HEATING & AIR CONDITIONING

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HEATING & AIR CONDITIONING

DESCRIPTION

HEATING AND A/C SYSTEMS

A manually controlled dual zone heating-A/C system and an automatically controlled dual zone heating-A/C system with rear blower controls is available on this model.

To maintain the performance level of the heating, ventilation and air conditioning (HVAC) system, the engine cooling system must be properly maintained. The use of a bug screen is not recommended. Any obstructions in front of the radiator or A/C condenser will reduce the performance of the A/C and engine cooling systems.

The engine cooling system includes the radiator, thermostat, radiator hoses and the engine coolant pump. Refer to 7 - Cooling for more information before opening or attempting any service to the engine cooling system.

All vehicles are equipped with a common heater, ventilation and air conditioning (HVAC) housing (Fig. 1). The system combines air conditioning, heating, and ventilating capabilities in a single housing mounted within the passenger compartment under the instrument panel. The HVAC housing includes:

- A/C Evaporator
- Evaporator temperature sensor
- Blower motor
- Recirculation-air door and actuator
- Blower motor resistor or power module (depending on application)
- Blend-air doors and actuators
- Heater core
- Mode-air doors and actuator

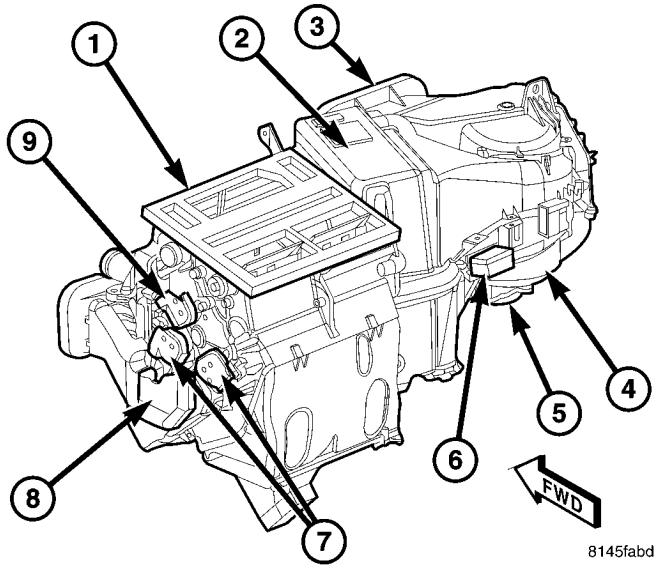

Fig. 1 HVAC Housing

1 - HVAC HOUSING
2 - A/C EVAPORATOR
3 - EVAPORATOR TEMPERATURE SENSOR
4 - BLOWER MOTOR
5 - RECIRCULATION DOOR ACTUATOR
6 - BLOWER POWER MODULE/RESISTOR BLOCK
7 - BLEND DOOR ACTUATORS
8 - HEATER CORE
9 - MODE DOOR ACTUATOR

HEATING & AIR CONDITIONING (Continued)

Based upon the system and mode selected, conditioned air can exit the HVAC housing through one or a combination of the three main housing outlets: defrost, panel or floor. The defrost and the panel outlets are located on the top of the housing and, the floor outlet is located on the bottom of the housing. Once the conditioned air exits the HVAC housing, it is further directed through molded plastic ducts to the various outlets within the vehicle interior. These outlets and their locations are as follows:

- **Defroster Outlet** - A dual, centrally mounted outlet delivers air for defrosting the large windshield. An integral grid is molded into the center of the instrument panel top cover to prevent objects from falling into the duct.
- **Demister Outlets** - There are two side window demisters that aid in defogging and defrosting the front door windows. One demister outlet is located at each outboard end of the instrument panel top pad, near the belt line at the A-pillars.
- **Instrument Panel Outlets** - There are four panel outlets in the instrument panel, one located near each outboard end of the instrument panel facing the rear of the vehicle, and two located near the top of the instrument panel center bezel.
- **Front Floor Outlets** - There are two front floor outlets, one located above each side of the floor panel center tunnel below the instrument panel.
- **Rear Floor Outlets** Rear passenger vents are located in the center floor console and have separate blower fan control switch.

AUTOMATIC TEMPERATURE CONTROL (ATC) - DUAL ZONE

The dual zone automatic temperature control (ATC) heating-A/C system allows completely independent side-to-side temperature control of the discharge air.

The dual zone ATC system includes a dust and odor filter. The particulate air filter element is the same size as the A/C evaporator to ensure ample capacity. A door at the base of the HVAC housing below the glove box provides easy access to the particular air filter element.

FRONT A/C-HEATER CONTROL

The ATC A/C-heater control (Fig. 2) is located in the instrument panel and contains:

- two temperature set controls for completely independent side-to-side temperature control of the discharged air. The full range of temperature that the system can produce in any mode is available on either side of the vehicle by independently adjusting the controls.
- a power on/off switch. Allows the heating-A/C system to be completely turned Off. The display indicates only the outside temperature when the system is off.
- a display screen to indicate the heating-A/C system operational modes and inside and outside temperatures.
- a dual zone control. Allows the selection of either single (driver) or dual (driver and passenger) temperature control mode.
- a separate front window defogger on/off switch. Contains an LED that illuminates to indicate when the front widow defroster is manually selected.
- a rear window defogger on/off switch. Contains an LED that illuminates to indicate when the EBL system is On.
- an air conditioning on/off switch. Contains an LED that illuminates to indicate when the A/C mode is manually selected.
- an air recirculation on/off switch. Contains an LED that illuminates to indicate when the Recirculation mode is manually selected.
- a manual mode switch. Allows the operator to manually select the air delivery mode.
- two infrared temperature sensors which independently measure the surface temperature of the driver and front seat passenger.
- a manual blower fan speed switch. Allows the operator to manually select six different fan speeds.
- a outside temperature switch. Allows the operator to select either outside air or passenger set temperatures.
- a rear blower fan switch. Allows the operator to set the rear blower fan speed to AUTO for automatic speed adjustment, or to REAR to give control to the intermediate seat occupants, or OFF to shut the rear blower motor down.
- an auto high and an auto low switch. Allows various modes of automatic temperature control operation. Contains LEDs that illuminate to indicate when operational.

The Computer logic remembers the settings of the A/C-heater controls when the ignition is turned to Off and, retains those settings after a restart, etc. The computer logic also provides variable air recirculation under high temperature and humidity conditions. Recirculation mode is initially accompanied by outside air to help remove any humidity within the passenger compartment and will gradually approach full recirculation over a broad range of temperatures.

REAR A/C-HEATER CONTROL

Primary controls for the rear compartment is on the instrument panel. The front A/C-heater control allows the driver to set the rear compartment blower fan speed, turn the rear unit off, or to give control to the intermediate seat occupants by switching to the REAR position. When the rear system is controlled

HEATING & AIR CONDITIONING (Continued)

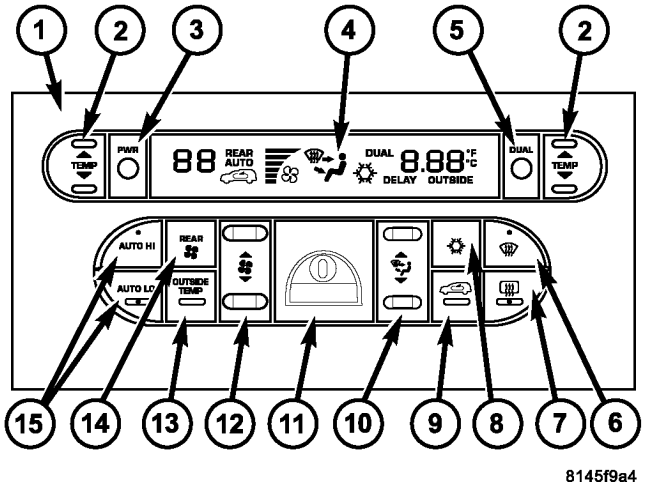

Fig. 2 ATC Dual Zone Front A/C-Heater Control

1 - A/C-HEATER CONTROL (ATC DUAL ZONE)
2 - INDEPENDENT TEMPERATURE CONTROLS
3 - POWER SWITCH
4 - DISPLAY SCREEN
5 - ZONE MODE CONTROL
6 - MANUAL FRONT WINDOW DEFROSTER SWITCH
7 - REAR WINDOW DEFROSTER (EBL) SWITCH
8 - MANUAL A/C MODE SWITCH
9 - MANUAL RECIRCULATION MODE SWITCH
10 - MANUAL AIR DELIVERY MODE SWITCH
11 - INFRARED TEMPERATURE SENSORS
12 - MANUAL BLOWER FAN SPEED SWITCH
13 - OUTSIDE TEMPERATURE SWITCH
14 - REAR BLOWER FAN SPEED SWITCH
15 - AUTO HIGH/LOW CONTROL SWITCHES

from the instrument panel, rear blower fan speed is automatically controlled based on the front A/C-heater control temperature setting. Air flow through the floor console is directed through upper or lower outlets based on the front mode settings.

The rear rotary blower fan control is centrally mounted on the center floor console between the second row seats and allows control of the rear blower fan speed by intermediate seat passengers.

MANUAL TEMPERATURE CONTROL (MTC) - DUAL ZONE

The dual zone manual temperature control (MTC) heating-A/C system allows completely independent side-to-side temperature control of the discharge air.

The MTC A/C-heater control (Fig. 3) is located in the instrument panel and contains:

- a power on/off switch. Contains an LED that illuminates to indicate when the heating-A/C system is On.
- a rear window defogger on/off switch. Contains an LED that illuminates to indicate when the EBL system is On.
- slide controls for completely independent side-to-side temperature control of the discharged air. The full range of temperature that the heating-A/C system can produce in any mode is available on either side of the vehicle by independently positioning the slide controls on the instrument panel.
- an air recirculation on/off switch. Contains an LED that illuminates to indicate when the heating-A/C system is in the Recirculation mode.
- an air conditioning on/off switch. Contains an LED that illuminates to indicate when the heating-A/C system is in the A/C mode.
- a rotary control to manually select the air delivery mode.
- a rotary control to manually select the blower fan speed.

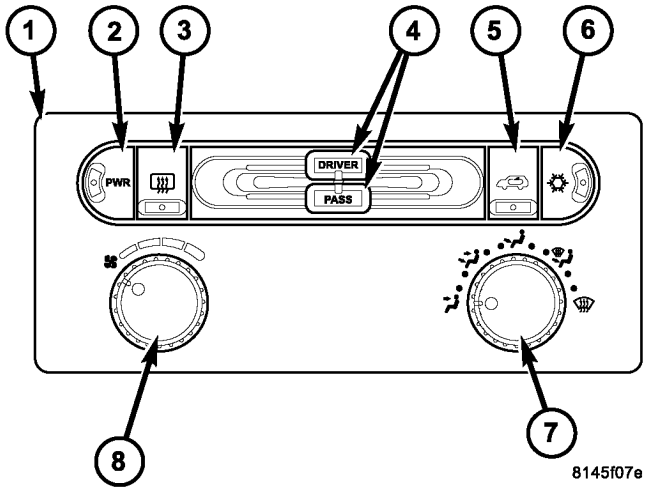

Fig. 3 MTC Dual Zone A/C-Heater Control

1 - A/C-HEATER CONTROL
2 - POWER SWITCH
3 - REAR WINDOW DEFOGGER (EBL) SWITCH
4 - TEMPERATURE CONTROLS
5 - RECIRCULATION MODE SWITCH
6 - A/C MODE SWITCH
7 - AIR DELIVERY CONTROL
8 - BLOWER FAN SPEED CONTROL

OPERATION

HEATING AND A/C SYSTEMS

Both the dual zone manual temperature control (MTC) and the dual zone automatic temperature control (ATC) heating-A/C systems are blend-air type systems. In a blend-air heating-A/C system (Fig. 4), a blend-air door controls the amount of conditioned air that is allowed to flow through, or around, the heater core. In the dual zone systems used on this model, two blend-air doors are used to provide completely independent side-to-side temperature control of the

discharge air. The temperature controls determines the discharge air temperatures by operating the two blend door actuators, which move the blend-air doors. This design allows almost immediate control of output air temperatures.

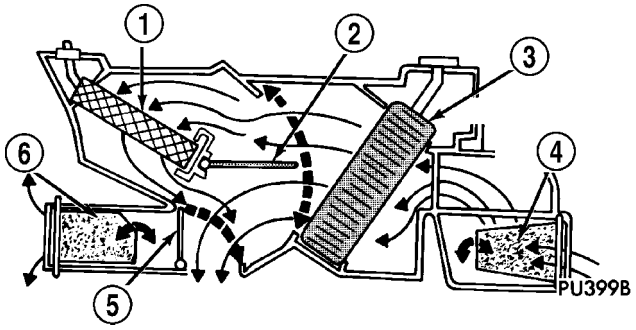

Fig. 4 Typical Blend-Air HVAC System

1 - HEATER CORE
2 - BLEND-AIR DOOR (2 DOORS IN DUAL ZONE)
3 - A/C EVAPORATOR
4 - RECIRCULATION-AIR DOOR
5 - FLOOR MODE-AIR DOOR
6 - PANEL/DEFROST MODE-AIR DOOR

The heating-A/C systems pulls outside (ambient) air through the cowl opening at the base of the windshield, then into the air inlet housing above the heating, ventilation and air conditioning (HVAC) housing. From the air inlet housing the air passes through the A/C evaporator and then can be directed either through or around the heater core. This is done by adjusting the blend-air doors with the temperature controls located on the front A/C-heater control in the instrument panel. The air flow can then be directed from the panel, floor and defrost outlets in various combinations using the mode control located on the A/C-heater control. Air flow velocity can be adjusted with the blower fan speed control located on the A/C-heater control.

On all models, the outside air intake can be shut off by selecting the Recirculation Mode. This will operate a electrically actuated recirculation-air door that closes off the fresh air intake and recirculates the air that is already inside the vehicle.

The A/C compressor can be engaged in any mode by pressing the snowflake, A/C on/off button. It can also be engaged by placing the mode control in the mix to defrost positions. This will remove heat and humidity from the air before it is directed through or around the heater core. The mode control on the A/C-heater control is used to also direct the conditioned air to the selected system outlets. The mode control uses an electric actuator to control the mode-air doors.

The defroster outlet receives airflow from the HVAC housing through the molded plastic defroster duct, which connects to the HVAC housing defroster outlet. The airflow from the defroster outlets is directed by fixed vanes in the defroster outlet grille and cannot be adjusted.

The side window demister outlets receive airflow from the HVAC housing through the molded plastic defroster duct and molded plastic demister ducts. The airflow from the side window demister outlets is directed by fixed vanes in the demister outlet grilles and cannot be adjusted. The demisters direct air from the HVAC housing through the outlets located on the top corners of the instrument panel. The demisters operate when the mode control knob is positioned in the floor-defrost and defrost-only settings. Some air may be noticeable from the demister outlets when the mode control is in the bi-level to floor positions or when in automatic mode (depending on application).

The panel outlets receive airflow from the HVAC housing through a molded plastic main panel duct, center panel duct and two end panel ducts. The two end panel ducts direct airflow to the left and right instrument panel outlets, while the center panel duct directs airflow to the two center bezel outlets. Each of these outlets can be individually adjusted to direct the flow of air.

The floor outlets receive airflow from the HVAC housing through the floor distribution duct. The front floor outlets are integral to the molded plastic floor distribution duct, which is secured to the bottom of the housing. The front floor outlets cannot be adjusted. When equipped, the rear console outlets receive air flow through a duct which is integral to the floor console. The floor console outlets can be individually adjusted to direct the flow of air.

NOTE: It is important to keep the air intake opening clear of debris. Leaf particles and other debris that is small enough to pass through the cowl opening screen can accumulate within the HVAC housing. The closed, warm, damp and dark environment created within the housing is ideal for the growth of certain molds, mildews and other fungi. Any accumulation of decaying plant matter provides an additional food source for fungal spores, which enter the housing with the fresh intake-air. Excess debris, as well as objectionable odors created by decaying plant matter and growing fungi can be discharged into the passenger compartment during heater-A/C operation if the air intake opening is not kept clear of debris.

The A/C system on models so equipped is designed for the use of non-CFC, R-134a refrigerant and uses an A/C expansion valve to meter the flow of refrigerant to the A/C evaporator. The A/C evaporator cools and dehumidifies the incoming air prior to blending it with the heated air. To maintain minimum evapo-

rator temperature and prevent evaporator freezing, an evaporator temperature sensor is used to supply an evaporator temperature message to the A/C-heater control. In turn, the powertrain control module (PCM) cycles the A/C compressor clutch off and on as necessary to protect the A/C system from evaporator freezing and optimize A/C system performance.

AUTOMATIC TEMPERATURE CONTROL (ATC) - DUAL ZONE

The dual zone automatic temperature control (ATC) system automatically maintains the interior comfort level desired by the driver and front seat passenger. This is accomplished by using two infrared sensors within the A/C-heater control which is located at the center of the instrument panel. The two infrared sensors independently measure the surface temperature of the driver and front seat passenger. Based on the sensor input, the system automatically adjusts the air temperature, the airflow volume, the airflow distribution, and amount of inside air recirculation to maintain front seat occupant comfort, even under changing outside weather conditions.

When DUAL is displayed on the A/C-heater control, the driver and passenger air outlet temperatures can be individually adjusted from the two independent TEMP buttons. When a front seat passenger is not present, pressing the DUAL button will:

- disable the passenger side infrared sensor and control the entire system based only on the driver side temperature setting.
- replace the passenger side temperature setting in the display to the outside temperature reading.

Pressing the DUAL button a second time or adjusting the passenger side TEMP button will:

- reactivate the passenger side infrared sensor.
- return the system to dual independent temperature operation.

This ATC system offers several manual override features. The indicator light in both the AUTO HI or AUTO LO buttons will turn off when the system is being used in the manual mode. The fan speed, airflow distribution, and outside air/recirculated air can be manually adjusted.

The front blower fan control can be set to any fixed blower fan speed by pressing the rocker switch up or down. This allows the front occupants to control the volume of air circulated in the vehicle and cancel the auto mode. The fan will now operate at a fixed speed until additional speeds are selected or until either the AUTO HI or AUTO LO buttons are pressed. The system will continue to automatically adjust air temperature and airflow distribution.

When the outside air contains smoke, odors, high humidity, or if rapid cooling is desired, interior air can be recirculated by pressing the recirculation button. The recirculate symbol will illuminate in the display when this button is selected.

The outside temperature can be shown in the A/C-heater control display by pressing the OUTSIDE TEMP button. After pressing this button, the front seat passenger side temperature setting display will be replaced with the current outside temperature. Pressing the OUTSIDE TEMP button again or pressing the passenger side TEMP button will return the display to the passenger side temperature setting.

- The system automatically adjusts the temperature, mode and fan speed.
- When the heating- A/C system is off, the recirculation door is automatically closed to prevent outside air from entering the passenger compartment.
- Air conditioning is available in any mode by pressing the snowflake, A/C on/off, button.

To provide maximum comfort in the automatic mode during cold start-ups, the blower fan will remain off and DELAY will appear in the display until the engine warms up. The estimated the time remaining until the DELAY is complete will appear periodically in the display. However, the fan will engage immediately if the defrost mode is selected or by pushing the blower switch and manually adjusting the fan speed.

MANUAL TEMPERATURE CONTROL (MTC) - DUAL ZONE

- The two slide controls enable continuously variable proportioning of the conditioned air.
- The mode control knob enables continuously variable proportioning of air flow between modes and has detents adjacent to each icon.
- The blower control provides four separate speeds and an Off position.
- When the heater-A/C system is off, the HVAC computer closes the recirculation door to prevent outside air from entering the passenger compartment.
- Interior air may be recirculated to speed up heating or cooling in all modes except defrost and mix by pressing the Recirculate button on the A/C-heater control.
- To reduce humidity for rapid defogging, the A/C compressor runs automatically in modes from “mix” to full defrost when outside temperatures are above freezing.
- Air conditioning is available in any mode by pressing the snowflake, A/C on/off button.

DIAGNOSIS AND TESTING

A/C COOL DOWN TEST

The A/C-heater control module can perform an A/C cool down test, which is a test performed during the manufacturing process to confirm that the air conditioning system is performing satisfactorily. This test can also provide a quick confirmation of air conditioning system performance to the service technician. If the test is completed satisfactorily, no further service is required. If the test is failed, proceed to the A/C Performance Test to confirm the A/C system is operating properly, or use a DRBIII® scan tool to diagnose the A/C system control and distribution systems. Refer to the appropriate diagnostic information.

MANUAL TEMPERATURE CONTROL

The blower fan speed must be set to High and the evaporator temperature sensor must be greater than 13° C (55° F) or the test will fail immediately. The test is activated by depressing the A/C and PWR buttons simultaneously and holding them depressed for no less than five seconds. The A/C and PWR button LEDs will blink on and off until the test is complete. If the LEDs stop blinking before two minutes, then the cool down test has been completed successfully. If the two minutes expire without the expansion valve temperature reaching -6° C (20° F) less than the outside air temperature, then the cool down test has been failed and further A/C system diagnosis is required. If the test is failed, the LEDs will continue to blink until the vehicle has been driven for greater than 13 km (8 miles).

AUTOMATIC TEMPERATURE CONTROL

The ambient air temperature in the room where the vehicle will be tested must be a minimum of 21° C (70°F) for this test. The test is activated by depressing the A/C and PWR buttons simultaneously and holding them depressed for no less than four seconds. The snowflake icon and the DELAY text in the A/C-heater control display will blink on and off alternately until the test is complete. If the snowflake icon and the DELAY text stop blinking before two minutes, then the cool down test has been completed successfully. If the two minutes expire without the evaporator temperature reaching 11° C (20° F) less than the evaporator initial temperature, then the cool down test has been failed and further A/C system diagnosis is required. If the test is failed, the snowflake icon and the DELAY text will continue to blink across ignition cycles until the vehicle has been driven for greater than 12 km (8 miles).

A/C PERFORMANCE TEST

The A/C system is designed to provide the passenger compartment with low temperature and low humidity air. The A/C evaporator, located in the HVAC housing is cooled to temperatures near the freezing point. As warm damp air passes over the fins of the A/C evaporator, the air transfers its heat to the refrigerant in the evaporator coils and the moisture in the air condenses on the evaporator fins. During periods of high heat and humidity, an A/C system will be more effective in the Recirculation mode (max-A/C). With the system in the Recirculation mode, only air from the passenger compartment passes through the A/C evaporator. As the passenger compartment air dehumidifies, the A/C system performance levels rise.

Humidity has an important bearing on the temperature of the air delivered to the interior of the vehicle. It is important to understand the effect that humidity has on the performance of the A/C system. When humidity is high, the A/C evaporator has to perform a double duty. It must lower the air temperature, and it must lower the temperature of the moisture in the air that condenses on the evaporator fins. Condensing the moisture in the air transfers heat energy into the evaporator fins and coils. This reduces the amount of heat the A/C evaporator can absorb from the air. High humidity greatly reduces the ability of the A/C evaporator to lower the temperature of the air.

However, evaporator capacity used to reduce the amount of moisture in the air is not wasted. Wringing some of the moisture out of the air entering the vehicle adds to the comfort of the passengers. Although, an owner may expect too much from their A/C system on humid days. A performance test is the best way to determine whether the system is performing up to design standards. This test also provides valuable clues as to the possible cause of trouble with the A/C system. The ambient air temperature in the location where the vehicle will be tested must be a minimum of 21° C (70° F) for this test.

PERFORMANCE TEST PROCEDURE

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation (Refer to 24 - HEATING & AIR CONDITIONING/PLUMBING - WARNINGS) and (Refer to 24 - HEATING & AIR CONDITIONING/PLUMBING - CAUTIONS). Failure to follow the warnings and cautions could result in possible personal injury or death.

HEATING & AIR CONDITIONING (Continued)

NOTE: When connecting the service equipment coupling to the line fitting, verify that the valve of the coupling is fully closed. This will reduce the amount of effort required to make the connection.

(1) Connect a tachometer to monitor the engine speed.

(2) Remove the caps from the refrigerant system service ports and attach a manifold gauge set to monitor the refrigerant system pressures.

(3) Set the A/C-heater control so that the compressor is engaged, the air within the vehicle is being recirculated, the output air is directed through the panel outlets, the temperature control is in the full cool position or the ATC temperature set points are set to LO, and the blower motor is operating at its highest speed.

(4) Start the engine and allow the engine to operate for about five minutes or until it reaches normal operating temperature. Then hold the engine speed at 1000 rpm with the compressor clutch engaged. If the compressor clutch does not engage, proceed with diagnosis of the compressor clutch coil (Refer to 24 - HEATING & AIR CONDITIONING/CONTROLS - FRONT/A/C COMPRESSOR CLUTCH COIL - DIAGNOSIS AND TESTING).

(5) Close all the vehicle windows and doors.

(6) Insert a thermometer in the left center panel outlet and operate the engine for five minutes.

(7) With the compressor clutch engaged, record the left center panel air outlet discharge temperature, the discharge pressure (high side service port) and the suction pressure (low side service port). The compressor clutch may cycle, depending upon the ambient temperature and humidity. If the clutch cycles, use the readings obtained before the clutch disengaged.

(8) Compare the air temperature at the center panel air outlet and the A/C compressor discharge pressure (high side) to the A/C Performance Temperature and Pressure chart.

A/C PERFORMANCE TEMPERATURE AND PRESSURE

Ambient Temperature	21° C (70° F)	27° C (80° F)	32° C (90° F)	38° C (100° F)	43° C (110° F)
Left Center Panel Outlet Discharge Air Temperature	1 to 8° C (34 to 46° F)	3 to 9° C (37 to 49° F)	4 to 10°C (39 to 50° F)	6 to 11°C (43 to 52° F)	7 to 18° C (45 to 65° F)
Discharge Pressure (High Side Service Port)	1034 to 1724 kPa (150 to 250 psi)	1517 to 2275 kPa (220 to 330 psi)	1999 to 2620 kPa (290 to 380 psi)	2068 to 2965 kPa (300 to 430 psi)	2275 to 3421 kPa (330 to 450 psi)
Suction Pressure (Low Side Service Port)	103 to 207 kPa (15 to 30 psi)	117 to 221 kPa (17 to 32 psi)	138 to 241 kPa (20 to 35 psi)	172 to 269 kPa (25 to 39 psi)	207 to 345 kPa (30 to 50 psi)

(9) If the air outlet temperature fails to meet the specifications in the A/C Performance Temperature and Pressure chart, or if the A/C compressor discharge pressure is high, refer to the A/C Pressure Diagnosis chart.

A/C PRESSURE DIAGNOSIS

Condition	Possible Causes	Correction
Constant compressor engagement and warm air from passenger vents.	1. Low refrigerant system charge.	1. See Refrigerant System Leaks in this group. Test the refrigerant system for leaks. Repair, evacuate and charge the refrigerant system, if required.
Equal pressures, but the compressor clutch does not engage.	1. No refrigerant in the refrigerant system.	1. See Refrigerant System Leaks in this group. Test the refrigerant system for leaks. Repair, evacuate and charge the refrigerant system, if required.

