

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS

Corvette

SPECIFICATIONS

WARNING: Vehicle is equipped with Supplemental Inflatable Restraint (SIR) system. When servicing vehicle, use care to avoid accidental air bag deployment. SIR system-related components are located in various locations throughout interior and exterior of vehicle, depending on application. Do not use electrical test equipment on or near these circuits. If necessary, deactivate SIR system before servicing components. See appropriate AIR BAG RESTRAINT SYSTEMS article in RESTRAINTS.

SPECIFICATIONS

Application	Specification
Compressor Type	Harrison V7
Compressor Belt Tension	(1)
System Oil Capacity	(2)
Total Capacity	9 ozs.
With Accumulator Replacement	2 ozs.
With Compressor Replacement	2 ozs.
With Condenser Replacement	2 ozs.
With Evaporator Replacement	2 ozs.
Refrigerant (R-134a) Capacity	1.75 lbs.
System Operating Pressures ⁽³⁾	
Low Side	30-34 psi (2.10-2.39 kg/cm ²)
High Side	148-218 psi (10.4-15.3 kg/cm ²)

(1) Belt tension is adjusted by automatic belt tensioner.

(2) Use PAG (Polyalkylene Glycol) Refrigerant Oil GM P/N 12378526 for United States. GM P/N 88900060 for Canada

(3) With ambient temperature at 76-85°F (24-29°C) and humidity above 60 percent.

DESCRIPTION & OPERATION

The air temperature controls and air delivery Description And Operation are divided into 9 areas:

- Air Delivery
- Air Speed
- A/C Cycle
- Automatic Operation
- Automatic Operation
- Engine Coolant
- Heating and A/C Operation
- HVAC Control Components
- Recirculation Operation

AIR DELIVERY

When the mode switch is pressed, a signal is sent from the HVAC control module to the vacuum control assembly. The HVAC control module will provide ground for the necessary mode actuator solenoid, connecting the desired mode actuator to vacuum. The instrument panel fuse block provides power to the vacuum control assembly through the ignition 3 voltage circuit. Ground is provided by the HVAC control module.

Bi-Level

When the driver selects the BI-LEVEL mode, cool air is delivered through the instrument panel outlets while warm air is delivered through the floor outlets. The HVAC control module grounds the lower mode valve solenoid control circuit. When the solenoid is grounded, vacuum is applied to the mode actuator through the Brown and the Blue vacuum lines, and to the defrost actuator through the Red vacuum line. Applying vacuum to both sides of the mode actuator will hold the vent door stationary in the half open position. The defroster actuator will retract, closing the defroster door and open the heater door through mechanical linkage.

Defog

When the driver selects the MIX-BLEND mode, air delivery is divided between the floor and windshield outlets. The HVAC control module ground the mix-blend mode valve solenoid control circuit. When the solenoid is grounded, vacuum is applied to the mode actuator through the Blue vacuum line, and to the defrost actuator through the Red and the Yellow vacuum lines. The mode actuator will retract, closing the vent door. Applying vacuum to both sides of the defroster actuator will hold the defroster door stationary in the half open position. The heater door will also be held stationary in the half open position through mechanical linkage.

Floor

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

When the driver selects the FLOOR mode, air is delivered through the floor outlets with some toward the windshield and side vents. The HVAC control module grounds both the lower mode valve solenoid control and the mix-blend mode valve solenoid control circuit. When the solenoids are grounded, vacuum is applied to the mode actuator through the Blue vacuum line, and to the defrost actuator through the Red vacuum line. The mode actuator will retract, closing the vent door. The defroster actuator will retract, closing the defroster door and open the heater door through mechanical linkage.

Front Defrost

If the HVAC system is in FRONT DEFROST mode when you turn the vehicle off, the HVAC system will restart in front defrost unless the engine is OFF longer than 40 minutes. If the engine is off longer than 40 minutes, the system will restart in the previous operating mode set prior to using FRONT DEFROST, with outside air being drawn into the vehicle.

The FRONT DEFROST mode is the only setting that is not controlled by the automatic HVAC system. When FRONT DEFROST is selected, the A/C compressor is activated and outside air is brought into the vehicle. The blower motor will be activated and air will be directed toward the windshield with a small amount of air toward the side window outlets. Pressing the AUTO or OFF button will turn OFF front defrost mode. Pressing the FRONT DEFROST button will return the HVAC system to the last operating mode. RECIRCULATION mode is not available in FRONT DEFROST. The rear window defogger does not affect the HVAC system at all.

The HVAC control module grounds the upper mode valve solenoid control and the mix-blend mode valve solenoid control circuits. When the solenoids are grounded, vacuum is applied to the mode actuator through the Blue vacuum line and to the defrost actuator through the Yellow vacuum line.

Mode Switch

Use the mode switch in order to change the air delivery mode in the vehicle. Selection of the mode switch when in AUTO mode will lock in the air flow mode that auto was controlling. The system will stay in that mode until the mode or auto switch is pressed. Pressing the mode button also activates the digital display for the mode selected. If an airflow mode is currently displayed, pressing the mode button selects the next air flow mode. The air flow direction will sequence through the following modes:

- PANEL
- BI-LEVEL
- DEFOG
- FLOOR

Panel

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

When the driver selects the PANEL mode, air is delivered through the instrument panel outlets and a small amount is delivered to the floor. The HVAC control module grounds the lower mode valve solenoid control and defrost mode valve solenoid control circuit. When the solenoids are grounded, vacuum is applied to the mode actuator through the Brown vacuum line, and to the defrost actuator through the Red vacuum line. The mode actuator will retract, opening the panel door. The defroster actuator will retract, closing the defroster door and open the heater door through mechanical linkage.

AIR SPEED

The blower motor circulates air through the vehicles interior. The vehicle operator determines the blower motors speed by pressing the blower motor switch manually or by using the automatic mode. The blower motor will only operate if the blower motor switch is in any position other than OFF, as long as the ignition switch is in the RUN position. The blower motor and mode switches are located within the HVAC control module.

Power is provided to the blower motor from the blower motor control processor through the blower motor supply voltage circuit. The blower motor control processor receives power from the instrument panel fuse block through the battery positive voltage circuit. Ground is provided by the blower motor control processor, ground circuit and splice pack.

The HVAC control module receives power from the instrument panel fuse block on the ignition 3 voltage circuit along with the battery positive voltage circuit. The module is grounded by the ground circuits and splice pack. The HVAC control module communicates directly to the Powertrain Control Module (PCM) on the class 2 serial data circuit through the star connector.

When any blower speed is selected, whether manual or automatic, the blower motor control processor will control blower motor speeds based on voltage signals from the HVAC control module. A 5-volt signal is sent from the blower motor control processor to the HVAC control module on the blower motor speed control circuit. When the driver manually selects a blower speed or the automatic HVAC system determines a needed speed, the HVAC control module will provide a pulse width modulated (PWM) ground. The remaining voltage at the blower motor control processor is used to provide a blower motor speed signal. A 12-volt signal is sent to the blower motor from the blower motor control processor on the blower motor supply voltage circuit. The blower motor control processor varies the ground on the blower motor control circuit internally with a separate PWM signal. An open circuit, short to ground or short to battery on the blower motor speed control circuit will disrupt the PWM signal and cause the blower motor to not operate. In automatic operation, the HVAC control module will determine what blower speed is necessary in order to achieve or maintain a desired temperature.

When in manual mode, the driver can change the blower speed by pressing the blower motor switch. If the driver presses the blower motor switch once, the blower speed will increase/decrease one level. Holding the blower motor switch down will increase/decrease

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

the blower speed to the maximum/minimum speed.

Off

Press the OFF switch to turn off the HVAC system. When the vehicle is moving, air flowing over the vehicle increases the air pressure just ahead of the windshield. This forces air into the HVAC air inlet and out through any desired mode setting. The HVAC control module attempts to match the inside air temperature and HVAC control module selected temperatures. Driver set temperature and passenger temperature offset can be adjusted. Since the A/C compressor is not running, the incoming air may be warmed but not cooled.

A/C CYCLE

Refrigerant is the key element in an air conditioning system. R-134a is presently the only EPA approved refrigerant for automotive use. R-134a is a very low temperature gas that can transfer the undesirable heat and moisture from the passenger compartment to the outside air.

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The A/C compressor is belt driven and operates when the magnetic clutch is engaged. The compressor builds pressure on the vapor refrigerant. Compressing the refrigerant also adds heat. The refrigerant is discharged from the compressor through the discharge hose, and forced through the condenser and then through the balance of the A/C system.

Compressed refrigerant enters the condenser at a high-temperature, high-pressure vapor state. As the refrigerant flows through the condenser, the heat is transferred to the ambient air passing through the condenser. Cooling causes the refrigerant to condense and change from a vapor to a liquid state.

The condenser is located in front of the radiator for maximum heat transfer. The condenser is made of aluminum tubing and aluminum cooling fins, which allows rapid heat transfer for the refrigerant. The semi-cooled liquid refrigerant exits the condenser and flows through the liquid line to the orifice tube.

The orifice tube is located in the liquid line between the condenser and the evaporator. The orifice tube is the dividing point for the high and the low pressure sides of the A/C system. As the refrigerant passes through the orifice tube, the pressure on the refrigerant is lowered, causing the refrigerant to vaporize at the orifice tube. The orifice tube also measures the amount of liquid refrigerant that can flow into the evaporator.

Refrigerant exiting the orifice tube flows into the evaporator core in a low-pressure, liquid state. Ambient air is drawn through the HVAC module and passes through the evaporator core. Warm and moist air will cause the liquid refrigerant to boil inside the evaporator core.

The boiling refrigerant absorbs the moisture and heat from the ambient air. The refrigerant exits the evaporator through the suction line and flows back to the compressor in a vapor state, completing the A/C cycle of heat removal. At the compressor, the refrigerant is compressed again and the cycle of heat removal is repeated.

The conditioned air is distributed through the HVAC module for passenger comfort. The heat and moisture removed from the passenger compartment condenses, and discharges from the HVAC module as water.

