the CCD data bus.

The BCM also monitors the PCM engine oil pressure messages. If the PCM message indicates that engine oil pressure is low, the BCM sends a message to the instrument cluster to turn on the Check Gauges lamp and to move the oil pressure gauge needle to the zero end of the gauge scale.

The engine oil pressure sensor is installed in a threaded hole that penetrates an oil passage of the engine. The engine oil pressure sensor contains a flexible diaphragm and a variable resistor coil. The diaphragm moves in response to changes in the engine oil pressure, which changes the internal electrical resistance of the sensor. Refer to Group 14 - Fuel Systems for more information on the PCM and the engine oil pressure sensor.

SPEEDOMETER

The speedometer gives an indication of the current vehicle speed. The instrument cluster circuitry controls the gauge pointer position. The instrument cluster circuitry calculates the proper gauge pointer position based upon a vehicle speed message received from the Powertrain Control Module (PCM) on the Chrysler Collision Detection (CCD) data bus.

The PCM uses an input from the Vehicle Speed Sensor (VSS) and internal programming to decide what vehicle speed message is required. The PCM then sends the proper message to the instrument cluster on the CCD data bus.

The VSS is a hall-effect sensor that is installed in the transmission (two-wheel drive) or transfer case (four-wheel drive), and is driven by the output shaft through a speedometer pinion gear. Incorrect tire size, incorrect axle ratio, a faulty or incorrect speedometer pinion gear, or a faulty VSS can each result in inaccurate speedometer readings.

Refer to Group 14 - Fuel Systems for more information on the PCM and the VSS. Refer to Group 21 - Transmission for more information on the speedometer pinion gear.

TACHOMETER

The tachometer gives an indication of the engine speed in revolutions-per-minute (RPM). The instrument cluster circuitry controls the gauge pointer position. The instrument cluster circuitry calculates the proper gauge pointer position based upon an engine speed message received from the Powertrain Control Module (PCM) on the Chrysler Collision Detection (CCD) data bus.

The PCM uses an input from the crankshaft position sensor and internal programming to decide what engine speed message is required. The PCM then sends the proper message to the instrument cluster on the CCD data bus. The crankshaft position sensor is a hall-effect sensor installed near the rear of the engine, where it is aimed at the trigger wheel attached to the rear flange of the crankshaft.

Refer to Group 14 Fuel Systems for more information on the PCM. Refer to Group 8D - Ignition Systems for more information on the crankshaft position sensor.

VOLTMETER

The voltmeter gives an indication of the electrical system voltage. The instrument cluster circuitry controls the gauge pointer position. The instrument cluster circuitry calculates the proper gauge pointer position based upon a system voltage message received from the Powertrain Control Module (PCM) on the Chrysler Collision Detection (CCD) data bus.

The PCM uses an input from the electrical system and internal programming to decide what system voltage message is required. The PCM then sends the proper message to the instrument cluster on the CCD data bus.

Refer to Group 14 - Fuel System for more information on the PCM. Refer to Group 8C - Charging System for more information on charging system components and diagnosis.

AIRBAG INDICATOR LAMP

The airbag indicator lamp gives an indication when the airbag system is faulty or inoperative. The lamp is turned on by the instrument cluster circuitry for about seven seconds when the ignition switch is turned to the On position as a bulb test. After the bulb test, the lamp is controlled by the instrument cluster circuitry based upon a message received from the Airbag Control Module (ACM) on the Chrysler Collision Detection (CCD) data bus.

DESCRIPTION AND OPERATION (Continued)

The ACM continually monitors the airbag system circuits and sensors to decide whether the system is in good operating condition. The ACM then sends the proper message to the instrument cluster on the CCD data bus to turn the lamp on or off. If the ACM sends a lamp-on message after the bulb test, it indicates that the ACM has detected a system malfunction and/or that the airbag system has become inoperative. Each time the instrument cluster circuitry receives a lamp-on message from the ACM, it will light the lamp for twelve seconds or the duration of the airbag system malfunction, whichever is longer.

The airbag indicator lamp also has a lamp backup feature. Following the seat belt reminder lamp display function, if an inoperative airbag warning lamp circuit was detected during the bulb test sequence, the instrument cluster circuitry will flash the seat belt reminder lamp on and off for about twenty seconds. If the seat belt reminder lamp flashes longer than twenty seconds, or flashes at any time other than about twenty seconds after the initial ignition-on sequence, it indicates an airbag system fault has been detected and that the airbag indicator lamp is inoperative.

Refer to Group 8M - Passive Restraint Systems for more information on the airbag system.

ANTI-LOCK BRAKE SYSTEM LAMP

The Anti-Lock Brake System (ABS) lamp gives an indication when the ABS system is faulty or inoperative. The lamp is hard-wired in the instrument cluster, and is completely controlled by the Controller Anti-lock Brake (CAB).

The ABS lamp receives battery voltage through the instrument cluster fused ignition switch output feed circuit, and is grounded by the CAB. The lamp is turned on by the CAB for about two seconds when the ignition switch is turned to the On position as a bulb test. After the bulb test, the CAB turns the lamp on or off based upon the results of the ABS system self-tests.

The CAB continually monitors the ABS circuits and sensors to decide whether the system is in good operating condition. If the CAB turns the lamp on after the bulb test, it indicates that the CAB has detected a system malfunction and/or that the ABS system has become inoperative. Refer to Group 5 - Brakes for more information.

BRAKE WARNING LAMP

The brake warning lamp gives an indication when the parking brake is applied, or when the pressures in the two halves of the split brake hydraulic system are unequal. The lamp is turned on by the instrument cluster circuitry for about four seconds when the ignition switch is turned to the On position as a bulb test. After the bulb test, the lamp is controlled by the instrument cluster circuitry based upon a message received from the Body Control Module (BCM) on the Chrysler Collision Detection (CCD) data bus.

The BCM uses inputs from the parking brake switch and the brake warning switch to decide whether the brake warning lamp should be on or off. The BCM then sends the proper message to the instrument cluster on the CCD data bus to turn the lamp on or off.

The brake warning switch closes to ground when it senses unequal hydraulic pressures in the two halves of the split brake hydraulic system, possibly due to low brake fluid level or brake fluid leakage. The parking brake switch closes to ground when the parking brake is applied. Refer to Group 5 - Brakes for more information.

CHECK GAUGES LAMP

The check gauges lamp gives an indication when certain gauges reflect a condition requiring immediate attention. The lamp is turned on by the instrument cluster circuitry for about three seconds after the ignition switch is turned to the On position as a bulb test. After the bulb test, the lamp is controlled by the instrument cluster circuitry based upon gauge data messages received from either the Body Control Module (BCM) or the Powertrain Control Module (PCM) on the Chrysler Collision Detection (CCD) data bus.

The BCM and PCM use several inputs to decide whether a condition exists requiring the check gauges lamp to be turned on. The responsible module then sends the proper message to the instrument cluster on the CCD data bus to turn the lamp on or off. When the instrument cluster circuitry receives a check gauges lamp-on message, it sends a chime request message to the BCM on the CCD data bus for a chime tone to sound.

The gauge data messages for which the instrument cluster is programmed to turn on the check gauges lamp and the responsible modules are:

- Engine coolant temperature is high or critical (BCM)
- Engine oil pressure is low (BCM)
- Charging system failure (PCM)
- System voltage is high (PCM).

CIGAR LIGHTER

A cigar lighter is standard equipment on this model. The cigar lighter is located in the instrument panel center bezel, near the ash receiver. The cigar lighter base is secured by a snap fit within an illuminated light ring and retainer unit. The light ring

DESCRIPTION AND OPERATION (Continued)

is illuminated by a small, replaceable incandescent bulb, which is controlled by the instrument panel lamp dimmer circuit.

The cigar lighter consists of two major components: a knob and heating element unit, and the cigar lighter base or receptacle shell. The receptacle shell is connected to ground, and an insulated contact in the bottom of the shell is connected to battery current. The cigar lighter receives battery voltage from a fuse in the junction block through the cigar lighter relay only when the ignition switch is in the Accessory or On positions. See Cigar Lighter Relay in this group for more information.

The knob and heating element are encased within a spring-loaded housing, which also features a sliding protective heat shield. When the knob and heating element are inserted in the receptacle shell, the heating element resistor coil is grounded through its housing to the receptacle shell. If the cigar lighter knob is pushed inward, the heat shield slides up toward the knob exposing the heating element, and the heating element extends from the housing toward the insulated contact in the bottom of the receptacle shell.

Two small spring-clip retainers are located on either side of the insulated contact inside the bottom of the receptacle shell. These clips engage and hold the heating element against the insulated contact long enough for the resistor coil to heat up. When the heating element is engaged with the contact, battery current can flow through the resistor coil to ground, causing the resistor coil to heat.

When the resistor coil becomes sufficiently heated, excess heat radiates from the heating element causing the spring-clips to expand. Once the spring-clips expand far enough to release the heating element, the spring-loaded housing forces the knob and heating element to pop back outward to their relaxed position. When the cigar lighter knob and element are pulled out of the receptacle shell, the protective heat shield slides downward on the housing so that the heating element is recessed and shielded around its circumference for safety.

The cigar lighter knob and heating element unit, the cigar lighter base unit, and the light ring and retainer unit are available for service. These cigar lighter components cannot be repaired and, if damaged or faulty, they must be replaced.

CIGAR LIGHTER RELAY

The cigar lighter relay is a International Standards Organization (ISO) micro-relay. The terminal designations and functions are the same as a conventional ISO relay. However, the micro-relay terminal orientation (or footprint) is different, current capacity is lower, and the relay case dimensions are smaller than those of the conventional ISO relay.

The cigar lighter relay is a electromechanical device that switches fused battery current to the cigar lighter when the ignition switch is turned to the Accessory or On positions. See the Diagnosis and Testing section of this group for more information on the operation of the cigar lighter relay.

The cigar lighter relay is located in the junction block, on the right cowl side panel below the instrument panel in the passenger compartment. The cigar lighter relay cannot be repaired and, if faulty or damaged, it must be replaced.

CLUSTER ILLUMINATION LAMP

When the park or head lamps are on, the cluster illumination lamps light. Illumination brightness is adjusted by sliding the panel dimmer switch knob (downwards to dim, upwards to brighten). Each of the instrument cluster illumination lamps receives pulse-width modulated battery feed from the Body Control Module (BCM) on the hard-wired panel lamps driver circuit. The BCM monitors the panel dimmer resistor switch to determine the desired dimming level, then adjusts the pulse-width signal accordingly.

The BCM also sends the proper panel lamps dimming level message on the Chrysler Collision Detection (CCD) data bus to control the dimming levels of the various vacuum fluorescent displays. All modules on the CCD data bus with vacuum fluorescent displays (instrument cluster, radio, mini trip computer, vehicle information center) receive this message and adjust their dimming levels to match that of the incandescent cluster illumination bulbs driven directly by the BCM.

Vehicles equipped with the automatic headlamps option have an automatic funeral mode or parade mode. In this mode, the BCM uses an input from the automatic headlamp light sensor to determine the ambient light levels. If the BCM decides that the exterior lighting is turned on in the daylight, it overrides the selected panel dimmer switch signal by sending a message on the CCD bus to illuminate all vacuum fluorescent displays at full brightness for easier visibility in daytime light levels. The automatic funeral mode or parade mode has no effect on the incandescent bulb dimming levels.

Each of the cluster illumination lamps is located on the instrument cluster circuit board. Each lamp has a replaceable bulb and bulb holder. Refer to Group 8L - Lamps for more information.

CRUISE-ON INDICATOR LAMP

The cruise-on indicator lamp gives an indication when the vehicle speed control system is turned on,

DESCRIPTION AND OPERATION (Continued)

even when the system is not currently engaged. The lamp is turned on by the instrument cluster circuitry for about four seconds when the ignition switch is turned to the On position as a bulb test. After the bulb test, the lamp is controlled by the instrument cluster circuitry based upon a message received from the Powertrain Control Module (PCM) on the Chrysler Collision Detection (CCD) data bus.

The PCM uses an input from the analog resistor-multiplexed vehicle speed control switches in the steering wheel to decide whether to turn the lamp on or off. The PCM then sends the proper message to the instrument cluster on the CCD data bus. Refer to Group 8H - Vehicle Speed Control System for more information.

HEADLAMP HIGH BEAM INDICATOR LAMP

The headlamp high beam indicator lamp gives an indication when the headlamp high beams are turned on. The lamp is turned on by the instrument cluster circuitry for about four seconds when the ignition switch is turned to the On position as a bulb test. After the bulb test, the lamp is controlled by the instrument cluster circuitry based upon a message received from the Body Control Module (BCM) on the Chrysler Collision Detection (CCD) data bus.

The BCM uses an input from the headlamp dimmer (multi-function) switch to decide whether the headlamp high beams are turned on. It then sends the proper message to the instrument cluster on the CCD data bus to turn the lamp on or off. Refer to Group 8L - Lamps for more information.

LOW FUEL WARNING LAMP

The low fuel warning lamp gives an indication when the fuel level in the fuel tank has fallen below about one-eighth of a full tank, as registered on the fuel gauge. The instrument cluster circuitry lights the lamp for about four seconds when the ignition switch is turned to the On position as a bulb test. After the bulb test, the instrument cluster circuitry controls the lamp based upon a fuel level message received from the Body Control Module (BCM) on the Chrysler Collision Detection (CCD) data bus.

The BCM uses a fuel level message received from the Powertrain Control Module (PCM) on the CCD data bus to decide when the fuel level is low. The BCM then sends the proper message to the instrument cluster on the CCD data bus. When the lamp-on message is sent, the BCM also issues a single low fuel warning chime tone. Once the lamp is turned on, an increase in the fuel level of at least one-half gallon is required before the PCM input to the BCM will change and cause a lamp-off message to be issued. If the PCM detects a short or open in the fuel gauge sending unit circuit, it sends a message on the CCD data bus that will cause the fuel gauge pointer to move to the empty stop and the low fuel lamp to be turned on.

Refer to Group 14 - Fuel Systems for more information on the PCM and its inputs.

MALFUNCTION INDICATOR LAMP

The Check Engine or Malfunction Indicator Lamp (MIL) gives an indication when the Powertrain Control Module (PCM) has recorded a Diagnostic Trouble Code (DTC) for an On-Board Diagnostics II (OBDII) emissions-related circuit or component malfunction. The lamp is turned on by the instrument cluster circuitry for about three seconds when the ignition switch is turned to the On position as a bulb test. After the bulb test, the lamp is controlled by the instrument cluster circuitry based upon messages received from the PCM on the Chrysler Collision Detection (CCD) data bus.