HEATING & AIR CONDITIONING (Continued)

Condition	Possible Causes	Correction
	2. Faulty fuse.	2. Check the fuses in the integrated power module (IPM). Repair the shorted circuit or component and replace the fuses, if required.
	3. Faulty A/C compressor clutch coil.	3. See A/C Compressor Clutch Coil in this group. Test the compressor clutch coil and replace, if required.
	4. Faulty A/C compressor clutch relay.	4. See A/C Compressor Clutch Relay in this group. Test the compressor clutch relay and relay circuits. Repair the circuits or replace the relay, if required.
	5. Improperly installed or faulty Evaporator Temperature Sensor.	5. See Evaporator Temperature Sensor in this group. Reinstall or replace the sensor as required.
	6. Faulty A/C pressure transducer.	6. See A/C pressure transducer in this group. Test the switch and replace, if required.
	7. Faulty Powertrain Control Module (PCM).	7. (Refer to Appropriate Diagnostic Information). Test the PCM and replace, if required.
Normal pressures, but A/C Performance Test air temperatures at center panel outlet are too high.	1. Excessive refrigerant oil in system.	1. See Refrigerant Oil Level in this group. Recover the refrigerant from the refrigerant system and inspect the refrigerant oil content. Restore the refrigerant oil to the proper level, if required.
	2. Blend-air door inoperative or sealing improperly.	2. See HVAC Housing in this group. Inspect the blend-air door for proper operation and sealing and correct, if required.
	3. Blend door actuator faulty or inoperative.	3. Perform blend door actuator diagnosis, replace if faulty.
The low side pressure is normal or slightly low, and the high side pressure is too low.	1. Low refrigerant system charge.	1. See Refrigerant System Leaks in this group. Test the refrigerant system for leaks. Repair, evacuate and charge the refrigerant system, if required.
	2. Refrigerant flow through the receiver/drier is restricted.	2. See Receiver/Drier in this group. Replace the restricted receiver/drier, if required.
	3. Refrigerant flow through the evaporator coil is restricted.	3. See A/C Evaporator in this group. Replace the restricted evaporator coil, if required.
	4. Faulty compressor.	4. See A/C Compressor in this group. Replace the compressor, if required.
The low side pressure is normal or slightly high, and the high side pressure is too high.	1. Condenser air flow restricted.	1. Check the A/C condenser for damaged fins, foreign objects obstructing air flow through the condenser fins, and missing or improperly installed air seals. Refer to Cooling for more information on air seals. Clean, repair, or replace components as required.
	2. Inoperative cooling fan.	2. Refer to Cooling for more information. Test the cooling fan and replace, if required.

HEATING & AIR CONDITIONING (Continued)

Condition	Possible Causes	Correction
	3. Refrigerant system overcharged.	3. See Refrigerant System Charge in this group. Recover the refrigerant from the refrigerant system. Charge the refrigerant system to the proper level, if required.
	4. Air in the refrigerant system.	4. See Refrigerant System Leaks in this group. Test the refrigerant system for leaks. Repair, evacuate and charge the refrigerant system, if required.
	5. Engine overheating.	5. Refer to Cooling for more information. Test the cooling system and repair, if required.
The low side pressure is too high, and the high side pressure is too low.	1. Accessory drive belt slipping.	1. Refer to Cooling for more information. Inspect the accessory drive belt condition and tension. Tighten or replace the accessory drive belt, if required.
	2. Faulty expansion valve.	2. See A/C Expansion Valve in this group. Replace the expansion valve, if required.
	3. Faulty compressor.	3. See A/C Compressor in this group. Replace the compressor, if required.
The low side pressure is too low, and the high side pressure is too high.	1. Restricted refrigerant flow through the refrigerant lines.	1. See Liquid, Suction, and Discharge Line in this group. Inspect the refrigerant lines for kinks, tight bends or improper routing. Correct the routing or replace the refrigerant line, if required.
	2. Restricted refrigerant flow through the expansion valve.	2. See A/C Expansion Valve in this group. Replace the expansion valve, if required.
	3. Restricted refrigerant flow through the condenser.	3. See A/C Condenser in this group. Replace the restricted condenser, if required.

HEATER PERFORMANCE TEST

WARNING: Review safety precautions and warnings in this group before performing this procedure (Refer to 24 - HEATING & AIR CONDITIONING/ PLUMBING - WARNINGS) and (Refer to 24 - HEATING & AIR CONDITIONING/PLUMBING - CAUTIONS). Failure to follow the warnings and cautions could result in possible personal injury or death.

Check the coolant level, drive belt tension, radiator air flow and fan operation. Start engine and allow to warm up to normal operating temperature.

WARNING: Do not remove radiator cap when engine is hot, personal injury can result.

If vehicle has been run recently, wait 15 minutes before removing the radiator cap. Place a rag over the cap and turn it to the first safety stop. Allow pressure to escape through the overflow tube. When the system pressure stabilizes, remove the cap completely.

MAXIMUM HEATER OUTPUT: TEST AND ACTION

Engine coolant is provided to the heater system by two heater hoses. With the engine idling at normal operating temperature, set the temperature control to maximum heat, the mode control to the floor position, and the blower in the highest speed position. Using a test thermometer, check the temperature of the air being discharged from the floor outlets. Compare the test thermometer reading to the Heater Temperature Reference chart.

HEATER TEMPERATURE REFERENCE

Ambient Temperature		Minimum Floor Outlet Temperature	
Celsius	Fahrenheit	Celsius	Fahrenheit
15.5°	60°	62.2°	144°
21.1°	70°	63.8°	147°
26.6°	80°	65.5°	150°
32.2°	90°	67.2°	153°

If the floor outlet air temperature is insufficient, check that the cooling system is operating to specifications (Refer to 7 - COOLING/ENGINE - DIAGNOSIS AND TESTING). Both heater hoses should be HOT to the touch (the coolant return hose should be slightly cooler than the supply hose). If the coolant return hose is much cooler than the supply hose, locate and repair the engine coolant flow obstruction in heater system.

OBSTRUCTED COOLANT FLOW Possible locations or causes of obstructed coolant flow are as follows:

- Pinched or kinked heater hoses.
- Improper heater hose routing.
- Plugged heater hoses or supply and return ports at the cooling system connections.
- Plugged heater core.

If proper coolant flow through the cooling system is verified, and heater outlet air temperature is insufficient, a mechanical problem may exist.

MECHANICAL PROBLEMS

Possible causes of insufficient heat due to mechanical problems are as follows:

- Faulty engine thermostat.
- Faulty blend door actuator.
- Obstructed fresh air intake.
- Obstructed heater system outlets.
- Faulty blend-air door.

TEMPERATURE CONTROL

If the heater outlet air temperature cannot be adjusted with the temperature control on the A/C-heater control panel, the following could require service:

- Faulty blend door actuator.
- Faulty A/C-heater control.
- Faulty related wiring harness or connectors.
- Faulty blend-air door.

SPECIFICATIONS

HEATING-A/C SYSTEM

A/C SYSTEM

Item	Description	Notes
A/C Compressor	Denso 10S17 (3.8L engine) Denso 10S20 (3.5L engine)	Uses ND-8 PAG Oil
Low PSI Control	A/C Pressure Transducer	Liquid line mounted - voltage input to powertrain control module (PCM) - PCM opens compressor clutch relay below 0.451 volts
High PSI Control	A/C Pressure Transducer	Liquid line mounted - input to PCM - PCM opens compressor clutch relay above 4.519 volts
	High Pressure Relief Valve	A/C Compressor mounted - opens at a discharge pressure over 3445 - 4135 kPa (500 - 600 psi)

HEATING & AIR CONDITIONING (Continued)

Item	Description	Notes
Refrigerant Charge Capacity	Refer to the A/C Underhood Specification Label located in the engine compartment	R-134a refrigerant
A/C Clutch Coil Draw	Denso 10S17 – 3.3 amps Denso 10S20 – 2.2 amps	@ 11.5 - 12V @ 21° C (70° F)
A/C Clutch Air Gap	0.35 - 0.60 mm (0.014 - 0.024 in.)	

FASTENER TORQUE

Description	N·m	Ft. Lbs.	In. Lbs.
All Screws NOT Listed Below	2	–	17
A/C Compressor Bolts	33	25	–
A/C Compressor Mounting Bracket Bolts	115	85	–
A/C Compressor Shaft Nut	17.5	13	155
Condenser Mounting Bracket Bolts	5	–	45
Discharge Line to Condenser Nut	23	17	–
Discharge Line to Compressor Nut	23	17	–
Expansion Valve Bolts	11	–	100
Receiver/Drier Mounting Bracket Nuts	10	–	89
Floor Console Base Nuts and Bolts	5	–	45
Front Fascia to Closure Panel Crossmember Bolts	6	–	53
HVAC Housing Bracket Bolt and Nut	3	–	26
HVAC Housing Stud Nuts	7	–	62
Heater Core Tube Sealing Plate Screws	3	–	27
Heater Inlet Tube Bolts	10	–	89
Hood Latch Bolts	14	10	123
Liquid Line to Condenser Nut	23	17	–
Liquid Lines to Receiver/Drier Bolts	11	–	100
Suction Line to Compressor Nut	23	17	–
Suction and Liquid Line to Expansion Valve Nut	23	17	–
Transmission Oil Cooler Bolts	5	–	45

SPECIAL TOOLS

HEATING-A/C SYSTEM

Snap Ring Pliers C-4574 (Fig. 5) are required to service the A/C clutch and field coil.

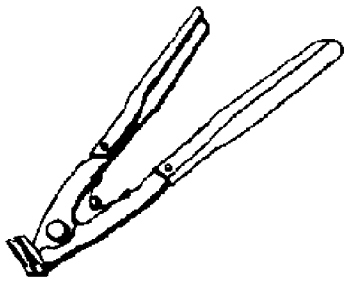

Fig. 5

CONTROLS - FRONT

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A/C COMPRESSOR CLUTCH/ COIL

DESCRIPTION

The A/C compressor clutch assembly consists of a stationary electromagnetic A/C clutch field coil with a zener diode, a pulley bearing and pulley assembly, and a clutch plate (Fig. 1). These components provide the means to engage and disengage the A/C compressor from the engine accessory drive belt.

The A/C clutch field coil and the pulley bearing and pulley assembly are both retained on the nose of the A/C compressor with snap rings. The clutch plate is splined to the compressor shaft and secured with a bolt.

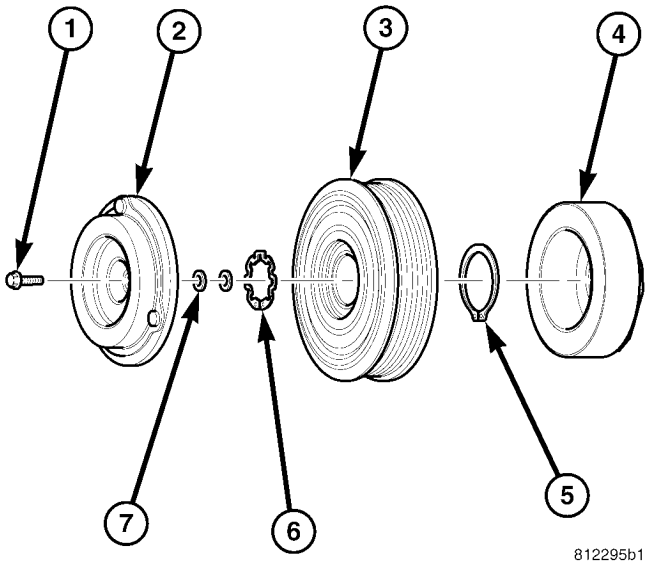

Fig. 1 A/C Compressor Clutch

1 - BOLT
2 - CLUTCH PLATE
3 - PULLEY AND BEARING
4 - FIELD COIL
5 - SNAP RING (2)
6 - SHIM

OPERATION

The A/C compressor clutch components provide the means to engage and disengage the compressor from the engine serpentine accessory drive belt. When the electromagnetic A/C clutch field coil is energized, it magnetically draws the clutch plate into contact with the clutch pulley and drives the compressor shaft. When the coil is not energized, the pulley freewheels on the clutch hub bearing, which is part of the pulley.

A zener diode is connected in parallel with the A/C clutch field coil. This diode controls the dissipation of voltage induced into the coil windings by the collapsing of the electromagnetic fields that occurs when the compressor clutch is disengaged. The zener diode dissipates this induced voltage by regulating a current path to ground. This arrangement serves to protect other circuits and components from potentially damaging voltage spikes in the vehicle electrical system that might occur if the voltage induced in the clutch coil windings could not be dissipated.

The A/C compressor clutch engagement is controlled by several components: the heater-A/C controls in the passenger compartment, the A/C pressure transducer on the liquid line, the evaporator temperature sensor on the A/C expansion valve, the powertrain control module (PCM) in the engine compartment, and the A/C compressor clutch relay in the integrated power module (IPM). The PCM may delay compressor clutch engagement for up to thirty seconds (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/POWERTRAIN CONTROL MODULE - DESCRIPTION - PCM OPERATION).

DIAGNOSIS AND TESTING

A/C COMPRESSOR CLUTCH COIL

The A/C compressor clutch coil electrical circuit is controlled by the powertrain control module (PCM) through the A/C clutch relay. The A/C clutch coil can be tested by either measuring cluch field coil resistance or by measuring current draw. Begin testing of a suspected compressor clutch coil problem by performing the preliminary checks.

PRELIMINARY CHECKS

(1) If the A/C compressor clutch will not engage, verify the refrigerant charge level (Refer to 24 - HEATING & AIR CONDITIONING/PLUMBING - DIAGNOSIS AND TESTING - REFRIGERANT CHARGE LEVEL). If the refrigerant charge level is OK, go to Step 2. If the refrigerant charge level is not OK, adjust the refrigerant charge as required.

(2) If the A/C compressor clutch still will not engage, disconnect the headlamp and dash wire harness connector for the A/C pressure transducer and check for battery current at the connector with the engine running and the A/C-heater control set to the A/C mode. If OK, go to TESTS. If not OK, refer toBody Diagnostic Procedures to perform further diagnosis.

TESTS

(1) Verify the battery state of charge (Refer to 8 - ELECTRICAL/BATTERY SYSTEM/BATTERY - DIAGNOSIS AND TESTING).

(2) Connect an ammeter (0 to 10 ampere scale selected) in series with the clutch coil feed terminal. Connect a voltmeter (0 to 20 volt scale selected) to measure voltage across the battery and the clutch coil.

(3) With the heater-A/C control in the A/C mode and the blower at low speed, start the engine and allow it to run at a normal idle speed.

(4) The compressor clutch should engage immediately, and the clutch coil voltage should be within two volts of the battery voltage. If the coil voltage is not within two volts of battery voltage, test the clutch coil feed circuit for excessive voltage drop. If the compressor clutch does not engage, refer to Body Diagnostic Procedures to perform further diagnosis.

(5) For the acceptable A/C clutch coil current draw specifications refer to 24 - HEATING & AIR CONDITIONING - SPECIFICATIONS. Specifications apply for a work area temperature of 21° C (70° F). If voltage is more than 12.5 volts, add electrical loads by turning on electrical accessories until voltage reads below 12.5 volts.

(a) If the compressor clutch coil current reading is zero, the coil is open and must be replaced.

(b) If the compressor clutch coil current reading is four amperes or more, the coil is shorted and must be replaced.

STANDARD PROCEDURE

A/C CLUTCH INSPECTION

NOTE: The A/C clutch can be serviced in the vehicle. The refrigerant system can remain fully-charged during compressor clutch, pulley and bearing assembly, or coil replacement.

Examine the friction surfaces of the clutch pulley and the clutch plate for wear (Fig. 2). The pulley and plate should be replaced if there is excessive wear or scoring.

If the friction surfaces are oily, inspect the shaft and nose area of the A/C compressor for refrigerant oil. If refrigerant oil is found, the compressor shaft seal is leaking and the A/C compressor must be replaced.

Check the clutch pulley bearing for roughness or excessive leakage of grease. Replace the pulley and bearing assembly, if required.

A/C CLUTCH BREAK-IN

After a new A/C compressor clutch has been installed, cycle the compressor clutch approximately twenty times (five seconds on, then five seconds off). During this procedure, set the A/C-heater controls to the A/C Recirculation Mode, the blower motor in the highest speed position, and the engine speed at 1500 to 2000 rpm. This procedure (burnishing) will seat the opposing friction surfaces and provide a higher compressor clutch torque capability.

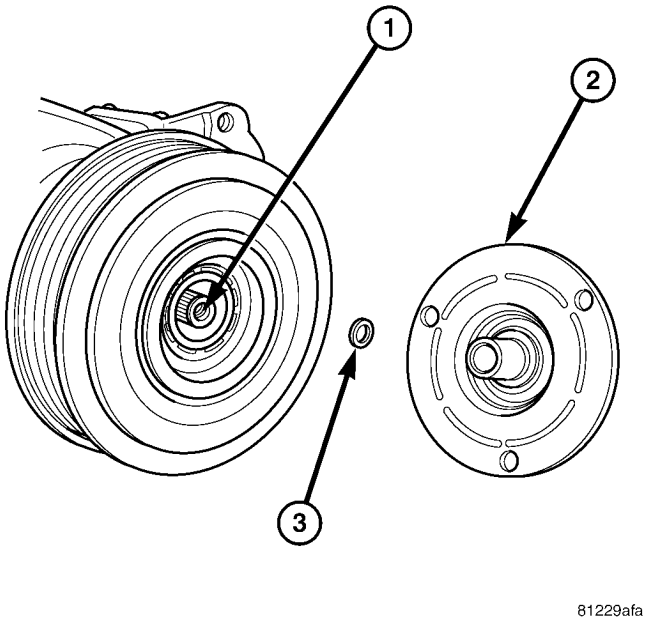

Fig. 2 Clutch Plate and Shim(s)

1 - A/C COMPRESSOR SHAFT
2 - CLUTCH PLATE
3 - SHIM

REMOVAL

NOTE: The compressor clutch can be serviced in the vehicle. The refrigerant system can remain fully-charged during compressor clutch, pulley, or coil replacement.

(1) Disconnect and isolate the negative battery cable.

(2) Remove the accessory drive belt (Refer to 7 - COOLING/ACCESSORY DRIVE/DRIVE BELTS - REMOVAL).

(3) Raise and support the vehicle.

(4) Disconnect the engine wire harness connector from the clutch coil connector located on the top of the A/C compressor.

(5) On models with the 3.3L and 3.8L engines, disengage the engine wire harness connector retainer from the bracket located on the top of the A/C compressor.

(6) On models with the 2.4L, 2.5L and 2.8L engines, remove all of the compressor mounting bolts except the upper left (rear of the A/C compressor), which should only be loosened. Allow the front (pulley end) of the A/C compressor to tilt downward far enough to access the clutch for removal, then tighten the loosened upper left compressor mounting bolt.

(7) On models with the 3.3L and 3.8L engines, remove the two bolts and two nuts that secure the A/C compressor to the engine. Disengage the mount-

A/C COMPRESSOR CLUTCH/COIL (Continued)

ing ear at the front of the A/C compressor from the stud on the engine, allow the front (pulley end) of the A/C compressor to tilt downward far enough to access the clutch for removal, then reinstall and tighten the upper left compressor mounting bolt.

(8) Remove the compressor shaft bolt (Fig. 3). A band-type oil filter wrench or a strap wrench may be used to secure the clutch during bolt removal.

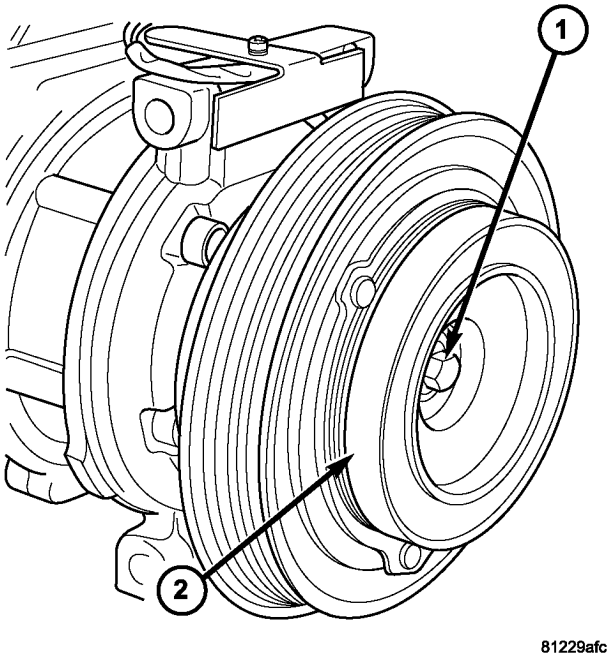

Fig. 3 A/C Compressor Shaft Bolt

1 - BOLT
2 - COMPRESSOR CLUTCH PLATE

(9) Tap the clutch plate lightly with a plastic mallet to release it from the splines on the compressor shaft. Remove the clutch plate and shim(s) from the compressor shaft (Fig. 4).

NOTE: Use care not to lose any of the shim(s).

CAUTION: Do not pry between the clutch plate unit and the pulley to remove the clutch plate from the compressor shaft as this may damage the clutch plate.

(10) Using snap ring pliers (Special Tool C-4574 or equivalent), remove the external snap ring that secures the pulley to the front cover of the A/C compressor, then slide the pulley off of the compressor (Fig. 5).

(11) Remove the screw that secures the clutch coil wire lead connector bracket and ground clip to the top of the compressor housing.

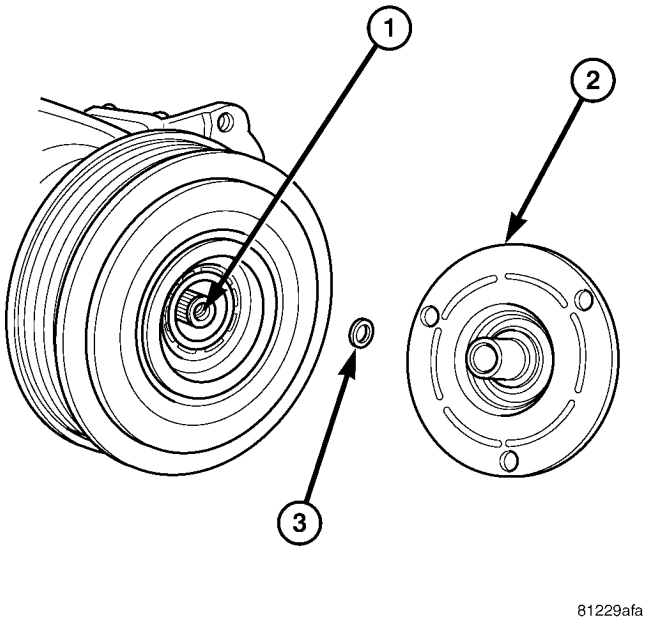

Fig. 4 Clutch Plate and Shim(s)

1 - A/C COMPRESSOR SHAFT
2 - CLUTCH PLATE
3 - SHIM

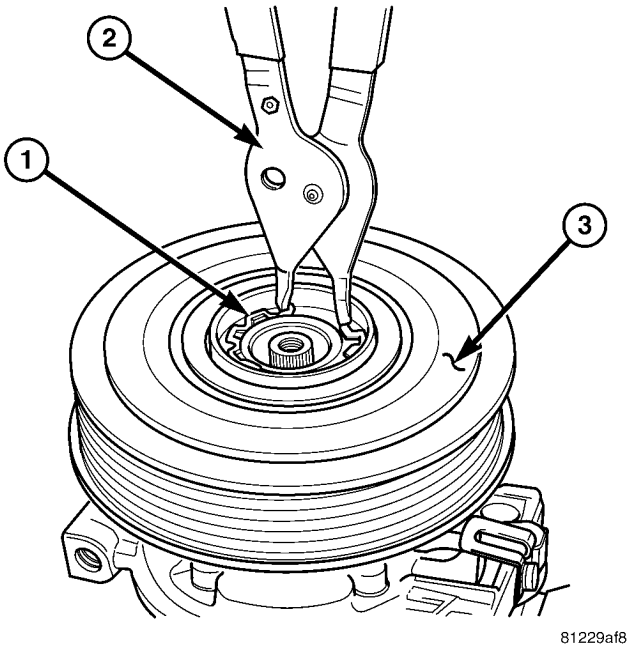

Fig. 5 Clutch Pulley Snap Ring

1 - SNAP RING
2 - SNAP RING PLIERS
3 - CLUTCH PULLEY AND BEARING

A/C COMPRESSOR CLUTCH/COIL (Continued)

(12) Using snap ring pliers (Special Tool C-4574 or equivalent), remove the external snap ring that secures the clutch coil to the front cover of the compressor housing, then slide the clutch coil off of the A/C compressor (Fig. 6).

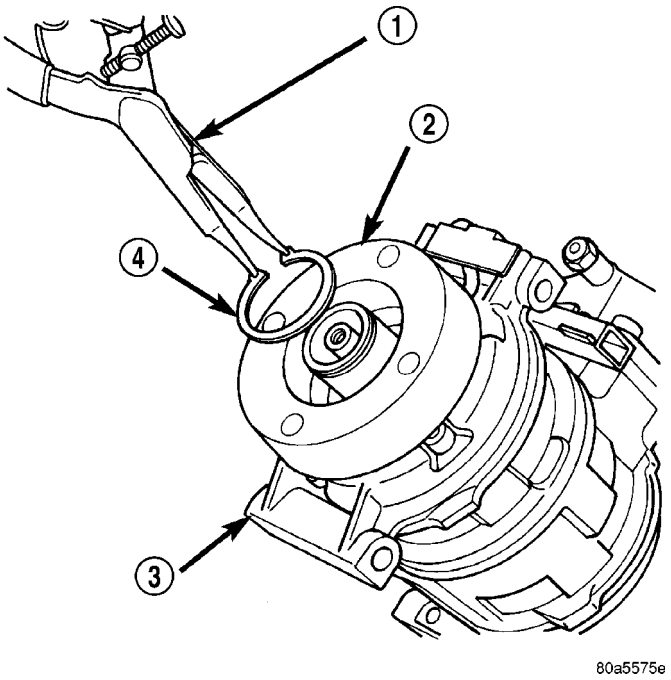

Fig. 6 Remove Clutch Coil Snap Ring

1 - SNAP RING PLIERS
2 - CLUTCH COIL
3 - COMPRESSOR
4 - SNAP RING

INSTALLATION

(1) Align the dowel pin on the back of the clutch coil with the hole in the compressor front cover and position the clutch coil onto the A/C compressor. Be certain that the clutch coil pigtail wires are properly oriented and routed so that they are not pinched between the compressor front cover and the clutch coil.

NOTE: A new snap ring must be used to secure the clutch coil to the A/C compressor. The bevel side of the snap ring must face outward.

(2) Using snap ring pliers (Special Tool C-4574 or equivalent), install the external snap ring that secures the clutch coil to the front cover of the A/C compressor. The bevel side of the snap ring must face outward and both snap ring eyelets must be oriented to the right or the left of the clutch coil dowel pin location on the A/C compressor. Be certain that the snap ring is fully and properly seated in the groove.

CAUTION: If the snap ring is not fully seated in the groove it will vibrate out, resulting in a clutch failure and severe damage to the compressor front cover.

(3) Install and securely tighten the screw that secures the clutch coil pigtail wire connector bracket and ground clip to the top of the compressor housing.

(4) Install the pulley onto the front cover of the A/C compressor. If necessary, tap the pulley gently with a block of wood placed on the pulley friction surface (Fig. 7).

CAUTION: Do not mar the friction surfaces of the pulley.

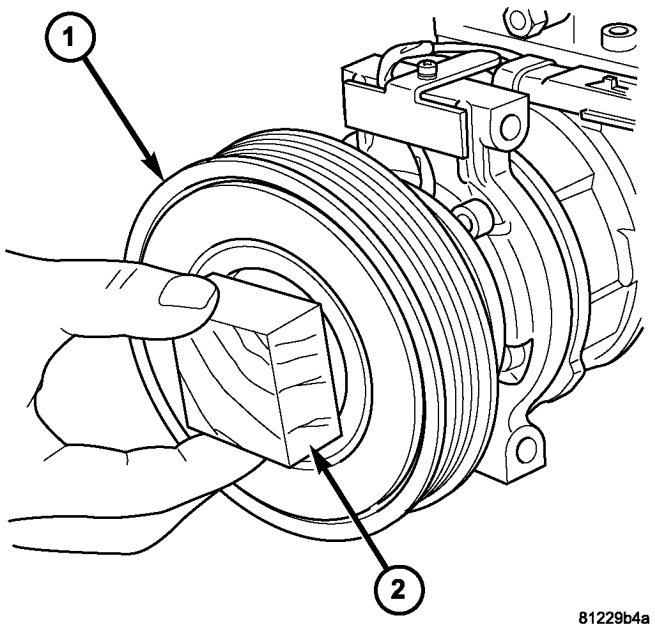

Fig. 7 Clutch Pulley - Installation

1 - PULLEY AND BEARING
2 - WOOD BLOCK

NOTE: A new snap ring must be used to secure the clutch pulley to the A/C compressor. The bevel side of the snap ring must face outward.