AUTOMATIC OPERATION

Automatic

The automatic HVAC system will warm up/cool down and maintain the interior temperature of the vehicle by controlling the A/C compressor clutch, blower motor, air temperature, mode and recirculation actuators to achieve the desired temperature. For fully automatic operation, both the blower and mode switches must be in the AUTO position. Blower speeds will change automatically based on inputs to the HVAC control module. The HVAC control module will always come back to the last settings after an ignition cycle or, if equipped, to the last settings of the driver by pressing the UNLOCK button on the remote keyless entry fob and placing the ignition in RUN.

In cold temperatures, the automatic HVAC system will provide heat in the most efficient manner. To warm the interior quickly, maximum heat is used where the blower is at maximum speed, floor mode, air temperature is in full hot and outside air is being drawn in. The vehicle operator can select the extreme warm setting, but the system will not warm the vehicle any faster. Once the desired temperature is reached, the blower motor, mode, recirculation and temperature will be adjusted automatically by the HVAC control module.

In warm temperatures, the automatic HVAC system will provide A/C in the most efficient manner. To cool the interior quickly, full cold is used where the blower is at maximum speed, air temperature actuator is in full cold and the recirculation actuator is drawing air from inside the vehicle. The vehicle operator can select the extreme cool setting, but the system will not cool the vehicle any faster. Once the desired temperature is reached, the blower motor, mode, recirculation and temperature will be adjusted automatically by the HVAC control module.

In automatic operation, the HVAC control module will maintain the comfort level inside of the vehicle by controlling the A/C compressor clutch, the blower motor, the air temperature actuators, the mode actuator and the recirculation actuator.

To place the HVAC system in Automatic mode, the following is required:

- The AUTO switch must be activated.
- The air temperature switch must be in any other position other than full HOT or full

COLD position.

Once the desired temperature is reached, the blower motor, mode, recirculation and temperature actuators will automatically be adjusted to maintain the temperature selected. The HVAC control module performs the following functions to maintain the desired air temperature:

- Monitor the inside air temperature sensor, ambient air temperature sensor and sunload sensor.
- Regulate blower motor speed.
- Position the air temperature actuators.
- Position the mode actuator.
- Position the recirculation actuator.
- Request A/C operation.

ENGINE COOLANT

Engine coolant is the essential element of the heating system. The thermostat controls the normal engine operating coolant temperature. The thermostat also creates a restriction for the cooling system that promotes a positive coolant flow and helps prevent cavitation.

Coolant enters the heater core through the inlet heater hose, in a pressurized state. The heater core is located inside the HVAC module. The ambient air drawn through the HVAC module absorbs the heat of the coolant flowing through the heater core. Heated air is distributed to the passenger compartment, through the HVAC module, for passenger comfort. Opening or closing the air temperature door controls the amount of heat delivered to the passenger compartment. The coolant exits the heater core through the return heater hose and recirculated back through the engine cooling system.

HEATING AND A/C OPERATION

The purpose of the heating and A/C system is to provide heated and cooled air to the interior of the vehicle. The A/C system will also remove humidity from the interior and reduce windshield fogging. The vehicle operator can determine the passenger compartment temperature by adjusting the air temperature switch. Regardless of the temperature setting, the following can effect the rate that the HVAC system can achieve the desired temperature:

- Recirculation actuator setting.
- Difference between inside and desired temperature.
- Difference between ambient and desired temperature.
- Blower motor speed setting.
- Mode setting.

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

The control module makes the following actions when automatic operation is not selected, and an air temperature setting is selected:

- When the air temperature switch is placed in the WARMEST position, the control module commands the air temperature door to divert maximum air past the heater core.
- When the air temperature switch is placed in the COLDEST position, the control module commands the air temperature door to direct air to bypass the heater core.
- When the air temperature switch is placed between the WARMEST and COLDEST positions, the control module monitors the sunload, ambient temperature and inside temperature sensor inputs to determine the air temperature door position that diverts the appropriate amount of air past the heater core in order to achieve the desired temperature.

The A/C system can be engaged by pressing the A/C switch. The A/C switch will illuminate when the A/C switch is pressed to the ON position. Pressing the A/C switch the control module grounds A/C request signal circuit from the Powertrain Control Module (PCM). The following conditions must be obtained before A/C compressor engagement is allowed:

- The Engine Coolant Temperature (ECT) is less than 250°F (121°C).
- The engine speed is more than 550 RPM.
- The A/C pressure is between 30 psi (207 kPa) and 410 psi (2826 kPa).
- The A/C request signal circuit is grounded.

Once engaged, the compressor clutch will be disengaged for the following conditions:

- The throttle position is 100 percent.
- The A/C pressure is more than 410 psi (2826 kPa).
- The A/C pressure is less than 30 psi (207 kPa).
- The Engine Coolant Temperature (ECT) is more than 250°F (121°C).
- The engine speed is more than 5500 RPM.
- The transmission shift.
- The PCM detects excessive torque load.
- The PCM detects insufficient idle quality.
- The PCM detects a hard launch condition.

When the compressor clutch disengages, the compressor clutch diode protects the electrical system from a voltage spike.

HVAC CONTROL COMPONENTS

A/C Pressure Sensor

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

The A/C refrigerant pressure sensor is a 3-wire piezoelectric pressure transducer. A 5-volt reference, low reference, and signal circuits enable the sensor to operate. The A/C pressure signal can be between zero-5 volts. When the A/C refrigerant pressure is low, the signal value is near zero volts. When the A/C refrigerant pressure is high, the signal value is near 5 volts. The PCM converts the voltage signal to a pressure value.

Air Temperature Actuator

The air temperature actuators are a 5 wire bi-directional electric motor that incorporates a feedback potentiometer. Ignition 3 voltage, low reference, control, 5-volt reference and position signal circuits enable the actuator to operate. The control circuit uses either a zero, 2.5 or 5-volt signal to command the actuator movement. When the actuator is at rest, the control circuit value is 2.5 volts. A zero or 5-volt control signal commands the actuator movement in opposite directions. When the actuator shaft rotates, the potentiometers adjustable contact changes the door position signal between zero-5 volts.

The HVAC control module uses a range of zero-255 counts to index the actuator position. The door position signal voltage is converted to a zero-255 count range. When the module sets a commanded, or targeted, value, the control signal is changed to either zero or 5 volts depending upon the direction that the actuator needs to rotate to reach the commanded value. As the actuator shaft rotates the changing position signal is sent to the module. Once the position signal and the commanded value are the same, the module changes the control signal to 2.5 volts.

Air Temperature Sensor

The air temperature sensors are a 2-wire negative temperature co-efficient thermistor. The vehicle uses the following air temperature sensors:

- Ambient air temperature sensor.
- Inside air temperature sensor.

A signal and low reference circuit enables the sensor to operate. As the air temperature surrounding the sensor increases, the sensor resistance decreases. The sensor signal voltage decreases as the resistance decreases. The sensor operates within a temperature range between -40°F (-40°C) to 215°F (101°C). The sensor signal varies between zero-5 volts.

The input of the duct sensor temperature is different from the ambient and inside sensors. The HVAC control module converts the signal to a range between zero-255 counts. As the air temperature increases the count value will decrease.

If the HVAC control module detects a malfunctioning sensor, then the control module software will use a defaulted air temperature value. The default action ensures that the HVAC system can adjust the inside air temperature near the desired temperature until the condition is corrected.

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

The Driver Information Center (DIC) displays the ambient air temperature value that it receives from the HVAC control module through a class 2 message. The scan tool has the ability to update the displayed ambient air temperature.

HVAC Control Module

The HVAC control module is a class 2 device that interfaces between the operator and the HVAC system to maintain air temperature and distribution settings. The battery positive voltage circuit provides power that the control module uses for Keep Alive Memory (KAM). If the battery positive voltage circuit loses power, all HVAC DTCs and settings will be erased from KAM. The ignition 3 voltage circuit provides a device on signal. Three integrated potentiometers control mode and air temperature door positions and blower motor speed. The control assembly communicates the mode door position to the vacuum control assembly through 5 solenoid control circuits.

Sunload Sensor

The sunload sensor is a 2-wire photo diode. Low reference and signal circuits enable the sensor to operate. As the light shining upon the sensor gets brighter, the sensor conductance increases. The sensor signal decreases as the conductance increases. The sensor operates within an intensity range between completely dark and bright. The sensor signal varies between zero-5 volts. The HVAC control module converts the signal to a range between zero-255 counts.

The sunload sensor provides the HVAC control module a measurement of the amount of light shining on the vehicle. Bright, or high intensity, light causes the vehicles inside temperature to increase. The HVAC system compensates for the increased temperature by diverting additional cool air into the vehicle.

If the HVAC control module detects a malfunctioning sensor, then the control module software will use a defaulted sunload value. The default action ensures that the HVAC system can adjust the inside air temperature near the desired temperature until the condition is fixed.

RECIRCULATION OPERATION

Outside Air Mode

When the OUTSIDE AIR switch is pressed, outside air is brought into the vehicle. This mode has no effect on the system when FRONT DEFROST mode is selected. OUTSIDE AIR and RECIRCULATION are separate modes and are not available together. When OUTSIDE AIR is selected, when in automatic mode, the HVAC system will stay in this mode until AUTO is pressed again.

Recirculation Mode

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

When the recirculation is requested, whether manual or automatic, a solenoid inside the vacuum control assembly connects the recirculation actuator to the vacuum source. Power is provided to the recirculation solenoid by the ignition 3 voltage circuit. Ground is provided by the recirculation valve solenoid control circuit and HVAC control module. When the solenoid is grounded, vacuum is supplied to the recirculation actuator. The recirculation actuator retracts, closing the recirculation door. This draws air from inside the vehicle instead of fresh air from the outside.

Recirculation can be used in both automatic and manual operation. The only time recirculation is not available is when FRONT DEFROST or MIX-BLEND is selected. The RECIRC LED will flash 3 times to alert the driver that recirculation mode is not available. When in AUTO mode, recirculation will stay ON until either the vehicle operator selects OUTSIDE AIR or the automatic system has cooled the vehicle sufficiently.