The PCM uses inputs from many emissions-related circuits and sensors, along with its internal programming, to decide whether a condition exists that requires the MIL lamp to be turned on. The PCM then sends the proper message to the instrument cluster on the CCD data bus to turn the lamp on or off. When the instrument cluster circuitry receives a MIL lamp-on message from the PCM, it sends a chime request message to the Body Control Module (BCM) on the CCD data bus for a single chime tone to sound.

The MIL lamp can also be used to display a stored DTC by flashing on and off. Refer to Group 14 - Fuel Systems for more information on the PCM or the PCM inputs. Refer to Group 25 - Emission Control Systems for more information on DTCs and their retrieval.

POWER OUTLET

An accessory power outlet is standard equipment on this model. The power outlet is located in the instrument panel center bezel, near the ash receiver. A hinged plastic door on the center bezel covers the power outlet when it is not being used.

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

While the power outlet is very similar to a cigar lighter base unit, it does not include the two small spring-clip retainers inside the bottom of the receptacle shell that are used to secure the cigar lighter heating element to the insulated contact. Also, the power outlet is not illuminated and uses a different mounting system to secure it to the center bezel than the cigar lighter base.

DESCRIPTION AND OPERATION (Continued)

The power outlet cannot be repaired and, if faulty or damaged, it must be replaced. The power outlet door is available for service.

SEAT BELT REMINDER LAMP

The seat belt reminder lamp gives a visual reminder to the vehicle occupants to fasten their seat belts. The lamp is turned on by the instrument cluster circuitry for about seven seconds when the ignition switch is turned to the On position.

If the driver seat belt switch is closed (seat belt is not buckled), the Body Control Module (BCM) will also sound a chime warning for the duration of the seat belt reminder lamp illumination. The chime warning will stop when the driver seat belt switch is open (seat belt is buckled).

The seat belt reminder lamp also serves as a backup for the airbag indicator lamp. Following the seat belt reminder lamp seven second display function, if the instrument cluster circuitry has detected an inoperative airbag indicator lamp circuit it will flash the seat belt reminder lamp on and off for twenty seconds. If the seat belt reminder lamp flashes longer than twenty seconds, or flashes at any time other than immediately after the initial seven second seat belt reminder lamp display, it indicates an airbag system fault has been detected and that the airbag indicator lamp is inoperative.

Refer to Group 8U - Chime/Buzzer Warning Systems for more information on the driver seat belt switch.

TURN SIGNAL INDICATOR LAMP

The left and right turn signal indicator lamps give an indication when the turn signal circuits are activated. The lamps are hard-wired in the instrument cluster, and are completely controlled by the turn signal and hazard warning (multi-function) switches.

The indicator lamps are grounded at all times and receive battery feed through the contacts of the multi-function switch when the turn signal lever (multi-function switch stalk) or the hazard warning button are actuated to their On positions. The instrument cluster circuitry does not perform a bulb test of these lamps. Refer to Group 8J - Turn Signal and Hazard Warning Systems for more information.

DIAGNOSIS AND TESTING

INSTRUMENT CLUSTER

All of the gauges and many of the indicator lamps in the instrument cluster are controlled by messages received by the instrument cluster circuitry on the CCD data bus. Only the cluster illumination lamps, anti-lock brake system lamp, turn signal indicator lamps, and the master lighting indicator lamp (if the vehicle is so equipped) are hard-wired in the gauge cluster.

If an individual gauge or lamp is inoperative, see the diagnostic procedure under the heading for that gauge or lamp. For circuit descriptions and diagrams, refer to 8W-40 - Instrument Cluster in Group 8W - Wiring Diagrams. If more than one gauge or lamp is inoperative, perform the following:

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

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

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

(3) Turn the ignition switch to the On position. Check for battery voltage at the fused ignition switch output (start/run) fuse in the junction block. If OK, go to Step 4. If not OK, repair the open circuit to the fuse in the Power Distribution Center (PDC) as required.

(4) Turn the ignition switch to the Off position. Disconnect and isolate the battery negative cable. Remove the instrument cluster as described in this group. Connect the battery negative cable. Check for battery voltage at the fused B(+) circuit cavity of the instrument cluster wire harness connector. If OK, go to Step 5. If not OK, repair the open circuit from the fuse in the junction block as required.

(5) Turn the ignition switch to the On position. Check for battery voltage at the fused ignition switch output (start/run) circuit cavity of the instrument cluster wire harness connector. If OK, go to Step 6. If not OK, repair the open circuit from the fuse in the junction block as required.

(6) Turn the ignition switch to the Off position. Disconnect and isolate the battery negative cable. Probe each of the ground circuit cavities of the instrument cluster wire harness connector. Check for continuity to a good ground. There should be continuity. If OK, refer to the proper Diagnostic Procedures manual for further testing of the instrument cluster circuitry and the CCD data bus with a DRB scan tool. If not OK, repair the open circuit(s) to ground as required.

DIAGNOSIS AND TESTING (Continued)

COOLANT TEMPERATURE GAUGE

If the problem being diagnosed is related to coolant temperature gauge accuracy, be certain to confirm that the problem is with the gauge and not with cooling system performance. The actual engine coolant temperature should be checked with a test gauge or thermometer and compared to the instrument cluster coolant temperature gauge readings before you proceed with gauge diagnosis. Refer to Group 7 - Cooling System for more information. Refer to Group 8W - Wiring Diagrams for circuit descriptions and diagrams.

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

Diagnosis of the coolant temperature sensor and circuit, the Chrysler Collision Detection (CCD) data bus, and/or the Powertrain Control Module (PCM) should be performed with a DRB scan tool as described in the proper Diagnostic Procedures manual. For further diagnosis of the coolant temperature gauge and the instrument cluster circuitry, see Instrument Cluster in this group.

FUEL GAUGE

If the problem being diagnosed is related to fuel gauge accuracy, be certain to confirm that the problem is with the gauge or sending unit and not with the fuel tank. Inspect the fuel tank for signs of damage or distortion that could affect the sending unit performance before you proceed with fuel gauge diagnosis. Refer to Group 8W - Wiring Diagrams for circuit descriptions and diagrams.

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

Diagnosis of the fuel gauge sending unit and circuit, the Chrysler Collision Detection (CCD) data bus, and/or the Powertrain Control Module (PCM) should be performed with a DRB scan tool as described in the proper Diagnostic Procedures manual. For further diagnosis of the fuel gauge and the instrument cluster circuitry, see Instrument Cluster in this group.

ODOMETER AND TRIP ODOMETER

If the problem being diagnosed is related to odometer and/or trip odometer accuracy, be certain to confirm that the problem is with the display and not with an incorrect speedometer pinion gear, axle ratio, or tire size. Refer to Group 21 - Transmission for more information on the speedometer pinion gear. Refer to Group 8W - Wiring Diagrams for circuit descriptions and diagrams.

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

Diagnosis of the vehicle speed sensor and circuit, the Chrysler Collision Detection (CCD) data bus, the Body Control Module (BCM) and/or the Powertrain Control Module (PCM) should be performed with a DRB scan tool as described in the proper Diagnostic Procedures manual. For further diagnosis of the odometer and/or trip odometer and the instrument cluster circuitry, see Instrument Cluster in this group.

OIL PRESSURE GAUGE

If the problem being diagnosed is related to oil pressure gauge accuracy, be certain to confirm that the problem is with the gauge and not with the engine oiling system performance. The actual engine oil pressure should be checked with a test gauge and compared to the instrument cluster oil pressure gauge readings before you proceed with gauge diagnosis. Refer to Group 9 - Engines for more information. Refer to Group 8W - Wiring Diagrams for circuit descriptions and diagrams.

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

DIAGNOSIS AND TESTING (Continued)

Diagnosis of the oil pressure sensor and circuit, the Chrysler Collision Detection (CCD) data bus, and/or the Powertrain Control Module (PCM) should be performed with a DRB scan tool as described in the proper Diagnostic Procedures manual. For further diagnosis of the oil pressure gauge and the instrument cluster circuitry, see Instrument Cluster in this group.

SPEEDOMETER

If the problem being diagnosed is related to speedometer accuracy, be certain to confirm that the problem is with the speedometer gauge and not with an incorrect speedometer pinion gear, axle ratio, or tire size. Refer to Group 21 - Transmission for more information on the speedometer pinion gear. Refer to Group 8W - Wiring Diagrams for circuit descriptions and diagrams.

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

Diagnosis of the vehicle speed sensor and circuit, the Chrysler Collision Detection (CCD) data bus, and/or the Powertrain Control Module (PCM) should be performed with a DRB scan tool as described in the proper Diagnostic Procedures manual. For further diagnosis of the speedometer and the instrument cluster circuitry, see Instrument Cluster in this group.

TACHOMETER

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

Refer to Group 8W - Wiring Diagrams for circuit descriptions and diagrams. Diagnosis of the crankshaft position sensor and circuit, the Chrysler Collision Detection (CCD) data bus, and/or the Powertrain Control Module (PCM) should be performed with a DRB scan tool as described in the proper Diagnostic Procedures manual. For further diagnosis of the tachometer and the instrument cluster circuitry, see Instrument Cluster in this group.

VOLTMETER

If the problem being diagnosed is related to voltmeter gauge accuracy, be certain to confirm proper charging system operation before considering gauge replacement. Refer to Group 8C - Charging System for more information. Refer to Group 8W - Wiring Diagrams for circuit descriptions and diagrams.

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

Diagnosis of the system voltage input circuit, the Chrysler Collision Detection (CCD) data bus, and/or the Powertrain Control Module (PCM) should be performed with a DRB scan tool as described in the proper Diagnostic Procedures manual. For further diagnosis of the voltmeter and the instrument cluster circuitry, see Instrument Cluster in this group.

AIRBAG INDICATOR LAMP

The diagnosis found here addresses an inoperative airbag indicator lamp condition. If the airbag indicator lamp stays on with the ignition switch in the On position, or comes on and stays on while driving, refer to Group 8M - Passive Restraint Systems for diagnosis. For circuit descriptions and diagrams, refer to 8W-40 - Instrument Cluster, 8W-43 - Airbag System, and 8W-45 - Body Control Module in Group 8W - Wiring Diagrams.

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

The airbag indicator lamp has a lamp backup feature. Following the seat belt reminder lamp display function, if the instrument cluster circuitry has detected an inoperative airbag warning lamp circuit it will flash the seat belt reminder lamp on and off for twenty seconds. Once the instrument cluster circuitry has detected an inoperative airbag warning

DIAGNOSIS AND TESTING (Continued)

lamp circuit, if a lamp-on message is received from the Airbag Control Module (ACM) on the Chrysler Collision Detection (CCD) data bus, the seatbelt reminder lamp will flash for twelve seconds or the duration of the airbag system malfunction, whichever is longer.

If the airbag indicator lamp fails to light when the ignition switch is turned to the On position, and the seat belt reminder lamp flashes following its normal display function (about seven seconds after the ignition switch is turned to the On position), replace the airbag indicator lamp bulb with a known good unit. If the airbag indicator lamp still fails to operate, diagnosis of the airbag lamp, the instrument cluster circuitry, the CCD data bus, and the Body Control Module (BCM) should be performed with a DRB scan tool as described in the proper Diagnostic Procedures manual. For further diagnosis of the airbag indicator lamp and the instrument cluster circuitry, see Instrument Cluster in this group.

ANTI-LOCK BRAKE SYSTEM LAMP

The diagnosis found here addresses an inoperative Anti-lock Brake System (ABS) lamp condition. If the ABS lamp stays on with the ignition switch in the On position, or comes on and stays on while driving, refer to Group 5 - Brakes for diagnosis. If no ABS problem is found, the following procedure will help locate a short or open in the ABS lamp circuit. For circuit descriptions and diagrams, refer to 8W-40 - Instrument Cluster, and 8W-35 - All-Wheel Anti-Lock Brakes in Group 8W - Wiring Diagrams.

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

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

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

(3) Turn the ignition switch to the Off position. Disconnect and isolate the battery negative cable. Remove the instrument cluster. Connect the battery negative cable. Turn the ignition switch to the On position and within five seconds check for battery voltage between the fused ignition switch output circuit and the ABS warning lamp driver circuit cavities of the instrument cluster wire harness connector. If OK, replace the faulty bulb. If not OK, go to Step 4.

(4) Turn the ignition switch to the Off position. Disconnect and isolate the battery negative cable. Unplug the Controller Anti-lock Brake (CAB) wire harness connector. Check for continuity between the ABS warning lamp driver circuit cavity of the instrument cluster 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 ABS warning lamp driver circuit cavities of the instrument cluster wire harness connector and the CAB wire harness connector. There should be continuity. If OK, refer to Group 5 - Brakes for diagnosis of the CAB. If not OK, repair the open circuit as required.

BRAKE WARNING LAMP

The diagnosis found here addresses an inoperative brake warning lamp condition. If the brake warning lamp stays on with the ignition switch in the On position and the parking brake released, or comes on while driving, refer to Group 5 - Brakes for diagnosis. If no service brake or parking brake problem is found, proceed as follows. Refer to 8W-40 - Instrument Cluster, 8W-35 - All-Wheel Anti-Lock Brakes, and 8W-45 - Body Control Module in Group 8W - Wiring Diagrams for circuit descriptions and diagrams.

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

If the brake warning lamp fails to light during the bulb test (for about four seconds after the ignition switch is turned to the On position), replace the bulb with a known good unit. If the brake warning lamp still fails to operate, diagnosis of the park brake switch and circuit, the brake warning switch and circuit, the Body Control Module (BCM), the instrument cluster circuitry, and/or the CCD data bus should be performed with a DRB scan tool as described in the proper Diagnostic Procedures manual. For further diagnosis of the brake warning lamp and the instrument cluster circuitry, see Instrument Cluster in this group.

DIAGNOSIS AND TESTING (Continued)

CHECK GAUGES LAMP

The diagnosis found here addresses an inoperative check gauges lamp condition. If the check gauges lamp stays on with the ignition switch in the On position, or comes on while driving with no unusual gauge readings evident, diagnosis of the Powertrain Control Module (PCM), Body Control Module (BCM) and the Chrysler Collision Detection (CCD) data bus should be performed with a DRB scan tool as described in the proper Diagnostic Procedures manual. For circuit descriptions and diagrams, refer to 8W-30 - Fuel/Ignition Systems, 8W-40 - Instrument Cluster, and 8W-45 - Body Control Module in Group 8W - Wiring Diagrams.