(5) Using snap ring pliers (Special Tool C-4574 or equivalent), install the external snap ring (bevel side facing outward) that secures the clutch pulley to the front cover of the A/C compressor. Be certain that the snap ring is fully and properly seated in the groove.

(6) If the original clutch plate and clutch pulley are to be reused, reinstall the original shim(s) on the compressor shaft against the shoulder. If a new clutch plate and/or clutch pulley are being used, install a trial stack of shims 2.54 mm (0.010 in.) thick on the compressor shaft against the shoulder.

(7) Install the clutch plate onto the compressor shaft.

A/C COMPRESSOR CLUTCH/COIL (Continued)

NOTE: The shims may compress after tightening the shaft bolt. Check the air gap in four or more places to verify the air gap is still correct. Spin the pulley before performing a final check of the air gap.

(8) With the clutch plate assembly tight against the shim(s), measure the air gap between the clutch plate and the pulley face with feeler gauges. The air gap should be between 0.35 - 0.60 mm (0.014 - 0.024 in.). If the proper air gap is not obtained, add or subtract shims as needed until the desired air gap is obtained.

(9) Install the compressor shaft bolt. Tighten the bolt to 17.5 N·m (155 in. lbs.).

(10) On models with the 2.4L, 2.5L and 2.8L engines, loosely install the four bolts that secure the A/C compressor to the mounting bracket on the engine (2.4L), or the cylinder block (2.5L/2.8L). Tighten the bolts to 28 N·m (21 ft. lbs.).

(11) On models with the 3.3L and 3.8L engines, loosely install the two bolts and two nuts that secure the A/C compressor to the engine. Tighten each of the fasteners to 54 N·m (40 ft. lbs.) using the following sequence:

- The upper nut at the front of the compressor.
- The lower nut at the front of the compressor.
- The upper bolt at the rear of the compressor.
- The lower bolt at the rear of the compressor.

(12) On models with the 3.3L and 3.8L engines, engage the retainer on the engine wire harness compressor clutch coil take out with the bracket on the top of the A/C compressor.

(13) Connect the engine wire harness connector to the A/C compressor clutch coil.

(14) Install the accessory drive belt (Refer to 7 - COOLING/ACCESSORY DRIVE/DRIVE BELTS - INSTALLATION).

(15) Lower the vehicle.

(16) Reconnect the negative battery cable.

A/C COMPRESSOR CLUTCH RELAY

DESCRIPTION

The A/C clutch relay (Fig. 8) is a International Standards Organization (ISO) micro-relay. Relays conforming to the ISO specifications have common physical dimensions, current capacities, terminal functions and patterns. The ISO micro-relay terminal functions are the same as a conventional ISO relay. However, the ISO micro-relay terminal pattern (or footprint) is different, the current capacity is lower, and the physical dimensions are smaller than those of the conventional ISO relay.

The A/C clutch relay is located in the integrated power module (IPM) in the engine compartment.

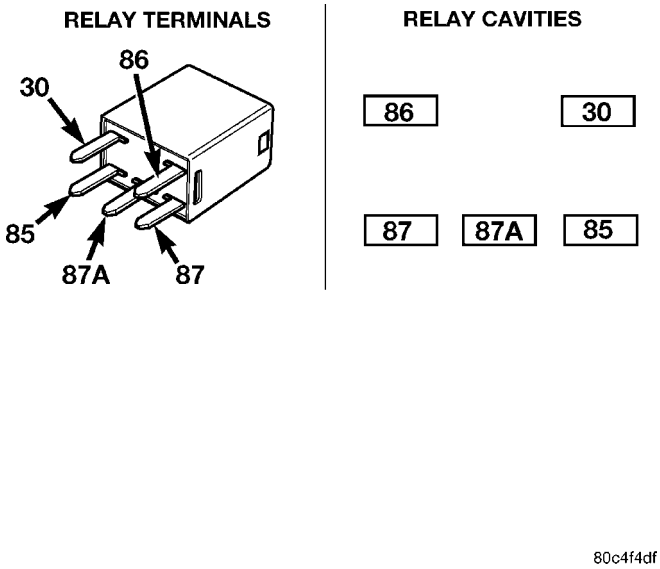

Fig. 8 A/C Compressor Clutch Relay

OPERATION

The ISO-standard A/C clutch micro-relay is an electromechanical switch that uses a low current input controlled by the powertrain control module (PCM) to control the high current output to the A/C clutch field coil. The movable, common feed relay contact is held against the fixed, normally closed relay contact by spring pressure. When the electromagnetic relay coil is energized, it draws the movable common feed relay contact away from the fixed, normally closed relay contact and, holds it against the fixed, normally open relay contact. This action allows high current to flow to the A/C clutch field coil.

When the relay coil is de-energized, spring pressure returns the movable relay contact back against the fixed, normally closed contact point. The resistor or diode is connected in parallel with the relay coil, and helps to dissipate voltage spikes and electromagnetic interference that can be generated as the electromagnetic field of the relay coil collapses.

The A/C clutch relay terminals are connected to the vehicle electrical system through a receptacle in the integrated power module (IPM). The inputs and outputs of the A/C compressor clutch relay include:

- The common feed terminal (30) receives a battery current input from a fuse in the IPM through a fused B(+) circuit at all times.
- The coil ground terminal (85) receives a ground input from the PCM through the compressor clutch relay control circuit only when the PCM electronically pulls the control circuit to ground.
- The coil battery terminal (86) receives a battery current input from the PCM through a fused ignition

A/C COMPRESSOR CLUTCH RELAY (Continued)

switch output (run-start) circuit only when the ignition switch is in the On or Start positions.

- The normally open terminal (87) provides a battery current output to the compressor clutch coil through the compressor clutch relay output circuit only when the compressor clutch relay coil is energized.
- The normally closed terminal (87A) is not connected to any circuit in this application, but provides a battery current output only when the compressor clutch relay coil is de-energized.

The A/C clutch relay cannot be repaired and, if faulty or damaged, it must be replaced. Refer to the appropriate wiring information for diagnosis and testing of the ISO-standard micro-relay and for complete HVAC wiring diagrams.

REMOVAL

(1) Disconnect and isolate the negative battery cable.

(2) Remove the cover from the integrated power module (IPM) located in the engine compartment (Fig. 9).

NOTE: Refer to the fuse and relay map on the inside of the IPM cover for A/C compressor clutch relay location.

(3) Remove the A/C compressor clutch relay from the IPM.

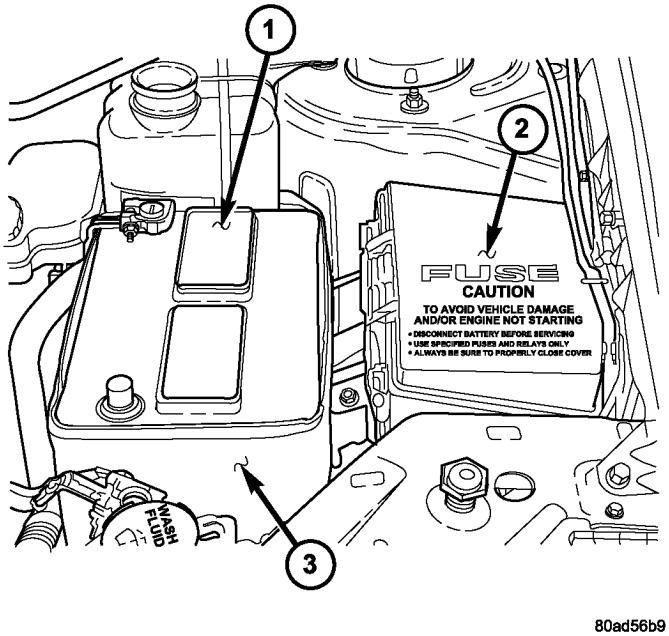

Fig. 9 Integrated Power Module (IPM)

1 - BATTERY
2 - INTEGRATED POWER MODULE (IPM)
3 - BATTERY THERMAL GUARD

INSTALLATION

NOTE: Refer to the fuse and relay map on the inside of the integrated power module (IPM) cover for A/C compressor clutch relay location.

(1) Position the A/C compressor clutch relay into the receptacle in the IPM.

(2) Align the A/C compressor clutch relay terminals with the terminal cavities in the IPM receptacle and push down firmly on the relay until the terminals are fully seated.

(3) Install the cover onto the IPM.

(4) Reconnect the negative battery cable.

A/C HEATER CONTROL

DESCRIPTION

The front A/C-heater control is located at the center of the instrument panel and uses electrical controls. These controls provide the vehicle operator with a number of setting options to help control the climate and comfort within the vehicle.

The front A/C-heater control allows both the driver and the front seat passenger the ability to individually regulate air temperature for their side of the vehicle. All controls are identified by ISO graphic symbols.

The front A/C-heater control module must be recalibrated each time an actuator motor or the A/C-heater control is replaced (Refer to 24 - HEATING & AIR CONDITIONING/CONTROLS - FRONT/A/C HEATER CONTROL - STANDARD PROCEDURE -A/C-HEATER CONTROL CALIBRATION).

The A/C-heater control cannot be repaired. If faulty or damaged, the entire unit must be replaced. The control knobs are available for service replacement.

STANDARD PROCEDURE

A/C-HEATER CONTROL CALIBRATION

The A/C-heater control module must be recalibrated each time an actuator motor or the A/C-heater control is replaced. If the vehicle is so equipped, the calibration procedure also includes rear HVAC positions for each actuator motor.

(1) Turn the ignition switch to the On position.

(2) If equipped with the manual temperature control (MTC) system, press and hold the Power and Recirculation buttons for at least five seconds. If equipped with the automatic temperature control (ATC) systen, simultaneously press and hold the Power and Recirculation buttons on the A/C-heater control for at least five seconds. The MTC A/C-heater control Power button light emitting diode (LED) and

A/C HEATER CONTROL (Continued)

Recirculation button LED, or the ATC A/C-heater control Delay and Recirculation graphics will begin to flash when the calibration procedure has begun.

(3) The calibration procedure should take less than two minutes to complete for the manual A/C-heater control, and less than twenty seconds for the ATC A/C-heater control. When the LEDs or graphics stop flashing, the calibration procedure is complete.

(4) If the LEDs or graphics continue to flash beyond the two minute (manual) or twenty second (ATC) calibration time, it indicates that the A/C-heater control has detected a failure and a Diagnostic Trouble Code (DTC) has been set. Refer to Body Diagnostic Procedures to perform further diagnosis. The LEDs or graphics will continue to flash even after the ignition switch is cycled Off and On, until a successful calibration is completed or until the vehicle has been driven about 13 kilometers (8 miles).

REMOVAL

WARNING: On vehicles equipped with airbags, disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

(1) Disconnect and isolate the negative battery cable.

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

(3) Remove the three screws that secure the A/C-heater control to the instrument panel (Fig. 10).

(4) Remove the A/C-heater control from the instrument panel and disconnect the two wire harness connectors from the control.

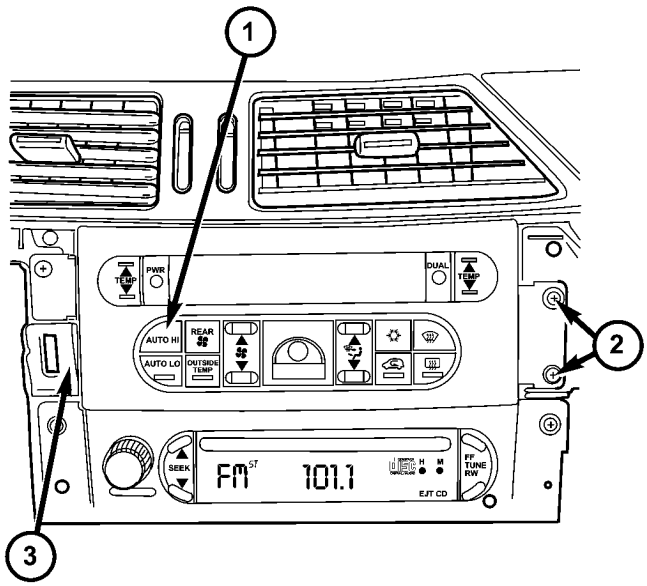

Fig. 10 A/C-Heater Control

1 - A/C-HEATER CONTROL
2 - SCREW (3)
3- INSTRUMENT PANEL

INSTALLATION

(1) Position the A/C-heater control to the instrument panel.

(2) Connect the two wire harness connectors to the back of the A/C-heater control.

(3) Install the A/C-heater control into the instrument panel.

(4) Install the three screws that secure the A/C-heater control to the instrument panel. Tighten the screws to 2 N·m (17 in. lbs.).

(5) Reconnect the negative battery cable and calibrate the A/C-heater control (Refer to 24 - HEATING & AIR CONDITIONING/CONTROLS - FRONT/A/C HEATER CONTROL - STANDARD PROCEDURE -A/C-HEATER CONTROL CALIBRATION).

A/C PRESSURE TRANSDUCER

DESCRIPTION

The A/C pressure transducer (Fig. 11) is a switch that is installed on a fitting located on the liquid line. An internally threaded hex fitting on the A/C pressure transducer connect it to the externally threaded Schrader-type fitting on the liquid line. A rubber O-ring seals the connection between the A/C pressure transducer and the liquid line fitting.The A/C pressure transducer is connected to the vehicle electrical system by a molded plastic connector with three terminals.

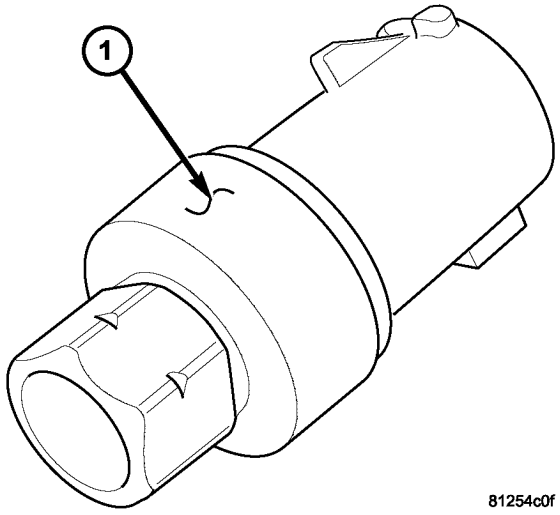

Fig. 11 A/C Pressure Transducer

1 - A/C PRESSURE TRANSDUCER

OPERATION

The A/C pressure transducer monitors the pressures in the high side of the refrigerant system through its connection to a fitting on the liquid line. The A/C pressure transducer will change its internal resistance in response to the pressures it monitors. The Schrader-type valve in the liquid line fitting permits the A/C pressure transducer to be removed or installed without disturbing the refrigerant in the system.

The powertrain control module (PCM) provides a five volt reference signal and a sensor ground to the A/C pressure transducer, then monitors the output voltage of the A/C pressure transducer on a sensor return circuit to determine refrigerant pressure. The PCM is programmed to respond to the A/C pressure transducer and other sensor inputs by controlling the operation of the A/C compressor clutch and the radiator cooling fan to help optimize A/C system performance and to protect the system components from damage. The PCM will disengage the A/C compressor clutch when high side pressure rises above 3082 kPa (447 psi) and re-engage the clutch when high side pressure drops below 2937 kPa (426 psi). The A/C pressure transducer will also disengage the A/C compressor clutch if the high side pressure drops below 110 kPa (16 psi) and will re-engage the clutch when the high side pressure rises above 221 kPa (32 psi). If the refrigerant pressure rises above 1655 kPa (240 psi), the PCM will actuate the cooling fan. The A/C pressure transducer input to the PCM will also prevent the A/C compressor clutch from engaging when ambient temperatures are below about 4.5° C (40° F) due to the pressure/temperature relationship of the refrigerant.

The A/C pressure transducer is diagnosed using a DRBIII® scan tool. Refer to 9 - Engine Electrical Diagnostics for more information.

The A/C pressure transducer cannot be adjusted or repaired and, if faulty or damaged, it must be replaced.

A/C PRESSURE TRANSDUCER (Continued)

DIAGNOSIS AND TESTING

A/C PRESSURE TRANSDUCER

The A/C pressure transducer is tested using a DRBIII® scan tool. Refer to the appropriate diagnostic information. Before testing the A/C pressure transducer, be certain that the transducer wire harness connection is clean of corrosion and properly connected. For the A/C to operate, an A/C pressure transducer voltage reading between 0.451 and 4.519 volts is required. Voltages outside this range indicate a low or high refrigerant system pressure condition to the powertrain control module (PCM). The PCM is programmed to respond to a low or high refrigerant system pressure by suppressing operation of the A/C compressor. Refer to the A/C Pressure Transducer Voltage chart for the possible conditions indicated by the transducer voltage reading.

A/C PRESSURE TRANSDUCER VOLTAGE

Voltage	Possible Indication
0.0	1. No sensor supply voltage from PCM. 2. Shorted sensor circuit. 3. Faulty transducer.
0.150 TO 0.450	1. Ambient temperature below 10° C (50° F). 2. Low refrigerant system pressure.
0.451 TO 4.519	1. Normal refrigerant system pressure.
4.520 TO 4.850	1. High refrigerant system pressure.
5.0	1. Open sensor circuit. 2. Faulty transducer.

REMOVAL

NOTE: It is not necessary to discharge the refrigerant system to replace the A/C pressure transducer.

(1) Disconnect and isolate the negative battery cable.

(2) Disconnect the wire harness connector from the A/C pressure transducer located on the liquid line (Fig. 12).

(3) Remove the A/C pressure transducer from the fitting on the liquid line and remove and discard the O-ring seal.

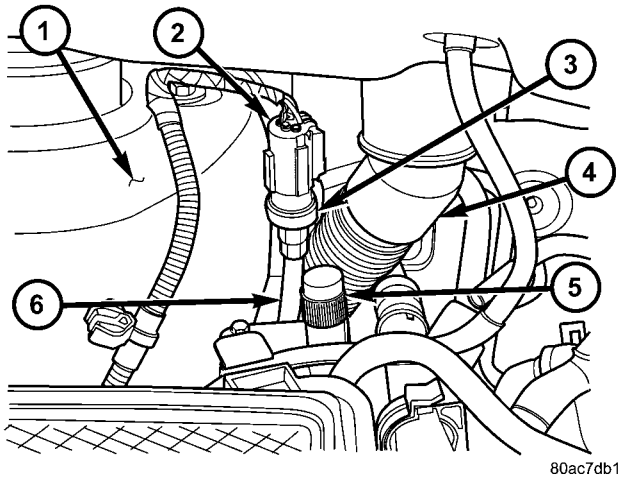

Fig. 12 A/C Pressure Transducer - Typical

1 - RIGHT FRONT STRUT TOWER
2 - WIRE HARNESS CONNECTOR
3 - A/C PRESSURE TRANSDUCER
4 - WIPER MODULE DRAIN TUBE
5 - HIGH SIDE SERVICE PORT
6 - LIQUID LINE

INSTALLATION

NOTE: Use only the specified O-ring as it is made of special material for R-134a. Use only refrigerant oil of the type required for the A/C compressor.

(1) Lubricate a new rubber O-ring seal with clean refrigerant oil and install it on the liquid line fitting.

(2) Install the A/C pressure transducer onto the liquid line. Tighten the A/C pressure transducer securely.

(3) Connect the wire harness connector to the A/C pressure transducer.

(4) Reconnect the negative battery cable.

BLEND DOOR ACTUATOR

DESCRIPTION

The two blend door actuators for the dual zone heating-A/C system are reversible, 12-volt Direct Current (DC), servo motors (Fig. 13).

For this dual zone heating-A/C system, one blend door actuator is mechanically connected to only the driver side blend-air door, while a second separate blend door actuator is mechanically connected to only the passenger side blend-air door.

The blend door actuators are interchangeable with each other, as well as with the actuator for the mode-air doors and the recirculation-air door. Each actuator is contained within an identical black molded plastic housing with an integral wire connector receptacle. Each actuator also has an identical output shaft with splines that connects it to its respective door linkage and two integral mounting tabs that allow the actuator to be

BLEND DOOR ACTUATOR (Continued)

secured to the HVAC housing. The blend door actuators do not require mechanical indexing to the blend-air doors, as they are electronically calibrated by the A/C-heater control.

The A/C-heater control must be recalibrated each time an actuator motor is replaced (Refer to 24 - HEATING & AIR CONDITIONING/CONTROLS - FRONT/A/C HEATER CONTROL - STANDARD PROCEDURE -A/C-HEATER CONTROL CALIBRATION).

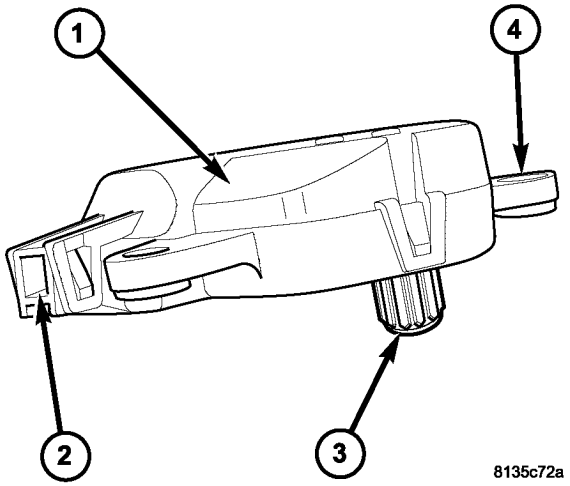

Fig. 13 Blend Door Actuator

1 - ACTUATOR MOTOR
2 - WIRE CONNECTOR RECEPTACLE
3 - OUTPUT SHAFT
4 - MOUNTING TAB (2)

OPERATION

Each blend door actuator is connected to the A/C-heater control through the vehicle electrical system by a dedicated two-wire lead and connector from the HVAC wire harness. The blend door actuator can move the blend-air door in two directions. When the A/C-heater control pulls the voltage on one side of the motor connection high and the other connection low, the blend-air door will move in one direction. When the A/C-heater control reverses the polarity of the voltage to the motor, the blend-air door moves in the opposite direction. When the A/C-heater control makes the voltage to both connections high or both connections low, the blend-air door stops and will not move. The motor connections also provide a feedback signal to the A/C-heater control. This feedback signal allows the A/C-heater control to monitor the operation and relative positions of the blend door actuator and the blend-air door. The A/C-heater control learns the blend door stop positions during the calibration procedure and will store a diagnostic trouble code (DTC) for any problems it detects in the blend door actuator circuits.

The blend door actuator(s) can be diagnosed using a DRBIII® scan tool. Refer to Body Diagnostic Procedures for more information.

The blend door actuator(s) cannot be adjusted or repaired and, if damaged or faulty, they must be replaced.

REMOVAL

WARNING: On vehicles equipped with airbags, disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

NOTE: The dual zone system has two blend door actuators, one for the driver side blend-air door and one for the passenger side blend-air door.

(1) Disconnect and isolate the negative battery cable.

(2) Remove the silencer from beneath the driver side end of the instrument panel. (Refer to 23 - BODY/INSTRUMENT PANEL/INSTRUMENT PANEL SILENCER - REMOVAL).

(3) Disconnect the wire harness connector from the blend door actuator being serviced (Fig. 14).

(4) Remove the two screws that secure the blend door actuator being serviced to the HVAC air distribution housing and remove the actuator.

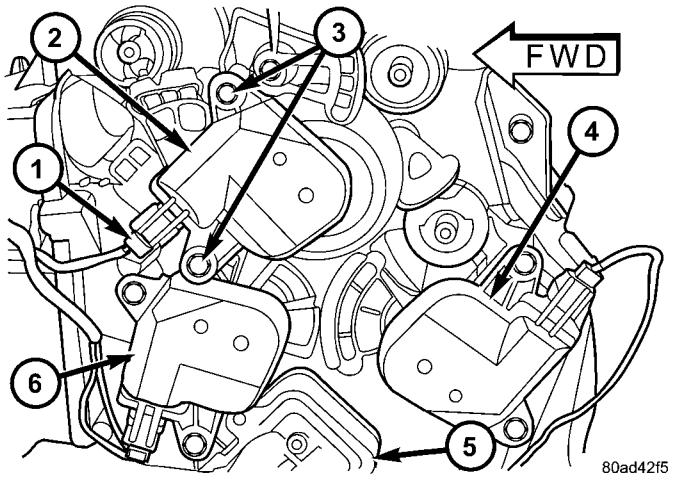

Fig. 14 Blend Door Actuator

1 - WIRE HARNESS CONNECTOR
2 - MODE DOOR ACTUATOR
3 - SCREW (2)
4 - DRIVER BLEND DOOR ACTUATOR (DUAL-ZONE)
5 - HEATER CORE
6 - BLEND DOOR ACTUATOR

BLEND DOOR ACTUATOR (Continued)

INSTALLATION

(1) Position the blend door actuator being serviced onto the air distribution housing. If necessary, rotate the actuator slightly to align the splines on the actuator output shaft with those in the blend air door linkage.

(2) Install the two screws that secure the blend door actuator to the air distribution housing. Tighten the screws to 2 N·m (17 in. lbs.).

(3) Connect the HVAC wire harness connector to the blend door actuator being serviced.

(4) Install the silencer under the driver side end of the instrument panel (Refer to 23 - BODY/INSTRUMENT PANEL/INSTRUMENT PANEL SILENCER - INSTALLATION).

(5) Reconnect the negative battery cable and calibrate the A/C-heater control (Refer to 24 - HEATING & AIR CONDITIONING/CONTROLS - FRONT/A/C HEATER CONTROL - STANDARD PROCEDURE -A/C-HEATER CONTROL CALIBRATION).

BLOWER MOTOR POWER MODULE

DESCRIPTION

A front blower motor power module is used on this model when it is equipped with the automatic temperature control (ATC) heating-A/C system (Fig. 15). Models equipped with the manual temperature control (MTC) heating-A/C system use a blower motor resistor, instead of the blower motor power module (Refer to 24 - HEATING & AIR CONDITIONING/CONTROLS-FRONT/RESISTOR-BLOWER MOTOR - DESCRIPTION).

The front blower motor power module is mounted to the rear of the front HVAC housing, directly behind the glove box. The blower motor power module consists of a molded plastic mounting plate with two integral connector receptacles (1). Concealed behind the mounting plate is the power module electronic circuitry and a large finned heat sink (2). The front blower motor power module is accessed for service by removing the glove box.

OPERATION

The front blower motor power module is connected to the vehicle electrical system through a dedicated lead and connector of the front HVAC wire harness. A second connector receptacle receives the wire harness connector from the front blower motor. The front blower motor power module allows the microprocessor-based automatic temperature control (ATC) A/C-heater control to calculate and provide infinitely variable blower motor speeds based upon either manual blower switch input or the ATC programming using a pulse width modulated (PWM) circuit strategy.