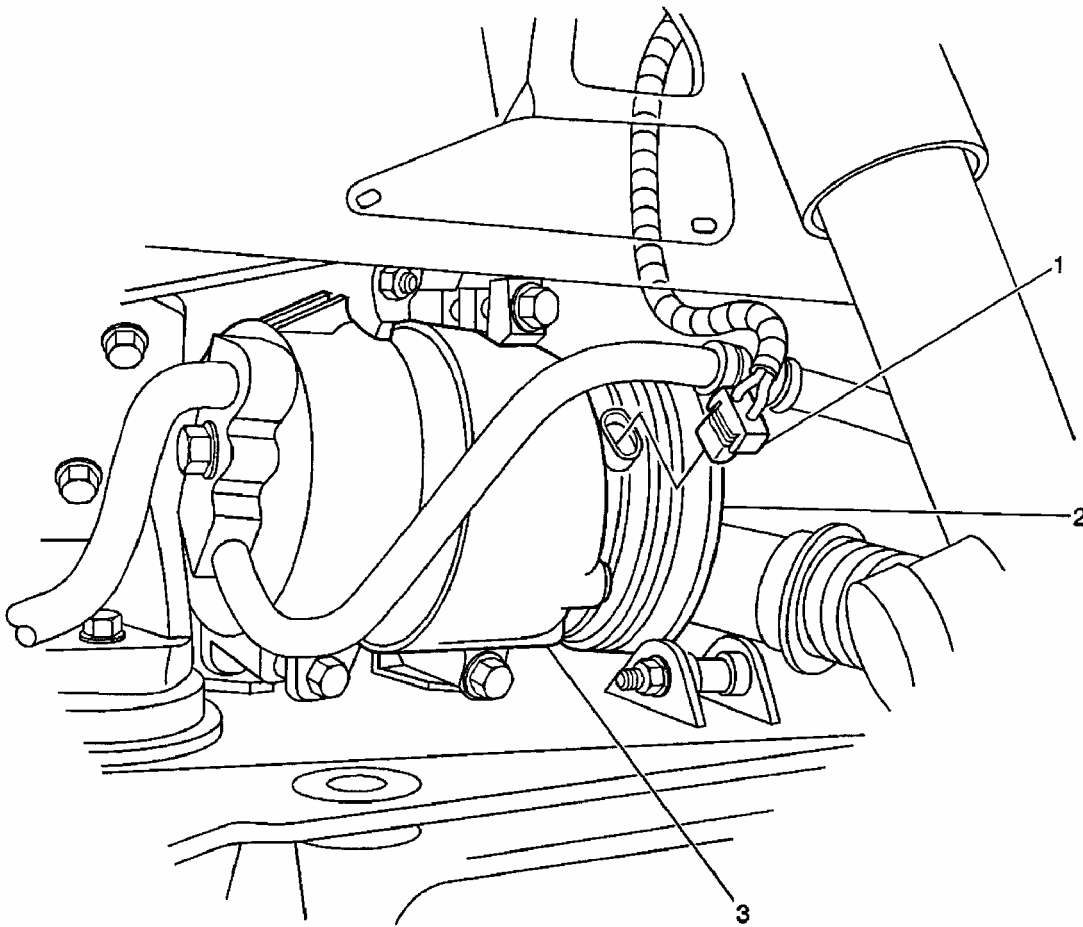
COMPONENT LOCATIONS

COMPONENT LOCATION

Component	Location
Air Temperature Actuator	On HVAC Module, Right Side
Air Temperature Sensor (Inside)	On Instrument Panel Trim, Right Of Steering Column
Body Control Module	Under Passenger Side Carpet Trim Cover
Blower Motor	On Bottom Of HVAC module
Blower Motor Control Processor	Next To Blower Motor
Blower Motor Relay	In Multi Use Relay Center, Near Blower Motor
HVAC Module Assembly	Behind Right Side Of Instrument Panel
Vacuum Control Assembly	Behind Right Front Wheel Well, Near PCM

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette



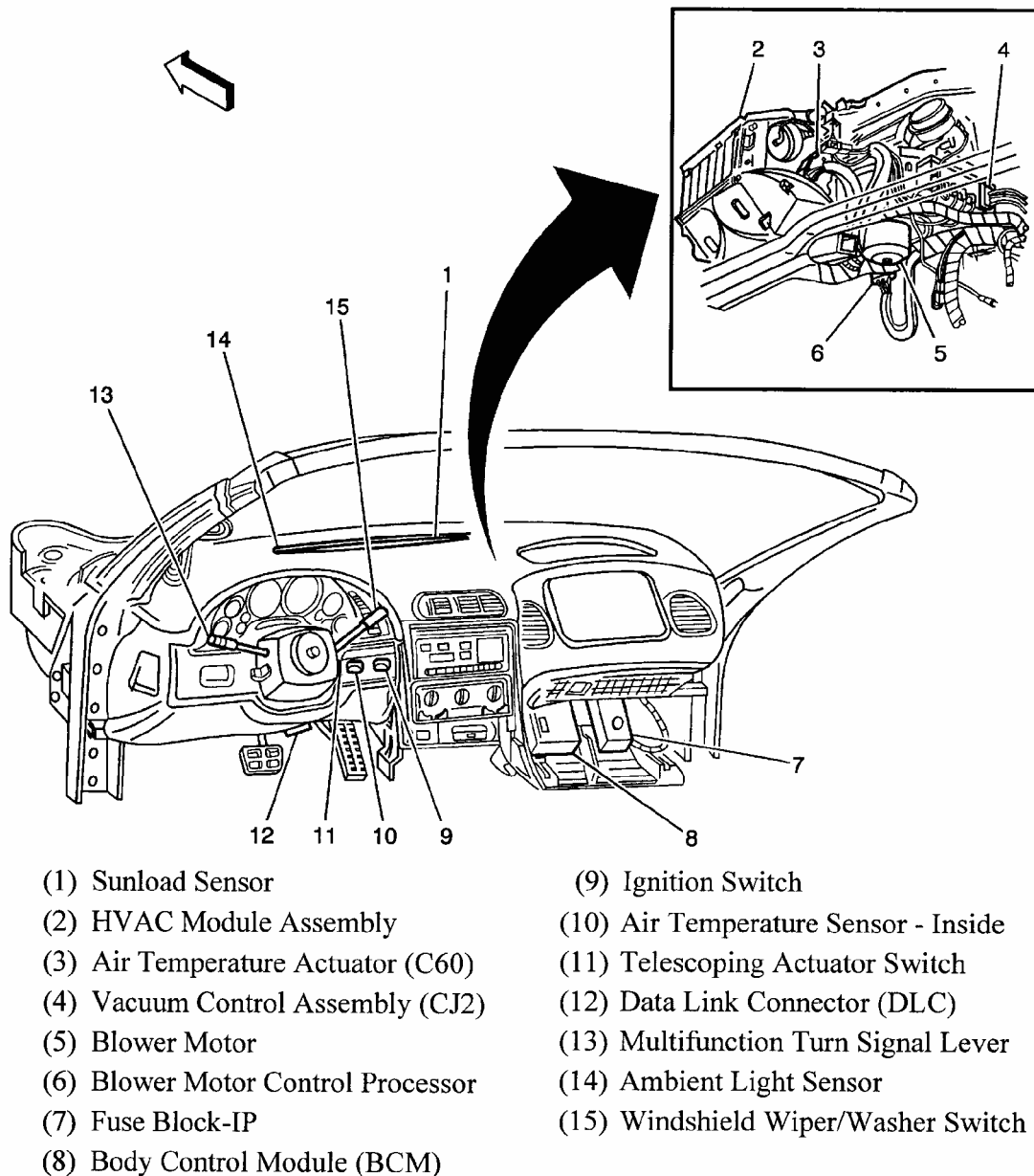
- (1) A/C Compressor Clutch Diode
- (2) A/C Compressor Clutch
- (3) A/C Compressor

G00209291

Fig. 1: Locating Components 1 Of 2
Courtesy of GENERAL MOTORS CORP.

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette



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Fig. 2: Locating Components 2 Of 2
Courtesy of GENERAL MOTORS CORP.

ADJUSTMENTS

RE-CALIBRATING ACTUATORS

1. Turn ignition off.
2. Remove the battery positive voltage circuit fuse of the HVAC Control Module.

NOTE: The module memory will not clear if the battery positive

voltage circuit fuse is installed in less than 60 seconds.

3. Wait 60 seconds.
4. Install the fuse.

TROUBLE SHOOTING

PRELIMINARY INSPECTION

Verify customers complaint. Before performing any testing, perform a visual inspection. Review the **DESCRIPTION & OPERATION** prior to diagnosing by symptom. Check coolant level and condition. Check system fuses. Check connectors for loose, damaged or corroded terminals. Check for damaged wiring harness. Check for damaged or binding actuator cable. If area of fault cannot be located or repaired during preliminary inspection, check self-diagnostic system. See **SELF-DIAGNOSTIC SYSTEM** . Repair as necessary.

If no problem is found, attempt diagnosis by symptom. See **SYMPTOM DIAGNOSIS** .

SYMPTOM DIAGNOSIS

NOTE: Perform **PRELIMINARY INSPECTION** prior to diagnosing by symptom.

NOTE: Use the following symptoms to aid in preliminary diagnosis. If a listed symptom matches the customers concern, check the applicable items for possible cause.

Visual/Physical Inspection

1. Inspect for aftermarket devices which could affect the operation of the HVAC System.
2. Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.
3. Verify the A/C compressor clutch turns freely and is not seized.
4. Verify that the customer is using the correct key to enable personalization and is not inadvertently activating passenger HVAC controls.
5. The A/C compressor will not operate in cold outside air temperatures.
6. The following conditions may cause window fogging:
 - Wet carpet or mats.
 - High humidity.
 - Interior water leak.
 - Blocked A/C evaporator drain tube.
 - Maximum passenger capacity.

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

- Blocked body pressure relief valves.
- 7. Inspect the air distribution system for blocked or damaged air inlet or outlet vents, or other causes of reduced air flow.

Intermittents

Intermittent faulty electrical connections or wiring may be the cause of intermittent conditions. Check for loose, bent or corroded terminals and terminal tension. Check for cut, bare or pinched wiring. Simulate the condition that is potentially causing the intermittent connection, either by wiggling the connections or the wiring, test driving or performing other operations while observing scan tool, DVOM or other testing equipment. See **CONNECTOR IDENTIFICATION** and/or **WIRING DIAGRAMS**.