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

If the check gauges lamp fails to light during the bulb test (about three seconds after the ignition switch is turned to the On position), replace the check gauges lamp bulb with a known good unit. If the check gauges lamp still fails to operate, diagnosis of the lamp, the instrument cluster circuitry, the CCD data bus, the BCM and the PCM should be performed with a DRB scan tool as described in the proper Diagnostic Procedures manual. For further diagnosis of the check gauges lamp and the instrument cluster circuitry, see Instrument Cluster in this group.

CIGAR LIGHTER

For circuit descriptions and diagrams, refer to 8W-41 - Horns/Cigar Lighter in Group 8W - Wiring Diagrams.

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

(1) Remove the cigar lighter knob and element from the cigar lighter receptacle shell. Check for continuity between the inside circumference of the cigar lighter receptacle shell and a good ground. there should be continuity. If OK, go to Step 2. If not OK, go to Step 3.

(2) Turn the ignition switch to the On position. Check for battery voltage at the insulated contact located at the back of the cigar lighter receptacle shell. If OK, replace the faulty cigar lighter knob and element. If not OK, go to Step 3.

(3) Turn the ignition switch to the Off position. Disconnect and isolate the battery negative cable. Remove the instrument panel center bezel. Check for continuity between the ground circuit cavity of the cigar lighter wire harness connector and a good ground. There should be continuity. If OK, go to Step 4. If not OK, repair the open circuit to ground as required.

(4) Connect the battery negative cable. Turn the ignition switch to the Accessory or On positions. Check for battery voltage at the fused B(+) circuit cavity of the cigar lighter wire harness connector. If OK, replace the faulty cigar lighter receptacle shell unit. If not OK, see the diagnosis for the cigar lighter relay in this group.

CIGAR LIGHTER RELAY

For circuit descriptions and diagrams, refer to 8W-41 - Horns/Cigar Lighter in Group 8W - Wiring Diagrams.

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

RELAY TEST

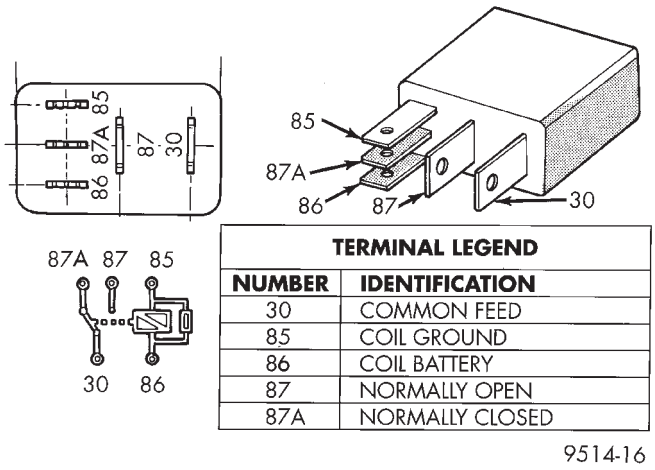
The cigar lighter relay (Fig. 1) is located in the junction block, on the right cowl side panel below the instrument panel in the passenger compartment. Remove the cigar lighter relay from the junction block to perform the following tests:

(1) 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 2. If not OK, replace the faulty relay.

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

(3) 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, see the Relay Circuit Test in this group. If not OK, replace the faulty relay.

DIAGNOSIS AND TESTING (Continued)



TERMINAL LEGEND	
NUMBER	IDENTIFICATION
30	COMMON FEED
85	COIL GROUND
86	COIL BATTERY
87	NORMALLY OPEN
87A	NORMALLY CLOSED

9514-16

Fig. 1 Cigar Lighter Relay

RELAY CIRCUIT TEST

(1) The relay common feed terminal (30) cavity of the junction block is connected to battery voltage and should be hot at all times. If OK, go to Step 2. If not OK, repair the fused B(+) circuit to the fuse in the junction block as required.

(2) The relay normally closed terminal (87A) is connected to terminal 30 in the de-energized position, but is not used for this application. Go to Step 3.

(3) The relay normally open terminal (87) is connected to the common feed terminal (30) in the energized position. This terminal supplies battery voltage to the cigar lighter when the relay is energized by the ignition switch. There should be continuity between the junction block cavity for relay terminal 87 and the fused B(+) circuit cavity of the cigar lighter wire harness connector at all times. If OK, go to Step 4. If not OK, repair the open circuit to the cigar lighter wire harness connector as required.

(4) The coil battery terminal (86) is connected to the electromagnet in the relay. It receives battery feed to energize the relay when the ignition switch is in the Accessory or On positions. There should be continuity between the junction block cavity for relay terminal 86 and the ignition switch output (acc/run) fuse in the junction block at all times. If OK, go to Step 5. If not OK, repair the open circuit to the junction block fuse as required.

(5) The coil ground terminal (85) is connected to the electromagnet in the relay. There should be continuity between the junction block cavity for relay terminal 85 and a good ground at all times. If not OK, repair the open circuit to ground as required.

CLUSTER ILLUMINATION LAMP

The diagnosis found here addresses an inoperative instrument cluster illumination lamp condition. If the problem being diagnosed is related to the dimming level of the instrument cluster illumination lamps, diagnosis should be performed with a DRB scan tool as described in the proper Diagnostic Procedures manual. For circuit descriptions and diagrams, refer to 8W-40 - Instrument Cluster, 8W-45 - Body Control Module, and/or 8W-50 - Front Lighting in Group 8W - Wiring Diagrams.

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

If only individual instrument cluster illumination lamps are inoperative, replace the faulty bulbs. If all of the instrument cluster illumination lamps are inoperative, proceed as follows.

(1) Disconnect and isolate the battery negative cable. Remove the instrument cluster. Connect the battery negative cable. Turn the park lamps on with the headlamp switch. Adjust the panel lamp dimmer switch knob to its highest level (fully upwards). Check for voltage at the panel lamp driver circuit cavity of the instrument cluster wire harness connector. If OK, replace the faulty instrument cluster. If not OK, go to Step 2.

(2) Disconnect and isolate the battery negative cable. Unplug the white 24-way Body Control Module (BCM) wire harness connector. Check for continuity between the panel lamp driver circuit cavities of the instrument cluster wire harness connector and the BCM wire harness connector. If OK, refer to Group 8L - Lamps for diagnosis of the headlamp switch and/or the proper Diagnostic Procedures manual for diagnosis of the BCM. If not OK, repair the open circuit as required.

CRUISE-ON INDICATOR LAMP

The diagnosis found here addresses an inoperative cruise-on indicator lamp condition. If the problem being diagnosed is an inaccurate cruise-on indicator lamp, refer to Group 8H - Vehicle Speed Control for diagnosis of the vehicle speed control system. For circuit descriptions and diagrams, refer to 8W-33 - Vehicle Speed Control and 8W-40 - Instrument Cluster in Group 8W - Wiring Diagrams.

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

DIAGNOSIS AND TESTING (Continued)

If the cruise-on indicator lamp fails to light during the bulb test (about four seconds after the ignition switch is turned to the On position), replace the cruise-on indicator lamp bulb with a known good unit. If the cruise-on lamp still fails to operate, diagnosis of the lamp, the instrument cluster circuitry, the vehicle speed control switches, the Powertrain Control Module (PCM) and the CCD data bus should be performed with a DRB scan tool as described in the proper Diagnostic Procedures manual. For further diagnosis of the cruise-on indicator lamp and the instrument cluster circuitry, see Instrument Cluster in this group.

GRAPHIC DISPLAY MODULE

If the problem being diagnosed is related to Graphic Display Module (GDM) illumination, see the GDM Illumination diagnosis below. If the problem being diagnosed is related to the four-wheel drive display or the four-wheel drive message lamps, see the Four-Wheel Drive Indicator Lamp diagnosis below. Refer to 8W-46 - Message Center in Group 8W - Wiring Diagrams for complete circuit descriptions and diagrams.

GDM ILLUMINATION

The diagnosis found here addresses an inoperative graphic display module illumination lamp condition. If the problem being diagnosed is related to the dimming level of the illumination lamps, diagnosis should be performed with a DRB scan tool as described in the proper Diagnostic Procedures manual.

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

If only individual illumination lamps are inoperative, replace the faulty bulbs. If all of the illumination lamps are inoperative, proceed as follows.

(1) Disconnect and isolate the battery negative cable. Remove the GDM from the instrument panel. Unplug the GDM wire harness connector. Connect the battery negative cable.

(2) Turn the park lamps on with the headlamp switch. Adjust the panel lamp dimmer switch knob to its highest level (fully upwards). Check for voltage at the panel lamp driver circuit cavity of the GDM wire harness connector. If OK, replace the faulty GDM. If not OK, go to Step 3.

(3) Disconnect and isolate the battery negative cable. Unplug the white 24-way Body Control Module (BCM) wire harness connector. Check for continuity between the panel lamp driver circuit cavities of the GDM wire harness connector and the BCM wire harness connector. If OK, refer to Group 8L - Lamps for diagnosis of the headlamp switch and/or the proper Diagnostic Procedures manual for diagnosis of the BCM. If not OK, repair the open circuit as required.

FOUR-WHEEL DRIVE INDICATOR LAMP

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

(1) Unplug the wire harness connector at the transfer case switch. Check for continuity between the ground circuit cavity of the transfer case switch wire harness connector and a good ground. There should be continuity. If OK, go to Step 2. If not OK, repair the open circuit as required.

(2) Check the transfer case switch continuity while shifting the transfer case shift lever to the proper positions. The switch continuity should be as shown in (Fig. 2). If OK, go to Step 3. If not OK, replace the faulty switch.

(3) Disconnect and isolate the battery negative cable. Remove the GDM from the instrument panel. Unplug the GDM wire harness connector.

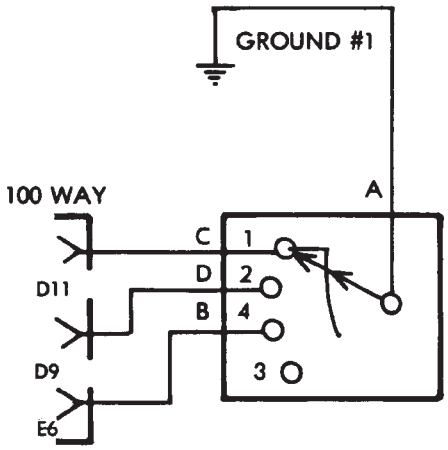
(4) Check for continuity in the circuit for the indicator lamp or wheel lamp that is not functioning between the GDM wire harness connector and the transfer case switch wire harness connector. There should be continuity. If OK, go to Step 5. If not OK, repair the open circuit as required.

(5) Replace the bulb for the inoperative indicator lamp or wheel lamp. Plug in the GDM and transfer case wire harness connectors. Connect the battery negative cable and check the operation of the inoperative lamp. If OK, discard the faulty bulb. If not OK, replace the faulty GDM.

HEADLAMP HIGH BEAM INDICATOR LAMP

The diagnosis found here addresses an inoperative headlamp high beam indicator lamp condition. If the problem being diagnosed is related to inoperative headlamp high beams, refer to Group 8L - Lamps for diagnosis of the headlamp system. If no headlamp system problems are found, proceed as follows. For circuit descriptions and diagrams, refer to 8W-40 - Instrument Cluster in Group 8W - Wiring Diagrams.

DIAGNOSIS AND TESTING (Continued)



231 TRANSFER CASE (COMMAND-TRAC)

T/C POSITION	SWITCH POSITION
2WD	1
4 PART TIME	2
N	3
4 LO	2

242 TRANSFER CASE (SELEC-TRAC)

T/C POSITION	SWITCH POSITION
2WD	1
4 PART TIME	2
4 FULL TIME	4
N	3
4 LO	2

249 TRANSFER CASE (QUADRA-TRAC)

T/C POSITION	SWITCH POSITION
4 ALL TIME	1
N	3
4 LO	2

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Fig. 2 Transfer Case Switch

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

If the headlamp high beam indicator lamp fails to light during the bulb test (about four seconds after the ignition switch is turned to the On position), replace the headlamp high beam indicator lamp bulb with a known good unit. If the indicator lamp still fails to operate, diagnosis of the lamp, the instrument cluster circuitry, the Chrysler Collision Detection (CCD) data bus, or the Body Control Module (BCM) should be performed with a DRB scan tool as described in the proper Diagnostic Procedures manual. For further diagnosis of the headlamp high beam indicator lamp and the instrument cluster circuitry, see Instrument Cluster in this group.

LOW FUEL WARNING LAMP

The diagnosis found here addresses an inoperative low fuel warning lamp condition. If the problem being diagnosed is related to lamp accuracy, be certain to confirm the problem is the with the low fuel warning lamp and not with the fuel gauge circuit. See the diagnosis for the Fuel Gauge in this group. If no fuel gauge problem is found, the following procedure will help to identify a faulty low fuel warning lamp circuit. For circuit descriptions and diagrams, refer to 8W-40 - Instrument Cluster in Group 8W - Wiring Diagrams.

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

If the low fuel warning lamp fails to light during the bulb test (about four seconds after the ignition switch is turned to the On position), replace the low fuel warning lamp bulb with a known good unit. If the indicator lamp still fails to operate, diagnosis of the lamp, the instrument cluster circuitry, the fuel gauge sending unit and circuit, the Powertrain Control Module (PCM), the Chrysler Collision Detection (CCD) data bus, or the Body Control Module (BCM)

DIAGNOSIS AND TESTING (Continued)

should be performed with a DRB scan tool as described in the proper Diagnostic Procedures manual. For further diagnosis of the low fuel warning lamp and the instrument cluster circuitry, see Instrument Cluster in this group.

MALFUNCTION INDICATOR LAMP

The diagnosis found here addresses an inoperative malfunction indicator (Check Engine) lamp condition. If the lamp comes on and stays on with the engine running, refer to Group 14 - Fuel Systems for diagnosis. For circuit descriptions and diagrams, refer to 8W-40 - Instrument Cluster in Group 8W - Wiring Diagrams.

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

If the malfunction indicator lamp fails to light during the bulb test (about three seconds after the ignition switch is turned to the On position), replace the malfunction indicator lamp bulb with a known good unit. If the indicator lamp still fails to operate, diagnosis of the lamp, the instrument cluster circuitry, the Powertrain Control Module (PCM) or the Chrysler Collision Detection (CCD) data bus should be performed with a DRB scan tool as described in the proper Diagnostic Procedures manual. For further diagnosis of the malfunction indicator lamp and the instrument cluster circuitry, see Instrument Cluster in this group.