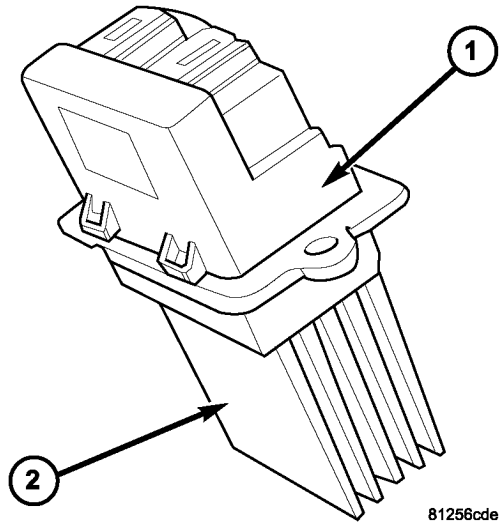

Fig. 15 Front Blower Motor Power Module

1 - BLOWER MOTOR POWER MODULE
2 - HEAT SINK

The PWM voltage is applied to a comparator circuit which compares the PWM signal voltage to the front blower motor feedback voltage. The resulting output drives the power module circuitry, which provides a linear output voltage to change or maintain the desired blower speed.

The front blower motor power module is diagnosed using a DRBIII® scan tool. Refer to Body Diagnostic Procedures.

The front blower motor power module cannot be adjusted or repaired and, if faulty or damaged, it must be replaced.

REMOVAL

WARNING: On vehicles equipped with airbags, disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

WARNING: The heat sink for the blower motor power module may get very hot during normal operation. If the blower motor was turned on prior to servicing the blower motor power module, wait five minutes to allow the heat sink to cool before performing diagnosis or service. Failure to take this precaution can result in possible personal injury.

(1) Disconnect and isolate the negative battery cable.

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

(3) Disconnect the two wire harness connectors from the front blower motor power module (Fig. 16).

(4) Remove the two screws that secure the front blower motor power module to the front HVAC housing and remove the power module.

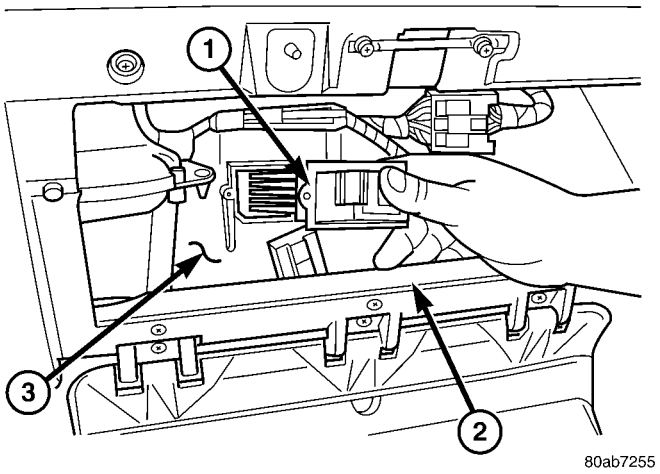

Fig. 16 Front Blower Motor Power Module

1 - FRONT BLOWER MOTOR POWER MODULE
2 - LOWER GLOVE BOX OPENING REINFORCEMENT
3 - FRONT HVAC HOUSING

INSTALLATION

(1) Position the front blower motor power module into the front HVAC housing.

(2) Install the two screws that secure the front blower motor power module to the front HVAC housing. Tighten the screws to 2 N·m (17 in. lbs.).

(3) Connect the two wire connectors to the front blower motor power module.

(4) Install the glove box (Refer to 23 - BODY/INSTRUMENT PANEL/GLOVE BOX - INSTALLATION).

(5) Reconnect the negative battery cable.

BLOWER MOTOR RELAY

DESCRIPTION

The blower motor relay for the front heating-A/C system is an International Standards Organization (ISO)-type relay (Fig. 17). Relays conforming to the ISO specifications have common physical dimensions, current capacities, terminal functions and patterns.

The front blower motor relay is located in the integrated power module (IPM) in the engine compartment.

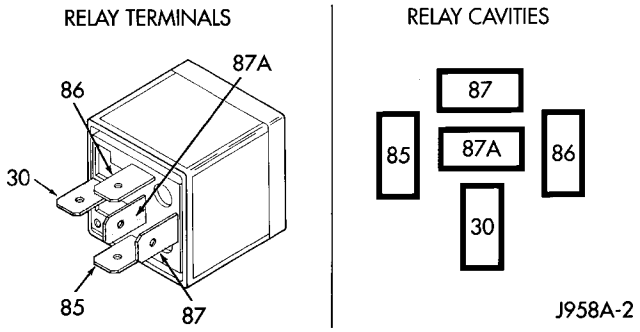

Fig. 17 Front Blower Motor Relay

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

OPERATION

The front blower motor relay is an electromechanical switch that uses a low current input from the integrated power module (IPM) to control the high current output to the blower motor resistor (manual temperature control) or the blower motor power module (automatic temperature control). The movable, common feed relay contact is held against the fixed, normally closed relay contact by spring pressure. When the electromagnetic relay coil is energized, it draws the movable common feed relay contact away from the fixed, normally closed relay contact and, holds it against the fixed, normally open relay contact. This action allows high current to flow to the blower motor.

When the relay coil is de-energized, spring pressure returns the movable relay contact back against the fixed, normally closed contact point. The resistor or diode is connected in parallel with the relay coil, and helps to dissipate voltage spikes and electromagnetic interference that can be generated as the electromagnetic field of the relay coil collapses.

The blower motor relay terminals are connected to the vehicle electrical system through a receptacle in the IPM. The inputs and outputs of the blower motor relay include:

BLOWER MOTOR RELAY (Continued)

- The common feed terminal (30) receives a battery current input from the battery through a B(+) circuit at all times.
- The coil ground terminal (85) receives a ground input through the front/rear blower motor relay control circuit only when the IPM electronically pulls the control circuit to ground.
- The coil battery terminal (86) receives a battery current input from the battery through a B(+) circuit at all times.
- The normally open terminal (87) provides a battery current output to the blower motor resistor (manual temperature control) or blower motor power module (automatic temperature control) through a fuse in the IPM on the fused front blower motor relay output circuit only when the blower motor relay coil is energized.
- The normally closed terminal (87A) is not connected to any circuit in this application, but provides a battery current output only when the blower motor relay coil is de-energized.

The blower motor relay cannot be repaired and, if faulty or damaged, it must be replaced. Refer to the appropriate wiring information for diagnosis and testing of the ISO-standard relay and for complete HVAC wiring diagrams.

REMOVAL

(1) Disconnect and isolate the negative battery cable.

(2) Remove the cover from the integrated power module (IPM) located in the engine compartment (Fig. 18).

NOTE: Refer to the fuse and relay map on the IPM cover for front blower motor relay location.

(3) Remove the front blower motor relay from the IPM.

INSTALLATION

NOTE: Refer to the fuse and relay map on the cover of the integrated power module (IPM) for front blower motor relay location.

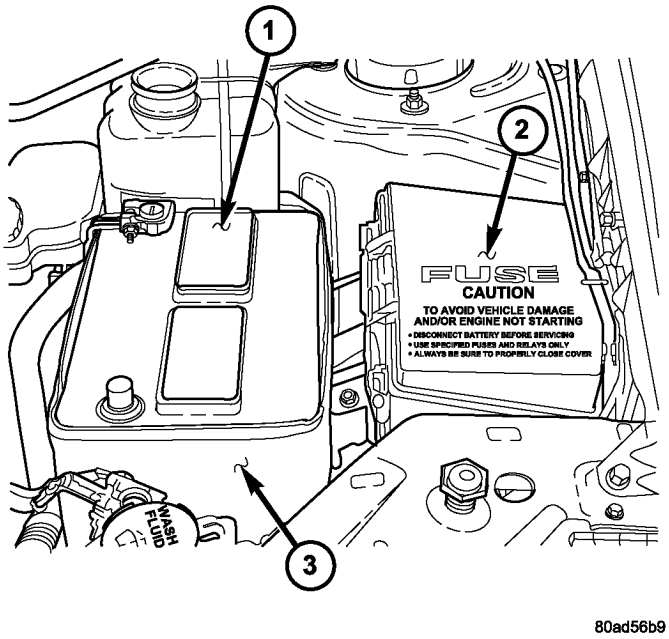

Fig. 18 Integrated Power Module (IPM)

1 - BATTERY
2 - INTEGRATED POWER MODULE (IPM)
3 - BATTERY THERMAL GUARD

(1) Position the front blower motor relay to the proper receptacle in the IPM.

(2) Align the front blower motor relay terminals with the terminal cavities in the IPM receptacle and push down firmly on the relay until the terminals are fully seated.

(3) Install the cover onto the IPM.

(4) Reconnect the negative battery cable.

BLOWER MOTOR RESISTOR

DESCRIPTION

A blower motor resistor is used on vehicles equipped with the manual temperature control (MTC) heating-A/C system (Fig. 19). Vehicles equipped with the automatic temperature control (ATC) heating-A/C system use a blower motor power module, instead of the blower motor resistor (Refer to 24 - HEATING & AIR CONDITIONING/CONTROLS - FRONT/BLOWER MOTOR POWER MODULE - DESCRIPTION).

The blower motor resistor is mounted to the rear of the HVAC housing, directly behind the glove box. The blower motor resistor consists of a molded plastic mounting plate with an integral wire connector receptacle. Concealed behind the mounting plate are coiled resistor wires contained within a ceramic heat sink.

The blower motor resistor is accessed for service by removing the glove box.

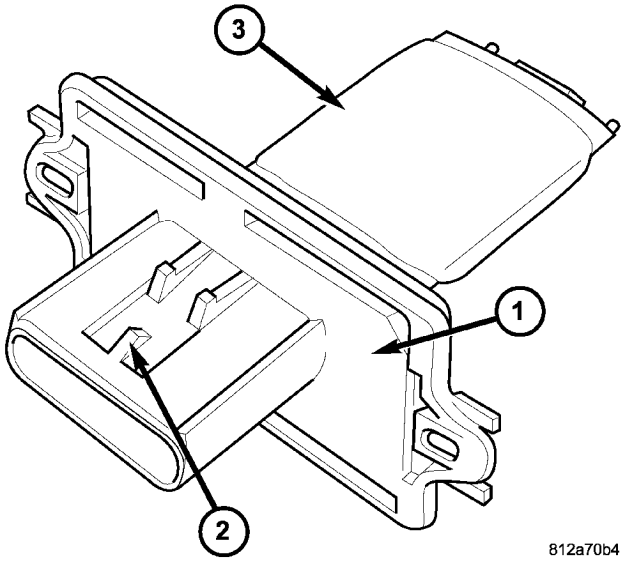

Fig. 19 Blower Motor Resistor - Typical

1 - BLOWER MOTOR RESISTOR
2 - WIRE CONNECTOR RECEPTICAL
3 - RESISTORS AND HEAT SINK

OPERATION

The blower motor resistor is connected to the vehicle electrical system through a dedicated wire lead and connector of the HVAC wire harness. The blower motor resistor has multiple resistor wires, each of which will reduce the current flow through the blower motor to change the blower motor speed.

The blower motor control in the manual temperature control (MTC) heating-A/C system directs the ground path for the blower motor through the correct resistor wire to obtain the selected speed. With the blower motor control in the lowest speed position, the ground path for the blower motor is applied through all of the resistor wires. Each higher speed selected with the blower motor control applies the blower motor ground path through fewer of the resistor wires, increasing the blower motor speed.

The blower motor resistor cannot be adjusted or repaired and, if faulty or damaged (such as a cracked ceramic heat sink), it must be replaced.

DIAGNOSIS AND TESTING

FRONT BLOWER MOTOR RESISTOR

WARNING: On vehicles equipped with airbags, disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

NOTE: For circuit descriptions and diagrams, refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, further details on wire harness routing and retention, as well as pinout and location views for the various wire harness connectors, splices and grounds.

(1) Disconnect and isolate the negative battery cable.

(2) Disconnect the wire harness connector from the blower motor resistor (Refer to 24 - HEATING & AIR CONDITIONING/CONTROLS-FRONT/BLOWER MOTOR RESISTOR - REMOVAL).

(3) Using an ohmmeter, check for continuity between all of the blower motor resistor terminals. In each case there should be continuity. If OK, repair the wire harness circuits between the blower motor switch and the blower motor resistor or blower motor as required. If not OK, replace the faulty blower motor resistor.

BLOWER MOTOR RESISTOR (Continued)

REMOVAL

WARNING: On vehicles equipped with airbags, disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

WARNING: The blower motor resistor may get very hot during normal operation. If the blower motor was turned on prior to servicing the blower motor resistor, wait five minutes to allow the blower motor resistors to cool before performing diagnosis or service. Failure to take this precaution can result in possible personal injury.

CAUTION: Do not operate the blower motor with the blower motor resistor removed from the circuit. Failure to take this precaution can result in vehicle damage.

(1) Disconnect and isolate the negative battery cable.

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

(3) Disconnect the two wire harness connectors from the blower motor resistor (Fig. 20).

(4) Remove the two screws that secure the blower motor resistor to the HVAC housing and remove the resistor.

INSTALLATION

(1) Position the blower motor resistor into the HVAC housing.

(2) Install the two screws that secure the blower motor resistor to the HVAC housing. Tighten the screws to 2 N·m (17 in. lbs.).

(3) Connect the two wire connectors to the blower motor resistor.

(4) Install the glove box (Refer to 23 - BODY/INSTRUMENT PANEL/GLOVE BOX - INSTALLATION).

(5) Reconnect the negative battery cable.

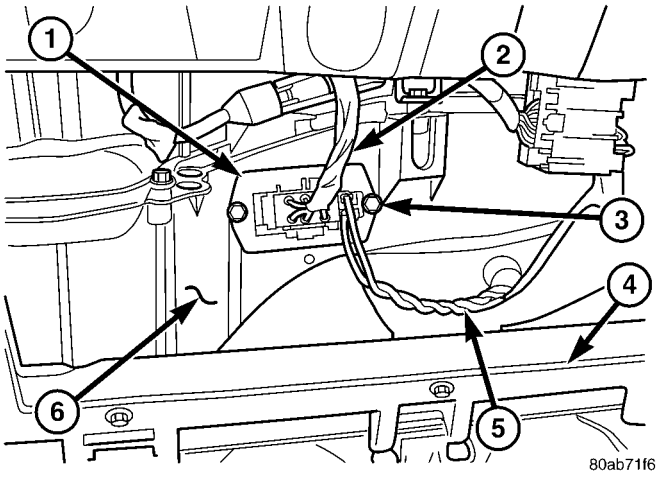

Fig. 20 Blower Motor Resistor

1 - BLOWER MOTOR RESISTOR
2 - INSTRUMENT PANEL WIRE HARNESS
3 - SCREW (2)
4 - GLOVE BOX OPENING REINFORCEMENT
5 - BLOWER MOTOR PIGTAIL WIRE HARNESS
6 - HVAC HOUSING

EVAPORATOR TEMPERATURE SENSOR

DESCRIPTION

The evaporator temperature sensor is a switch that is installed on the top of the expansion valve in the right rear corner of the engine compartment. The sensor has a small probe that is inserted in a small well in the body of the expansion valve that is filled with a special silicone-based thermal grease. A small molded plastic push-in retainer secures the sensor to a threaded hole in the top surface of the expansion valve. Two terminals within a molded plastic connector receptacle on the sensor connect it to the vehicle electrical system through a take out and connector of the HVAC wire harness.

The evaporator temperature sensor cannot be adjusted or repaired and, if faulty or damaged, it must be replaced.

OPERATION

The evaporator temperature sensor monitors the temperature of the evaporator through its connection to the top of the expansion valve. The sensor will change its internal resistance in response to the temperatures it monitors. The A/C-heater control module is connected to the sensor through a sensor ground circuit and a sensor signal circuit. As the evaporator temperature increases, the resistance of the sensor decreases and the voltage monitored by the module decreases. The module uses this monitored voltage reading to an indication of the evaporator temperature. The A/C-heater control module is programmed

to respond to this input by sending electronic messages to the powertrain control module (PCM) over the programmable communications interface (PCI) data bus, and the PCM then cycles the air conditioning compressor clutch as necessary to optimize air conditioning system performance and to protect the system from evaporator freezing. The external location of the sensor and the use of a retainer allows the sensor to be removed or installed from the expansion valve without disturbing the refrigerant in the system. The evaporator temperature sensor is diagnosed using a DRBIII® scan tool. Refer to Body Diagnostic Procedures.

REMOVAL

(1) Disconnect and isolate the battery negative cable.

(2) Remove the air cleaner housing from the right side of the engine compartment.

(3) Remove the temperature sensor retainer from the expansion valve (Fig. 21).

(4) Pull the evaporator temperature sensor away from the expansion valve far enough to access the red release ring on the wiring connector. Push the red ring toward the connector to release the lock and remove the wire harness connector from the evaporator temperature sensor.

(5) Remove the evaporator temperature sensor from the engine compartment.

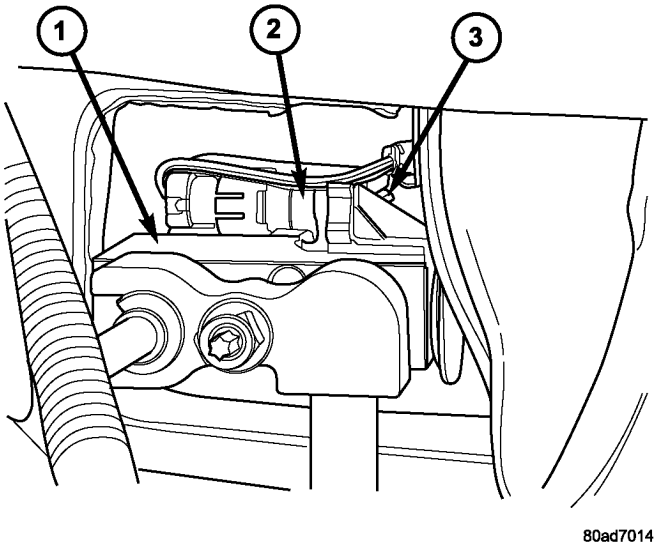

Fig. 21 Evaporator Temperature Sensor

1 - EXPANSION VALVE
2 - EVAPORATOR TEMPERATURE SENSOR
3 - RETAINER

INSTALLATION

NOTE: Any grease removed with the evaporator temperature sensor must be replaced. Failure to do so could result in poor A/C performance.

(1) Position the evaporator temperature sensor into the right rear corner of the engine compartment.

(2) Reconnect the wire harness connector to the evaporator temperature sensor.

(3) Position the evaporator temperature sensor onto the top of the expansion valve with the sensor probe inserted into the well in the expansion valve.

(4) Install the temperature sensor retainer.

(5) Reinstall the air cleaner housing into the right side of the engine compartment.

(6) Reconnect the battery negative cable.

(7) Run the HVAC Cool Down test to verify system is operating properly (Refer to 24 - HEATING & AIR CONDITIONING - DIAGNOSIS AND TESTING).

INFRARED TEMPERATURE SENSOR

DESCRIPTION

The infrared temperature sensor consists of two infrared transducers that are concealed behind a clear lens located within the instrument panel mounted A/C-heater control (Fig. 22). These sensors are used only on models equipped with the automatic temperature control (ATC) heating-A/C system.

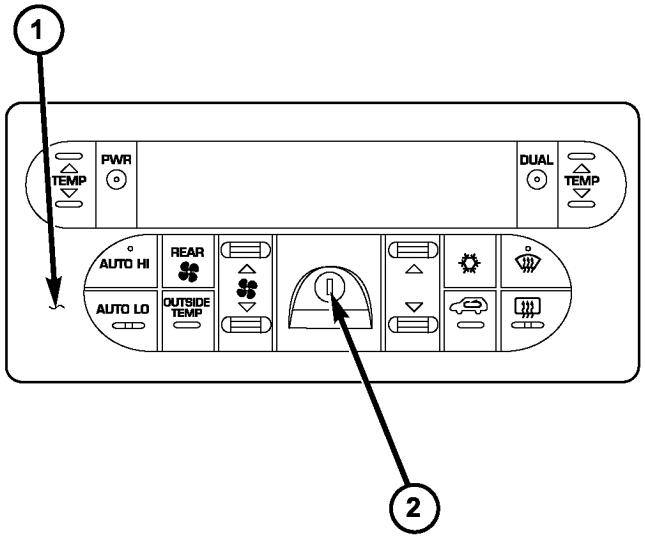

Fig. 22 Infrared Temperature Sensor

1 - ATC A/C-HEATER CONTROL
2 - INFRARED TEMPERATURE SENSOR

INFRARED TEMPERATURE SENSOR (Continued)

OPERATION

The dual infrared temperature sensors provide independent measurement inputs to the automatic temperature control (ATC) A/C-heater control module that indicates the surface temperature of the driver seat and front seat passenger seat occupants. By using a surface temperature measurement, rather than an air temperature measurement, the ATC system is able to adjust itself to the comfort level as perceived by the occupant. This allows the system to detect and compensate for other ambient conditions affecting comfort levels, such as solar heat gain or evaporative heat loss. The ATC system logic responds to the infrared sensor inputs by calculating and adjusting the air flow temperature and air flow rate needed to properly obtain and maintain the individually selected comfort level temperatures of both the driver and passenger seat occupants.

The ATC A/C-heater control module continually monitors the infrared sensor circuits, and will store a diagnostic trouble code (DTC) for any problem it detects. The infrared temperature sensor is diagnosed using a DRBIII® scan tool. Refer to Body Diagnostic Procedures.

The infrared sensors cannot be adjusted or repaired and, if faulty or damaged, the A/C-heater control must be replaced.

MODE DOOR ACTUATOR

DESCRIPTION

The mode door actuator for the heating-A/C system is a reversible, 12-volt Direct Current (DC), servo motor (Fig. 23). The single mode door actuator is located on the driver side end of the HVAC air distribution housing, close to the top of the housing. The mode door actuator is mechanically connected to the mode-air doors.

The mode door actuator is interchangeable with the actuators for the blend-air doors and the recirculation-air door. Each actuator is contained within an identical black molded plastic housing with an integral wire connector receptacle. Each actuator also has an identical output shaft with splines that connects it to its respective door linkage and two integral mounting tabs that allow the actuator to be secured to the HVAC housing. The mode door actuator does not require mechanical indexing to the mode-air doors, as it is electronically calibrated by the A/C-heater control.

The A/C-heater control must be recalibrated each time an actuator motor is replaced (Refer to 24 - HEATING & AIR CONDITIONING/CONTROLS - FRONT/A/C HEATER CONTROL - STANDARD PROCEDURE -A/C-HEATER CONTROL CALIBRATION).

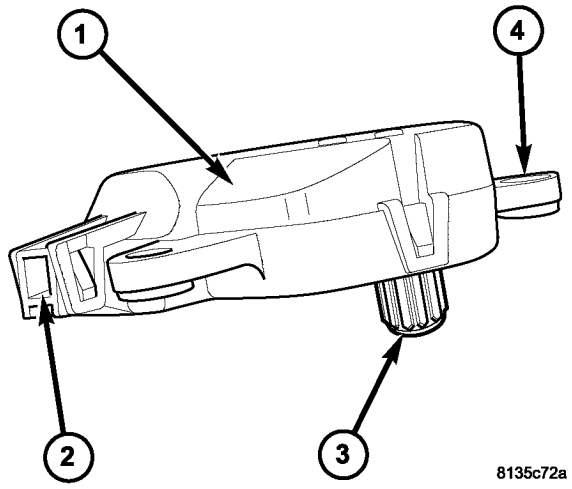

Fig. 23 Mode Door Actuator

1 - ACTUATOR MOTOR
2 - WIRE CONNECTOR RECEPTACLE
3 - OUTPUT SHAFT
4 - MOUNTING TAB (2)

OPERATION

The mode door actuator is connected to the A/C-heater control through the vehicle electrical system by a dedicated two-wire lead and connector of the HVAC wire harness. The mode door actuator can move the mode-air doors in two directions. When the A/C-heater control pulls the voltage on one side of the motor connection high and the other connection low, the mode-air doors will move in one direction. When the A/C-heater control reverses the polarity of the voltage to the motor, the mode-air doors move in the opposite direction.

When the A/C-heater control makes the voltage to both connections high or both connections low, the mode-air doors stop and will not move.

The A/C-heater control uses a feedback signal positioning system to monitor the operation and relative position of the mode door actuator and the mode-air doors. The A/C-heater control learns the mode-air doors stop positions during the calibration procedure and will store a diagnostic trouble code (DTC) for any problems it detects in the mode door actuator circuits.

The mode door actuator is diagnosed using a DRBIII® scan tool. Refer to 9 - Engine Electrical Diagnostics for more information.

The mode door actuator cannot be adjusted or repaired and, if faulty or damaged, it must be replaced.

MODE DOOR ACTUATOR (Continued)

REMOVAL

WARNING: On vehicles equipped with airbags, disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

(1) Disconnect and isolate the negative battery cable.

(2) Remove the silencer from beneath the driver side end of the instrument panel. (Refer to 23 - BODY/INSTRUMENT PANEL/INSTRUMENT PANEL SILENCER - REMOVAL).

(3) Disconnect the wire harness connector from the mode door actuator (Fig. 24).

(4) Remove the two screws that secure the mode door actuator to the HVAC air distribution housing and remove the actuator.

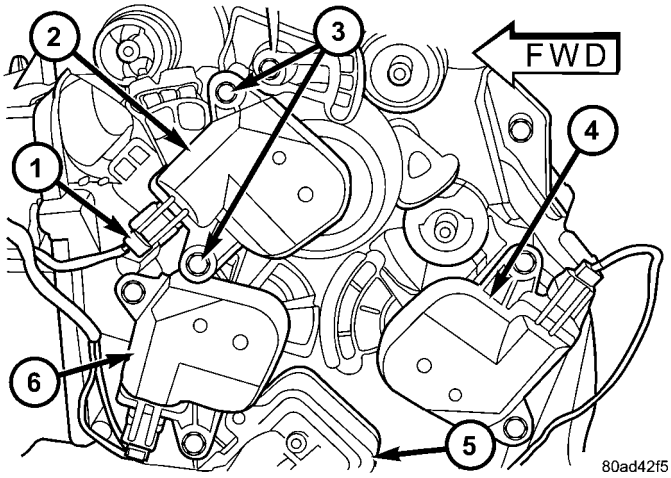

Fig. 24 Mode Door Actuator

1 - WIRE HARNESS CONNECTOR
2 - MODE DOOR ACTUATOR
3 - SCREW (2)
4 - DRIVER BLEND DOOR ACTUATOR (DUAL-ZONE)
5 - HEATER CORE
6 - BLEND DOOR ACTUATOR

INSTALLATION

(1) Position the mode door actuator onto the HVAC air distribution housing. If necessary, rotate the actuator slightly to align the splines on the actuator output shaft with those in the mode door linkage.

(2) Install the two screws that secure the mode door actuator to the air distribution housing. Tighten the screws to 2 N·m (17 in. lbs.).

(3) Connect the wire harness connector to the mode door actuator.

(4) Install the silencer under the driver side end of the instrument panel (Refer to 23 - BODY/INSTRUMENT PANEL/INSTRUMENT PANEL SILENCER - INSTALLATION).

(5) Reconnect the negative battery cable and calibrate the A/C-heater control (Refer to 24 - HEATING & AIR CONDITIONING/CONTROLS - FRONT/A/C HEATER CONTROL - STANDARD PROCEDURE -A/C-HEATER CONTROL CALIBRATION).

RECIRCULATION DOOR ACTUATOR

DESCRIPTION

The recirculation door actuator is a reversible, 12 volt direct current (DC), servo motor (Fig. 25). The recirculation door actuator is located on the bottom of the HVAC air inlet housing and is directly connected to the pivot shaft of the recirculation-air door.