Symptom List

Refer to a symptom diagnostic procedure from the following list in order to diagnose the symptom:

- A/C Compressor Clutch Does Not Engage
- A/C Compressor Clutch Does Not Disengage
- Air Delivery Improper
- Air Recirculation Malfunction
- Blower Motor Always On
- Blower Motor Inoperative
- Blower Motor Malfunction
- Too Cold in Vehicle
- Too Hot in Vehicle

PERFORMANCE TESTS

A/C PERFORMANCE TEST

NOTE: **Tools Required: ACR 2000 Air Conditioning Service Center (J-43600) or equivalent.**

The following test measures the A/C system operating efficiency by comparing:

- The current ambient air temperature.
- The current relative humidity.
- The high side pressure of the A/C system.
- The low side pressure of the A/C system.
- The temperature of the air being discharged into the passenger compartment.

NOTE: The ambient air temperature must be at least 60°F (16°C). Do not induce additional air flow across the front of the vehicle during the test. If you were sent here from a DTC diagnostic table, clear the DTC upon completion of this test.

1. Park the vehicle inside or in the shade. Open the windows in order to ventilate the interior of the vehicle. If the A/C system was operating, allow the A/C system to equalize (about 2 minutes). Ensure that the ignition key is in the OFF position. Install the ACR 2000 Air Conditioning Service Center. Record the ambient air temperature displayed on the ACR 2000 Air Conditioning Service Center. Record readings of the low and high side static pressures. Are both the low and high side pressures within the specified value?
 - Above 60°F (16°C) - 50 psi (345 kPa).
 - Above 75°F (24°C) - 70 psi (483 kPa).
 - Above 90°F (33°C) - 100 psi (690 kPa).

If so, go to step 2 . If not, check for leaks. See LEAK TESTING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING.

NOTE: When using the print function of the ACR 2000 Air Conditioning Service Center for this step it is necessary to press reset button before pressing the print button after the 5 minute operating time in order to capture the correct information.

NOTE: Record the relative humidity and the ambient air temperature at the time of the test.

2. Close the vehicle doors and windows. Open the driver door window 5-6 in (12.7-15.2 cm). Set the HVAC control to A/C in RECIRCULATION, Dual Zone system OFF, blower control to the highest position, HVAC control assembly to discharge air through the A/C outlets, temperature control to the coldest position and All A/C outlets open. Install temperature probes of the ACR 2000 Air Conditioning Service Center in the left and right center A/C air outlets. Apply the parking brake. Place transmission in Park (Automatic) or Neutral (Manual). Start the engine and allow to idle. Operate the A/C system for 5 minutes. Inspect for abnormal frost areas and unusual noises. Record the outlet air temperatures, the low-side pressure and the high-side pressure. Compare the low and high side pressures and the output temperatures to the table. See A/C PERFORMANCE SPECIFICATIONS table. Does all the data recorded fall within the specified ranges of the table? If so, go to 4 . If not, go to next step.
3. If the pressures and temperatures recorded do not fall within the specified ranges, continue to operate the A/C system for an additional 5 minutes. Record the pressures and temperatures again. Compare the low and high side pressures and the output

2002 Chevrolet Corvette**2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette**

temperature to the table. See **A/C PERFORMANCE SPECIFICATIONS** table. Does all the data recorded fall within the specified ranges of the table? If so, go to step 8 . If not, go to next step.

4. Do the high and low side pressures fall within the specified ranges but the outlet temperatures do not? If so, go to **A/C PRESSURE ZONE "A" DIAGNOSIS** . If not, go to next step.
5. Is the low side pressure higher than the specified range and the high side pressure within or lower than the specified range? If so, go to **A/C PRESSURE ZONE "B" DIAGNOSIS** . If not, go to next step.
6. Are the low and high side pressures both higher than the specified ranges? If so, go to **A/C PRESSURE ZONE "C" DIAGNOSIS** . If not, go to next step.
7. Is the low side pressure within or lower than the specified range and the high side pressure higher than the specified range? If so, go to **A/C PRESSURE ZONE "D" DIAGNOSIS** . If not, go to next step.
8. Operate the system in order to verify the test results. Did you find the same results? If so, system is okay. If not, go to **SYMPTOM DIAGNOSIS** under TROUBLE SHOOTING.

A/C PERFORMANCE SPECIFICATIONS

Ambient Air Temp - °F (°C)	Low Side Pressure - psi (kg/cm²)	High Side Pressure - psi (kg/cm²)	Discharge Air Temp - °F (°C)
55-65 (13-18) ⁽¹⁾	31-35 (2.18-2.46)	73-107 (5.13-7.52)	46 (8)
66-75 (19-23) ⁽²⁾	28-32 (1.97-2.25)	106-167 (7.45-11.74)	46 (8)
66-75 (19-23) ⁽³⁾	30-35 (2.11-2.46)	106-167 (7.45-11.74)	48 (9)
76-85 (24-29) ⁽⁴⁾	25-31 (1.76-2.18)	148-178 (10.41-12.52)	48 (9)
76-85 (24-29) ⁽⁵⁾	29-33 (2.04-2.32)	141-189 (9.91-13.29)	48 (9)
76-85 (24-29) ⁽⁶⁾	30-34 (2.11-2.39)	148-218 (10.41-15.33)	50 (10)
86-95 (30-35) ⁽⁷⁾	31-35 (2.18-2.46)	164-221 (11.53-15.54)	50 (10)

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

86-95 (30-35) ⁽⁸⁾	30-35 (2.11-2.46)	173-242 (12.16-17.02)	52 (11)
86-95 (30-35) ⁽⁹⁾	30-35 (2.11-2.46)	186-277 (13.08-19.48)	52 (11)
96-105 (30-40) ⁽¹⁰⁾	33-37 (2.32-2.60)	186-240 (13.08-16.87)	54 (12)
96-105 (30-40) ⁽¹¹⁾	32-36 (2.25-2.53)	197-217 (13.85-15.26)	54 (12)
96-105 (30-40) ⁽³⁾	31-35 (2.18-2.46)	221-305 (15.54-21.44)	54 (12)
106-115 (41-46) ⁽¹⁰⁾	35-39 (2.46-2.74)	212-267 (14.91-18.77)	55 (13)
106-115 (41-46) ⁽¹²⁾	33-37 (2.32-2.60)	228-306 (16.08-21.51)	55 (13)
116-120 (47-49) ⁽⁷⁾	35-39 (2.46-2.74)	254-303 (17.86-21.30)	57 (14)

(1) With relative humidity 0-100%

(2) With relative humidity below 40%

(3) With relative humidity above 40 %

(4) With relative humidity below 35%

(5) With relative humidity 35-60%

(6) With relative humidity above 60%

(7) With relative humidity below 30%

(8) With relative humidity 30-50%

(9) With relative humidity above 50%

(10) With relative humidity below 20%

(11) With relative humidity 20-40%

With relative humidity above 20%

(12)

HEATER PERFORMANCE DIAGNOSTIC

WARNING: Avoid contact with moving parts and hot surfaces while working around a running engine in order to prevent physical injury.

1. Were you sent here from TOO COLD IN VEHICLE? If so, go to next step. If not, see **TOO COLD IN VEHICLE** in SYMPTOM TESTS.
2. Start the engine. Allow the engine to idle. Does the engine reach a normal operating temperature? If so, go to next step. If not, go to step 9 .
3. Allow to idle. Select the FLOOR mode. Select the minimum blower speed. Select the maximum temperature setting. Feel the temperature of the inlet and outlet hoses at the heater core. Does the inlet hose feel warmer than the outlet hose? If so, go to step 7 . If not, go to next step.
4. Install a thermometer into the I/P center air outlet. Secure a thermometer to the heater core outlet hose. Select the PANEL mode. Select the maximum blower speed. Select the maximum temperature setting. Record the temperature at the I/P center air outlet and the heater core outlet hose. Compare the recorded temperatures. Are the temperatures similar? If so, go to next step. If not, go to step 6 .
5. Inspect and repair the cowl, the recirculation door and the HVAC module case of the vehicle for cold air leaks. After repairs are complete, go to step 10 .
6. Inspect the temperature door operation. See **SYMPTOM TESTS** . Perform the necessary repairs. After repairs are complete, go to step 10 .
7. Turn the engine off. Back flush the heater core. Start the engine. Select the FLOOR mode. Select the minimum blower speed. Select the maximum temperature setting. Feel the temperature of the inlet and outlet hoses at the heater core. Does the inlet hose feel warmer than the outlet hose? If so, go to next step. If not, go to step 10 .
8. Replace the heater core. See **HEATER CORE** in REMOVAL & INSTALLATION. After repairs are complete, go to step 10 .
9. Repair the low engine temperature concern. After repairs are complete, go to next step.
10. Operate the system in order to verify the repair. Does the system operate correctly? If so, system is okay. If not, go to step 2 .

SELF-DIAGNOSTICS

NOTE: For correct circuit identification and terminal locations, see **WIRING DIAGRAMS** .

RETRIEVING & CLEARING DIAGNOSTIC TROUBLE CODES

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

NOTE: Diagnostic Trouble Codes (DTCs) can be retrieved using a scan tool. Follow manufacturers instructions and follow screen prompts. Retrieve and record current and history DTCs.

NOTE: Current DTCs will automatically clear as soon as fault in system is repaired or fault no longer exists for 50 drive cycles. DTCs can be manually cleared by using a scan tool, following scan tool manufacturers instructions.