POWER OUTLET

For circuit descriptions and diagrams, refer to 8W-41 - Horns/Cigar Lighter in Group 8W - Wiring Diagrams.

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

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

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

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

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

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

SEAT BELT REMINDER LAMP

The diagnosis found here addresses an inoperative seat belt reminder lamp condition. If the lamp comes on and flashes following its display function (for about seven seconds after the ignition switch is turned to the On position), see the diagnosis for the airbag indicator lamp in this group. For circuit descriptions and diagrams, refer to 8W-40 - Instrument Cluster in Group 8W - Wiring Diagrams.

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

If the seat belt reminder lamp fails to light during its display function, replace the seat belt reminder lamp bulb with a known good unit. If the reminder lamp still fails to operate, diagnosis of the lamp and the instrument cluster circuitry should be performed with a DRB scan tool as described in the proper Diagnostic Procedures manual. For further diagnosis of the seat belt indicator lamp and the instrument cluster circuitry, see Instrument Cluster in this group.

TURN SIGNAL INDICATOR LAMP

The diagnosis found here addresses an inoperative turn signal indicator lamp condition. For any other turn signal problem, refer to Group 8J - Turn Signal and Hazard Warning Systems for diagnosis. If no turn signal or hazard warning system problem is found, the following procedure will help locate a short or open in the indicator lamp circuit. For cir-

DIAGNOSIS AND TESTING (Continued)

cuit descriptions and diagrams, refer to 8W-40 - Instrument Cluster and 8W-50 - Front Lighting in Group 8W - Wiring Diagrams.

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

(1) Disconnect and isolate the battery negative cable. Remove the instrument cluster.

(2) Connect the battery negative cable. Activate the hazard warning system by depressing the hazard warning switch button to the On position. Check for battery voltage at the inoperative (right or left) turn signal indicator lamp circuit cavity of the instrument cluster wire harness connector. There should be a switching (on and off) battery voltage signal. If OK, replace the faulty (right or left) indicator lamp bulb. If not OK, repair the open circuit to the turn signal/ hazard warning (multi-function) switch as required.

VEHICLE INFORMATION CENTER

The Vehicle Information Center (VIC) has a number of display functions and features. The diagnosis found here addresses only those VIC messages and functions that are controlled by hard-wired inputs. To diagnose any internally controlled VIC function or feature, or any that are enabled by inputs on the Chrysler Collision Detection (CCD) data bus network, use a DRB scan tool and the proper Diagnostic Procedures manual. Refer to 8W-46 - Message Center in Group 8W - Wiring Diagrams for complete circuit descriptions and diagrams.

COOLANT LEVEL LOW/COOLANT SENSOR BAD

If the problem being diagnosed is related to message accuracy, be certain to confirm that the problem is with the VIC display and sensor and not with the engine coolant level. The actual engine coolant level should be checked before you proceed with lamp and sensor diagnosis. Refer to 8W-46 - Message Center in Group 8W - Wiring Diagrams for complete circuit descriptions and diagrams.

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

(1) Unplug the coolant level sensor wire harness connector from the coolant sensor located on the coolant reserve bottle. Check for continuity between the ground circuit cavity of the coolant level sensor wire harness connector and a good ground. There should be continuity. If OK, go to Step 2. If not OK, repair the open circuit as required.

(2) With the engine coolant at the proper level, check the resistance between the two terminals of the coolant level sensor. The resistance should be 3000 to 3500 ohms. If OK, go to Step 3. If not OK, replace the faulty sensor.

(3) Disconnect and isolate the battery negative cable. Remove the VIC module from the instrument panel. Unplug the VIC module wire harness connector. Check for continuity between the engine coolant level switch sense circuit cavity of the VIC wire harness connector and a good ground. There should be no continuity. If OK, go to Step 4. If not OK, repair the short circuit as required.

(4) Check for continuity between the engine coolant level switch sense circuit cavities of the VIC wire harness connector and the engine coolant level sensor wire harness connector. If OK, replace the faulty VIC module. If not OK, repair the open circuit as required.

FOUR-WHEEL DRIVE DISPLAY AND INDICATORS/SERVICE 4WD SWITCH

If the problem being diagnosed is related to an incorrect or no four-wheel drive display or indicator functions, be certain to confirm that the problem is with the VIC module and transfer case switch circuits, and not with a Powertrain Control Module (PCM) with an incorrect Vehicle Identification Number (VIN). This condition can only occur if the original PCM was replaced with a unit from another vehicle. The VIC module uses the VIN message received on the Chrysler Collision Detection (CCD) data bus from the PCM to determine if the vehicle is equipped with two-wheel drive or four-wheel drive.

If a four-wheel drive vehicle has a two-wheel drive VIN entered in the PCM, the VIC will ignore all transfer case switch inputs. If a two-wheel drive vehicle has a four-wheel drive VIN entered in the PCM, the rear wheels in the VIC display will not light. Use a DRB scan tool and the proper Diagnostic Procedures manual to confirm the VIN stored in the PCM.

In addition, it should be noted that a VIC “Service 4WD Switch” message on a two-wheel drive vehicle can occur if a short circuit occurs in the transfer case switch circuits from the VIC module, in combination with a PCM having a four-wheel drive VIN. To locate

DIAGNOSIS AND TESTING (Continued)

the short circuit, start at Step 3 of the following diagnostic procedure. Two-wheel drive models do have the same VIC wire harness provisions as four-wheel drive models.

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

(1) Unplug the wire harness connector at the transfer case switch. Check for continuity between the ground circuit cavity of the transfer case switch wire harness connector and a good ground. There should be continuity. If OK, go to Step 2. If not OK, repair the open circuit as required.

(2) Check the transfer case switch continuity while shifting the transfer case shift lever to the various positions. The switch continuity should be as shown in (Fig. 3). If OK, go to Step 3. If not OK, replace the faulty switch.

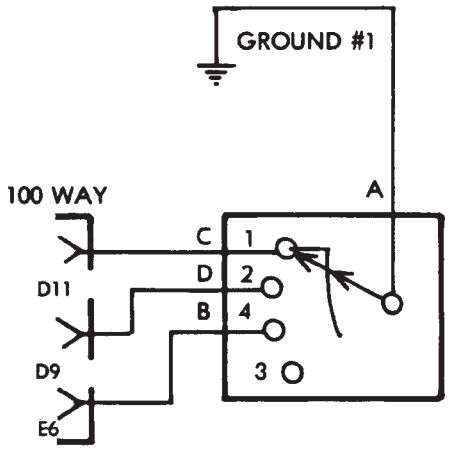
(3) Disconnect and isolate the battery negative cable. Remove the VIC module from the instrument panel. Unplug the VIC module wire harness connector.

(4) Locate two pairs of wire harness connectors located in the wire harness leading to the VIC module. The wire harness connectors should be taped back to the harness. One pair of connectors are black with a single cavity. The other pair are red with two cavities. If the vehicle has the Quadra-Trac 4WD transfer case, only the red wire harness connectors should be joined. If the vehicle has the Command-Trac or Selec-Trac 4WD transfer case, only the black wire harness connectors should be joined. In all cases, only one pair of wire harness connectors should be joined. If OK, go to Step 5. If not OK, correct the wire harness connections as required.

(5) Refer to the VIC 4WD Display Characteristics chart (Fig. 4). Check the continuity of the circuit for the indicator lamp or wheel lamp that is not functioning between the VIC module wire harness connector and the transfer case switch wire harness connector. There should be continuity. If OK, replace the faulty VIC module. If not OK, repair the open circuit as required.

REAR LAMP FAILURE

Refer to the diagnosis for the lamp outage module in Group 8L - Lamps to diagnose this feature of the



231 TRANSFER CASE (COMMAND-TRAC)

T/C POSITION	SWITCH POSITION
2WD	1
4 PART TIME	2
N	3
4 LO	2

242 TRANSFER CASE (SELEC-TRAC)

T/C POSITION	SWITCH POSITION
2WD	1
4 PART TIME	2
4 FULL TIME	4
N	3
4 LO	2

249 TRANSFER CASE (QUADRA-TRAC)

T/C POSITION	SWITCH POSITION
4 ALL TIME	1
N	3
4 LO	2

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Fig. 3 Transfer Case Switch

DIAGNOSIS AND TESTING (Continued)

DRIVE SYSTEM (TRANSFER CASE)	VIC 4WD DISPLAY CHARACTERISTICS	TRANSFER CASE SHIFT LEVER POSITION				
		2WD	4 PART TIME	4 FULL/ALL TIME	NEUTRAL	4 LO
4WD QUADRA-TRAC (NP249)	Nomenclature	N/A	N/A	None	None	''LO''
	Lighted Wheels	N/A	N/A	All	None	All
4WD SELEC-TRAC (NP242)	Nomenclature	None	''PART TIME''	''FULL TIME''	None	''PART TIME''
	Lighted Wheels	Rear	All	All	None	All
4WD COMMAND-TRAC (NP231)	Nomenclature	None	''PART TIME''	N/A	None	''PART TIME''
	Lighted Wheels	Rear	All	N/A	None	All
2WD (NONE)	Nomenclature	None	N/A	N/A	N/A	N/A
	Lighted Wheels	None	N/A	N/A	N/A	N/A

N/A = Not Applicable J958E-42

Fig. 4 VIC 4WD Display Characteristics

VIC module. Refer to 8W-46 - Message Center in Group 8W - Wiring Diagrams for complete circuit descriptions and diagrams.

TURN SIGNAL ON

Refer to Group 8J - Turn Signal and Hazard Warning Systems for more information on this feature of the VIC module. The VIC module uses its internal programming, and inputs from the combination flasher on the fused ignition switch output (L5) circuit, and a vehicle speed sensor (distance) message received on the Chrysler Collision Detection (CCD) data bus from the Powertrain Control Module (PCM) to control this message.

If testing of the L5 circuit between the VIC module wire harness connector and the combination flasher cavity in the junction block reveals no problem, use a DRB scan tool and the proper Diagnostic Procedures manual to diagnose the VIC module and the CCD data bus. Refer to 8W-46 - Message Center in Group 8W - Wiring Diagrams for complete circuit descriptions and diagrams.

WASHER LEVEL LOW/WASHER SENSOR BAD

If the problem being diagnosed is related to message accuracy, be certain to confirm that the problem is with the VIC display and sensor and not with the washer fluid level. The actual fluid level should be checked before you proceed with lamp and sensor diagnosis. Refer to 8W-46 - Message Center in Group 8W - Wiring Diagrams for complete circuit descriptions and diagrams.

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(1) Unplug the washer fluid level sensor wire harness connector from the sensor located on the washer reservoir bottle. Check for continuity between the ground circuit cavity of the washer fluid level sensor wire harness connector and a good ground. There should be continuity. If OK, go to Step 2. If not OK, repair the open circuit as required.

(2) With the washer fluid at the proper level, check the resistance between the two terminals of the washer fluid level sensor. The resistance should be 3000 to 3500 ohms. If OK, go to Step 3. If not OK, replace the faulty sensor.

(3) Disconnect and isolate the battery negative cable. Remove the VIC module from the instrument panel. Unplug the VIC module wire harness connector. Check for continuity between the washer fluid level sense circuit cavity of the VIC module wire harness connector and a good ground. There should be no continuity. If OK, go to Step 4. If not OK, repair the short circuit as required.

(4) Check for continuity between the washer fluid level sense circuit cavities of the VIC module wire harness connector and the washer fluid level sensor wire harness connector. If OK, replace the faulty VIC module. If not OK, repair the open circuit as required.

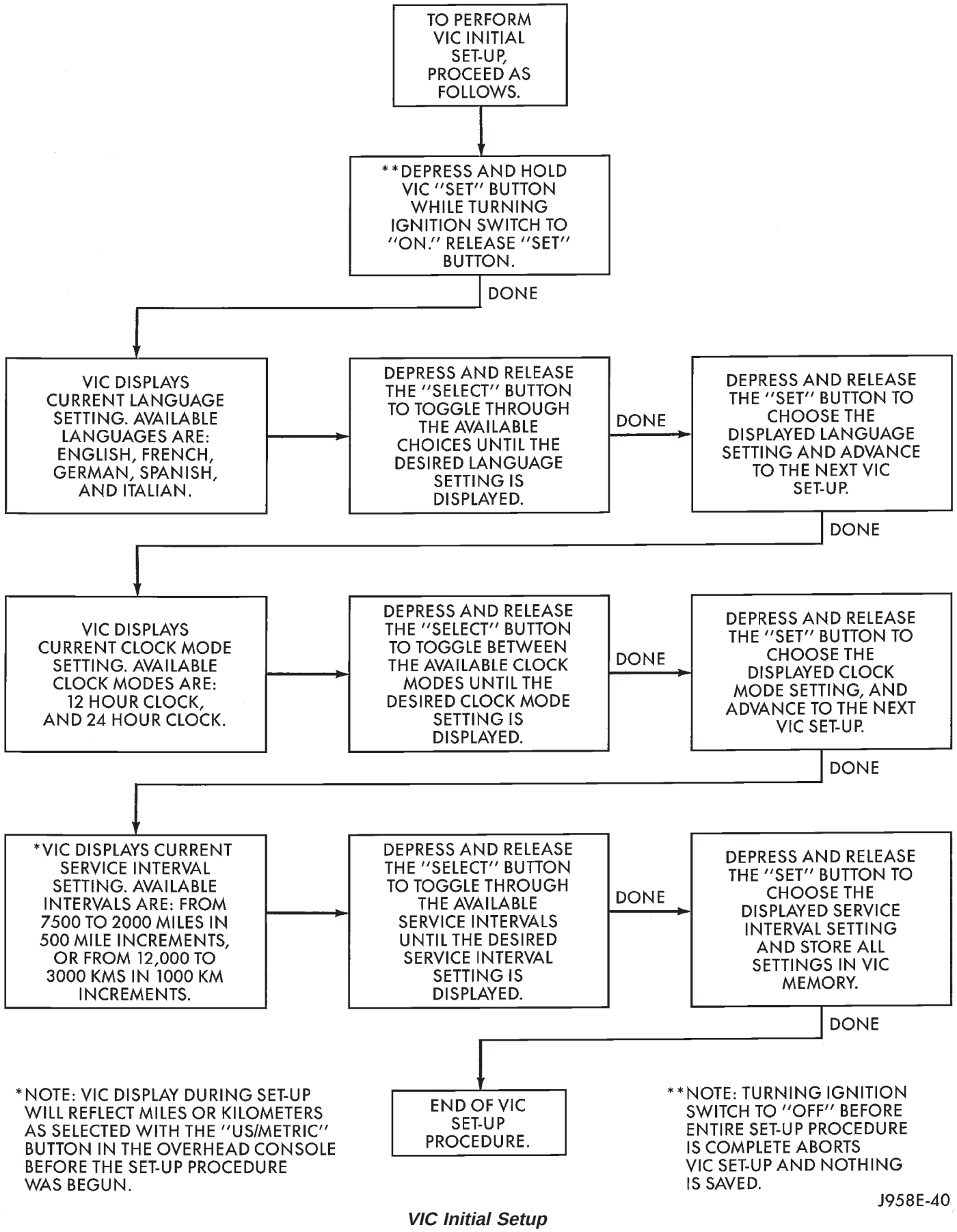
SERVICE PROCEDURES

VEHICLE INFORMATION CENTER

The following flow charts describe the procedures to perform an initial setup of the Vehicle Information Center (VIC), and how to reset the VIC service reminder or time/date settings.