The recirculation door actuator is interchangeable with the actuators for the blend-air door(s) and the mode-air doors. Each actuator is contained within an identical black molded plastic housing with an integral wire connector receptacle. Each actuator also has an identical output shaft with splines that connects it to its door linkage and two integral mounting tabs that allow the actuator to be secured to the air inlet housing. The recirculation door actuator does not require mechanical indexing to the recirculation-air door, as it is electronically calibrated by the A/C-heater control.

The A/C-heater control must be recalibrated each time an actuator motor is replaced (Refer to 24 - HEATING & AIR CONDITIONING/CONTROLS - FRONT/A/C HEATER CONTROL - STANDARD PROCEDURE -A/C-HEATER CONTROL CALIBRATION).

OPERATION

The recirculation door actuator is connected to the A/C-heater control through the vehicle electrical system by a dedicated two-wire lead and connector of the HVAC wire harness. The recirculation door actuator can move the recirculation-air door in two directions. When the A/C-heater control pulls the voltage on one side of the motor connection high and the other connection low, the recirculation-air door will move in one direction. When the A/C-heater control reverses the polarity of the voltage to the motor, the recirculation-air door moves in the opposite direction.

RECIRCULATION DOOR ACTUATOR (Continued)

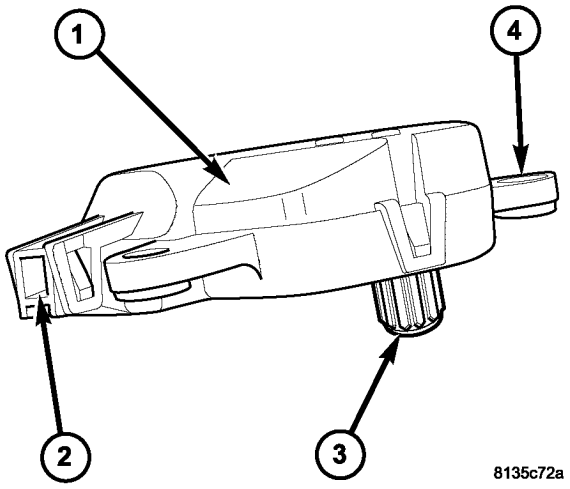

Fig. 25 Recirculation Door Actuator

1 - ACTUATOR MOTOR
2 - WIRE CONNECTOR RECEPTACLE
3 - OUTPUT SHAFT
4 - MOUNTING TAB (2)

When the A/C-heater control makes the voltage to both connections high or both connections low, the recirculation-air door stops and will not move.

The A/C-heater control uses a feedback signal positioning system to monitor the operation and relative position of the recirculation door actuator and the recirculation-air door. The A/C-heater control learns the recirculation-air door stop positions during the calibration procedure and will store a diagnostic trouble code (DTC) for any problems it detects in the recirculation door actuator circuits.

The recirculation door actuator is diagnosed using a DRBIII® scan tool. Refer to 9 - Engine Electrical Diagnostics for more information.

The recirculation door actuator cannot be adjusted or repaired and, if faulty or damaged, it must be replaced.

REMOVAL

WARNING: On vehicles equipped with airbags, disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

(1) Disconnect and isolate the negative battery cable.

(2) Pull the carpet on the passenger side front floor away from the dash panel far enough to access the recirculation door actuator.

(3) Disconnect the HVAC wire harness connector from the recirculation door actuator (Fig. 26).

(4) Remove the two screws that secure the recirculation door actuator to the air inlet housing and remove the actuator.

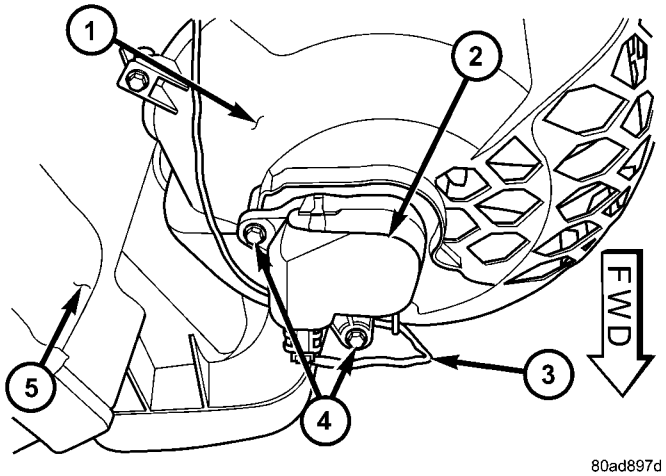

Fig. 26 Recirculation Door Actuator

1 - AIR INLET HOUSING
2 - RECIRCULATION DOOR ACTUATOR
3 - HVAC WIRE HARNESS
4 - SCREW (2)
5 - LOWER HVAC HOUSING

INSTALLATION

(1) Position the recirculation door actuator onto the air inlet housing. If necessary, rotate the actuator slightly to align the splines on the actuator output shaft with those in the recirculation-air door pivot shaft.

(2) Install the two screws that secure the recirculation door actuator to the air inlet housing. Tighten the screws to 2 N·m (17 in. lbs.).

(3) Connect the HVAC wire harness connector to the recirculation door actuator.

(4) Reposition the carpet on the passenger side front floor back up to the dash panel.

(5) Reconnect the negative battery cable and calibrate the A/C-heater control (Refer to 24 - HEATING & AIR CONDITIONING/CONTROLS - FRONT/A/C HEATER CONTROL - STANDARD PROCEDURE -A/C-HEATER CONTROL CALIBRATION).

CONTROLS - REAR

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BLOWER MOTOR RELAY

DESCRIPTION

The rear blower motor relay used in the rear center floor console when equipped with the automatic temperature control (ATC) heating-A/C system is a International Standards Organization (ISO)-type relay (Fig. 1). Relays conforming to the ISO specifications have common physical dimensions, current capacities, terminal functions and patterns.

The rear blower motor relay is located in the integrated power module (IPM) in the engine compartment.

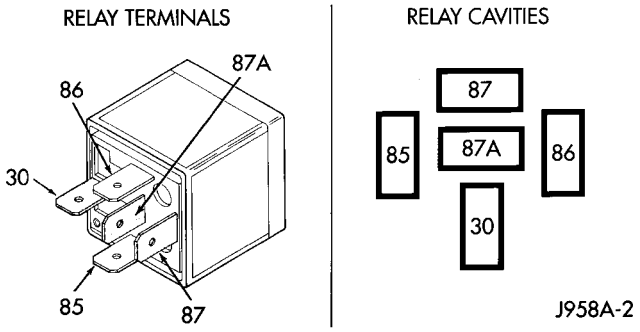

Fig. 1 Rear Blower Motor Relay

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

OPERATION

The rear blower motor relay is an electromechanical switch that uses a low current input from the front control module (FCM) to control the high current output to the rear blower motor power module. The movable, common feed relay contact is held against the fixed, normally closed relay contact by spring pressure. When the electromagnetic relay coil is energized, it draws the movable common feed relay contact away from the fixed, normally closed relay contact and, holds it against the fixed, normally open relay contact. This action allows high current to flow to the rear blower motor.

When the relay coil is de-energized, spring pressure returns the movable relay contact back against the fixed, normally closed contact point. The resistor or diode is connected in parallel with the relay coil, and helps to dissipate voltage spikes and electromagnetic interference that can be generated as the electromagnetic field of the relay coil collapses.

The rear blower motor relay terminals are connected to the vehicle electrical system through a receptacle in the integrated power module (IPM). The inputs and outputs of the rear blower motor relay include:

- The common feed terminal (30) receives a battery current input from the battery through a B(+) circuit at all times.
- The coil ground terminal (85) receives a ground input through the front/rear blower motor relay control circuit only when the FCM electronically pulls the control circuit to ground.
- The coil battery terminal (86) receives a battery current input from the battery through a B(+) circuit at all times.
- The normally open terminal (87) provides a battery current output to the rear blower motor power module through a fuse in the IPM on the fused rear blower motor relay output circuit only when the rear blower motor relay coil is energized.
- The normally closed terminal (87A) is not connected to any circuit in this application, but provides a battery current output only when the rear blower motor relay coil is de-energized.

BLOWER MOTOR RELAY (Continued)

Refer to the appropriate wiring information for diagnosis and testing of the micro-relay and for complete HVAC wiring diagrams.

REMOVAL

(1) Disconnect and isolate the negative battery cable.

(2) Remove the cover from the integrated power module (IPM) located in the engine compartment (Fig. 2).

NOTE: Refer to the fuse and relay map on the IPM cover for rear blower motor relay location.

(3) Remove the rear blower motor relay from the IPM.

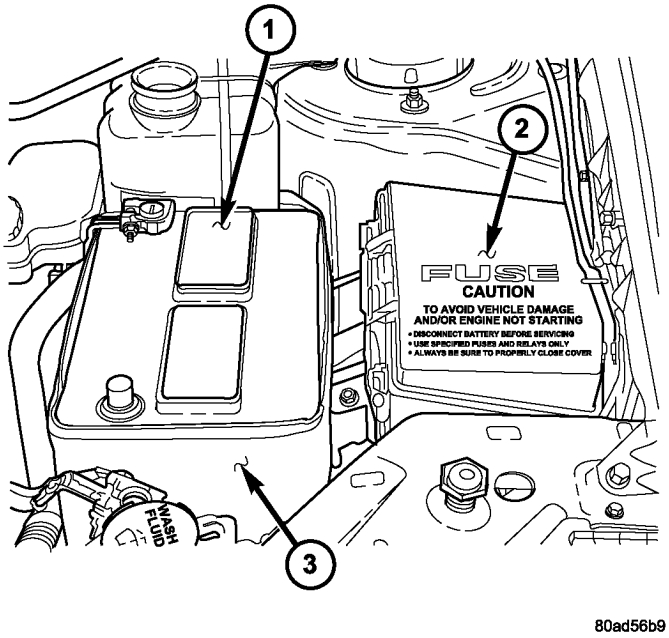

Fig. 2 Integrated Power Module (IPM)

1 - BATTERY
2 - INTEGRATED POWER MODULE (IPM)
3 - BATTERY THERMAL GUARD

INSTALLATION

NOTE: Refer to the fuse and relay map on the cover of the integrated power module (IPM) for rear blower motor relay location.

(1) Position the rear blower motor relay to the proper receptacle in the IPM.

(2) Align the rear blower motor relay terminals with the terminal cavities in the IPM receptacle and push down firmly on the relay until the terminals are fully seated.

(3) Install the cover onto the IPM.

(4) Reconnect the negative battery cable.

BLOWER MOTOR SWITCH

DESCRIPTION

The rear blower motor is controlled by a rotary-type blower motor switch, mounted in the rear center console (Fig. 3). The rear blower motor switch allows the selection of rear blower motor speeds, Auto and an Off position when the front A/C-heater control is set to the Rear position, otherwise the front A/C-heater control operates both the front and rear blower motors.

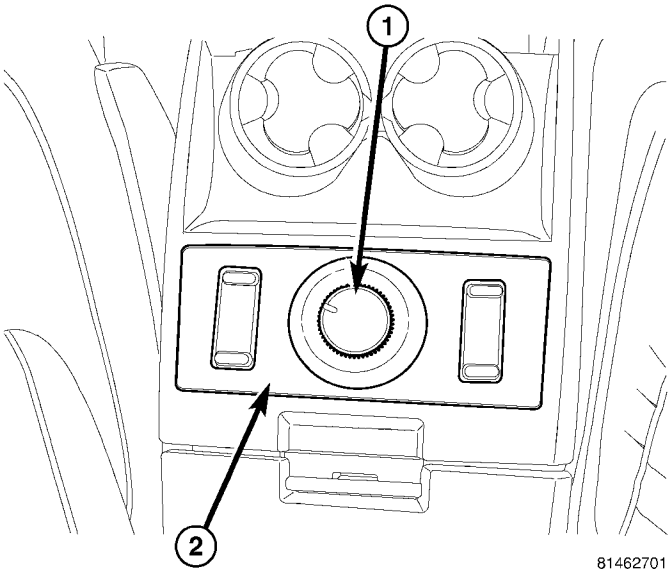

Fig. 3 Rear Blower Motor Switch

1 - REAR BLOWER MOTOR SWITCH
2 - REAR CONTROL PANEL

OPERATION

When the front A/C-heater control display for the automatic temperature control (ATC) heating-A/C system reads REAR AUTO or when the rear blower fan is off, the switch located in the center console between the second row seats is not functional. When the front A/C-heater control display reads REAR, only the rear seat occupants control the rear blower fan speed from the rear switch. When in the Rear mode, the rear occupants can set the rear switch to any fan speed including OFF or AUTO. While in the Auto position, the rear fan speed will be automatically controlled. Refer to Body Diagnostic Procedures for further diagnostic information.

REMOVAL

(1) Disconnect and isolate the negative battery cable.

(2) Remove the contol knob from the rear blower motor switch.

BLOWER MOTOR SWITCH (Continued)

(3) Using a trim stick C-4755 or equivalent, gently pry the outer perimeter of the rear control panel from the rear of the center floor console.

(4) Disconnect the wire harness connector from the rear blower motor switch (Fig. 4).

(5) Remove the two screws that secure the rear blower motor switch to the rear control panel and remove the switch from the panel.

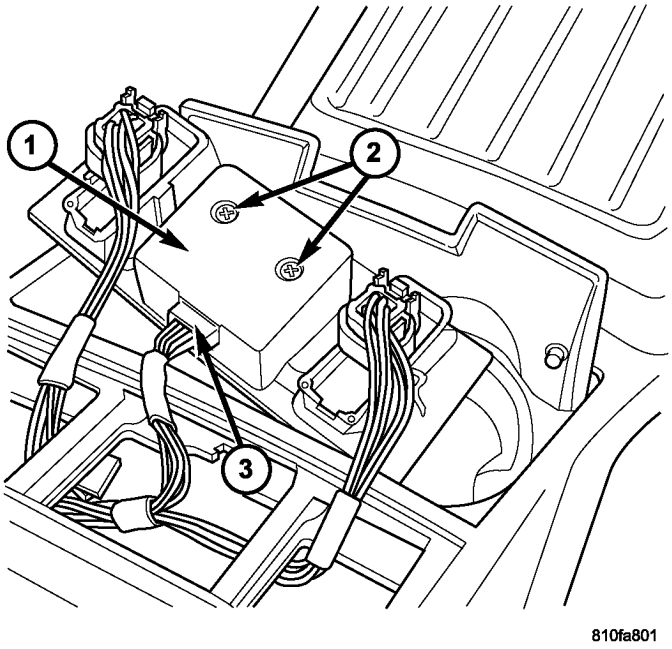

Fig. 4 Rear Blower Motor Switch

1 - REAR BLOWER MOTOR SWITCH
2 - SCREW (2)
3 - ELECTRICAL CONNECTOR

INSTALLATION

(1) Position the rear blower motor switch onto the rear control panel.

(2) Install the two screws that secure the blower motor switch to the rear control panel. Tighten the screws to 2 N·m (17 in. lbs.).

(3) Connect the wire harness connector to the rear blower motor switch.

(4) Install the rear control panel to the rear of the center floor console.

(5) Install the control knob onto the rear blower motor switch.

(6) Reconnect the negative battery cable.

MODE DOOR ACTUATOR

DESCRIPTION

The mode door actuator used in the rear center floor console when equipped with the automatic temperature control (ATC) heating-A/C system, is a reversible, 12-volt direct current (DC), servo motor (Fig. 5). The rear mode door actuator is located in the rear blower motor housing within the center floor console. The rear mode door actuator is mechanically connected to the two floor console mode-air doors.

The rear mode door actuator is interchangeable with the actuator for the front mode-air doors, front blend-air doors and the recirculation-air door. Each actuator is contained within an identical black molded plastic housing with an integral wire connector receptacle. Each actuator also has an identical output shaft with splines that connects it to its respective door linkage and two integral mounting tabs that allow the actuator to be secured to the rear blower motor housing. The rear mode door actuator does not require mechanical indexing to the rear mode-air door linkage, as it is electronically calibrated by the A/C-heater control.

The A/C-heater control must be recalibrated each time an actuator motor is replaced (Refer to 24 - HEATING & AIR CONDITIONING/CONTROLS - FRONT/A/C HEATER CONTROL - STANDARD PROCEDURE -A/C-HEATER CONTROL CALIBRATION).

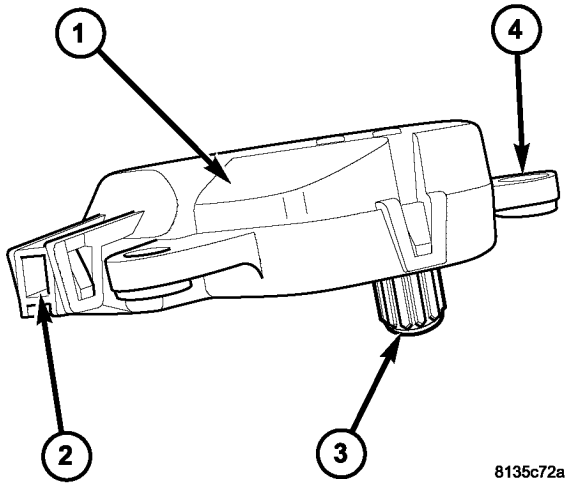

Fig. 5 Mode Door Actuator

1 - ACTUATOR MOTOR
2 - WIRE CONNECTOR RECEPTACLE
3 - OUTPUT SHAFT
4 - MOUNTING TAB (2)

OPERATION

The mode door actuator for the center floor console is connected to the A/C-heater control through the vehicle electrical system by a dedicated two-wire lead and connector of the body wire harness. The rear mode door actuator can move the two floor console mode-air doors in two directions. When the A/C-heater control pulls the voltage on one side of the

MODE DOOR ACTUATOR (Continued)

motor connection high and the other connection low, the mode-air doors will move in one direction. When the A/C-heater control reverses the polarity of the voltage to the motor, the mode-air doors move in the opposite direction.

When the A/C-heater control makes the voltage to both connections high or both connections low, the mode-air doors stop and will not move.

The A/C-heater control uses a feedback signal positioning system to monitor the operation and relative position of the rear mode door actuator and the mode-air doors. The A/C-heater control learns the mode-air doors stop positions during the calibration procedure and will store a diagnostic trouble code (DTC) for any problems it detects in the rear mode door actuator circuits.

The rear mode door actuator is diagnosed using a DRBIII® scan tool. Refer to 9 - Engine Electrical Diagnostics for more information.

The rear mode door actuator cannot be adjusted or repaired and, if faulty or damaged, it must be replaced.

REMOVAL

(1) Remove the front center floor console cover (Refer to 23 - BODY/INTERIOR/CENTER CONSOLE - REMOVAL).

(2) Disconnect and isolate the negative battery cable.

(3) Disconnect the body wire harness connector from the rear mode door actuator (Fig. 6).

(4) Remove the two screws that secure the mode door actuator to the rear blower motor housing and remove the actuator.

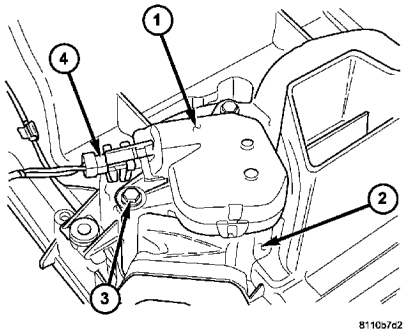

Fig. 6 Mode Door Actuator - Floor Console

1 - MODE DOOR ACTUATOR
2 - REAR BLOWER MOTOR HOUSING
3 - SCREW (2)
4 - WIRE HARNESS CONNECTOR

INSTALLATION

(1) Position the rear mode door actuator onto the rear blower motor housing. If necessary, rotate the actuator slightly to align the splines on the actuator output shaft with those in the mode door linkage.

(2) Install the two screws that secure the rear mode door actuator to the blower motor housing. Tighten the screws to 2 N·m (17 in. lbs.).

(3) Connect the wire harness connector to the rear mode door actuator.

(4) Reconnect the negative battery cable.

(5) Install the front center floor console cover (Refer to 23 - BODY/INTERIOR/CENTER CONSOLE - INSTALLATION).

(6) Calibrate the A/C-heater control (Refer to 24 - HEATING & AIR CONDITIONING/CONTROLS - FRONT/A/C HEATER CONTROL - STANDARD PROCEDURE -A/C-HEATER CONTROL CALIBRATION).

BLOWER MOTOR POWER MODULE

DESCRIPTION

A rear blower motor power module is used on this model when it is equipped with the automatic temperature control (ATC) heating-A/C system (Fig. 7). The blower motor power module is installed in the rear blower motor housing, which is located within the center floor console. The power module consists of a molded plastic mounting plate with two integral wire harness connector receptacles. Concealed behind the mounting plate within the blower motor housing is the power module electronic circuitry and a large finned, heat sink. The module mounting plate is secured with two screws to the rear blower motor housing and is accessed for service by removing the front center floor console.

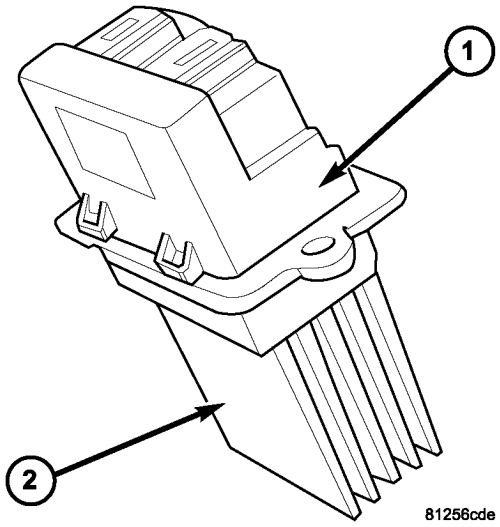

Fig. 7 Blower Motor Power Module

1 - BLOWER MOTOR POWER MODULE
2 - HEAT SINK

OPERATION

The rear blower motor power module is connected to the vehicle electrical system through a dedicated wire harness lead and connector of the body wire harness. A second connector receptacle receives the wire harness connector from the rear blower motor. The rear blower motor power module allows the microprocessor-based automatic temperature control (ATC) A/C-heater control to calculate and provide infinitely variable blower motor speeds based upon either manual blower switch input or the ATC programming using a pulse width modulated (PWM) circuit strategy.

The PWM voltage is applied to a comparator circuit which compares the PWM signal voltage to the rear blower motor feedback voltage. The resulting output drives the power module circuitry, which adjusts the voltage output received from the rear blower motor relay to change or maintain the desired rear blower motor speed.

The rear blower motor power module is diagnosed using a DRBIII® scan tool. Refer to Body Diagnostic Procedures.

The rear blower motor power module cannot be adjusted or repaired and, if faulty or damaged, it must be replaced.

REMOVAL

(1) Remove the rear center console upper cover (Refer to 23 - BODY/INTERIOR/CENTER CONSOLE - REMOVAL).

(2) Disconnect and isolate the negative battery cable.

(3) Disconnect the body wire harness connector from the rear blower motor power module (Fig. 8).

(4) Disconnect the rear blower motor wire harness connector from the power module.

(5) Remove the two screws that secure the power module to the rear blower motor housing.

(6) Remove the power module from the blower motor housing.

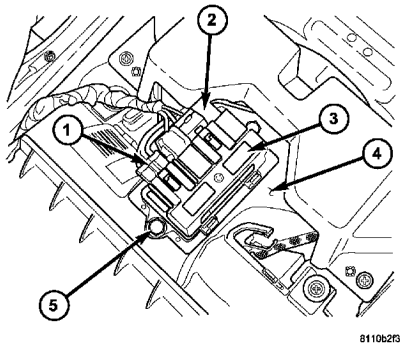

Fig. 8 Rear Blower Motor Power Module

1 - BLOWER MOTOR WIRE CONNECTOR
2 - BODY HARNESS WIRE CONNECTOR
3 - REAR BLOWER MOTOR POWER MODULE
4 - REAR BLOWER MOTOR HOUSING
5 - SCREW (2)

INSTALLATION

(1) Position the rear blower motor power module into the rear blower motor housing.

(2) Install the two screws that secure the power module to the blower motor housing. Tighten the screws to 2 N·m (17 in. lbs.).

(3) Reconnect the blower motor wire harness connector to the power module.

(4) Reconnect the body wire harness connector to the power module.

(5) Reconnect the negative battery cable.

(6) Install the front center floor console cover (Refer to 23 - BODY/INTERIOR/CENTER CONSOLE - INSTALLATION).

DISTRIBUTION - FRONT

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AIR FILTER

DESCRIPTION

A dust and odor air filter is available on some models (Fig. 1). The particulate air filter element is the same size as the A/C evaporator to ensure ample filtering capacity. A removable door on the bottom of the HVAC housing below the glove box provides easy access to the particulate air filter element for replacement. The particulate air filter element should be checked and replaced at least once every 24,000 km (15,000 miles) and checked if heater-A/C system performance seems lower than expected.

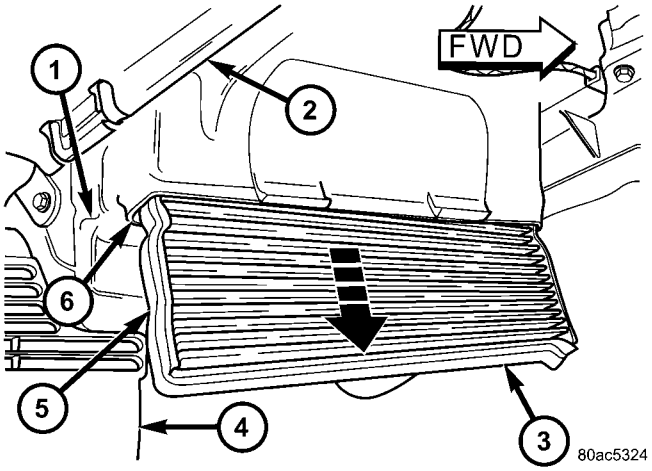

Fig. 1 Particulate Air Filter

1 - LOWER FRONT HVAC HOUSING
2 - LOWER EDGE OF INSTRUMENT PANEL
3 - AIR FILTER (IF EQUIPPED)
4 - CENTER FLOOR BRACKET COVER
5 - FILTER SEALING EDGES (IF EQUIPPED)
6 - AIR FILTER OPENING (IF EQUIPPED)

AIR FILTER (Continued)

REMOVAL

(1) Locate the air filter door on the bottom of the lower front HVAC housing just outboard of the passenger side of the instrument panel center stack (Fig. 2).

(2) Slide the air filter door latch toward the rear of the vehicle until it engages the opened stop on the door.

(3) Pull the air filter door straight downward to disengage it from the air filter opening of the HVAC housing.

(4) Use your fingers to reach through the air filter opening of the HVAC housing far enough to grasp the air filter.

(5) Pull the air filter straight down and out of the HVAC housing.

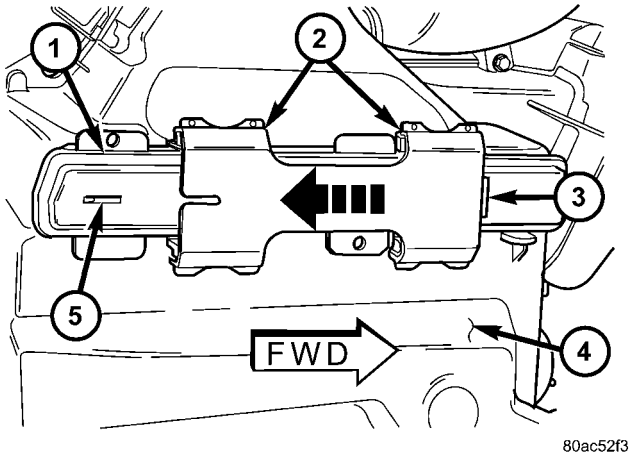

Fig. 2 Air Filter Door - Typical

1 - AIR FILTER DOOR
2 - LATCH
3 - CLOSED STOP
4 - LOWER FRONT HVAC HOUSING
5 - OPENED STOP

INSTALLATION

NOTE: The particulate air filter is labeled with "Airflow" and an arrow to indicate air flow direction through the filter. This arrow should always be oriented towards the center of the vehicle. Make sure to properly install the particulate air filter. Failure to properly install the filter will result in the need to replace the filter sooner than required by design.