DIAGNOSTIC TROUBLE CODE DEFINITION

DTC	Circuit Affected
<u>B0332</u>	Ambient Air Temperature Sensor
<u>B0333</u>	Ambient Air Temperature Sensor
<u>B0337</u>	Inside Air Temperature Sensor
<u>B0338</u>	Inside Air Temperature Sensor
<u>B0348</u>	Sunload Sensor
<u>B0361</u>	Left Air Temperature Actuator
<u>B0363</u>	Left Air Temperature Actuator
<u>B0365</u>	Right Air Temperature Actuator
<u>B0367</u>	Right Air Temperature Actuator
<u>B0441</u>	Left Air Temperature Actuator
<u>B0446</u>	Right Air Temperature Actuator
<u>P0530</u>	A/C Refrigerant Pressure Sensor
<u>P0645</u>	A/C Compressor Clutch Relay
<u>P1539</u>	A/C Compressor Clutch Relay
<u>P1546</u>	A/C Compressor Clutch Relay

DIAGNOSTIC SYSTEM CHECK

1. Did you review DESCRIPTION & OPERATION? If so, go to next step. If not, go to **DESCRIPTION & OPERATION**.
2. Install a scan tool. Does the scan tool power up? If so, go to next step. If not, go to SCAN TOOL DOES NOT POWER UP IN DATA LINK COMMUNICATIONS under SYSTEM TESTS in appropriate BODY CONTROL MODULES article in ACCESSORIES & EQUIPMENT.

NOTE: Lack of communication may be due to a partial malfunction of the class 2 serial data circuit or due to a total malfunction of the class 2 serial data circuit. The specified procedure will determine the particular condition.

3. Turn ignition on. Attempt to establish communication with the HVAC Control Module, BCM and PCM. Does the scan tool communicate with the control modules? If so, go to next step. If not, go to **SCAN TOOL DOES NOT COMMUNICATE WITH CLASS 2 DEVICE** under **SYSTEM TESTS** in appropriate **BODY CONTROL MODULES** article in **ACCESSORIES & EQUIPMENT**.

NOTE: Determine if the HVAC Control Module, Body Control Module or Powertrain Control Module have set DTCs which may affect HVAC operation are present.

4. Select the display DTCs function on the scan tool for the HVAC Control Module, Body Control Module and Powertrain Control Module. Does the scan tool display any DTCs? If so, go to next step. If not, go to **SYMPTOM DIAGNOSIS** under **TROUBLESHOOTING**.

NOTE: The presence of DTCs which begin with "U" indicate some other module is not communicating. The specified procedure will compile all the available information before tests are performed.

5. Does the scan tool display any DTCs which begin with a "U"? If so, go to **SCAN TOOL DOES NOT COMMUNICATE WITH CLASS 2 DEVICE** under **SYSTEM TESTS** in appropriate **BODY CONTROL MODULES** article in **ACCESSORIES & EQUIPMENT**. If not, go to next step.

NOTE: Answer YES if the first 3 characters of the DTC name begins with B10; regardless of the last 2 characters.

6. Does the scan tool display DTC B10XX? If so, go to **DIAGNOSTIC TROUBLE CODE DEFINITION** table. If not, go to next step.
7. Does the scan tool display any DTCs which begin with a B that are associated with the charging system? If so, go to **DIAGNOSTIC TROUBLE CODE DEFINITION** table. If not, go to next step.
8. Does the scan tool display any DTCs that are associated with the HVAC system? If so, go to **DIAGNOSTIC TROUBLE CODE DEFINITION** table. If not, go to appropriate **SELF-DIAGNOSTIC** article in **ENGINE PERFORMANCE**.

DIAGNOSTIC TESTS

DTC B0332 & B0333: AMBIENT AIR TEMPERATURE SENSOR

NOTE: For circuit reference, see **CONNECTOR IDENTIFICATION** and/or **WIRING DIAGRAMS**.

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

Circuit Description

The HVAC control module monitors the ambient air temperature with an ambient air temperature sensor. When the air is cold, the sensor resistance and signal voltage are high. When the air is warm, the sensor resistance and signal voltage are low. The HVAC control module displays the ambient air temperature.

Conditions for Running the DTC

Ignition is on.

Conditions for Setting the DTC

The HVAC control module detects the signal circuit is less than 0.09 volts.

Action Taken When the DTC Sets

- The HVAC control module will store the trouble code in memory.
- A default value will be used for the sensor data by the HVAC control module to allow the A/C system to operate.

Conditions for Clearing the DTC

- The DTC will become history if the HVAC control module no longer detects a failure.
- The history DTC will clear after 100 fault free ignition cycles.
- The DTC can be cleared with a scan tool.

Diagnostic Procedure

1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** under SELF-DIAGNOSTIC SYSTEM. After diagnostic system check, go to next step.
2. Connect scan tool. Turn ignition on. Using scan tool, observe OUTSIDE TEMP SENSOR parameter in Heating and Air Conditioning data list. If scan tool indicates OUTSIDE TEMP SENSOR parameter is 0.09-4.90 volts, problem is intermittent. Check wiring and connections. If scan tool indicates OUTSIDE TEMP SENSOR parameter is not 0.09-4.90 volts, go to next step.
3. Turn ignition off. Disconnect ambient air temperature sensor. Turn ignition switch to ON position. Using scan tool, observe OUTSIDE TEMP SENSOR parameter. If scan tool indicates OUTSIDE TEMP SENSOR parameter is greater than 4.9 volts, go to next step. If scan tool indicates OUTSIDE TEMP SENSOR parameter is 4.9 volts or less, go to step 5 .
4. Turn ignition off. Connect a 3-amp fused jumper wire between ambient air temperature sensor signal circuit and low reference circuit. Turn ignition on. Using scan tool, observe OUTSIDE TEMP SENSOR parameter. If scan tool indicates OUTSIDE TEMP SENSOR parameter is less than 0.09 volt, go to step 8 . If scan tool indicates

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

OUTSIDE TEMPERATURE SENSOR parameter is greater than 0.09 volt, go to step 6 .

5. Check ambient air temperature sensor signal circuit for a short to ground. Repair circuit as necessary, then go to step 12 . If circuit is okay, go to step 9 .
6. Check ambient air temperature sensor signal circuit for a short to voltage, a high resistance, or an open. Repair circuit as necessary, then go to step 12 . If circuit is okay, go to next step.
7. Check ambient air temperature sensor low reference circuit for a high resistance or an open. Repair circuit as necessary, then go to step 12 . If circuit is okay, go to step 9 .
8. Inspect ambient outside air temperature sensor harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 12 . If wiring and connections are okay, go to step 10 .
9. Inspect HVAC control module harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 12 . If wiring and connections are okay, go to step 11 .
10. Replace ambient air temperature sensor. See **AMBIENT AIR TEMPERATURE SENSOR** under REMOVAL & INSTALLATION. After repairs are complete, go to step 12 .
11. Replace HVAC control module. See **HVAC CONTROL ASSEMBLY** under REMOVAL & INSTALLATION. After repairs are complete, go to next step.
12. Use scan tool to clear DTCs. Turn ignition switch to ON position. Check for DTCs. If DTCs B0332 or B0333 do not reset, system is okay. If DTCs B0332 or B0333 reset, go to step [2](#) .

DTC B0337 & B0338: INSIDE TEMPERATURE SENSOR

NOTE: For circuit reference, see **CONNECTOR IDENTIFICATION** and/or **WIRING DIAGRAMS** .

Circuit Description

The HVAC control module monitors the inside air temperature with an inside air temperature sensor. When the air is cold, the sensor resistance and signal voltage are high. When the air is warm, the sensor resistance and signal voltage are low. The HVAC control module requests A/C compressor clutch engagement and controls the air temperature actuator door positions in order to maintain the selected air temperature.

Conditions for Running the DTC

Ignition is on.

Conditions for Setting the DTC

The HVAC control module detects the signal circuit is less than 0.09 volts.

Action Taken When the DTC Sets

- The HVAC control module will store the trouble code in memory.
- A default value will be used for the sensor data by the HVAC control module to allow the system to operate.

Conditions for Clearing the DTC

- The DTC will become history if the HVAC control module no longer detects a failure.
- The history DTC will clear after 100 fault free ignition cycles.
- The DTC can be cleared with a scan tool.

Diagnostic Procedure

1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** under SELF-DIAGNOSTIC SYSTEM. After diagnostic system check, go to next step.
2. Connect scan tool. Turn ignition on. Using scan tool, observe INSIDE TEMP SENSOR parameter in Heating and Air Conditioning data list. If scan tool indicates INSIDE TEMP SENSOR parameter is 0.09-4.90 volts, problem is intermittent. Check wiring and connections. If scan tool indicates INSIDE TEMP SENSOR parameter is not 0.09-4.90 volts, go to next step.
3. Turn ignition off. Disconnect inside air temperature sensor. Turn ignition on. Using scan tool, observe INSIDE TEMP SENSOR parameter. If scan tool indicates INSIDE TEMP SENSOR parameter is greater than 4.9 volts, go to next step. If scan tool indicates INSIDE TEMP SENSOR parameter is 4.9 volts or less, go to step 5 .
4. Turn ignition off. Connect a 3-amp fused jumper wire between inside air temperature sensor signal circuit and low reference circuit. Turn ignition on. Using scan tool, observe INSIDE TEMP SENSOR parameter. If scan tool indicates INSIDE TEMP SENSOR parameter is less than 0.09 volt, go to step 8 . If scan tool indicates INSIDE TEMP SENSOR parameter is greater than 0.09 volt, go to step 6 .
5. Check for a short to ground in inside air temperature sensor signal circuit. Repair circuit as necessary, then go to step 12 . If circuit is okay, go to step 9 .
6. Check inside air temperature sensor signal circuit for a short to voltage, a high resistance, or an open. Repair circuit as necessary, then go to step 12 . If circuit is okay, go to next step.
7. Check inside air temperature sensor low reference circuit for a high resistance or an open in . Repair circuit as necessary, then go to step 12 . If circuit is okay, go to step 9 .
8. Inspect inside air temperature sensor harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 12 . If wiring and connections are okay, go to step 10 .
9. Inspect HVAC control module harness connector for loose wires and/or poor

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

connections. Repair as necessary, then go to step 12 . If wiring and connections are okay, go to step 11 .

10. Replace inside air temperature sensor. See **INSIDE AIR TEMPERATURE SENSOR** under REMOVAL & INSTALLATION. After repairs are complete, go to step 12 .
11. Replace HVAC control module. See **HVAC CONTROL ASSEMBLY** under REMOVAL & INSTALLATION. After repairs are complete, go to next step.
12. Use scan tool to clear DTCs. Turn ignition on. Check for DTCs. If DTCs B0337 or B0338 do not reset, system is okay. If DTCs B0337 or B0338 reset, go to step 2 .