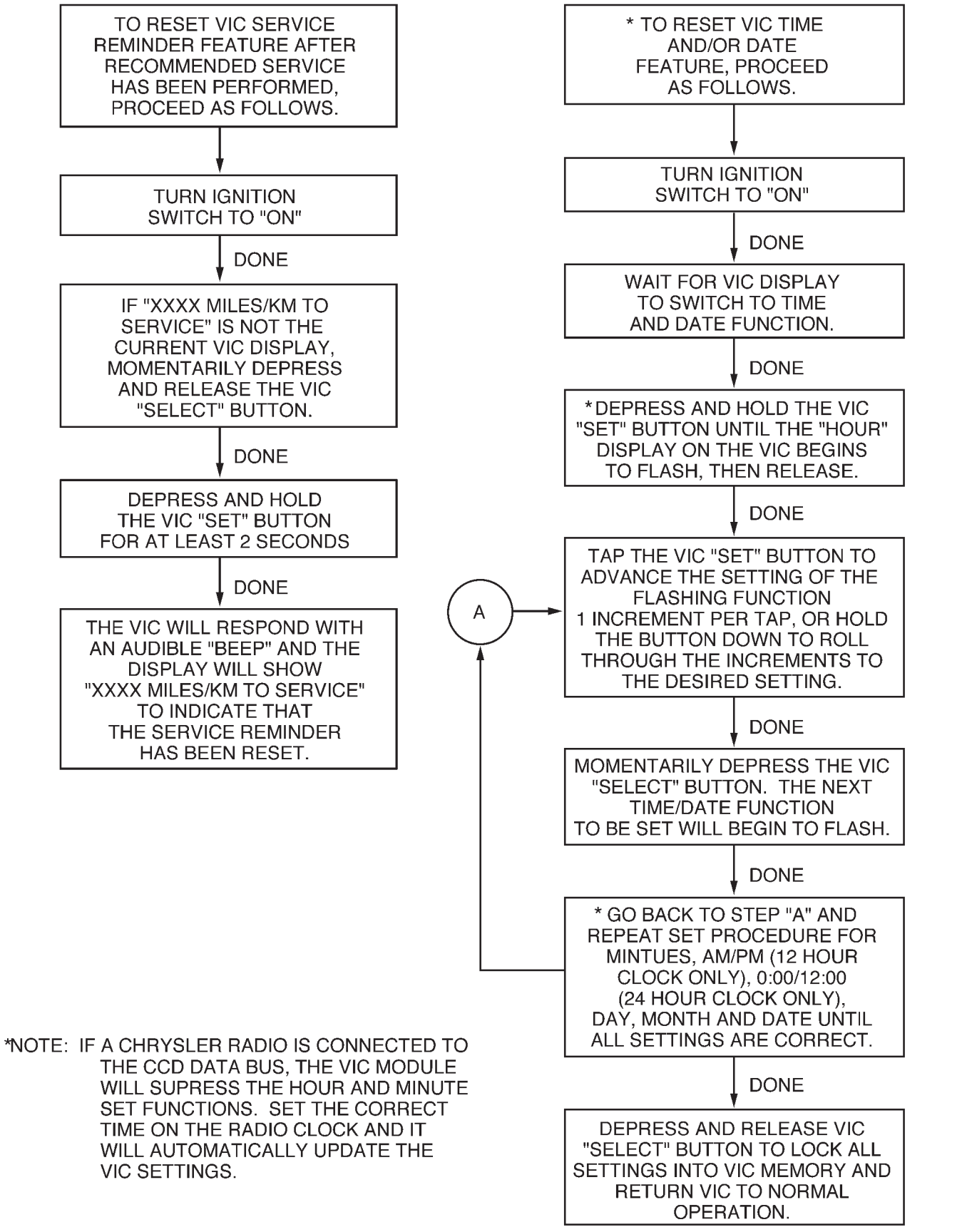
If the vehicle is equipped with a Chrysler radio that is connected to the Chrysler Collision Detection (CCD) data bus network, the hour and minute settings of the VIC clock will automatically be synchronized to the hour and minute settings of the radio clock. This is done by a message that the radio sends to the VIC module on the CCD data bus. Also, the VIC module will automatically suppress the VIC hour and minute set functions if there is a Chrysler radio connected to the CCD data bus, and the VIC clock must be set through the radio clock. Refer to Group 8F - Audio Systems for more information on this feature.

SERVICE PROCEDURES (Continued)



VIC Initial Setup

SERVICE PROCEDURES (Continued)



*NOTE: IF A CHRYSLER RADIO IS CONNECTED TO THE CCD DATA BUS, THE VIC MODULE WILL SUPRESS THE HOUR AND MINUTE SET FUNCTIONS. SET THE CORRECT TIME ON THE RADIO CLOCK AND IT WILL AUTOMATICALLY UPDATE THE VIC SETTINGS.

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VIC Reset

REMOVAL AND INSTALLATION

SWITCH POD BEZEL

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

(1) Both switch pod bezels are secured to the instrument panel with snap clip retainers and a light snap fit. Using a trim stick or another suitable wide flat-bladed tool, gently pry around the perimeter edges of the bezel to release the snap clip retainers.

(2) Remove the bezel from the instrument panel.

(3) To install the bezel, use one hand to hold it in position on the instrument panel, then use the other hand to push the bezel towards the instrument panel until each of the retainers snaps firmly into place.

STEERING COLUMN OPENING COVER AND KNEE BLOCKER

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

(1) Disconnect and isolate the battery negative cable.

(2) Remove both switch pod bezels. See Switch Pod Bezel in this group for the procedures.

(3) Remove the one screw on each side of the steering column that secures the upper edge of the steering column opening cover/knee blocker to the instrument panel (Fig. 5).

(4) Remove the one screw that secures the steering column opening cover/knee blocker to the outboard end of instrument panel.

(5) Remove the four screws that secure the lower edge of the steering column opening cover/knee blocker to the lower instrument panel reinforcement.

(6) Using a trim stick or another suitable wide flat-bladed tool, gently pry the edges of the steering column opening cover/knee blocker away from the instrument panel at the snap clip retainer locations (Fig. 5).

(7) Remove the steering column opening cover/knee blocker from the instrument panel.

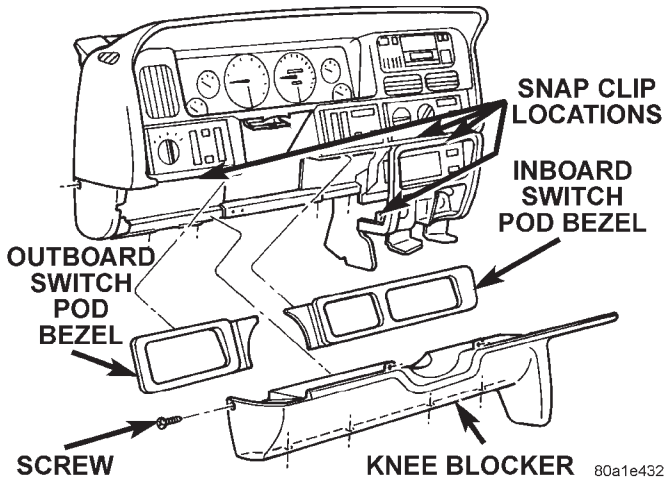

Fig. 5 Steering Column Opening Cover/Knee Blocker Remove/Install

(8) Reverse the removal procedures to install. Tighten the mounting screws to 2.2 N·m (20 in. lbs.).

CLUSTER BEZEL

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

(1) Disconnect and isolate the battery negative cable.

(2) Remove both switch pod bezels from the instrument panel. See Switch Pod Bezel in this group for the procedures.

(3) Remove the ten screws that secure the cluster bezel to the instrument panel (Fig. 6).

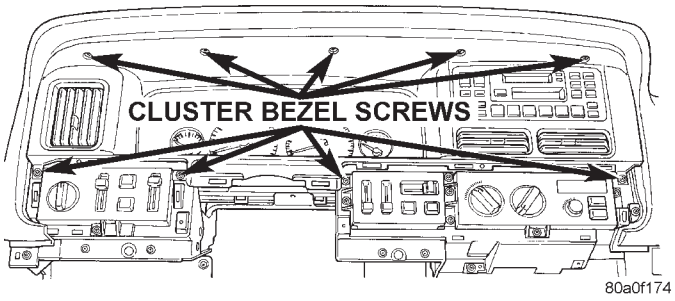

Fig. 6 Cluster Bezel Screws Remove/Install

(4) Pull the cluster bezel rearward and move it to the outboard side of the steering wheel to remove it from the instrument panel.

(5) Reverse the removal procedures to install. Tighten the mounting screws to 2.2 N·m (20 in. lbs.).

REMOVAL AND INSTALLATION (Continued)

INSTRUMENT CLUSTER

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

(1) Remove the cluster bezel from the instrument panel. See Cluster Bezel in this group for the procedures.
(2) Remove the two screws that secure each end of the instrument cluster to the instrument panel.
(3) Pull the instrument cluster rearward to disengage the self-docking wire harness connector.

NOTE: The instrument cluster has a self-docking wire harness connector that will be automatically aligned with, and connected to the instrument panel wire harness when the cluster is installed in the instrument panel.

(4) Remove the instrument cluster from the vehicle.
(5) Reverse the removal procedures to install. Tighten the mounting screws to 2.2 N·m (20 in. lbs.).

TRIP ODOMETER RESET KNOB

(1) Grasp the knob firmly between the thumb and forefinger.
(2) Gently pull the knob away from the instrument cluster until it slides off of the trip odometer reset switch stem.
(3) Reverse the removal procedures to install.

CLUSTER COMPONENTS

CLUSTER LENS

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

(1) Disconnect and isolate the battery negative cable.
(2) Remove the trip odometer reset knob from the trip odometer reset switch stem. See Trip Odometer Reset Knob in this group for the procedures.
(3) Remove the instrument cluster from the instrument panel. See Instrument Cluster in this group for the procedures.
(4) Work around the perimeter of the cluster depressing the snap clips that secure the cluster lens to the cluster hood, and gently pull the lens away from the cluster (Fig. 7).
(5) Reverse the removal procedures to install.

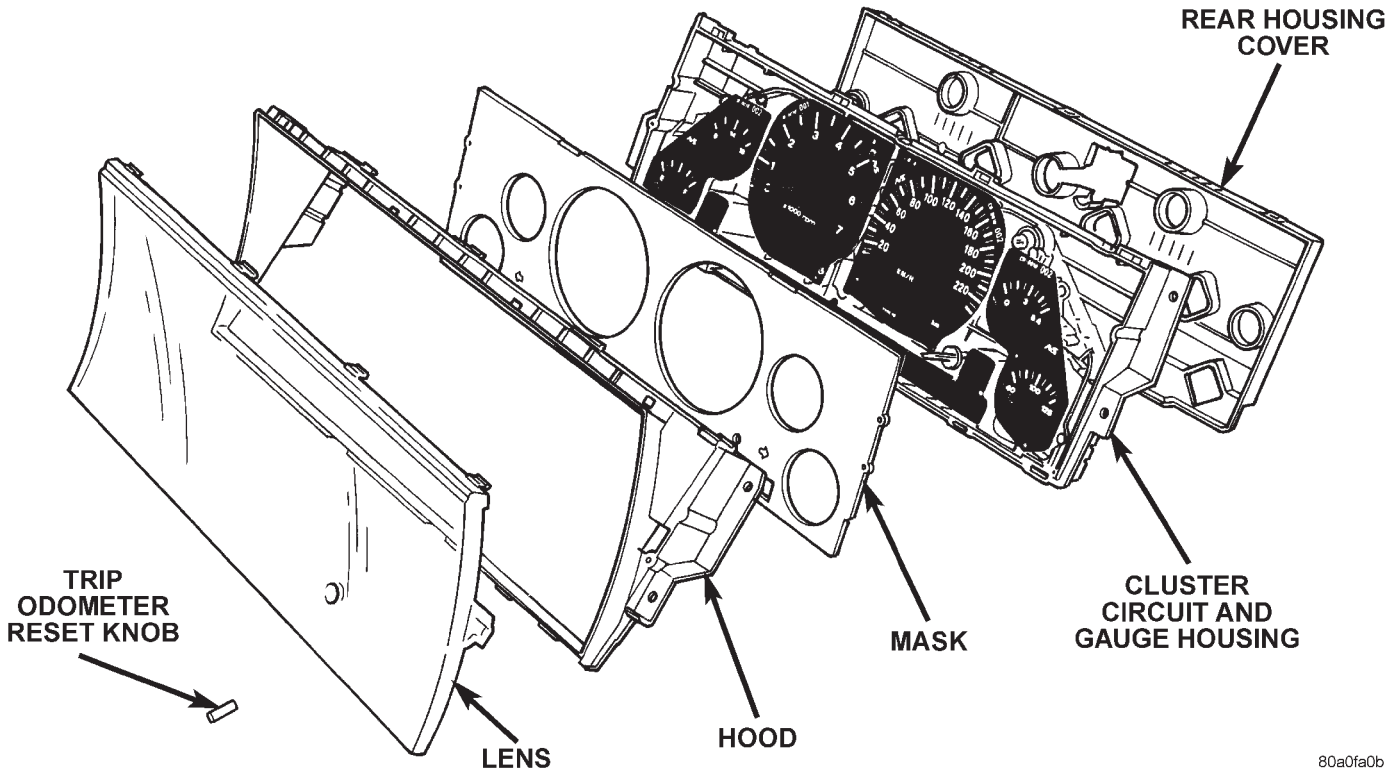

Fig. 7 Instrument Cluster Components

REMOVAL AND INSTALLATION (Continued)

CLUSTER HOOD AND MASK

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

(1) Disconnect and isolate the battery negative cable.
(2) Remove the cluster lens from the instrument cluster. See Cluster Lens in this group for the procedures.
(3) Work around the perimeter of the cluster depressing the snap clips that secure the cluster hood to the cluster housing, and gently pull the hood away from the cluster (Fig. 7).
(4) Lift the cluster mask off of the locating pins on the front of the cluster housing.
(5) Reverse the removal procedures to install.