(1) Install the filter fully upward into the HVAC housing through the air filter opening with the "Airflow" arrow oriented towards the center of the vehicle.

(2) With the latch still positioned against its opened stop, install the air filter door onto the lower HVAC housing air filter opening.

(3) Slide the air filter door latch toward the front of the vehicle until it contacts the closed stop on the door.

AIR OUTLETS

REMOVAL

CENTER AIR OUTLETS

WARNING: On vehicles equipped with airbags, disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

NOTE: The two center air outlets located above the instrument panel center bezel are serviced as an assembly.

(1) Disconnect and isolate the negative battery cable.

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

(3) Remove the two screws that secure the bottom of the center air outlet to the instrument panel (Fig. 3).

(4) Roll the bottom of the center air outlet upward and disengage the retaining clips that secure the top of the air outlet to the instrument panel and remove the outlet.

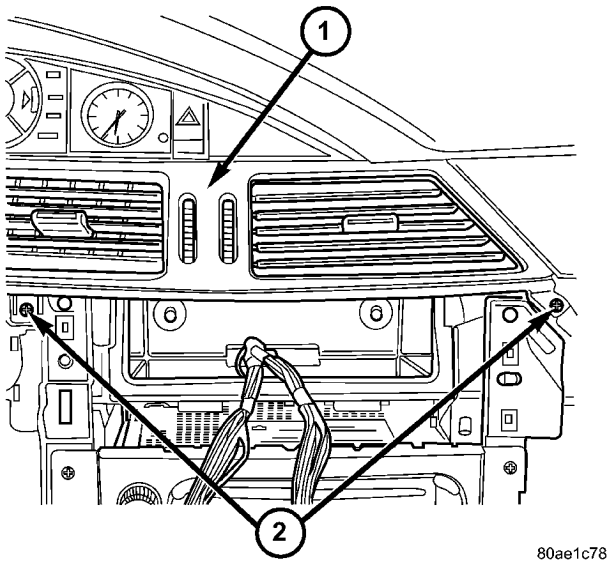

Fig. 3 Center Air Outlets

1 - CENTER AIR OUTLET
2 - SCREW (2)

AIR OUTLETS (Continued)

INSTRUMENT PANEL AIR OUTLETS

(1) If servicing the right instrument panel air outlet, use a trim stick C-4755 or equivalent and gently pry the outer perimeter of the center trim panel from the right side of the instrument panel and remove the trim panel. If servicing the left instrument panel air outlet, remove the instrument cluster bezel (Refer to 23 - BODY/INSTRUMENT PANEL/CLUSTER BEZEL - REMOVAL).

(2) Remove the instrument panel end cap from the end of the instrument panel being serviced (Refer to 23 - BODY/INSTRUMENT PANEL/INSTRUMENT PANEL END CAP - REMOVAL).

(3) Remove the two screws that secure the instrument panel air outlet to the instrument panel and remove the outlet (Fig. 4).

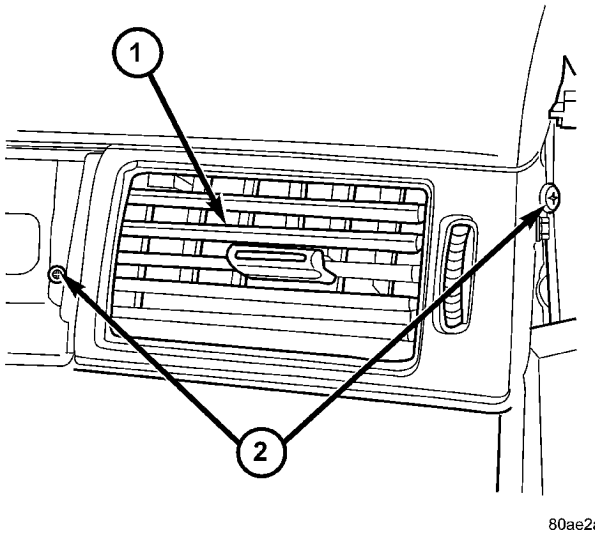

Fig. 4 Instrument Panel Outlet - Right Side Shown

1 - INSTRUMENT PANEL AIR OUTLET
2 - SCREW (2)

INSTALLATION

CENTER AIR OUTLETS

(1) Position the center air outlet onto the instrument panel.

(2) Engage the retaining tabs at the top of the center air outlet to the top of the opening in the instrument panel, then roll the center air outlet downward.

(3) Install the two screws that secure the bottom of the center air outlet to the instrument panel. Tighten the screws to 2 N·m (17 in. lbs.).

(4) Install the center bezel (Refer to 23 - BODY/INSTRUMENT PANEL/INSTRUMENT PANEL CENTER BEZEL - INSTALLATION).

(5) Reconnect the negative battery cable.

INSTRUMENT PANEL AIR OUTLETS

(1) Position the instrument panel air outlet into opening in the instrument panel.

(2) Install the two screws that secure the instrument panel air outlet to the instrument panel. Tighten the screws to 2 N·m (17 in. lbs.).

(3) Install the instrument panel end cap (Refer to 23 - BODY/INSTRUMENT PANEL/INSTRUMENT PANEL END CAP - INSTALLATION).

(4) If servicing the left instrument panel air outlet, install the instrument cluster bezel (Refer to 23 - BODY/INSTRUMENT PANEL/CLUSTER BEZEL - INSTALLATION). If servicing the right instrument panel air outlet, install the right trim panel firmly and evenly onto the instrument panel until the retaining tabs are fully engaged.

BLOWER MOTOR

DESCRIPTION

The blower motor is a 12-volt, direct current (DC) motor mounted within a plastic housing with a squirrel cage-type blower wheel that is secured to the blower motor shaft and an integral wire harness with a grommet and connector (Fig. 5). The blower motor and wheel is located in the air inlet housing at the passenger side end of the HVAC housing.

The blower motor can be accessed for service from underneath the instrument panel.

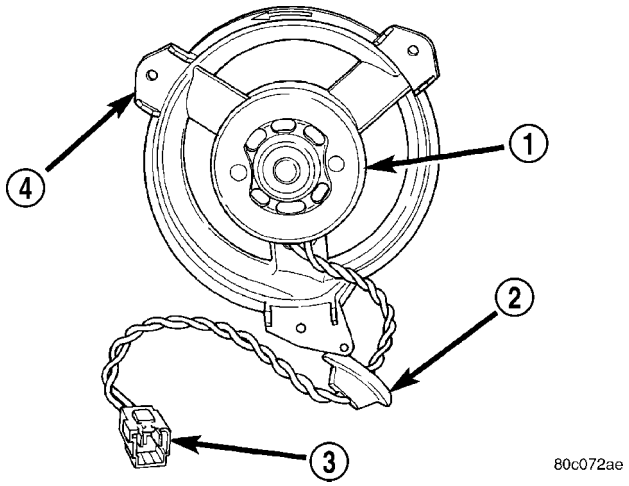

Fig. 5 Blower Motor

1 - BLOWER MOTOR
2 - RUBBER GROMMET
3 - BLOWER MOTOR CONNECTOR
4 - MOUNTING TABS

BLOWER MOTOR (Continued)

OPERATION

The front blower motor is used to control the velocity of air moving through the front HVAC housing by spinning the blower wheel within the housing at the selected or programed speed (depending on application).

On models equipped with the manual temperature control (MTC) heating-A/C system, the front blower motor will operate whenever the ignition switch is in the On position and the blower control switch is in any position except Off. On models equipped with the automatic temperature control (ATC) heating-A/C system, the front blower motor will operate whenever the ignition switch is in the On position and the A/C-heater control power is turned on.

The front blower motor relay output circuit is protected by a fuse in the integrated power module (IPM) located in the engine compartment. In the MTC system, the front blower motor speed is controlled by regulating the path to ground through the blower control switch and the blower motor resistor. In the ATC system, the front blower motor speed is controlled by an electronic blower motor power module, which uses a pulse width modulated input from the A/C-heater control and a feedback signal from the blower motor to regulate the blower motor ground path. On both systems, the front blower motor receives battery current whenever the front blower motor relay is energized.

The front blower motor and blower motor wheel are factory balanced and cannot be adjusted or repaired. If faulty or damaged, the front blower motor and blower wheel must be replaced as an assembly.

DIAGNOSIS AND TESTING

BLOWER MOTOR

WARNING: On vehicles equipped with airbags, disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

For circuit descriptions and diagrams, refer to Air Conditioning/Heater in Group 8W - Wiring Diagrams. Possible causes of an inoperative front or rear blower motor include:

- Faulty fuse (the fuse is located in the integrated power module (IPM) in the engine compartment)
- Faulty blower motor circuit wiring or wire harness connectors
- Faulty blower motor resistor or power module (depending on application)
- Faulty blower motor relay
- Faulty blower motor switch
- Faulty blower motor.

VIBRATION

Possible causes of front or rear blower motor vibration include:

- Improper blower motor mounting
- Improper blower wheel mounting
- Blower wheel out of balance or deformed
- Foreign material in blower wheel causing out of balance condition
- Blower motor faulty.

NOISE

To determine if the front or rear blower motor is the source of the noise, simply switch the front or rear blower motor from Off to On. To verify that the blower motor is the source of the noise, unplug the blower motor wire harness connector and operate the heating-A/C system. If the noise goes away, possible causes include:

- Foreign material in the HVAC housing
- Improper blower motor mounting
- Improper blower wheel mounting
- Blower motor faulty.

REMOVAL

WARNING: On vehicles equipped with airbags, disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in an accidental airbag deployment and possible personal injury or death or death.

NOTE: The blower motor is located on the passenger side of the vehicle under the instrument panel. The blower motor can be removed from the vehicle without having to remove the HVAC housing.

(1) Disconnect and isolate the negative battery cable.

(2) Remove the passenger side cowl trim panel (Refer to 23 - BODY/INTERIOR/COWL TRIM - REMOVAL).

BLOWER MOTOR (Continued)

(3) Pull back the carpet to access the front upper screw that secures the air inlet housing.

(4) Remove the recirculation door actuator (Refer to 24 - HEATING & AIR CONDITIONING/CONTROLS - FRONT/RECIRCULATION DOOR ACTUATOR - REMOVAL).

(5) Remove the recirculation door actuator wire lead from the routing clip located on the lower air inlet housing and position the wire lead aside.

(6) Disconnect the blower motor wire lead connector from the blower motor resistor or power module, depending on application.

(7) Remove the one screw (from the top) that secures the lower air inlet housing to the upper air inlet housing (Fig. 6).

(8) Remove the four screws (from the bottom) that secure the lower air inlet housing to the upper air inlet housing and remove the lower HVAC housing.

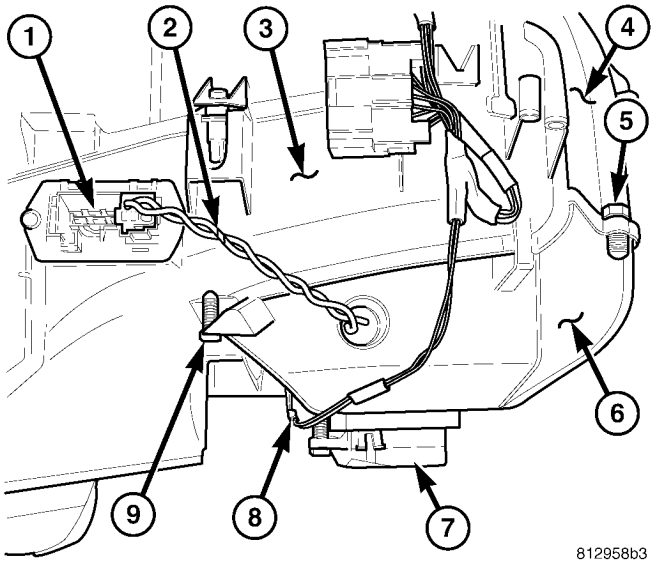

Fig. 6 Lower Air Inlet Housing

1 - BLOWER MOTOR RESISTOR/POWER MODULE
2 - BLOWER MOTOR WIRE LEAD
3 - LOWER HVAC HOUSING
4 - UPPER AIR INLET HOUSING
5 - UPPER SCREW (1)
6 - LOWER AIR INLET HOUSING
7 - RECIRCULATION DOOR ACTUATOR
8 - ACTUATOR WIRE LEAD
9 - LOWER SCREW (4)

(9) Push the rubber blower motor wire lead grommet through the opening in the lower air inlet housing (Fig. 7).

(10) Feed the blower motor wire lead through the opening in the lower air inlet housing and remove the lower air inlet housing from the vehicle.

(11) Position the recirculation-air door as necessary to access and remove the three screws that secure the blower motor to the lower half of the HVAC housing.

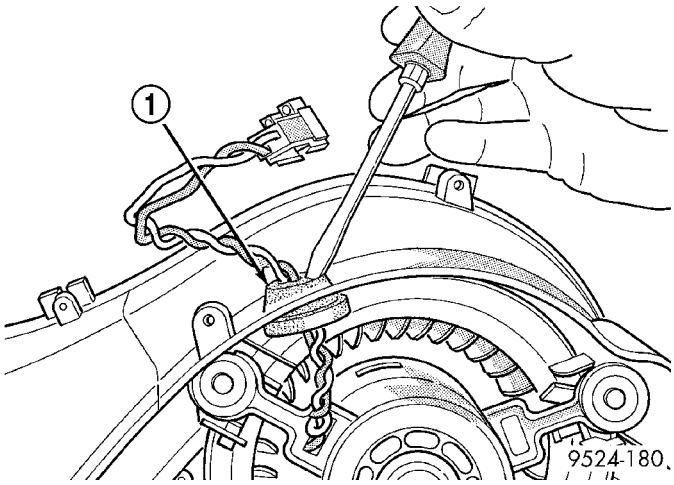

Fig. 7 Blower Motor Wire Lead Grommet

1 - BLOWER MOTOR WIRE LEAD GROMMET

(12) Gently flex the recirculation air door far down enough to remove the blower motor and wheel from the HVAC housing.

(13) Remove the blower motor and wheel from the HVAC housing. Note the position of the blower motor mounting tabs (Fig. 8).

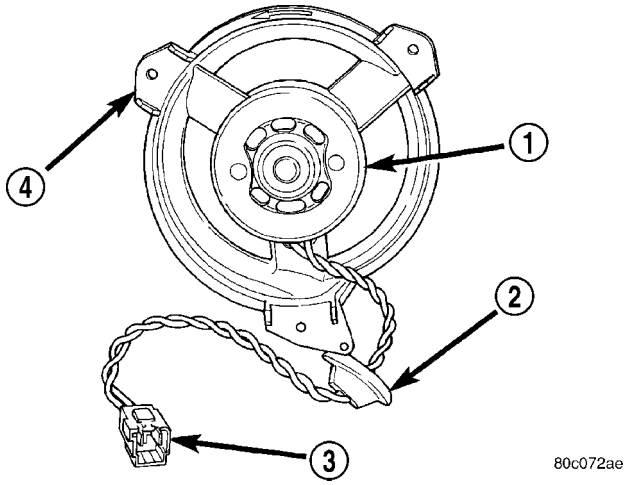

Fig. 8 Blower Motor Mounting Tabs

1 - BLOWER MOTOR
2 - RUBBER GROMMET
3 - BLOWER MOTOR CONNECTOR
4 - MOUNTING TABS

INSTALLATION

(1) Position the blower motor and wheel to the lower half of the HVAC housing. Align the blower motor mounting tabs to the correct location on the HVAC housing.

(2) Gently flex the recirculation-air door far down enough to install the blower motor and wheel into the HVAC housing.

(3) Position the recirculation-air door as necessary to install the three screws that secure the blower

BLOWER MOTOR (Continued)

motor to the HVAC housing. Tighten the screws to 2 N·m (17 in. lbs.).

(4) Feed the blower motor wire lead through the opening in the lower air inlet housing and seat the rubber grommet into the lower air inlet housing.

(5) Position the recirculation-air door pivot into the lower air inlet housing.

(6) Install the four screws (from the bottom) that secure the lower air inlet housing to the upper air inlet housing and the lower HVAC housing. Tighten the screws to 2 N·m (17 in. lbs.).

(7) Install the one screw (from the top) that secures the lower air inlet housing to the upper air inlet housing. Tighten the screws to 2 N·m (17 in. lbs.).

(8) Connect the blower motor wire lead connector to the blower motor resistor or power module, depending on application.

(9) Install the recirculation door actuator wire lead into the routing clip located on the lower air inlet housing.

(10) Install the recirculation door actuator (Refer to 24 - HEATING & AIR CONDITIONING/CONTROLS - FRONT/RECIRCULATION DOOR ACTUATOR - INSTALLATION).

(11) Reinstall the carpet.

(12) Install the passenger side cowl trim panel (Refer to 23 - BODY/INTERIOR/COWL TRIM - INSTALLATION).

(13) Reconnect the negative battery cable.

(14) Perform the heater-A/C control calibration procedure (Refer to 24 - HEATING & AIR CONDITIONING/CONTROLS - FRONT/A/C-HEATER CONTROL - STANDARD PROCEDURE - HEATER-A/C CONTROL CALIBRATION).

FLOOR DISTRIBUTION DUCT

REMOVAL

(1) Remove the center console assembly to access the front floor distribution duct (Refer to 23 - BODY/INTERIOR/CENTER CONSOLE - REMOVAL).

(2) Remove the screws that secure the floor distribution duct to the bottom of the HVAC housing.

(3) Pull the floor distribution duct rearward far enough to disengage the floor distribution duct from the outlet on the bottom of the HVAC housing.

(4) Remove the floor distribution duct from the vehicle (Fig. 9).

INSTALLATION

(1) Position the floor distribution duct under the instrument panel center stack and engage the center floor distribution duct with the outlet on the bottom of the HVAC housing.

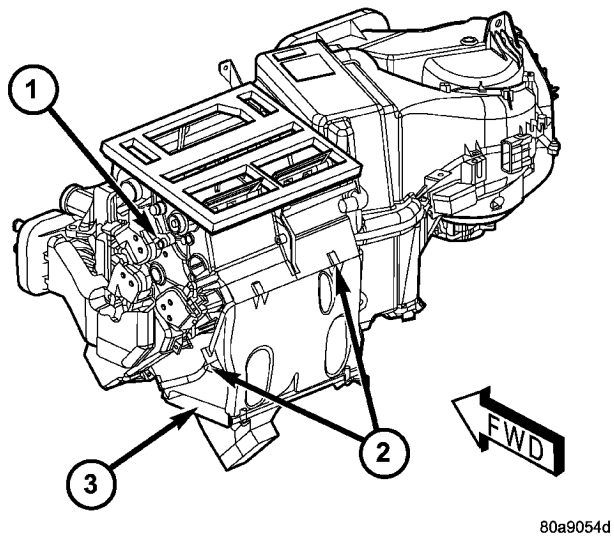

Fig. 9 Floor Distribution Duct Assembly

1 - HVAC HOUSING
2 - SCREWS
3 - FLOOR DISTRIBUTION DUCT

(2) Install the floor distribution duct screws. Tighten screws to 2 N·m (17 in. lbs.).

(3) Reinstall the center console (Refer to 23 - BODY/INTERIOR/CENTER CONSOLE - INSTALLATION).

HVAC HOUSING

DESCRIPTION

All models are equipped with a common HVAC housing assembly that combines A/C and heating capabilities into a single unit mounted within the passenger compartment (Fig. 10). The HVAC housing assembly consists of three separate housings:

- **HVAC housing** — The HVAC housing is mounted to the dash panel behind the instrument panel and contains the A/C evaporator and the blower motor resistor or power model (depending on application) and the particulate air filter (if equipped). The HVAC housing consists of a upper and a lower housing that are attached together and has mounting provisions for the air inlet housing, blower motor, air distribution housing and the HVAC wire harness.
- **Air inlet housing** — The air inlet housing is mounted to the right end of the HVAC housing and contains the recirculation-air door and actuator.
- **Air distribution housing** — The air distribution housing is mounted to the rear of the HVAC housing and contains the heater core, blend-air doors and actuators, mode-air doors and actuator and door linkage.

HVAC HOUSING (Continued)

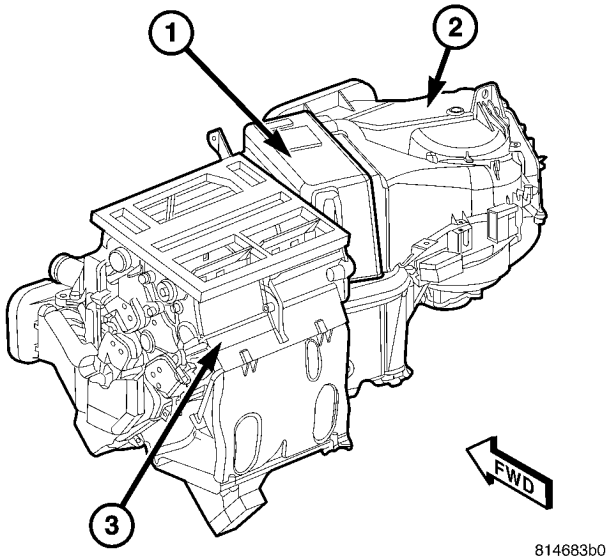

Fig. 10 HVAC Housing Assembly

1 - HVAC HOUSING
2 - AIR INLET HOUSING
3 - AIR DISTRIBUTION HOUSING

The heating-A/C system is a blend-air type system. The blend-air doors control the amount of conditioned air that is allowed to flow through, or around, the heater core. The dual zone heating A/C system uses two blend door actuators.

The A/C system is designed for the use of a non-CFC, R-134a refrigerant and uses an A/C evaporator to cool and dehumidify the incoming air prior to blending it with the heated air. A temperature control determines the discharge air temperature by operating the blend door actuators, which moves the blend-air doors. This allows an almost immediate control of the output air temperature of the system. The mode door actuator operates the mode-air doors which direct the flow of the conditioned air out the various air outlets, depending on the mode selected. The recirculation door actuator operates the recirculation-air door which closes off the fresh air intake and recirculates the air already inside the vehicle. The electric door actuators are connected to the vehicle electrical system by the HVAC wire harness. The blower motor controls the velocity of air flowing through the HVAC housing assembly by spinning the blower wheel within the HVAC housing at the selected speed by use of the blower motor resistor or power model, depending on application.

The air distribution housing must be removed from the HVAC housing and disassembled for service of the mode-air and blend-air doors. The air inlet housing must be removed from HVAC housing and disassembled for service of the recirculation-air door. The HVAC housing must be removed from the vehicle and disassembled for service of the A/C evaporator.

REMOVAL

AIR DISTRIBUTION HOUSING

WARNING: On vehicles equipped with airbags, disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation (Refer to 24 - HEATING & AIR CONDITIONING/PLUMBING - WARNINGS) and (Refer to 24 - HEATING & AIR CONDITIONING/PLUMBING - CAUTIONS). Failure to follow the warnings and cautions could result in possible personal injury or death.

NOTE: The air distribution housing must be removed from the HVAC housing and disassembled for service of the mode-air and blend-air doors.

(1) Remove the HVAC housing from the vehicle and place it on a workbench (Refer to 24 - HEATING & AIR CONDITIONING/DISTRIBUTION - FRONT/HVAC HOUSING - REMOVAL).

(2) Disconnect the HVAC wire harness connectors from the mode door actuator and the two blend door actuators located on the driver side of the air distribution housing and position the HVAC wire harness out of the way (Fig. 11).

(3) Remove the foam seal from the heater core tubes and the flange located at the front of the HVAC housing (Fig. 12). If the seal is deformed or damaged, it must be replaced.

(4) Remove the plastic retaining strap that secures the heater core tubes to the front of the HVAC housing.

NOTE: Take the proper precautions to protect against spilled engine coolant. Have absorbent toweling readily available to clean up any spills.

(5) Remove the bolt that secures the heater core tube sealing plate to the heater core.

(6) Disconnect the heater core tubes from the heater core and remove and discard the O-ring seals.

HVAC HOUSING (Continued)

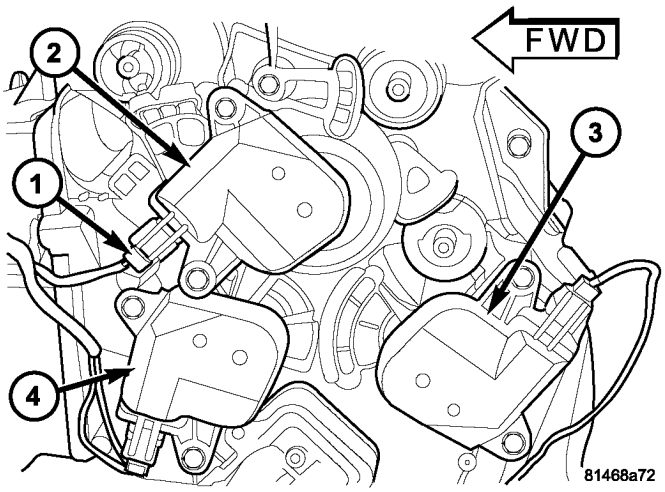

Fig. 11 Actuator - Wire Harness Connections

1 - ACTUATOR WIRE HARNESS CONNECTOR (3)
2 - MODE DOOR ACTUATOR
3 - DRIVER BLEND DOOR ACTUATOR
4 - PASSENGER BLEND DOOR ACTUATOR

(7) Install plugs in, or tape over the opened heater core ports.

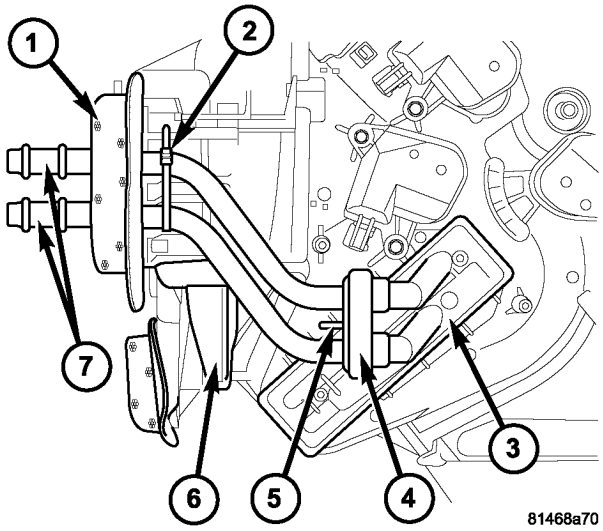

Fig. 12 Heater Core Tubes

1 - FOAM SEAL
2 - RETAINING STRAP
3 - HEATER CORE
4 - SEALING PLATE
5 - SCREW
6 - HVAC HOUSING
7 - HEATER CORE TUBES

(8) Remove the four screws that secure the air distribution housing to the rear of the HVAC housing (Fig. 13).

(9) Tilt the top of the air distribution housing rearward to disconnect the distribution housing from the two tab-and-slot type retainers located at the bottom of the housing and remove the distribution housing.

(10) If required, disassemble the air distribution housing (Refer to 24 - HEATING & AIR CONDITIONING/DISTRIBUTION - FRONT/HVAC HOUSING - AIR DISTRIBUTION HOUSING - DISASSEMBLY).