DTC B0348: SUNLOAD SENSOR

NOTE: For circuit reference, see **CONNECTOR IDENTIFICATION** and/or **WIRING DIAGRAMS** .

Circuit Description

The HVAC control module monitors the ambient light on the inside of the vehicle through a light sensitive photodiode which is called a sunload sensor. The HVAC control module uses this information to compensate for the effect of the sun on the inside air temperature of the vehicle. When the sensor is in direct sunlight, the signal voltage is low. When the sensor is shaded, the signal voltage is high. The HVAC control module requests A/C compressor clutch engagement and controls the air temperature actuator door positions in order to maintain the selected air temperature.

Conditions for Running the DTC

Ignition is on.

Conditions for Setting the DTC

The HVAC control module detects the signal circuit is more than 4.90 volts.

Action Taken When the DTC Sets

The HVAC control module will store the trouble code in memory.

Conditions for Clearing the DTC

- The DTC will become history if the HVAC control module no longer detects a failure.
- The history DTC will clear after 100 fault free ignition cycles.
- The DTC can be cleared with a scan tool.

Diagnostic Procedure

1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** under SELF-DIAGNOSTIC SYSTEM. After diagnostic system check, go to next step.

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

2. Connect scan tool. Turn ignition on. Using scan tool, observe SUNLOAD SENSOR parameter in Heating and Air Conditioning data list. If scan tool indicates SUNLOAD SENSOR parameter is 0.09-4.90 volts, problem is intermittent. Check wiring and connections. If scan tool indicates SUNLOAD SENSOR parameter is not 0.09-4.90 volts, go to next step.
3. Turn ignition off. Disconnect SUNLOAD SENSOR. Turn ignition on. Using scan tool, observe SUNLOAD SENSOR parameter. If scan tool indicates SUNLOAD SENSOR parameter is greater than 4.9 volts, go to next step. If scan tool indicates SUNLOAD SENSOR parameter is 4.9 volts or less, go to step 5 .
4. Turn ignition off. Connect a 3-amp fused jumper wire between sunload sensor signal circuit and low reference circuit. Turn ignition on. Using scan tool, observe SUNLOAD SENSOR parameter. If scan tool indicates SUNLOAD SENSOR parameter is less than 0.09 volt, go to step 8 . If scan tool indicates SUNLOAD SENSOR parameter is greater than 0.09 volt, go to step 6 .
5. Check for a short to ground in sunload sensor signal circuit. Repair circuit as necessary, then go to step 12 . If circuit is okay, go to step 9 .
6. Check for a short to voltage, a high resistance, or an open in sunload sensor signal circuit. Repair circuit as necessary, then go to step 12 . If circuit is okay, go to next step.
7. Check sunload sensor low reference circuit for a high resistance or an open. Repair circuit as necessary, then go to step 12 . If circuit is okay, go to step 9 .
8. Inspect sunload sensor harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 12 . If wiring and connections are okay, go to step 10 .
9. Inspect HVAC control module harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 12 . If wiring and connections are okay, go to step 11 .
10. Replace sunload sensor. See **SUNLOAD SENSOR** under REMOVAL & INSTALLATION. After repairs are complete, go to step 12 .
11. Replace HVAC control module. See **HVAC CONTROL ASSEMBLY** under REMOVAL & INSTALLATION. After repairs are complete, go to next step.
12. Use scan tool to clear DTCs. Turn ignition switch to ON position. Check for DTCs. If DTC B0348 does not reset, system is okay. If DTC B0348 resets, go to step2 .

DTC B0361 & B0363: LEFT AIR TEMPERATURE ACTUATOR

NOTE: For circuit reference, see **CONNECTOR IDENTIFICATION** and/or **WIRING DIAGRAMS** .

Circuit Description

The HVAC control module commands the left air temperature actuator to move by

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

controlling the voltage supplied on the control circuit. A low voltage of zero volts moves door toward full cold. A voltage of 2.5 volts stops the door. A high voltage of 5 volts moves the door toward full hot. The HVAC control module determines the current position of the actuator by monitoring the voltage on the signal circuit. The feedback potentiometer is a function of the motor position. A high voltage of 4-5 volts indicates full cold door position. A low voltage of less than one volt indicates full hot door position. The HVAC control module controls the left air temperature actuator door positions in order to maintain the selected air temperature.

Conditions for Running the DTC

Ignition is on.

Conditions for Setting the DTC

The HVAC control module detects the signal circuit is less than 0.09 volts.

Action Taken When the DTC Sets

A default value will be used for the sensor data by the HVAC control module in an attempt to maintain the air temperature selected by the driver. This default value will be displayed on the scan tool.

Conditions for Clearing the DTC

- The DTC will become history if the HVAC control module no longer detects a failure.
- The history DTC will clear after 100 fault free ignition cycles.
- The DTC can be cleared with a scan tool.

Diagnostic Procedure

1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** under SELF-DIAGNOSTIC SYSTEM. After diagnostic system check, go to next step.
2. Connect scan tool. Turn ignition switch to ON position. Using scan tool, observe LH MIX MTR POSITION FEEDBACK parameter in Heating and Air Conditioning data list. If scan tool indicates LH MIX MTR POSITION FEEDBACK parameter is between 5-250 counts, go to next step. If scan tool indicates LH MIX MTR POSITION FEEDBACK parameter is not between 5-250 counts, go to step 4 .
3. Place air temperature switch from warmest position to coldest position. If scan tool indicates LH MIX MTR POSITION FEEDBACK parameter remains near 127 counts, go to next step. If scan tool indicates LH MIX MTR POSITION FEEDBACK parameter does not remain near 127 counts, check for a disconnected or broken door causing an overtravel condition. If door is okay, problem is intermittent. Check wiring and connections.
4. Turn ignition off. Disconnect left air temperature actuator. Turn ignition on. Measure

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

- voltage from left air temperature actuator signal circuit to ground. If voltage is greater than 4.90 volts, go to next step. If voltage is less than 4.90 volts, go to step 9 .
5. Turn ignition off. Connect a 3-amp fused jumper wire between left air temperature actuator signal circuit and low reference circuit. Turn ignition on. Measure voltage from the jumper wire to ground. If voltage is less than 0.09 volt, go to next step. If voltage is greater than 0.09 volt, go to step 10 .
 6. Turn ignition off. Disconnect fused jumper wire. Turn ignition on. Measure voltage from left air temperature actuator 5 volt reference circuit to ground. If voltage is greater than 4.90 volts, go to step 8 . If voltage is less than 4.90 volts, go to next step.
 7. Check left air temperature actuator 5 volt reference circuit for a short to ground or an open. Repair circuit as necessary, then go to step 16 . If circuit is okay, go to step 13 .
 8. Check left air temperature actuator 5 volt reference circuit for short to voltage, a high resistance, or an open. Repair circuit as necessary, then go to step 16 . If circuit is okay, go to step 12 .
 9. Check left air temperature actuator signal circuit for a short to ground or an open. Repair circuit as necessary, then go to step 16 . If circuit is okay, go to step 13 .
 10. Check left air temperature actuator signal circuit for short to voltage, a high resistance, or an open. Repair circuit as necessary, then go to step 16 . If circuit is okay, go to next step.
 11. Check left air temperature actuator low reference circuit for a high resistance or an open. Repair circuit as necessary, then go to step 16 . If circuit is okay, go to step 13 .
 12. Inspect left air temperature actuator harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 16 . If wiring and connections are okay, go to step 14 .
 13. Inspect HVAC control module harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 16 . If wiring and connections are okay, go to step 15 .
 14. Replace left air temperature actuator. See **AIR TEMPERATURE ACTUATOR** under REMOVAL & INSTALLATION. After repairs are complete, go to step 16 .
 15. Replace HVAC control module. See **HVAC CONTROL ASSEMBLY** under REMOVAL & INSTALLATION. After repairs are complete, go to next step.
 16. Use scan tool to clear DTCs. Turn ignition on. Check for DTCs. If DTCs B0361 or B0363 do not reset, system is okay. If DTCs B0361 or B0363 reset, go to step 2 .

DTC B0365 & B0367: RIGHT AIR TEMPERATURE ACTUATOR

NOTE: For circuit reference, see **CONNECTOR IDENTIFICATION** and/or **WIRING DIAGRAMS** .

Circuit Description

The HVAC control module commands the right air temperature actuator to move by

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

controlling the voltage supplied on the control circuit. A low voltage of zero volts moves door toward full hot. A voltage of 2.5 volts stops the door. A high voltage of 5 volts moves the door toward full cold. The HVAC control module determines the current position of the actuator by monitoring the voltage on the signal circuit. The feedback potentiometer is a function of the motor position. A high voltage of 4-5 volts indicates full hot door position. A low voltage of less than one volt indicates full cold door position. The HVAC control module controls the right air temperature actuator door positions in order to maintain the selected air temperature.

Conditions for Running the DTC

Ignition is on.

Conditions for Setting the DTC

The HVAC control module detects the signal circuit is greater than 4.90 volts.

Action Taken When the DTC Sets

A default value will be used for the sensor data by the HVAC control module in an attempt to maintain the air temperature selected by the driver. This default value will be displayed on the scan tool.

Conditions for Clearing the DTC

- The DTC will become history if the HVAC control module no longer detects a failure.
- The history DTC will clear after 100 fault free ignition cycles.
- The DTC can be cleared with a scan tool.