CLUSTER REAR COVER

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

(1) Disconnect and isolate the battery negative cable.
(2) Remove the instrument cluster from the instrument panel. See Instrument Cluster in this group for the procedures.
(3) Work around the perimeter of the cluster releasing the snap clips that secure the rear cover to the back of the cluster housing, and gently pull the rear cover away from the cluster housing (Fig. 7).
(4) Reverse the removal procedures to install.

GAUGE

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

(1) Remove the cluster hood and mask, and the cluster rear cover from the cluster housing. See Cluster Hood and Mask, and Cluster Rear Cover in this group for the procedures.
(2) Remove the screws that secure the faulty gauge(s) to the cluster housing from the rear of the cluster electronic circuit board (Fig. 8).

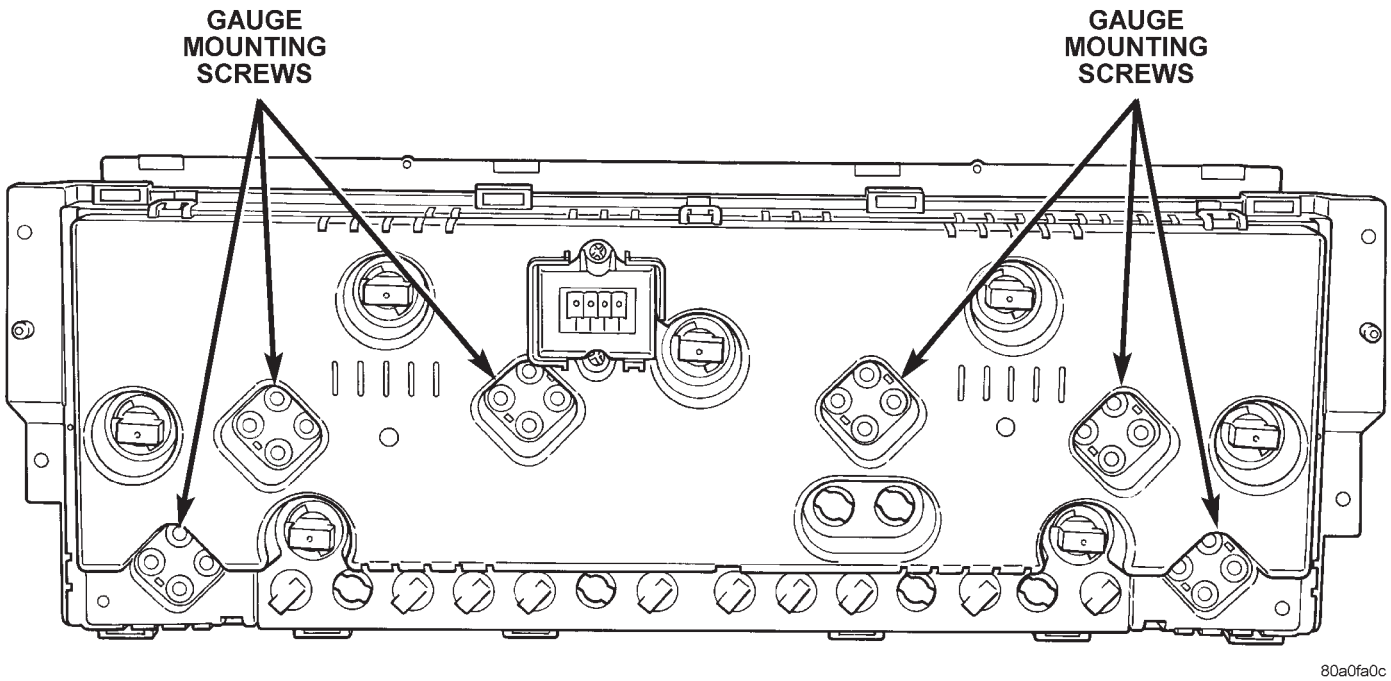

Fig. 8 Gauge Mounting Screws

REMOVAL AND INSTALLATION (Continued)

(3) Remove the faulty gauge(s) from the front of the cluster housing.

(4) Reverse the removal procedures to install. Tighten the gauge mounting screws to 2.2 N·m (20 in. lbs.).

CLUSTER BULB

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(1) Remove the instrument cluster from the instrument panel. See Instrument Cluster in this group for the procedures.

(2) Remove the bulb and bulb holder from the circuit board on the rear of the cluster housing by turning the holder counterclockwise (Fig. 9).

CAUTION: Always use the correct bulb size and type for replacement. An incorrect bulb size or type may overheat and cause damage to the instrument cluster printed circuit and/or the gauges.

(3) Reverse the removal procedures to install.

OUTBOARD SWITCH POD

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(1) Remove the cluster bezel from the instrument panel. See Cluster Bezel in this group for the procedures.

(2) Remove the two screws that secure the outboard switch pod to the instrument panel (Fig. 10).

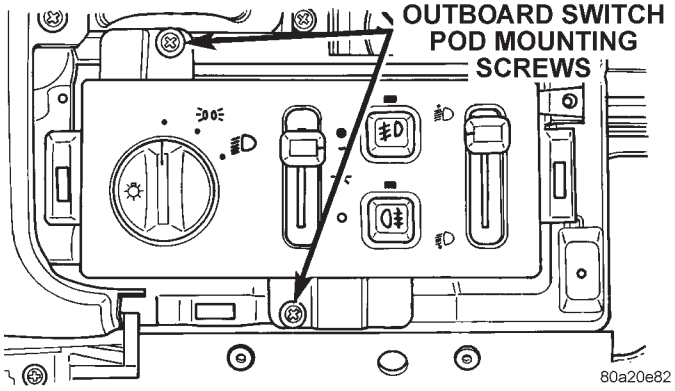

Fig. 10 Outboard Switch Pod Remove/Install

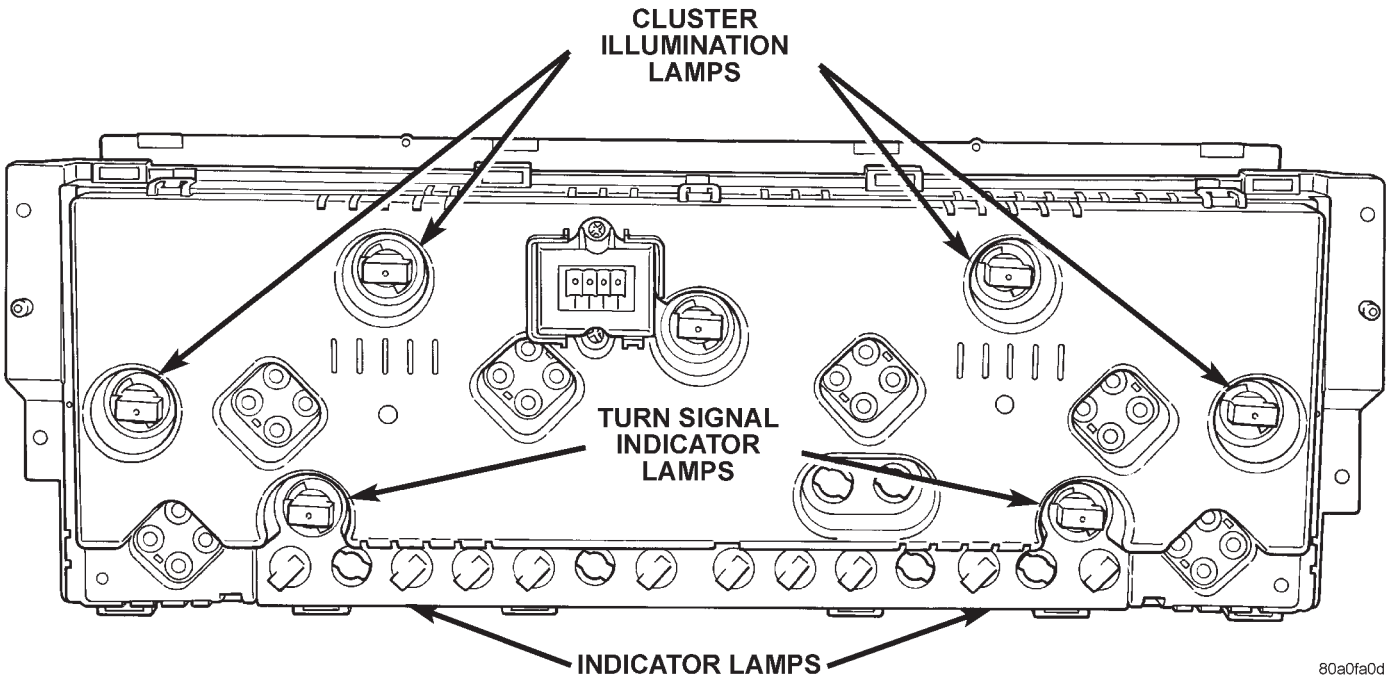

Fig. 9 Cluster Bulb Locations

REMOVAL AND INSTALLATION (Continued)

(3) Pull the outboard switch pod out from the instrument panel far enough to unplug the wire harness connectors.

(4) Remove the outboard switch pod from the instrument panel.

(5) Reverse the removal procedures to install. Tighten the mounting screws to 2.2 N·m (20 in. lbs.).

INBOARD SWITCH POD

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

(1) Remove the cluster bezel from the instrument panel. See Cluster Bezel in this group for the procedures.

(2) Remove the two screws that secure the inboard switch pod to the instrument panel (Fig. 11).

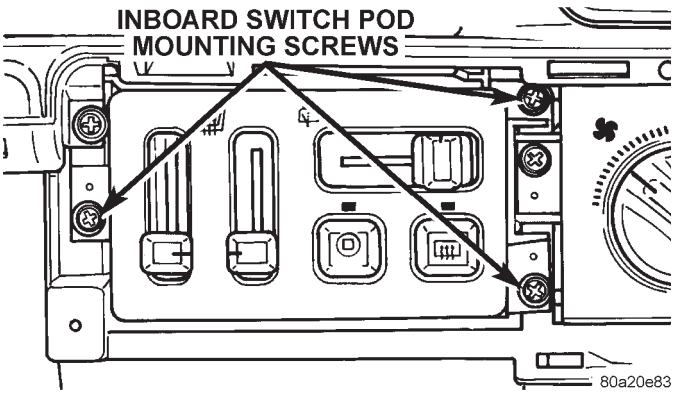

Fig. 11 Inboard Switch Pod Remove/Install

(3) Pull the inboard switch pod out from the instrument panel far enough to unplug the wire harness connectors.

(4) Remove the inboard switch pod from the instrument panel.

(5) Reverse the removal procedures to install. Tighten the mounting screws to 2.2 N·m (20 in. lbs.).

BODY CONTROL MODULE

Before replacing the Body Control Module (BCM), use a DRB scan tool to determine the current settings for the BCM programmable features. These settings should be duplicated in the replacement BCM using the DRB scan tool, before returning the vehicle to service.

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(1) Remove the steering column opening cover/knee blocker from the instrument panel. See Steering Column Opening Cover and Knee Blocker in this group for the procedures.

(2) Remove the four screws located below the outboard switch pod that secure the Body Control Module (BCM) to the instrument panel armature (Fig. 12).

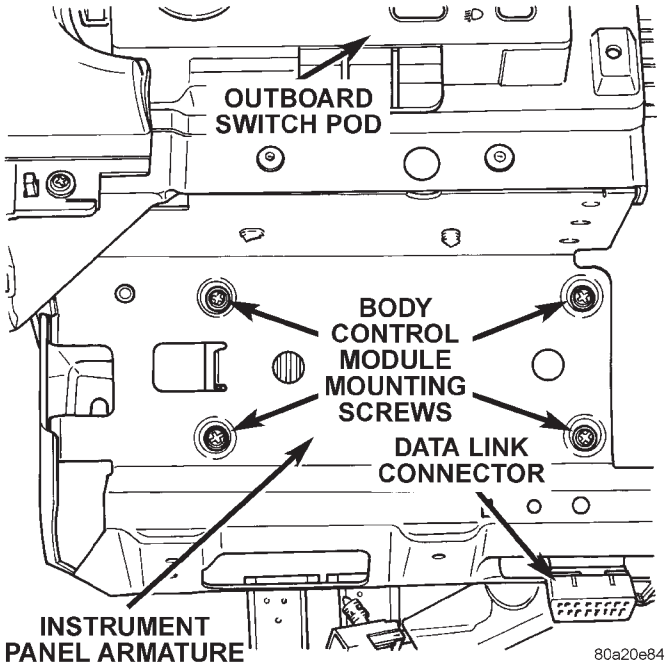

Fig. 12 Body Control Module Remove/Install

(3) Move the BCM towards the steering column far enough to access the three wire harness connectors.

(4) Unplug the wire harness connectors from the BCM.

(5) Remove the BCM from the instrument panel.

(6) Reverse the removal procedures to install. Tighten the mounting screws to 2.2 N·m (20 in. lbs.).

NOTE: If a new Body Control Module is installed, the programmable features must be enabled and/or disabled to the customer's preferred settings. Use a DRB scan tool and the proper Diagnostic Procedures manual to perform these operations.