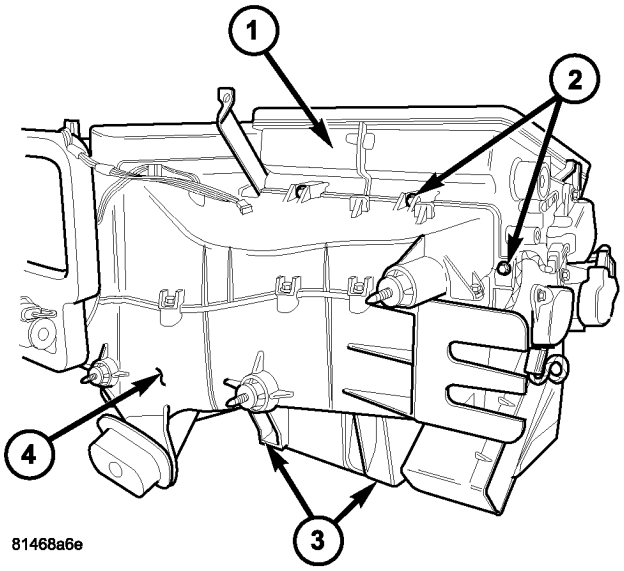

Fig. 13 Retainers - Air Distribution Housing

1 - AIR DISTRIBUTION HOUSING
2 - SCREWS (4)
3 - TAB-AND-SLOT RETAINERS (2)
4 - HVAC HOUSING

AIR INLET HOUSING

WARNING: On vehicles equipped with airbags, disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation (Refer to 24 - HEATING & AIR CONDITIONING/PLUMBING - WARNINGS) and (Refer to 24 - HEATING & AIR CONDITIONING/PLUMBING - CAUTIONS). Failure to follow the warnings and cautions could result in possible personal injury or death.

HVAC HOUSING (Continued)

NOTE: The air inlet housing must be removed from HVAC housing for service of the recirculation-air door.

(1) Remove the HVAC housing assembly (Refer to 24 - HEATING & AIR CONDITIONING/DISTRIBUTION - FRONT/HVAC HOUSING - REMOVAL).

(2) Remove the recirculation door actuator (Fig. 14) (Refer to 24 - HEATING & AIR CONDITIONING/CONTROLS - FRONT/RECIRCULATION DOOR ACTUATOR - REMOVAL).

(3) Remove the recirculation door actuator wire lead from the routing clip located on the lower air inlet housing and position the wire lead aside.

(4) Disconnect the blower motor wire lead connector from the blower motor resistor or power module, depending on application.

(5) Remove the one screw (from the top) that secures the lower air inlet housing to the upper air inlet housing.

(6) Remove the four screws (from the bottom) that secure the lower air inlet housing to the upper air inlet housing and remove the lower HVAC housing.

(7) Push the rubber blower motor wire lead grommet through the opening in the lower air inlet housing (Fig. 15).

(8) Feed the blower motor wire lead through the opening in the lower air inlet housing and remove the lower air inlet housing from the vehicle.

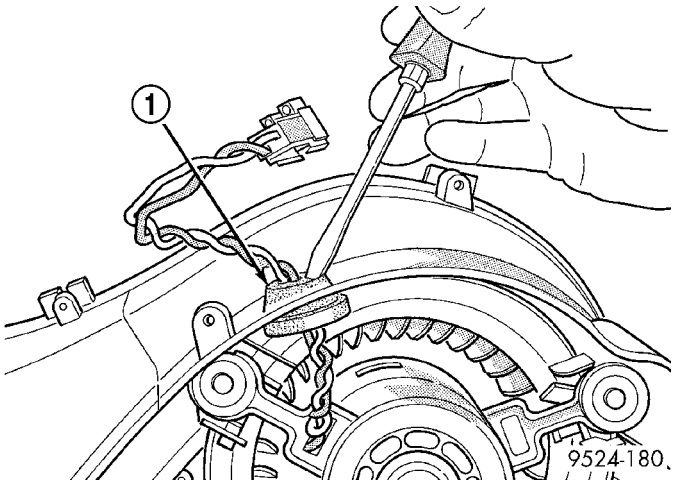

Fig. 15 Blower Motor Wire Lead Grommet

1 - BLOWER MOTOR WIRE LEAD GROMMET

(9) Carefully cut the foam seal along the parting line of the upper air inlet housing (Fig. 16). If the seal is deformed or damaged, it must be replaced.

(10) Remove the three screws that secure the upper air inlet housing to HVAC housing.

(11) Remove the upper air inlet housing and recirculation-air door from the HVAC housing.

(12) If required, remove the screw that secures the recirculation-air door to the upper air inlet housing and remove the air door.

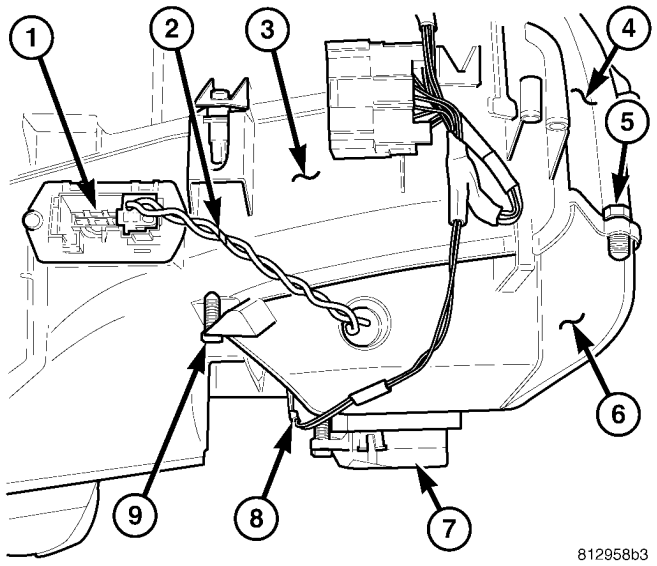

Fig. 14 Lower Air Inlet Housing

1 - BLOWER MOTOR RESISTOR/POWER MODULE
2 - BLOWER MOTOR WIRE LEAD
3 - LOWER HVAC HOUSING
4 - UPPER AIR INLET HOUSING
5 - UPPER SCREW (1)
6 - LOWER AIR INLET HOUSING
7 - RECIRCULATION DOOR ACTUATOR
8 - ACTUATOR WIRE LEAD
9 - LOWER SCREW (4)

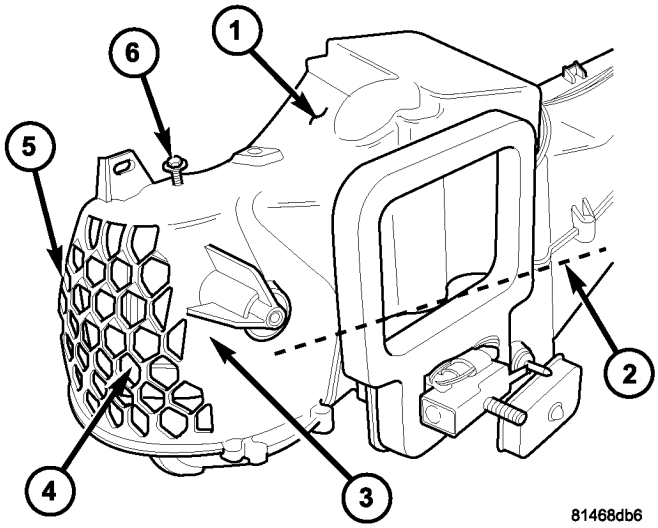

Fig. 16 Upper Air Inlet Housing

1 - HVAC HOUSING
2 - PARTING LINE
3 - UPPER AIR INLET HOUSING
4 - RECIRCULATION-AIR DOOR
5 - SCREW (3)
6 - SCREW

HVAC HOUSING (Continued)

HVAC HOUSING

WARNING: On vehicles equipped with airbags, disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation (Refer to 24 - HEATING & AIR CONDITIONING/PLUMBING - WARNINGS) and (Refer to 24 - HEATING & AIR CONDITIONING/PLUMBING - CAUTIONS). Failure to follow the warnings and cautions could result in possible personal injury or death.

NOTE: The HVAC housing must be removed from the vehicle and disassembled for service of the air inlet housing, air distribution housing and the A/C evaporator.

NOTE: Take the proper precautions to protect the front face of the instrument panel from cosmetic damage while performing this procedure.

(1) Recover the refrigerant from the refrigerant system (Refer to 24 - HEATING & AIR CONDITIONING/PLUMBING - STANDARD PROCEDURE - REFRIGERANT SYSTEM RECOVERY).

(2) Drain the engine cooling system (Refer to 7 - COOLING - STANDARD PROCEDURE - COOLING SYSTEM DRAIN).

(3) Disconnect and isolate the negative battery cable.

(4) Disconnect the liquid and suction lines from the A/C expansion valve (Refer to 24 - HEATING & AIR CONDITIONING/PLUMBING/LIQUID LINE - REMOVAL).

(5) Disconnect the heater hoses from the heater core (Refer to 24 - HEATING & AIR CONDITIONING/PLUMBING/HEATER INLET HOSE - REMOVAL) and (Refer to 24 - HEATING & AIR CONDITIONING/PLUMBING/HEATER RETURN HOSE - REMOVAL).

(6) Remove the three nuts that secure the HVAC housing to the engine compartment side of the dash panel (Fig. 17).

(7) Remove the instrument panel from the passenger compartment (Refer to 23 - BODY/INSTRUMENT PANEL/INSTRUMENT PANEL ASSEMBLY - REMOVAL).

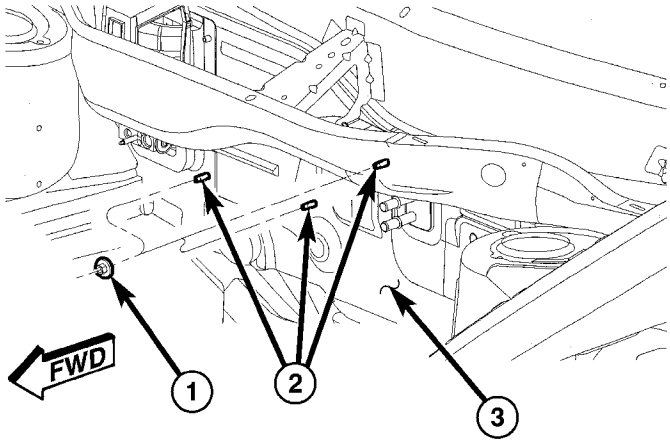

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Fig. 17 HVAC Housing-Engine Compartment

1 - NUT (3)
2 - HVAC HOUSING MOUNTING STUDS
3 - DASH PANEL

(8) Remove the nut and bolt that secure the HVAC housing to the passenger compartment side of the dash panel (Fig. 18).

(9) Pull the HVAC housing rearward to clear the dash panel and remove the HVAC housing from the passenger compartment.

(10) If required, disassemble the HVAC housing (Refer to 24 - HEATING & AIR CONDITIONING/DISTRIBUTION -FRONT/HVAC HOUSING - DISASSEMBLY).

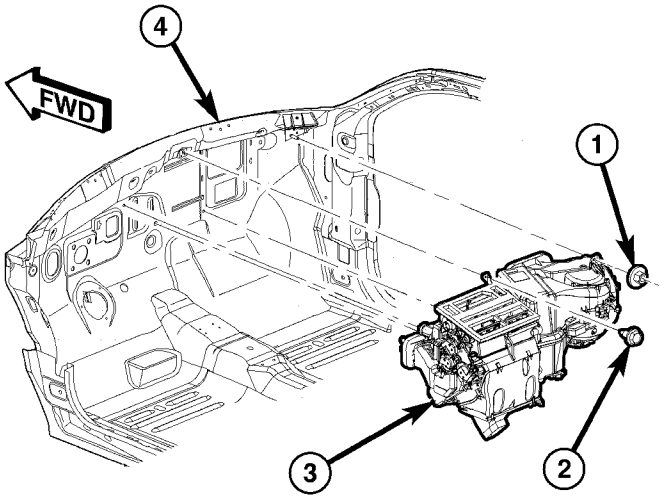

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Fig. 18 HVAC Housing-Passenger Compartment

1 - NUT
2 - BOLT
3 - HVAC HOUSING ASSEMBLY
4 - DASH PANEL

HVAC HOUSING (Continued)

DISASSEMBLY

AIR DISTRIBUTION HOUSING

NOTE: The air distribution housing must be removed from the HVAC housing and disassembled for service of the mode-air and blend-air doors.

(1) Remove the air distribution housing from the HVAC housing and place it on a workbench (Refer to 24 - HEATING & AIR CONDITIONING/DISTRIBUTION - FRONT/HVAC HOUSING - AIR DISTRIBUTION HOUSING - REMOVAL).

(2) Remove the two screws that secure the heater core to the driver side of the air distribution housing and carefully remove the heater core (Fig. 19).

(3) Remove the screws that secure the mode door actuator and the two blend door actuators to the driver side of the air distribution housing and remove the actuators.

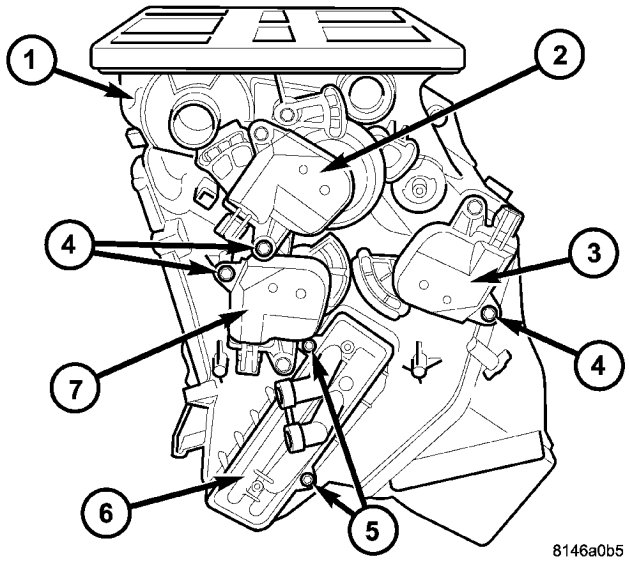

Fig. 19 Actuators and Heater Core

1 - AIR DISTRIBUTION HOUSING
2 - MODE DOOR ACTUATOR
3 - BLEND DOOR ACTUATOR (DRIVER)
4 - SCREW (2)
5 - SCREWS
6 - HEATER CORE
7 - BLEND DOOR ACTUATOR (PASSENGER)

(4) Remove the defrost door linkage arm, instrument panel door linkage arm, mode door cam, floor door gear, driver side blend door gear and the passenger side blend door stop from the driver side of the air distribution housing (Fig. 20).

(5) Remove the six screws that secure the floor distribution ducts to the air distribution housing and remove the ducts (Fig. 21).

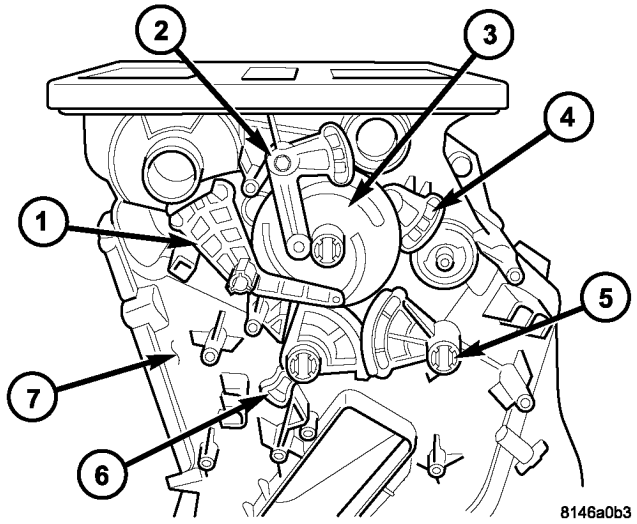

Fig. 20 Air Door Linkage

1 - DEFROST DOOR LINKAGE ARM
2 - INSTRUMENT PANEL DOOR LINKAGE ARM
3 - MODE DOOR CAM
4 - FLOOR DOOR GEAR
5 - DRIVER SIDE BLEND DOOR GEAR
6 - PASSENGER SIDE BLEND DOOR STOP
7 - AIR DISTRIBUTION HOUSING

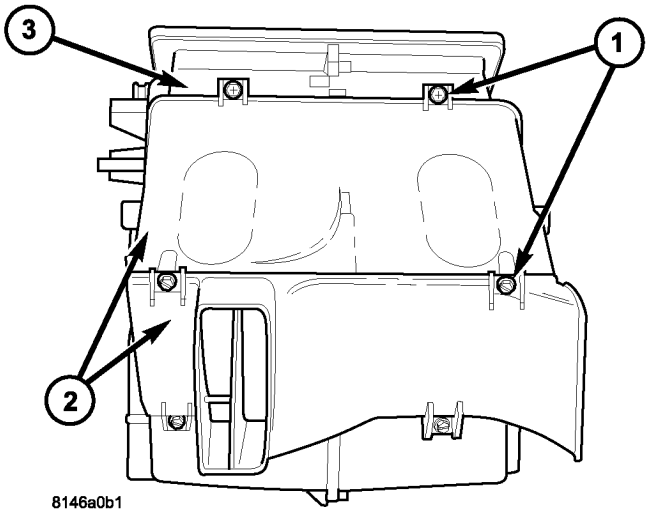

Fig. 21 Front Floor Distribution Duct

1 - SCREWS (6)
2 - FLOOR DISTRIBUTION DUCTS
3 - HVAC HOUSING

HVAC HOUSING (Continued)

(6) Remove the screw from the center of the driver side of the air distribution housing (Fig. 22).

(7) Carefully cut the foam seal along the parting line of the two halves of the air distribution housing. If the seal is deformed or damaged, it must be replaced.

(8) Remove the seven screws that secure the two halves of the air distribution housing together and carefully separate the housing.

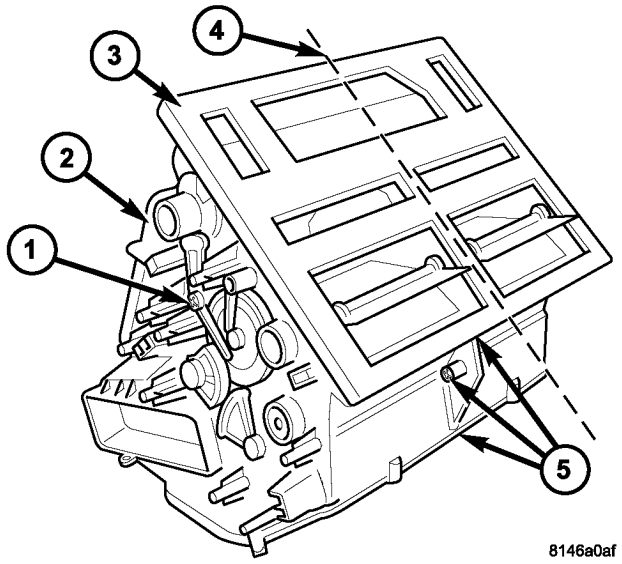

Fig. 22 Air Distribution Housing Screws

1 - SCREW
2 - AIR DISTRIBUTION HOUSING
3 - FOAM SEAL
4 - PARTING LINE
5 - SCREWS (7)

(9) Push down on the retaining tab of the blend door gear and carefully pull the gear out of the blend door pivot shaft (Fig. 23).

NOTE: If the seal on the air door is deformed or damaged, the air door must be replaced.

(10) Remove the blend-air door from the driver side of the air distribution housing.

(11) Remove the screw that secures the driver side air vane to the passenger side of the air distribution housing and remove the vane (Fig. 24).

NOTE: If the seal on any air door is deformed or damaged, the air door must be replaced.

(12) Remove the air doors and the partition from the air distribution housing.

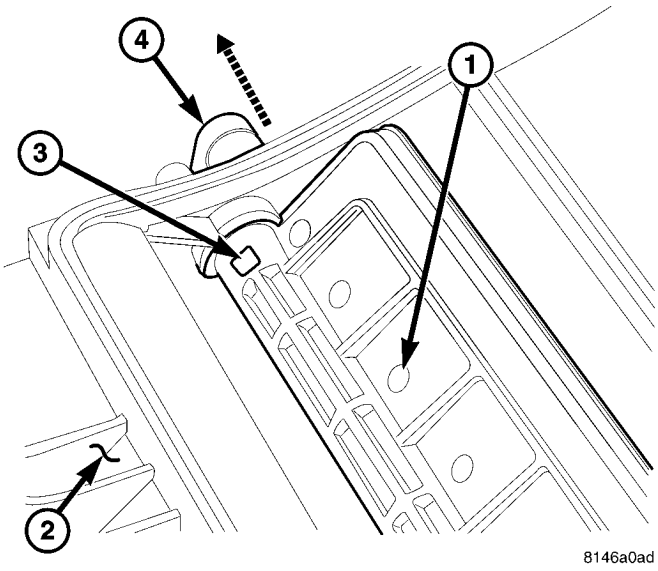

Fig. 23 Dual Zone Driver Side Blend-Air Door

1 - BLEND-AIR DOOR (DRIVER SIDE)
2 - AIR DISTRIBUTION HOUSING
3 - GEAR RETAINING TAB
4 - BLEND DOOR GEAR

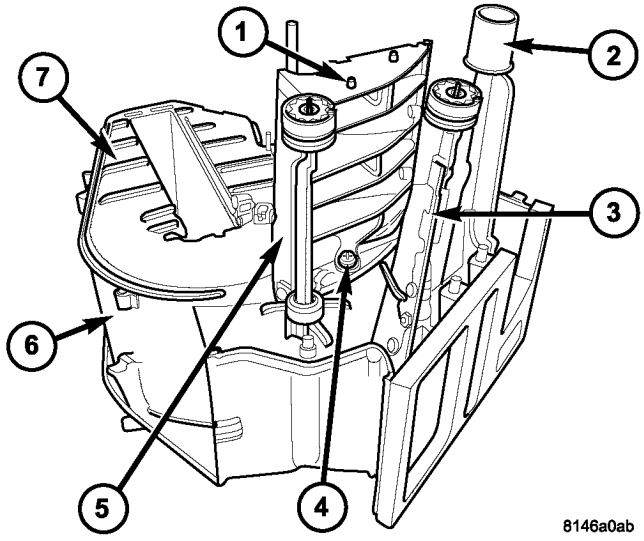

Fig. 24 Air Doors and Partition - Driver Side

1 - AIR VANE (DRIVER SIDE)
2 - DEFROST-AIR DOORS
3 - PANEL-AIR DOOR (DRIVER SIDE)
4 - SCREW
5 - FLOOR-AIR DOOR (DRIVER SIDE)
6 - AIR DISTRIBUTION HOUSING (PASSENGER SIDE)
7 - PARTITION

HVAC HOUSING (Continued)

(13) Remove the screw that secures the passenger side air vane to the passenger side of the air distribution housing and remove the vane (Fig. 25).

NOTE: If the seal on any air door is deformed or damaged, the air door must be replaced.

(14) Remove the air doors from the passenger side of the air distribution housing.

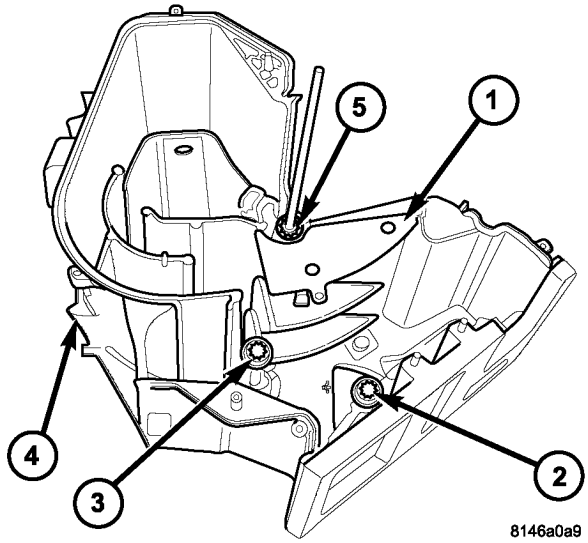

Fig. 25 Air Doors and Vane - Passenger Side

1 - AIR VANE (PASSENGER SIDE)
2 - PANEL-AIR DOOR (PASSENGER SIDE)
3 - FLOOR-AIR DOOR (PASSENGER SIDE)
4 - AIR DISTRIBUTION HOUSING (PASSENGER SIDE)
5 - BLEND-AIR DOOR (PASSENGER SIDE)

HVAC HOUSING

NOTE: The HVAC housing must be removed from the vehicle and disassembled for service of the A/C evaporator.

(1) Remove the HVAC housing from the vehicle and place it on a workbench (Refer to 24 - HEATING & AIR CONDITIONING/DISTRIBUTION - FRONT/ HVAC HOUSING - REMOVAL).

(2) Remove the air distribution housing from the HVAC housing (Fig. 26) (Refer to 24 - HEATING & AIR CONDITIONING/DISTRIBUTION - FRONT/ HVAC HOUSING - AIR DISTRIBUTION HOUSING - REMOVAL).

(3) Remove the air inlet housing from the HVAC housing (Refer to 24 - HEATING & AIR CONDITIONING/DISTRIBUTION - FRONT/HVAC HOUSING - AIR INLET HOUSING - REMOVAL).

(4) Remove the A/C expansion valve from the A/C evaporator (Refer to 24 - HEATING & AIR CONDITIONING/PLUMBING/A/C EXPANSION VALVE - REMOVAL).

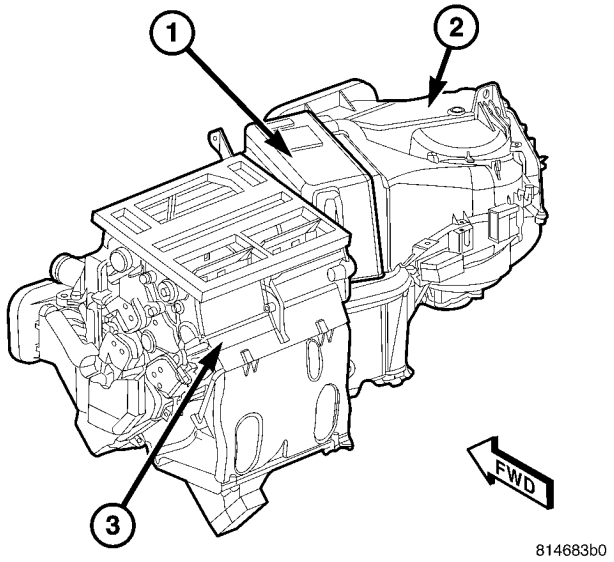

Fig. 26 HVAC Housing Assembly

1 - HVAC HOUSING
2 - AIR INLET HOUSING
3 - AIR DISTRIBUTION HOUSING

(5) Disconnect the HVAC wiring harness from the blower motor resistor or power module (depending on application) (Fig. 27).

(6) Disengage the HVAC wire harness from the routing clips on the HVAC housing and remove the wire harness from the housing.

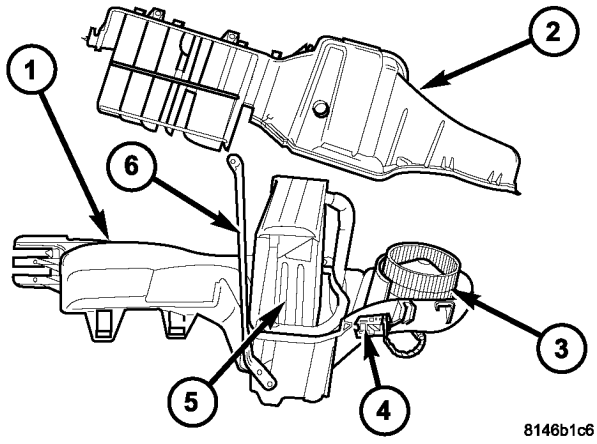

Fig. 27 HVAC Housing

1 - LOWER HVAC HOUSING
2 - UPPER HVAC HOUSING
3 - BLOWER MOTOR
4 - BLOWER MOTOR RESISTOR/POWER MODULE
5 - A/C EVAPORATOR
6 - SUPPORT BRACKET

HVAC HOUSING (Continued)

(7) If required, remove three screws that secure the blower motor to the HVAC housing and remove the blower motor.