Diagnostic Procedure

1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** under SELF-DIAGNOSTIC SYSTEM. After diagnostic system check, go to next step.
2. Connect scan tool. Turn ignition on. Using scan tool, observe right MIX MTR POSITION FEEDBACK parameter in Heating and Air Conditioning data list. If scan tool indicates right MIX MTR POSITION FEEDBACK parameter is between 5-250 counts, go to next step. If scan tool indicates right MIX MTR POSITION FEEDBACK parameter is not between 5-250 counts, go to step 4 .
3. Place air temperature switch from warmest position to coldest position. If scan tool indicates right MIX MTR POSITION FEEDBACK parameter remains near 127 counts, go to next step. If scan tool indicates right MIX MTR POSITION FEEDBACK parameter does not remain near 127 counts, check for a disconnected or broken door causing an overtravel condition. If door is okay, problem is intermittent. Check wiring and connections.
4. Turn ignition off. Disconnect right air temperature actuator. Turn ignition on. Measure

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

- voltage from right air temperature actuator signal circuit to ground. If voltage is greater than 4.90 volts, go to next step. If voltage is less than 4.90 volts, go to step 9 .
5. Turn ignition off. Connect a 3-amp fused jumper wire between right air temperature actuator signal circuit and low reference circuit. Turn ignition on. Measure voltage from the jumper wire to ground. If voltage is less than 0.09 volt, go to next step. If voltage is greater than 0.09 volt, go to step 10 .
 6. Turn ignition off. Disconnect fused jumper wire. Turn ignition on. Measure voltage from right air temperature actuator 5 volt reference circuit to ground. If voltage is greater than 4.90 volts, go to step 8 . If voltage is less than 4.90 volts, go to next step.
 7. Check right air temperature actuator 5 volt reference circuit for a short to ground or an open. Repair circuit as necessary, then go to step 16 . If circuit is okay, go to step 13 .
 8. Check right air temperature actuator 5 volt reference circuit for short to voltage, a high resistance, or an open. Repair circuit as necessary, then go to step 16 . If circuit is okay, go to step 12 .
 9. Check right air temperature actuator signal circuit for a short to ground or an open. Repair circuit as necessary, then go to step 16 . If circuit is okay, go to step 13 .
 10. Check right air temperature actuator signal circuit for short to voltage, a high resistance, or an open. Repair circuit as necessary, then go to step 16 . If circuit is okay, go to next step.
 11. Check right air temperature actuator low reference circuit for a high resistance or an open. Repair circuit as necessary, then go to step 16 . If circuit is okay, go to step 13 .
 12. Inspect right air temperature actuator harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 16 . If wiring and connections are okay, go to step 14 .
 13. Inspect HVAC control module harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 16 . If wiring and connections are okay, go to step 15 .
 14. Replace right air temperature actuator. See **AIR TEMPERATURE ACTUATOR** under REMOVAL & INSTALLATION. After repairs are complete, go to step 16 .
 15. Replace HVAC control module. See **HVAC CONTROL ASSEMBLY** under REMOVAL & INSTALLATION. After repairs are complete, go to next step.
 16. Use scan tool to clear DTCs. Turn ignition on. Check for DTCs. If DTCs B0365 or B0367 do not reset, system is okay. If DTCs B0365 or B0367 reset, go to step 2 .

DTC B0441: LEFT AIR TEMPERATURE ACTUATOR

NOTE: For circuit reference, see **CONNECTOR IDENTIFICATION** and/or **WIRING DIAGRAMS** .

Circuit Description

The HVAC control module commands the left air temperature actuator movement with one

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

of three voltage signals applied to the left air temperature door control circuit. A low voltage of zero volts moves the left air temperature door toward full cold. A voltage of 2.5 volts stops the door. A voltage of 5 volts moves the left air temperature door toward full hot. The HVAC control module determines the current position of the actuator by monitoring the feedback voltage of the left air temperature door position signal circuit. The feedback potentiometer position is a function of the actuator position. A high voltage indicates a full cold left air temperature door position. A low voltage indicates a full hot left air temperature door position. The HVAC control module controls the left air temperature door position in order to maintain the selected air temperature.

Whenever the HVAC control module keep alive memory battery power is interrupted, the HVAC control module will perform a recalibration of the actuators. During recalibration, the HVAC control module will drive the actuators to their minimum and maximum travel extremes. The HVAC control module will then calculate a travel range from this data and compare it to a calibrated range within the HVAC control module. If the actual travel range is not within the calibrated expected range, the actuator will be considered not calibrated and the DTC will set.

Conditions for Running the DTC

- Ignition is on.
- The HVAC control module power must be interrupted.

Conditions for Setting the DTC

The left air temperature actuator actual total travel range is less than or greater than the calibrated limits.

Action Taken When the DTC Sets

- The HVAC control module will continue to make use of whatever left air temperature actuator travel range is still available.
- Each time the ignition switch is turned on the HVAC control module will perform a recalibration of the actuator.

Conditions for Clearing the DTC

The left air temperature actuator travel range error must be corrected.

Diagnostic Aids

- The range fault code can only be detected following a check of the left air temperature actuator travel range. The left air temperature actuator travel range check can only be initiated by disrupting power to the HVAC control module (disconnecting the battery) or with the scan tool.
- The calibration limit is 2.9-4.4 volts. An actual range below this limit suggests an

obstruction, something stuck in the door limiting travel. An actual range above this limit suggests an over travel condition, damaged or missing foam seals.

Diagnostic Procedure

1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** under SELF-DIAGNOSTIC SYSTEM. After diagnostic system check, go to next step.
2. Install scan tool. Turn ignition on. Using scan tool, command Left Mix Motor ON and OFF to display maximum and minimum counts of LH MIX MOTOR POSITION FEEDBACK in Heating and Air Conditioning, Special Functions, Miscellaneous Test list. Subtract minimum LH MIX MOTOR POSITION FEEDBACK from maximum LH MIX MOTOR POSITION/ FEEDBACK. If result of calculation indicates actual travel of left air temperature actuator is within 147-220 counts, check for an obstruction which limits door travel, or damaged or missing foam seals. If visual inspection is satisfactory, problem is intermittent. Check wiring and connections. If result of calculation indicates actual travel of left air temperature actuator is not within 147-220 counts, go to next step.
3. Check for an open or high resistance left air temperature actuator ignition 3 voltage circuit. Repair circuit as necessary, then go to step 13 . If circuit is okay, go to next step.
4. Check for an open, high resistance, short to ground or short to voltage in air temperature door control circuit of the left air temperature actuator. Repair circuit as necessary, then go to step 13 . If circuit is okay, go to next step.
5. Check for an open or high resistance in left air temperature actuator 5 volt reference circuit. Repair circuit as necessary, then go to step 13 . If circuit is okay, go to next step.

NOTE: **Left air temperature actuator connector and HVAC control module connector must be connected to correctly perform test.**

6. Turn ignition on. Using scan tool, observe LH MIX MOTOR POSITION FEEDBACK data parameter. Connect a 3-amp fused jumper wire between air temperature door control circuit and 5-volt reference circuit of the left air temperature actuator. This action drives actuator to full HOT position. Remove and reconnect jumper wire between air temperature door control circuit and low reference circuit. This action drives actuator to full COLD position. If left air temperature actuator drive shaft rotates and counts change, go to next step. If left air temperature actuator drive shaft does not rotate and/or counts do not change, go to step 9 .
7. Measure voltage from temperature door control circuit of the left air temperature actuator to ground. Using scan tool, command LEFT TEMP DOOR POSITION from HOT to COLD. If voltage measures near zero volt when decreasing temperature, 5 volts when increasing temperature and 2.5 volts when stationary, go to next step. If

voltage does not measure near zero volts when decreasing temperature, 5 volts when increasing temperature and 2.5 volts when stationary, go to step 10 .

8. Inspect left air temperature door and left air temperature actuator for the following conditions: a misaligned air temperature actuator, a broken or binding linkages or air temperature door, an obstruction that prevents air temperature door from operating within its full range of motion, missing air temperature door seals, or misaligned air temperature door seals. Repair as necessary, then go to step 13 . If visual inspection is satisfactory, problem is intermittent. Check wiring and connections.
9. Inspect left air temperature actuator harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 13 . If wiring and connections are okay, go to step 11 .
10. Inspect HVAC control module harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 13 . If wiring and connections are okay, go to step 12 .
11. Replace left air temperature actuator. See **AIR TEMPERATURE ACTUATOR** under REMOVAL & INSTALLATION. After repairs are complete, go to step 13 .
12. Replace HVAC control module. See **HVAC CONTROL ASSEMBLY** under REMOVAL & INSTALLATION. After repairs are complete, go to next step.
13. Use scan tool to clear DTCs. Turn ignition on. Check for DTCs. If DTC B0441 does not reset, system is okay. If DTC B0441 resets, go to step 2 .

DTC B0446: RIGHT AIR TEMPERATURE ACTUATOR

NOTE: For circuit reference, see **CONNECTOR IDENTIFICATION** and/or **WIRING DIAGRAMS** .

Circuit Description

The HVAC control module commands right air temperature actuator movement with one of 3 voltage signals applied to the right air temperature door control circuit. A low voltage of zero volts moves the right air temperature door toward full hot. A voltage of 2.5 volts stops the door. A voltage of 5 volts moves the right air temperature door toward full cold. The HVAC control module determines the current position of the actuator by monitoring the feedback voltage of the right air temperature door position signal circuit. The feedback potentiometer position is a function of the actuator position. A high voltage indicates a full hot right air temperature door position. A low voltage indicates a full cold right air temperature door position. The HVAC control module controls the right air temperature door position in order to maintain the selected air temperature.

Whenever the HVAC control module keep alive memory battery power is interrupted, the HVAC control module will perform a recalibration of the actuators. During recalibration, the HVAC control module will drive the actuators to their minimum and maximum travel extremes. The HVAC control module will then calculate a travel range from this data and

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

compare it to a calibrated range within the HVAC control module. If the actual travel range is not within the calibrated expected range, the actuator will be considered not calibrated and the DTC will set.

Conditions for Running the DTC

- Ignition is on.
- The HVAC control module power must be interrupted.

Conditions for Setting the DTC

The right air temperature actuator actual total travel range is less than or greater than the calibrated limits.

Action Taken When the DTC Sets

- The HVAC control module will continue to make use of whatever right air temperature actuator travel range is still available.
- Each time the ignition switch is turned on the HVAC control module will perform a recalibration of the actuator.

Conditions for Clearing the DTC

The right air temperature actuator travel range error must be corrected.

Diagnostic Aids

- The range fault code can only be detected following a check of the right air temperature actuator travel range. The right air temperature actuator travel range check can only be initiated by disrupting power to the HVAC control module, disconnecting the battery or with the scan tool.
- The calibration limit is 2.9-4.4 volt. An actual range below this limit suggests an obstruction, something stuck in the door limiting travel. An actual range above this limit suggests an over travel condition, damaged or missing foam seals.