REMOVAL AND INSTALLATION (Continued)

GLOVE BOX MODULE

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

(1) Remove the steering column opening cover/ knee blocker from the instrument panel. See Steering Column Opening Cover and Knee Blocker in this group for the procedures.
(2) Remove the two screws that secure the top of the instrument panel center bezel to the instrument panel above the Graphic Display Module (GDM) or Vehicle Information Center (VIC).
(3) Remove the ash receiver from the instrument panel center bezel.
(4) Remove the two screws in the back of the ash receiver opening that secure the instrument panel center bezel to the instrument panel armature.
(5) Remove the screw that secures the courtesy lamp to the lower instrument panel located under the outboard end of the glove box module.
(6) Open the passenger side front door and remove the screw that secures the outboard end of the glove box module to the instrument panel armature.
(7) Remove the four screws that secure the glove box hinge to the instrument panel armature on the lower edge of the glove box module.
(8) Open the glove box door and remove the four screws at the top of the glove box opening that secure the upper edge of the glove box module to the instrument panel armature.
(9) Lower the glove box module far enough to access and unplug the wire harness connectors from the glove box lamp and switch, the cigar lighter and lamp, and the power outlet. Also remove the ash receiver lamp bulb and socket as a unit by gently pulling it out of the ash receiver lamp hood.
(10) Remove the glove box module from the instrument panel.
(11) Reverse the removal procedures to install. Tighten the mounting screws to 2.2 N·m (20 in. lbs.).

GRAPHIC DISPLAY MODULE AND VEHICLE INFORMATION CENTER

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(1) Remove the glove box module from the instrument panel. See Glove Box Module in this group for the procedures.
(2) Remove the three screws that secure the Graphic Display Module (GDM) or Vehicle Information Center (VIC) to the instrument panel armature (Fig. 13).

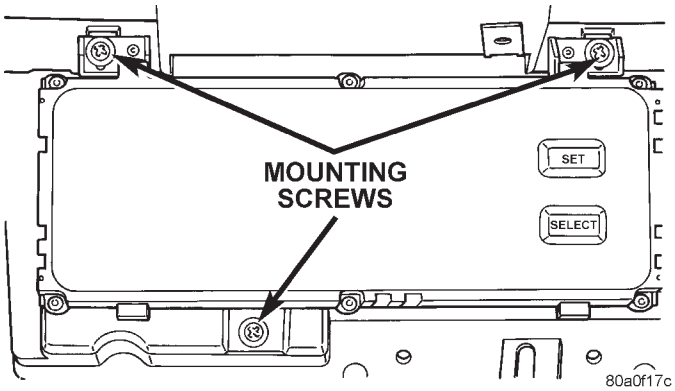

Fig. 13 Graphic Display Module and Vehicle Information Center Remove/Install

(3) Pull the GDM or VIC unit out from the instrument panel far enough to access and unplug the wire harness connector.
(4) Remove the GDM or VIC from the instrument panel.
(5) Reverse the removal procedures to install. Tighten the mounting screws to 2.2 N·m (20 in. lbs.).

GLOVE BOX LAMP AND SWITCH

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

(1) Remove the glove box module from the instrument panel. See Glove Box Module in this group for the procedures.
(2) From the back side of the glove box module, squeeze the retaining tabs on the glove box lamp and switch housing together and push the unit out through the mounting hole towards the front of the module (Fig. 14).

REMOVAL AND INSTALLATION (Continued)

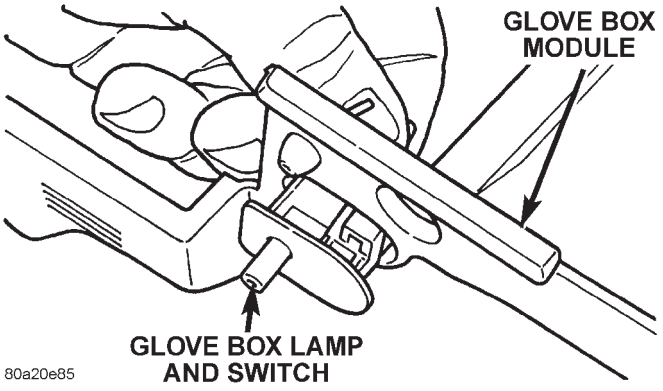

Fig. 14 Glove Box Lamp and Switch Remove/Install

(3) To install the glove box lamp and switch unit, insert the unit through the mounting hole from the front of the glove box module and push in on the unit firmly, until the retaining tabs snap into place.

(4) Reverse the remaining removal procedures to complete the installation.

GLOVE BOX LATCH STRIKER

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(1) Remove the glove box module from the instrument panel. See Glove Box Module in this group for the procedures.

(2) From the top of the glove box module, straighten the two mounting tabs that secure the glove box latch striker to the glove box module (Fig. 15).

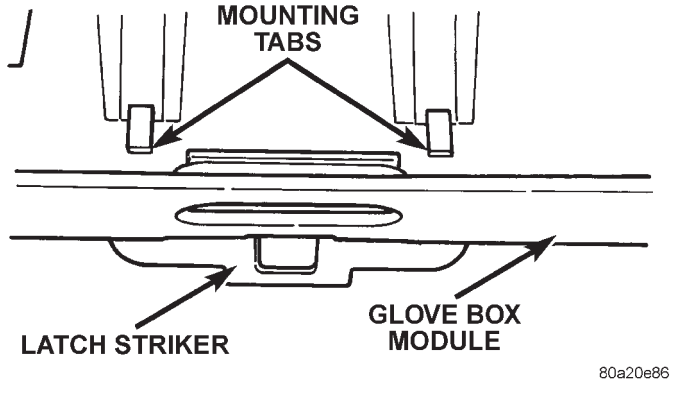

Fig. 15 Glove Box Latch Striker Remove/Install

(3) Remove the latch striker through the upper glove box opening of the glove box module.

(4) To install the latch striker, insert the mounting tabs through the slots in the upper glove box opening of the glove box module, and bend the tabs over from the top of the glove box module.

CIGAR LIGHTER

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

(1) Disconnect and isolate the battery negative cable.

(2) Pull the cigar lighter knob and element out of the cigar lighter base.

(3) Look inside the cigar lighter base and note the position of the retaining bosses that secure the unit to the light ring/retainer in the instrument panel center bezel (Fig. 16).

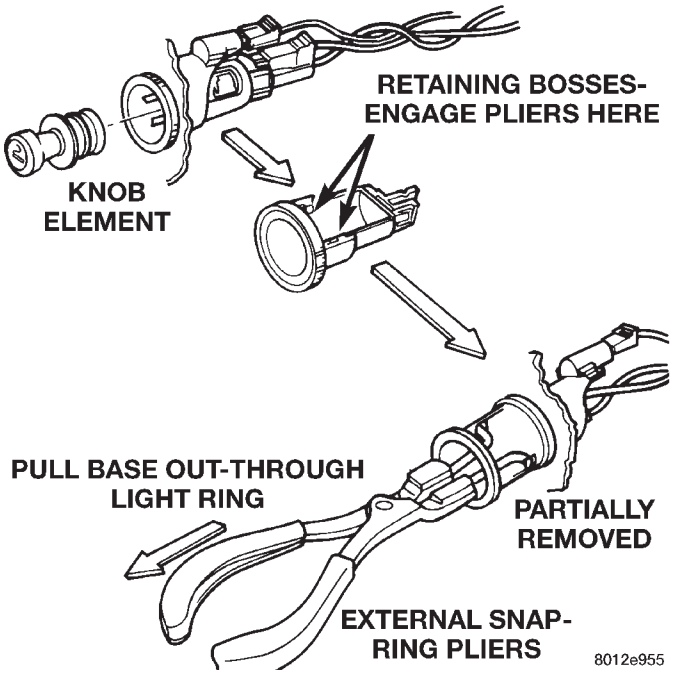

Fig. 16 Cigar Lighter Remove/Install

(4) Insert a pair of external snap ring pliers into the cigar lighter base and engage the tips of the pliers with the retaining bosses.

(5) Squeeze the pliers to disengage the retaining bosses from the base, and using a gentle rocking

REMOVAL AND INSTALLATION (Continued)

motion pull the pliers and the cigar lighter base out of the light ring/retainer.

(6) Remove the pliers from the cigar lighter base and unplug the cigar lighter wire harness connector.

(7) Remove the cigar lighter light ring/retainer from the instrument panel center bezel and unplug the light ring lamp wire harness connector.

(8) Reverse the removal procedures to install.

POWER OUTLET

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

(1) Remove the glove box module from the instrument panel. See Glove Box Module in this group for the procedures.

(2) From the rear of the instrument panel center bezel, unscrew the power outlet receptacle shell clamp from the power outlet receptacle shell base.

(3) Remove the power outlet receptacle shell base from the front of the instrument panel center bezel.

(4) Reverse the removal procedures to install.

POWER OUTLET DOOR

(1) Insert a trim stick or another suitable wide flat-bladed tool between the side of the power outlet housing in the instrument panel center bezel and the upper pivot area of the power outlet door.

(2) Pry gently against the upper pivot area of the power outlet door until the door pivot pin clears the pivot receptacle in the instrument panel center bezel.

(3) Pull the power outlet door out of the power outlet housing using a twisting motion.

(4) To install the door, insert one of the pivot pins into a pivot receptacle in the instrument panel center bezel and twist the door gently until the pivot pin on the opposite side of the door snaps into the other center bezel pivot receptacle.

INSTRUMENT PANEL CENTER BEZEL

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(1) Remove the glove box module from the instrument panel. See Glove Box Module in this group for the procedures.

(2) Remove the two screws located on the back side of the glove box module that secure the instrument panel center bezel to the inboard end of the glove box module (Fig. 17).

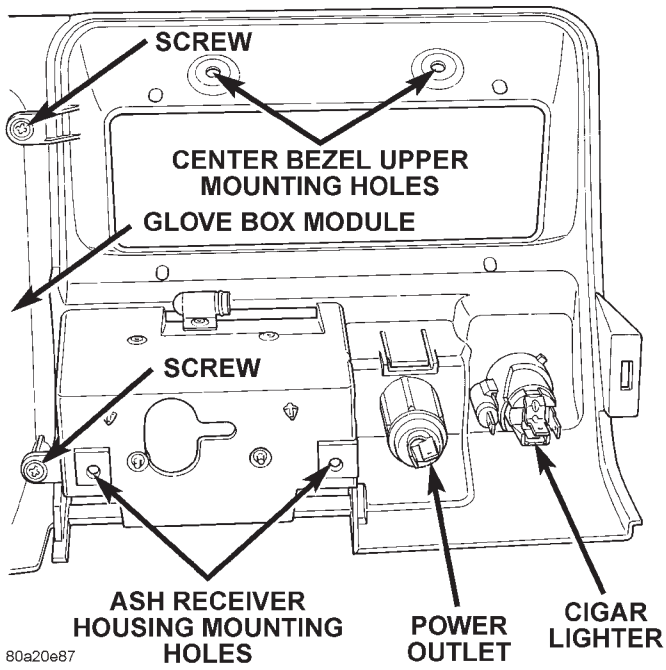

Fig. 17 Instrument Panel Center Bezel Remove/ Install

(3) Reverse the removal procedures to install. Tighten the mounting screws to 2.2 N·m (20 in. lbs.).

GLOVE BOX

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(1) Disconnect and isolate the battery negative cable.

(2) Drill out the two rivets that secure the glove box hinge to the lower edge of the glove box module (Fig. 18).

REMOVAL AND INSTALLATION (Continued)

NOTE: The rivets are used to ease assembly during the manufacturing process, but do not require replacement following service.

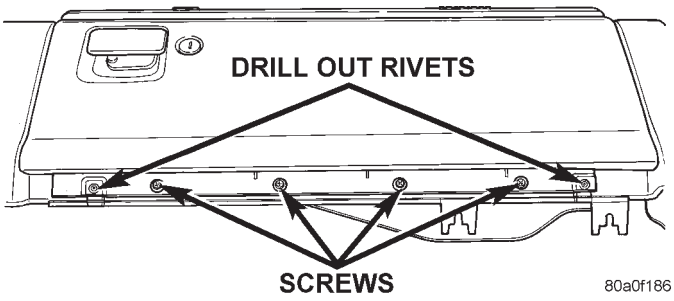

Fig. 18 Glove Box Remove/Install

(3) Remove the four screws that secure the glove box hinge to the instrument panel armature.

(4) Release the glove box latch and remove the glove box from the glove box module.

(5) Reverse the removal procedures to install. Tighten the mounting screws to 2.2 N·m (20 in. lbs.).

GLOVE BOX COMPONENTS

The glove box bezel is the only component of the glove box that can be serviced without glove box removal. All other components will require that the glove box be removed from the instrument panel.

GLOVE BOX BEZEL

(1) Open the glove box.

(2) Remove the two screws that secure the bezel to the glove box near the top of the glove box inner door panel (Fig. 19).

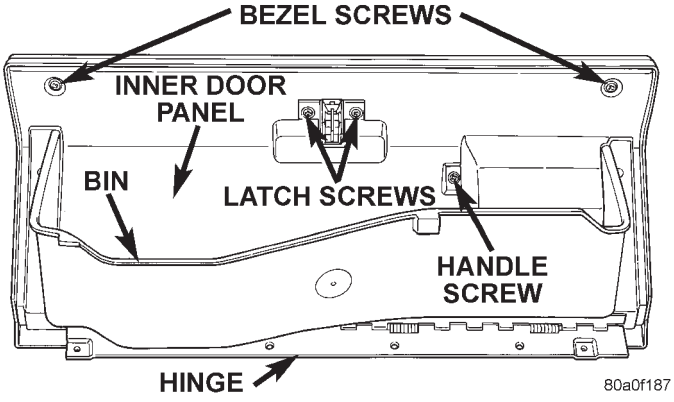

Fig. 19 Glove Box Components

(3) Using a trim stick or another suitable wide flat-bladed tool, gently pry the bezel away from the outside of the glove box door. There is double-faced adhesive tape between the bezel and the outer door panel.

(4) Reverse the removal procedures to install. Tighten the mounting screws to 2.2 N·m (20 in. lbs.).

GLOVE BOX HINGE

(1) Remove the glove box from the instrument panel. See Glove Box in this group for the procedures.

(2) Remove the screws that secure the glove box hinge to the glove box inner door panel.

(3) Remove the glove box hinge from the glove box door.

(4) Reverse the removal procedures to install. Tighten the mounting screws to 2.2 N·m (20 in. lbs.).

GLOVE BOX BIN

(1) Remove the glove box hinge from the glove box door. See Glove Box Hinge in this group for the procedures.

(2) Remove the screws that secure each side of the glove box bin to the glove box door.

(3) Remove the glove box bin from the glove box door.

(4) Reverse the removal procedures to install. Tighten the mounting screws to 2.2 N·m (20 in. lbs.).

GLOVE BOX LATCH AND HANDLE

(1) Remove the glove box bin from the glove box door. See Glove Box Bin in this group for the procedures.

(2) Remove the two bezel screws, two latch screws, and one handle screw from the glove box inner door panel.

(3) Remove the glove box inner door panel from the glove box outer door panel.