(8) If required, remove two screws that secure the blower motor resistor or power module (depending on application) to the HVAC housing and remove the resistor or module.

(9) If required, remove two screws that secure the support bracket to the HVAC housing and remove the bracket.

(10) Remove the thirteen screws that secure the upper HVAC housing half to the lower half of the HVAC housing.

(11) Separate the two halves of the HVAC housing.

(12) Carefully lift the A/C evaporator and insulator out of the lower half of the HVAC housing.

ASSEMBLY

AIR DISTRIBUTION HOUSING

NOTE: The air distribution housing must be removed from the HVAC housing and disassembled for service of the mode-air and blend-air doors.

(1) Install the air doors into the passenger side of the air distribution housing as required. Align the air doors with the pivot shaft holes in the housing.

(2) Install the air vane and retaining screw to the passenger side of the air distribution housing. Tighten the screw to 2 N·m (17 in. lbs.).

(3) Align the air door pivot shafts with the pivot holes in the center partition and install the partition onto the passenger side of the air distribution housing.

(4) Install the driver side air vane and retaining screw to the center partition. Tighten the screw to 2 N·m (17 in. lbs.).

(5) Install the blend-air door to the driver side of the air distribution housing. Align the air door with the pivot shaft hole in the housing.

(6) Align and install the blend door gear into the pivot shaft of the driver side blend-air door. Make sure that the retaining tab on the door gear is securely engaged to the pivot shaft.

(7) Align the air door pivot shafts to each other and carefully install the driver side half of the air distribution housing to the passenger side half of the housing.

(8) Install the seven screws that secure the two halves of the air distribution housing together. Tighten the screws to 2 N·m (17 in. lbs.).

(9) Inspect the foam seal, especially at the parting line. If the seal is deformed or damaged, it must be replaced.

(10) Install the screw to the center of the driver side air distribution housing. Tighten the screw to 2 N·m (17 in. lbs.).

(11) Position the floor distribution ducts onto the air distribution housing.

(12) Install the six screws that secure the floor distribution ducts to the air distribution housing. Tighten the screws to 2 N·m (17 in. lbs.).

NOTE: Align the guide pin on the linkage arms with the guides on the mode door cam during installation of the floor door gear and linkage arms.

(13) Install the passenger side blend door stop, driver side blend door gear, floor door gear, mode door cam, instrument panel door linkage arm and the defrost door linkage arm onto the driver side of the air distribution housing.

(14) Position the mode door and blend door actuators onto the driver side of the air distribution housing. If necessary, rotate the actuators slightly to align the splines on the actuator output shaft with those in the air door linkage.

(15) Install the two screws that secure each actuator to the air distribution housing. Tighten the screws to 2 N·m (17 in. lbs.).

(16) Carefully install the heater core into the driver side of the air distribution housing.

(17) Install the two screws that secure the heater core to the air distribution housing. Tighten the screw to 2 N·m (17 in. lbs.).

(18) Install the air distribution housing onto the HVAC housing (Refer to 24 - HEATING & AIR CONDITIONING/DISTRIBUTION - FRONT/HVAC HOUSING - AIR DISTRIBUTION HOUSING - INSTALLATION).

HVAC HOUSING

(1) Install the A/C evaporator into the lower half of the HVAC housing. Make sure that the evaporator drain within the HVAC housing is clean and unrestricted and that the insulator around the A/C evaporator is properly installed.

(2) Install the upper half of the HVAC housing onto the lower half of the HVAC housing.

(3) Install the thirteen screws that secure the two halves of the HVAC housing together. Tighten the screws to 2 N·m (17 in lbs.).

(4) If removed, install the support bracket and the two retaining screws. Tighten the screws to 2 N·m (17 in lbs.).

(5) If removed, install the blower motor resistor or power module (depending on application) and the two retaining screws. Tighten the screws to 2 N·m (17 in lbs.).

HVAC HOUSING (Continued)

(6) If removed, install the blower motor and the three retaining screws. Tighten the screws to 2 N·m (17 in lbs.).

(7) Install the HVAC wiring harness (1). Make sure the harness is routed through all wiring retainers.

(8) Engage the HVAC wire harness into the routing clips on the HVAC housing.

(9) Connect the HVAC wire harness connector to the blower motor resistor or power module (depending on application).

(10) Install the A/C expansion valve (Refer to 24 - HEATING & AIR CONDITIONING/PLUMBING/A/C EXPANSION VALVE - INSTALLATION).

(11) Install the air inlet housing onto the HVAC housing (Refer to 24 - HEATING & AIR CONDITIONING/DISTRIBUTION - FRONT/HVAC HOUSING - AIR INLET HOUSING - INSTALLATION).

(12) Install the air distribution housing onto the HVAC housing (Refer to 24 - HEATING & AIR CONDITIONING/DISTRIBUTION - FRONT/HVAC HOUSING - AIR DISTRIBUTION HOUSING - INSTALLATION).

(13) Install the HVAC housing into the vehicle (Refer to 24 - HEATING & AIR CONDITIONING/DISTRIBUTION - FRONT/HVAC HOUSING - INSTALLATION).

INSTALLATION

AIR DISTRIBUTION HOUSING

NOTE: The air distribution housing must be removed from the HVAC housing and disassembled for service of the mode-air and blend-air doors.

(1) Install the air distribution housing onto the rear of the HVAC housing by inserting the two tabs on the bottom of the distribution housing into the slots located on the bottom of the HVAC housing and tipping the distribution housing forward until it is properly aligned with the HVAC housing.

(2) Install the four screws that secure the air distribution housing to the HVAC housing. Tighten the screws to 2 N·m (17 in. lbs.).

(3) Remove the tape or plugs from the heater core ports.

(4) Lubricate new rubber O-ring seals with clean engine coolant and install them onto the heater core tube fittings. Use only the specified O-ring as they are made of a special material for the engine cooling system.

(5) Position both heater core tubes and the sealing plate simultaneously onto the heater core.

NOTE: The heater core tubes each have a slot that must be indexed to a location tab within each of the heater core ports. Adjust the position of the tubes as required so that the sealing plate fits flush against the heater core supply and return ports, which indicates that the tubes are properly indexed.

(6) Index both heater core tubes to the heater core ports.

(7) Install the bolt that secures the heater core tube sealing plate to the heater core. Tighten the bolt to 3 N·m (27 in. lbs.).

(8) Install the plastic retaining clamp that secures the heater core tubes to the front of the HVAC housing.

(9) Install the foam seal onto the heater core tubes and the flange located at the front of the HVAC housing.

(10) Position the HVAC wire harness onto the air distribution housing.

(11) Connect the HVAC wire harness connectors to the mode door actuator and the two blend door actuators located on the driver side of the air distribution housing.

(12) Install the HVAC housing assembly (Refer to 24 - HEATING & AIR CONDITIONING/DISTRIBUTION - FRONT/HVAC HOUSING - INSTALLATION).

AIR INLET HOUSING

NOTE: The air inlet housing must be removed from HVAC housing for service of the recirculation-air door.

(1) If removed, install the recirculation-air door into the upper air inlet housing and install the retaining screw. Tighten the screw to 2 N·m (17 in. lbs.).

(2) Position the air inlet housing and recirculation-air door onto the HVAC housing.

CAUTION: Make sure that the recirculation-air door pivot shaft is properly seated in the pivot seats.

(3) Install the three screws that secure the upper air inlet housing to the HVAC housing. Tighten the screws to 2 N·m (17 in. lbs.).

(4) Inspect the foam seal along the parting line. If the seal is deformed or damaged, it must be replaced.

(5) Feed the blower motor wire lead through the opening in the lower air inlet housing and seat the rubber grommet into the lower air inlet housing.

(6) Position the recirculation-air door pivot into the lower air inlet housing.

(7) Install the four screws (from the bottom) that secure the lower air inlet housing to the upper air

inlet housing and the lower HVAC housing. Tighten the screws to 2 N·m (17 in. lbs.).

(8) Install the one screw (from the top) that secures the lower air inlet housing to the upper air inlet housing. Tighten the screws to 2 N·m (17 in. lbs.).

(9) Connect the blower motor wire lead connector to the blower motor resistor or power module, depending on application.

(10) Install the recirculation door actuator wire lead into the routing clip located on the lower air inlet housing.

(11) Install the recirculation door actuator (Refer to 24 - HEATING & AIR CONDITIONING/CONTROLS - FRONT/RECIRCULATION DOOR ACTUATOR - INSTALLATION).

(12) Install the HVAC housing assembly (Refer to 24 - HEATING & AIR CONDITIONING/DISTRIBUTION - FRONT/HVAC HOUSING - INSTALLATION).

HVAC HOUSING

NOTE: The HVAC housing must be removed from the vehicle and disassembled for service of the air inlet housing, air distribution housing and the A/C evaporator.

(1) Position the HVAC housing against the dash panel in the passenger compartment with the three mounting studs located in their proper holes. Make sure that the condensate drain tube protrudes through its opening.

(2) Loosely install the nut and bolt that secures the HVAC housing to the passenger compartment side of the dash panel.

(3) Install the three nuts that secure the HVAC housing to the engine compartment side of the dash panel. Tighten the nuts to 7 N·m (62 in. lbs.).

(4) Tighten the nut and bolt that secures the HVAC housing to the passenger compartment side of the dash panel to 3 N·m (26 in. lbs.).

(5) Install the instrument panel (Refer to 23 - BODY/INSTRUMENT PANEL/INSTRUMENT PANEL ASSEMBLY - INSTALLATION).

(6) Connect the heater hoses to the heater core (Refer to 24 - HEATING & AIR CONDITIONING/PLUMBING/HEATER INLET HOSE - INSTALLATION) and (Refer to 24 - HEATING & AIR CONDITIONING/PLUMBING/HEATER RETURN HOSE - INSTALLATION).

(7) Connect the suction and liquid lines to the A/C expansion valve (Refer to 24 - HEATING & AIR CONDITIONING/PLUMBING/LIQUID LINE - INSTALLATION).

(8) Reconnect the negative battery cable.

(9) If the heater core is being replaced, flush the cooling system (Refer to 7 - COOLING - STANDARD PROCEDURE - COOLING SYSTEM CLEANING/REVERSE FLUSHING).

(10) Refill the engine cooling system (Refer to 7 - COOLING - STANDARD PROCEDURE - COOLING SYSTEM REFILL).

(11) Evacuate the refrigerant system (Refer to 24 - HEATING & AIR CONDITIONING/PLUMBING - STANDARD PROCEDURE - REFRIGERANT SYSTEM EVACUATE).

(12) Charge the refrigerant system (Refer to 24 - HEATING & AIR CONDITIONING/PLUMBING - STANDARD PROCEDURE - REFRIGERANT SYSTEM CHARGE).

(13) Calibrate the A/C-heater control (Refer to 24 - HEATING & AIR CONDITIONING/CONTROLS - FRONT/A/C HEATER CONTROL - STANDARD PROCEDURE -A/C-HEATER CONTROL CALIBRATION).

DISTRIBUTION - REAR

TABLE OF CONTENTS

BLOWER MOTOR

DESCRIPTION

Vehicles equipped with 4 passenger seating and automatic temperature control (ATC) heating-A/C system, use a 12-volt, direct current (DC) rear blower motor. The rear blower motor has an integral wire harness and two squirrel cage-type blower wheels that are secured to the blower motor shaft (Fig. 1). The blower motor and wheels are contained within the two halves of the rear blower motor housing, which is located under the front center floor console cover.

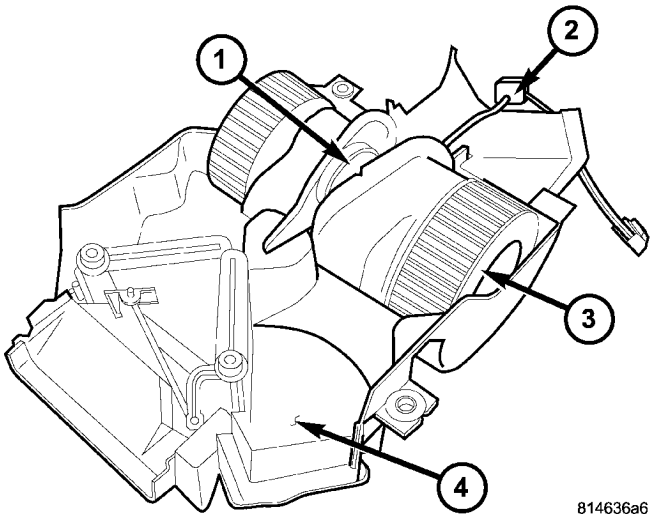

Fig. 1 Rear Blower Motor

1 - REAR BLOWER MOTOR
2 - WIRE HARNESS
3 - BLOWER WHEEL (2)
4 - LOWER REAR BLOWER MOTOR HOUSING

OPERATION

The rear blower motor and wheels are used to control the velocity of air moving through the center floor console ducts by spinning the blower wheels within the housing at the selected or programmed speed (depending on application).

The rear blower motor will operate whenever the ignition switch is in the On position and the power for the A/C-heater control of the automatic temperature control (ATC) heating-A/C system is turned on. When the ATC A/C-heater control display reads REAR AUTO or when the rear blower motor is off, the switch located in the center console between the second row seats is not functional. When the A/C-heater control display reads REAR, only the rear seat occupants control the rear blower motor speed from the rear switch. When in the Rear mode, the rear occupants can set the rear switch to any blower motor speed including OFF or AUTO. While in the Auto position, the rear blower motor speed will be automatically controlled.

The rear blower motor speed is controlled by an electronic blower motor power module, which uses a pulse width modulated input from the ATC A/C-heater control and feedback signal from the rear blower motor to regulate the blower motor ground path. The rear blower motor receives battery current whenever the rear blower motor relay is energized.

For diagnosis and testing of the rear blower motor, refer to 24 - HEATING & AIR CONDITIONING/DISTRIBUTION - FRONT/BLOWER MOTOR - DIAGNOSIS AND TESTING.

The rear blower motor and blower motor wheels are factory balanced and cannot be adjusted or repaired. If faulty or damaged, the rear blower motor and blower wheels must be replaced as an assembly.

BLOWER MOTOR (Continued)

REMOVAL

NOTE: The rear blower motor and blower wheels are serviced only as a balanced unit. If either component is faulty or damaged, the entire blower motor and wheel assembly must be replaced.

(1) Remove the front center floor console cover (Refer to 23 - BODY/INTERIOR/CENTER CONSOLE - REMOVAL).

(2) Disconnect and isolate the negative battery cable.

(3) Disconnect the body wire harness connectors from the rear blower motor power module and the rear mode door actuator (Fig. 2).

(4) Remove the body wire harness bracket from the console support bracket.

(5) Remove the eight screws and the two console support brackets from the floor console base and duct assembly

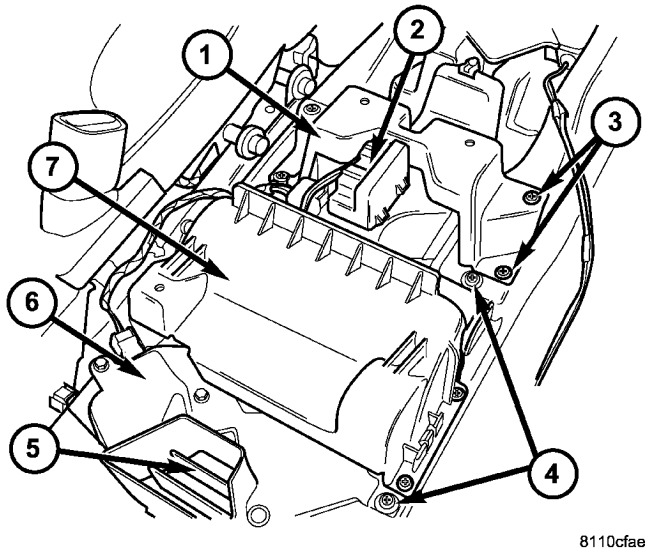

Fig. 2 Rear Blower Motor Housing

1 - SUPPORT BRACKET (FRONT)
2 - POWER MODULE
3 - SCREWS (8)
4 - SCREWS (4)
5 - REAR BLOWER MOTOR HOUSING
6 - REAR MODE DOOR ACTUATOR
7 - SUPPORT BRACKET (REAR)

(6) Remove the four screws that secure the rear blower motor housing to the floor console base and duct assembly.

(7) Remove the rear blower motor housing and place it on a bench.

(8) Disconnect the rear blower motor wire harness connector from the power module.

(9) Remove the eleven retaining clips and three screws that secure the housing together.

(10) Carefully separate the two halves of the housing.

(11) Remove the blower motor wire harness and grommet from the housing and remove the blower motor (Fig. 3).

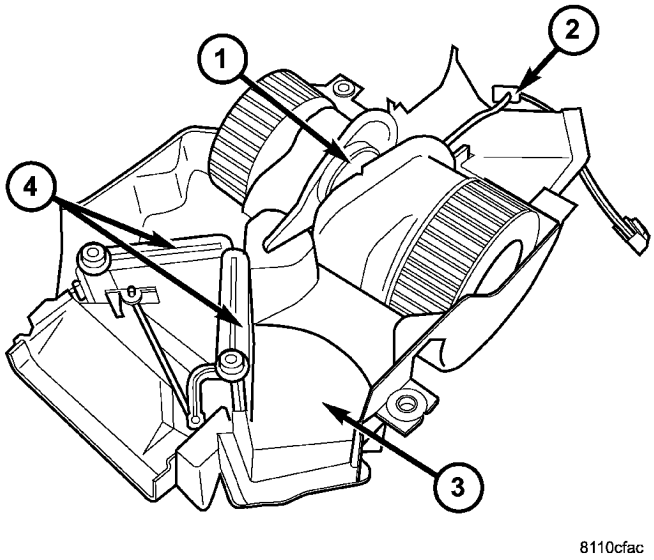

Fig. 3 Rear Blower Motor

1 - REAR BLOWER MOTOR
2 - WIRE HARNESS GROMMET
3 - REAR BLOWER MOTOR HOUSING
4 - CENTER CONSOLE MODE DOORS

INSTALLATION

(1) Position the rear blower motor into the housing and install the blower motor wire harness and grommet.

(2) Assemble the two halves of the rear blower motor housing and install the eleven retaining clips and three screws. Tighten the screws to 2 N·m (17 in. lbs.).

(3) Connect the rear blower motor wire harness connector to the rear blower motor power module.

(4) Position the rear blower motor housing into the floor console.

(5) Install the four screws that secure the rear blower motor housing to the floor console base. Tighten the screws to 2 N·m (17 in. lbs.).

(6) Position the two console support brackets onto the floor console base.

(7) Install the eight screws that secure the support brackets to the floor console base. Tighten the screws to 2 N·m (17 in. lbs.).

(8) Install the body wire harness bracket onto the console rear support bracket.

(9) Connect the body wire harness connectors to the rear blower motor power module and the rear mode door actuator.

(10) Reconnect the negative battery cable.

BLOWER MOTOR (Continued)

(11) Install the front center floor console (Refer to 23 - BODY/INTERIOR/CENTER CONSOLE - INSTALLATION).

(12) Calibrate the A/C-heater control (Refer to 24 - HEATING & AIR CONDITIONING/CONTROLS - FRONT/A/C HEATER CONTROL - STANDARD PROCEDURE -A/C-HEATER CONTROL CALIBRATION).

FLOOR CONSOLE DUCTS

REMOVAL

4 PASSENGER SEATING

(1) Remove the front and rear center floor console covers (Refer to 23 - BODY/INTERIOR/CENTER CONSOLE - REMOVAL).

(2) Disconnect and isolate the negative battery cable.

(3) Disconnect the body wire harness connectors from the rear blower motor power module, floor console mode door actuator and the hands-free module (Fig. 4).

(4) Remove the body wire harness bracket from the console support bracket.

(5) Remove the gear shift assembly (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 41TE/SHIFT MECHANISM - REMOVAL).

(6) If necessary, remove the two support brackets, the rear blower motor housing and the hands-free module from the floor console base and duct assembly.

(7) Remove the nine nuts and two bolts that secure the floor console base and duct assembly to the center floor panel and remove the base and duct assembly.

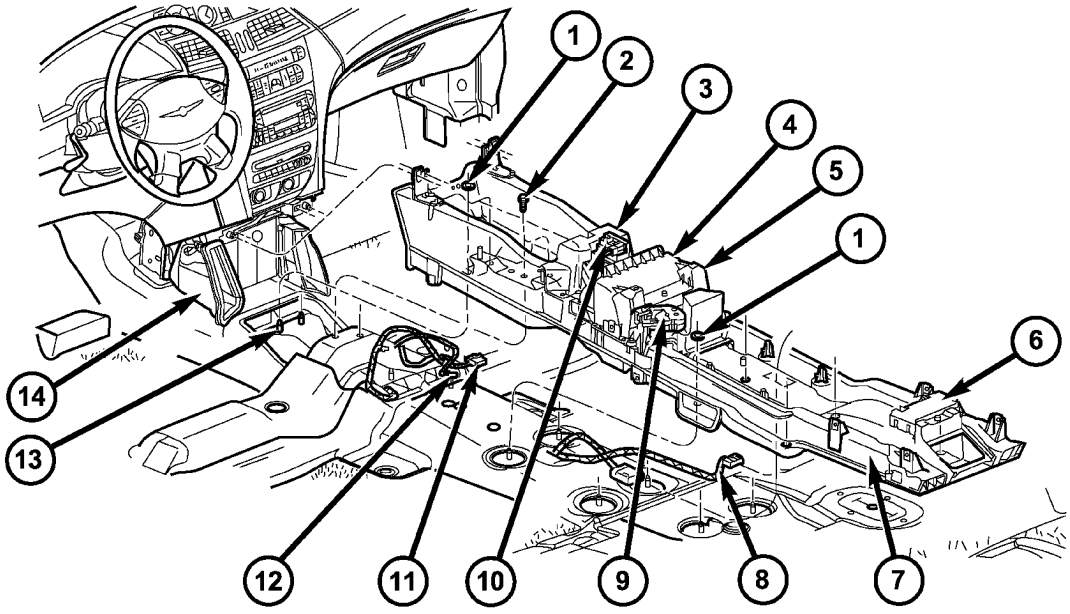

Fig. 4 Floor Console Base and Duct Assembly

1 - NUT (9)
2 - BOLT (2)
3 - SUPPORT BRACKET (FRONT)
4 - REAR BLOWER MOTOR HOUSING
5 - SUPPORT BRACKET (REAR)
6 - HANDS-FREE MODULE
7 - FLOOR CONSOLE BASE AND DUCT ASSEMBLY
8 - HANDS-FREE MODULE WIRE CONNECTOR
9 - MODE DOOR ACTUATOR
10 - POWER MODULE
11 - POWER MODULE WIRE CONNECTOR
12 - MODE DOOR ACTUATOR WIRE CONNECTOR
13 - WELD STUD (9)
14- FLOOR DISTRIBUTION DUCT

FLOOR CONSOLE DUCTS (Continued)

5 PASSENGER SEATING

(1) Remove the two screws that secure the rear floor outlet assembly to the rear of the center floor console and remove the floor outlet assembly (Fig. 5).

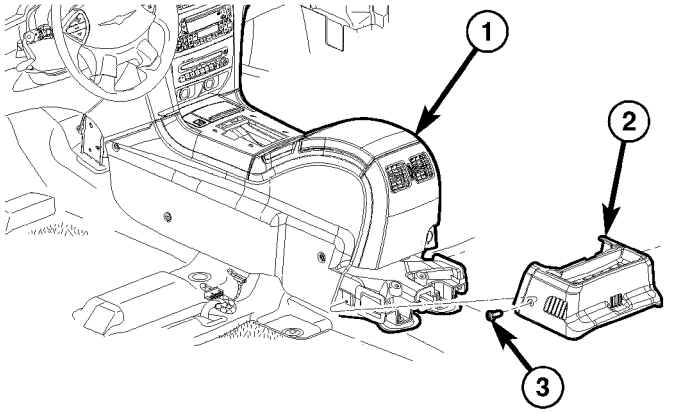

Fig. 5 Rear Floor Outlet Assembly

1 - CENTER FLOOR CONSOLE
2 - REAR FLOOR OUTLET ASSEMBLY
3 - SCREW (2)

(2) Remove the center floor console cover (Refer to 23 - BODY/INTERIOR/CENTER CONSOLE - REMOVAL).

(3) Remove the gear shift assembly (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 41TE/SHIFT MECHANISM - REMOVAL).

(4) Remove the five nuts and two bolts that secure the floor console base and duct assembly to the floor panel and remove the base and duct assembly (Fig. 6).

INSTALLATION

4 PASSENGER SEATING

(1) Position the floor console base and duct assembly into the vehicle.

(2) Install the nine nuts and two bolts that secure the floor console base and duct assembly to the center floor panel. Tighten the nuts and bolts to 5 N·m (45 in. lbs.).

(3) If removed, install the two support brackets, the rear blower motor housing and the hands-free module. Tighten the screws to 2 N·m (17 in. lbs.).

(4) Install the gear shift assembly (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 41TE/SHIFT MECHANISM - INSTALLATION).

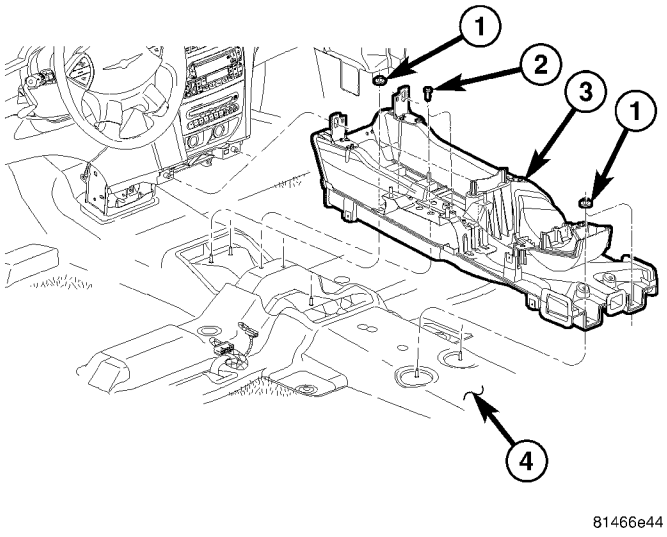

Fig. 6 Floor Console Base and Duct Assembly

1 - NUT (5)
2 - BOLT (2)
3 - BASE AND DUCT ASSEMBLY
4 - CENTER FLOOR PANEL

(5) Install the body wire harness bracket onto the console support bracket.

(6) Connect the body wire harness connectors to the rear blower motor power module, floor console mode door actuator and the hands-free module.

(7) Reconnect the negative battery cable.

(8) Install the front and rear center floor console covers (Refer to 23 - BODY/INTERIOR/CENTER CONSOLE - INSTALLATION).

5 PASSENGER SEATING

(1) Position the floor console base and duct assembly into the vehicle.

(2) Install the five nuts and two bolts that secure the floor console base and duct assembly to the center floor panel. Tighten the nuts and bolts to 5 N·m (45 in. lbs.).

(3) Install the gear shift assembly (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 41TE/SHIFT MECHANISM - INSTALLATION).

(4) Install the center floor console cover (Refer to 23 - BODY/INTERIOR/CENTER CONSOLE - INSTALLATION).

(5) Install the rear floor outlet assembly onto the rear of the center floor console.

(6) Install the two screws that secure the rear floor outlet assembly to the center floor console. Tighten the screws to 2 N·m (17 in. lbs.).