(4) Remove the screw that secures the glove box latch and handle to the inside of the glove box outer door panel (Fig. 20).

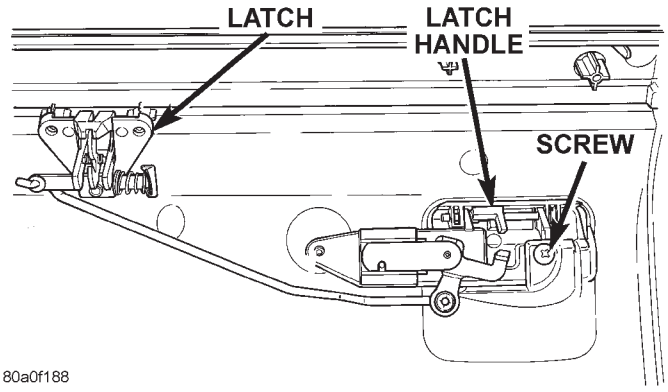

Fig. 20 Glove Box Latch and Handle Remove/Install

(5) Remove the latch and handle from the glove box door as a unit.

(6) Reverse the removal procedures to install. Tighten the mounting screws to 2.2 N·m (20 in. lbs.).

REMOVAL AND INSTALLATION (Continued)

GLOVE BOX LOCK CYLINDER

(1) Remove the glove box latch and handle from the glove box. See Glove Box Latch and Handle in this group for the procedures.

(2) Insert the glove box key into the glove box lock cylinder.

(3) Insert a small screwdriver into the retaining tumbler release slot and depress the retaining tumbler (Fig. 21).

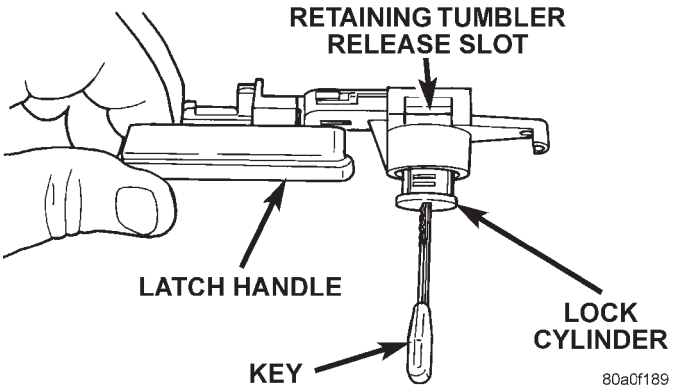

Fig. 21 Glove Box Lock Cylinder Remove/Install

(4) Pull the lock cylinder out of the latch handle by using a gentle twisting and pulling action on the key.

(5) Reverse the removal procedures to install.

COWL TOP TRIM PANEL

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

(1) Disconnect and isolate the battery negative cable.

(2) Using a trim stick or another suitable wide flat-bladed tool, gently pry the cowl top trim panel off of the instrument panel top pad (Fig. 22).

(3) Pull the trim panel up far enough to access and unplug the wire harness connector for the solar sensor, or to remove the solar sensor from the cowl top trim, if the vehicle is so equipped.

(4) Remove the cowl top trim panel from the instrument panel.

(5) Reverse the removal procedures to install.

INSTRUMENT PANEL TOP PAD

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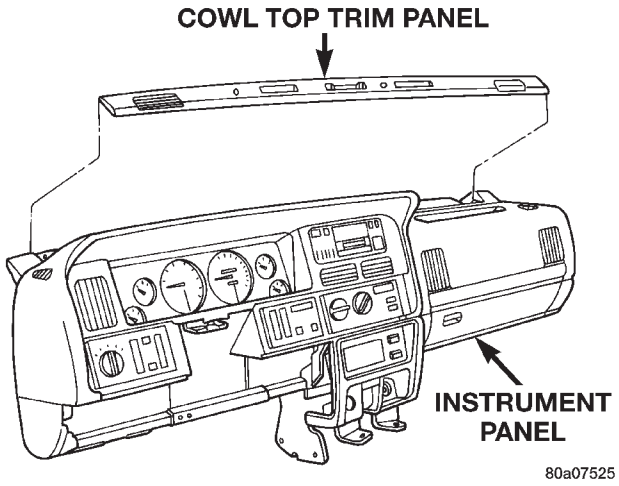

Fig. 22 Cowl Top Trim Remove/Install

(1) Disconnect and isolate the battery negative cable.

(2) Remove the steering column opening cover and knee blocker from the instrument panel. See Steering Column Opening Cover and Knee Blocker in this group for the procedures.

(3) Remove the cluster bezel from the instrument panel. See Cluster Bezel in this group for the procedures.

(4) Remove the glove box module from the instrument panel. See Glove Box Module in this group for the procedures.

(5) Remove the cowl top trim panel from the instrument panel. See Cowl Top Trim Panel in this group for the procedures.

(6) If the vehicle is so equipped, remove the screw that secures the auto headlamp light sensor/vehicle theft security system lamp to the top of the instrument panel near the defroster duct outlet, and move it far enough for clearance during removal of the instrument panel top pad.

(7) Remove all of the screws that secure the perimeter of the instrument panel top pad to the instrument panel armature.

(8) Remove the instrument panel top pad from the instrument panel armature.

(9) Reverse the removal procedures to install. Tighten the mounting screws to 2.2 N·m (20 in. lbs.).

REMOVAL AND INSTALLATION (Continued)

JUNCTION BLOCK

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(1) Disconnect and isolate the battery negative cable.

(2) Remove the fuse access panel by unsnapping it from the right cowl side trim panel.

(3) Remove the push nut that secures the right cowl side trim panel to the junction block stud (Fig. 23).

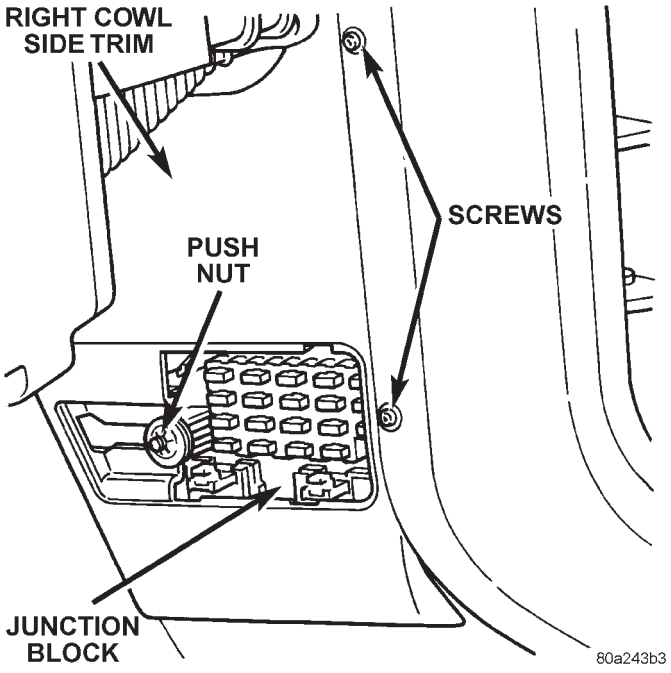

Fig. 23 Right Cowl Side Trim Panel Remove/Install

(4) Remove the two screws that secure the right cowl side trim panel to the right front door opening trim.

(5) Remove the right cowl side trim panel from the right cowl side inner panel.

(6) Unplug all of the wire harness connectors from the junction block cavities.

(7) Remove the two screws that secure the junction block to the mounting bracket on the right cowl side inner panel.

(8) Remove the junction block from the mounting bracket on the right cowl side inner panel.

(9) Reverse the removal procedures to install. Tighten the mounting screws to 2.2 N·m (20 in. lbs.).

INSTRUMENT PANEL ASSEMBLY

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

(1) Disconnect and isolate the battery negative cable.

(2) Remove the steering column opening cover and knee blocker from the instrument panel. See Steering Column Opening Cover and Knee Blocker in this group for the procedures.

(3) Remove the bolts that secure the lower instrument panel reinforcement to the instrument panel armature and remove the reinforcement (Fig. 24).

(4) Remove the upper and lower steering column shrouds from the steering column. Refer to Group 19 - Steering for the procedures.

(5) Unplug all of the wire harness connectors from the steering column-mounted components and switches.

(6) Remove the three nuts that secure the steering column toe plate to the dash panel at the base of the steering column.

(7) Remove the two nuts that secure the steering column mounting bracket to the studs on the steering column and brake pedal support. Lower the steering column to the floor.

(8) Remove both cowl side trim panels. Refer to Group 23 - Body for the procedures.

(9) Unplug the instrument panel to body wire harness connector under the left end of the instrument panel.

(10) Unplug the brake lamp switch wire harness connector.

(11) Unplug the instrument panel to heater-A/C housing vacuum harness connector (manual temperature control only) and wire harness connector located under the passenger side end of the instrument panel.

(12) Unplug the radio antenna coaxial cable connector near the right cowl side panel.

(13) Unplug all of the instrument panel wire harness connectors from the junction block on the right cowl side panel.

(14) If the vehicle is so equipped, disconnect the in-car temperature sensor aspirator hose at the coupling near the passenger side of the transmission floor tunnel.

(15) Remove the ash receiver and remove the screw in the back of the ash receiver housing that

REMOVAL AND INSTALLATION (Continued)

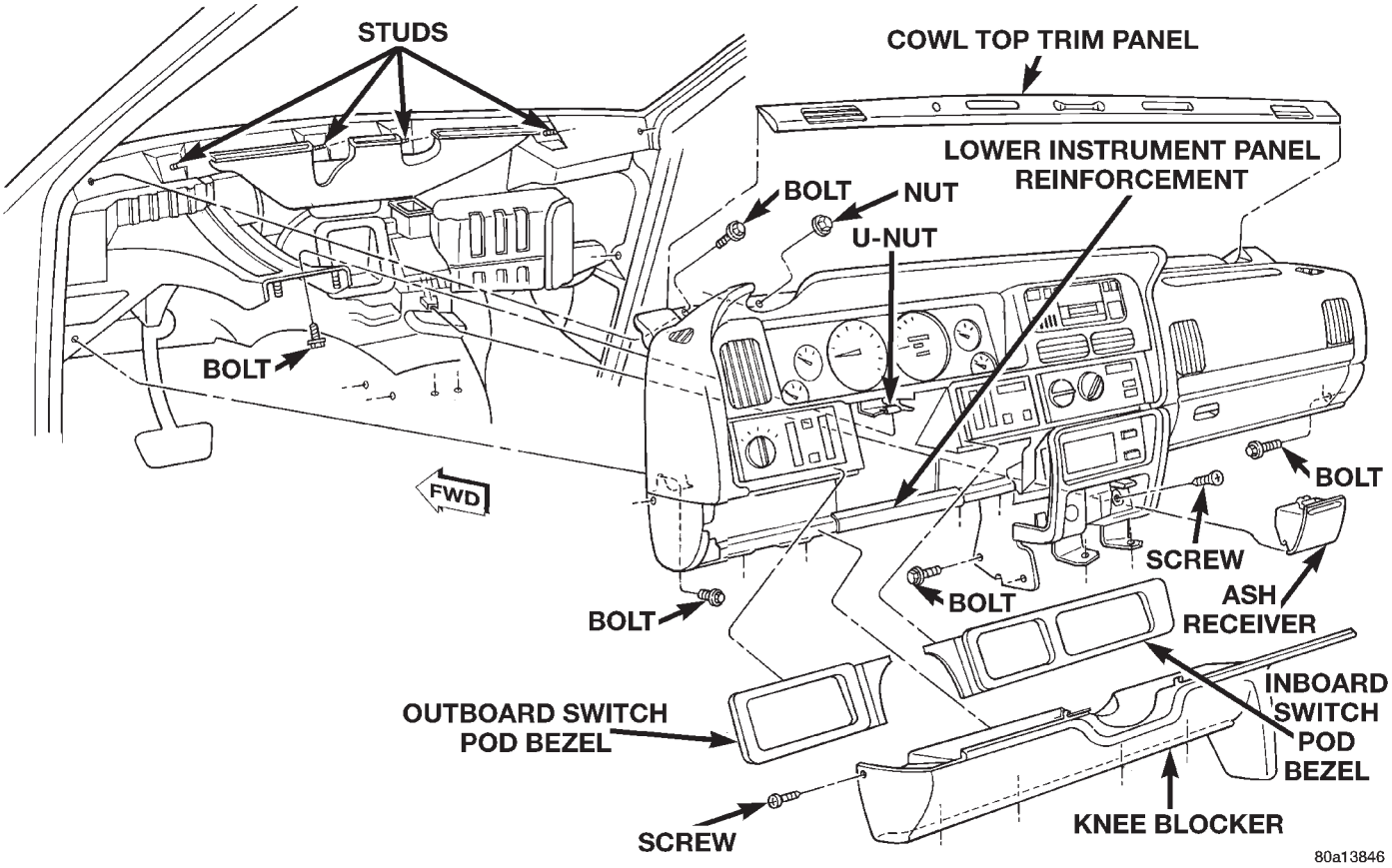

Fig. 24 Instrument Panel Assembly Remove/Install

secures the instrument panel armature to the heater-A/C housing.

(16) Pull back the floor carpet on the transmission floor tunnel from the base of the instrument panel center bezel and remove the two bolts that secure the instrument panel center bracket to the floor.

(17) Remove the two bolts that secure the instrument panel center bracket to the driver side of the transmission floor tunnel.

(18) Remove the bolt that secures the instrument panel armature to the steering column and brake pedal support.

(19) Remove the two bolts that secure the ends of the instrument panel armature to the cowl side inner panels.

(20) Remove the cowl top trim panel from the instrument panel. See Cowl Top Trim Panel in this group for the procedures.

(21) Remove the two bolts that secure the ends of the instrument panel armature to the windshield fence.

(22) Remove the four nuts that secure the top of the instrument panel armature to the studs on the windshield fence.

(23) With the aid of an assistant, lift the instrument panel off of the windshield fence studs and maneuver the assembly out of the vehicle through the passenger side front door.

(24) Reverse the removal procedures to install. Tighten the mounting hardware as follows:

- Instrument panel center bracket to floor pan transmission tunnel fasteners - 28 N·m (250 in. lbs.)
- Instrument panel to windshield fence bolts and nuts - 12 N·m (105 in. lbs.)
- Instrument panel to cowl side inner panel bolts - 12 N·m (105 in. lbs.)
- Instrument panel to steering column support bolt - 12 N·m (105 in. lbs.).