Diagnostic Procedure

1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** under SELF-DIAGNOSTIC SYSTEM. After diagnostic system check, go to next step.
2. Install scan tool. Turn ignition on. Using scan tool, command Right Mix Motor ON and OFF to display maximum and minimum counts of right MIX MOTOR POSITION FEEDBACK in Heating and Air Conditioning, Special Functions, Miscellaneous Test list. Subtract minimum right MIX MOTOR POSITION FEEDBACK from maximum right MIX MOTOR POSITION FEEDBACK. If result of calculation indicates actual travel of right air temperature actuator is within 147-220 counts, check for an obstruction which limits door travel, or damaged or missing foam seals. If visual

inspection is satisfactory, problem is intermittent. Check wiring and connections. If result of calculation indicates actual travel of right air temperature actuator is not within 147-220 counts, go to next step.

3. Check for an open or high resistance right air temperature actuator ignition 3 voltage circuit. Repair circuit as necessary, then go to step 13 . If circuit is okay, go to next step.
4. Check air temperature door control circuit of the right air temperature actuator for an open, high resistance, short to ground or short to voltage. Repair circuit as necessary, then go to step 13 . If circuit is okay, go to next step.
5. Check right air temperature actuator 5 volt reference circuit for an open or high resistance. Repair circuit as necessary, then go to step 13 . If circuit is okay, go to next step.

NOTE: Right air temperature actuator connector and HVAC control module connector must be connected to correctly perform test.

6. Turn ignition on. Using scan tool, observe right MIX MOTOR POSITION FEEDBACK data parameter. Connect a 3-amp fused jumper wire between air temperature door control circuit and 5-volt reference circuit of the right air temperature actuator. This action drives actuator to full HOT position. Remove and reconnect jumper wire between air temperature door control circuit and low reference circuit. This action drives actuator to full COLD position. If right air temperature actuator drive shaft rotates and counts change, go to next step. If right air temperature actuator drive shaft does not rotate and/or counts do not change, go to step 9 .
7. Measure voltage from temperature door control circuit of the right air temperature actuator to ground. Using scan tool, command RIGHT TEMP DOOR POSITION from HOT to COLD. If voltage measures near zero volt when decreasing temperature, 5 volts when increasing temperature and 2.5 volts when stationary, go to next step. If voltage does not measure near zero volt when decreasing temperature, 5 volts when increasing temperature and 2.5 volts when stationary, go to step 10 .
8. Inspect right air temperature door and right air temperature actuator for the following conditions: a misaligned air temperature actuator, a broken or binding linkages or air temperature door, an obstruction that prevents air temperature door from operating within its full range of motion, missing air temperature door seals, or misaligned air temperature door seals. Repair as necessary, then go to step 13 . If visual inspection is satisfactory, problem is intermittent. Check wiring and connections.
9. Inspect right air temperature actuator harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 13 . If wiring and connections are okay, go to step 11 .
10. Inspect HVAC control module harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 13 . If wiring and connections are

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

okay, go to step 12 .

11. Replace right air temperature actuator. See **AIR TEMPERATURE ACTUATOR** under REMOVAL & INSTALLATION. After repairs are complete, go to step 13 .
12. Replace HVAC control module. See **HVAC CONTROL ASSEMBLY** under REMOVAL & INSTALLATION. After repairs are complete, go to next step.
13. Use scan tool to clear DTCs. Turn ignition on. Check for DTCs. If DTC B0446 does not reset, system is okay. If DTC B0446 resets, go to step 2 .

DTC P0530: A/C REFRIGERANT PRESSURE SENSOR

NOTE: For circuit reference, see **CONNECTOR IDENTIFICATION** and/or **WIRING DIAGRAMS** .

Circuit Description

The Powertrain Control Module (PCM) monitors the high side refrigerant pressure through a A/C refrigerant pressure sensor. When the pressure is high the signal voltage is high. When the pressure is low the signal voltage is low. When pressure is high the PCM commands the cooling fans on. When pressure is too high or too low the PCM will not allow the A/C compressor clutch to engage.

Conditions for Running the DTC

- The engine is running.
- A/C has been requested.

Conditions for Setting the DTC

- The PCM detects the signal circuit is less than 0.09 volts or more than 4.9 volts.
- The condition exists for 5 seconds.

Action Taken When the DTC Sets

- The PCM will not illuminate the Malfunction Indicator Lamp (MIL).
- The PCM stores the failure records.
- The A/C compressor clutch is disabled.

Conditions for Clearing the DTC

- The DTC will become history if the PCM no longer detects a failure.
- The history DTC will clear after 40 fault-free ignition cycles.
- The DTC can be cleared with a scan tool.

Diagnostic Procedure

1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** under SELF-DIAGNOSTIC SYSTEM. After diagnostic system check, go to next step.

NOTE: Ambient (outside) air temperature must be above 38°F (3°C).

2. Turn ignition off. Inspect A/C compressor for free rotation operation. Start engine. Turn HVAC controls to OFF position. If A/C compressor operates, go to **TEST A: A/C COMPRESSOR CLUTCH DOES NOT DISENGAGE** under SYMPTOM TESTS. If A/C compressor does not operate, go to next step.
3. Install scan tool. Turn ignition on. Using scan tool, observe A/C HIGH SIDE PRESSURE parameter in Powertrain Control Module (PCM) Engine Data 2 list. If scan tool indicates A/C HIGH SIDE PRESSURE parameter is within 0.09-4.90 volts, problem is intermittent. Check wiring and connections. If scan tool indicates A/C HIGH SIDE PRESSURE parameter is not within 0.09-4.90 volts, go to next step.
4. Turn ignition off. Disconnect A/C refrigerant pressure sensor. Turn ignition on. Using scan tool, observe A/C HIGH SIDE PRESSURE parameter. If scan tool indicates A/C HIGH SIDE PRESSURE parameter is less than 0.09 volt, go to next step. If scan tool indicates A/C HIGH SIDE PRESSURE parameter is greater than 0.09 volt, go to step 11 .
5. Turn ignition off. Connect a 3-amp fused jumper wire between A/C refrigerant pressure sensor 5 volt reference circuit and signal circuit. Turn ignition on. Using scan tool, observe A/C HIGH SIDE PRESSURE parameter. If scan tool indicates A/C HIGH SIDE PRESSURE parameter is greater than 4.90 volts, go to next step. If scan tool indicates A/C HIGH SIDE PRESSURE parameter is less than 4.90 volts, go to step 9 .
6. Disconnect fused jumper wire. Measure voltage between A/C refrigerant pressure sensor 5 volt reference circuit and low reference circuit. If voltage measures less than 5.1 volts, go to next step. If voltage measures greater than 5.1 volts, go to step 8 .
7. Turn ignition off. Disconnect negative battery cable. Measure resistance from A/C refrigerant pressure sensor low reference circuit to a good ground. If resistance measures less than 5 ohms, go to step 13 . If resistance measures greater than 5 ohms, go to step 12 .
8. Check A/C refrigerant pressure sensor 5 volt reference circuit for a short to voltage. Repair circuit as necessary, then go to step 17 . If circuit is okay, go to step 14 .
9. Check A/C refrigerant pressure sensor 5 volt reference circuit for a short to ground, a high resistance or an open. Repair circuit as necessary, then go to step 17 . If circuit is okay, go to next step.
10. Check A/C refrigerant pressure sensor signal circuit for a short to ground, a high resistance or an open. Repair circuit as necessary, then go to step 17 . If circuit is okay, go to step 14 .
11. Check A/C refrigerant pressure sensor signal circuit for a short to voltage. Repair circuit as necessary, then go to step 17 . If circuit is okay, go to step 14 .

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

12. Disconnect PCM. Check A/C refrigerant pressure sensor low reference circuit for an open or high resistance. Repair circuit as necessary, then go to step 17 . If circuit is okay, go to step 14 .
13. Inspect A/C refrigerant pressure sensor harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 17 . If wiring and connections are okay, go to step 15 .
14. Inspect PCM harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 17 . If wiring and connections are okay, go to step 16 .
15. Replace A/C refrigerant pressure sensor. See **A/C REFRIGERANT PRESSURE SENSOR** under REMOVAL & INSTALLATION. After repairs are complete, go to step 17 .
16. Replace and reprogram PCM. See POWERTRAIN CONTROL MODULE under **COMPUTERIZED ENGINE CONTROLS** in REMOVAL, OVERHAUL & INSTALLATION article in ENGINE PERFORMANCE. After repairs are complete, go to next step.
17. Use scan tool to clear DTCs. Turn ignition on. Check for DTCs. If DTC P0530 does not reset, system is okay. If DTC P0530 resets, go to step 2 .

DTC P0645: A/C COMPRESSOR CLUTCH RELAY

NOTE: For circuit reference, see **CONNECTOR IDENTIFICATION** and/or **WIRING DIAGRAMS** .

Circuit Description

Ignition voltage is supplied directly to the A/C compressor clutch relay. The Powertrain Control Module (PCM) controls the relay by grounding the control circuit through an internal solid state device called a driver. The primary function of the driver is to supply the ground for the component being controlled. Each driver has a fault line which is monitored by the PCM. When the PCM is commanding a component ON, the voltage of the control circuit should be near zero volts. When the PCM is commanding the control circuit to a component OFF, the voltage potential of the circuit should be near battery voltage. If the fault detection circuit senses a voltage other than what is expected, this DTC will set.

Conditions for Running the DTC

- The ignition voltage is 9.0-18.0 volts.
- The engine speed is more than 80 RPM.
- The PCM driver is activated.

Conditions for Setting the DTC

- The PCM detects an improper voltage level on the output circuit that controls the A/C

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

relay.

- The condition is present for at least 5 seconds.

Action Taken When the DTC Sets

- The PCM will not illuminate the Malfunction Indicator Lamp (MIL).
- The PCM stores the failure records.
- The A/C compressor clutch is disabled.

Conditions for Clearing the DTC

- The DTC will become history if the PCM no longer detects a failure.
- The history DTC will clear after 40 fault-free ignition cycles.
- The DTC can be cleared with a scan tool.

Diagnostic Procedure

1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** under SELF-DIAGNOSTIC SYSTEM. After diagnostic system check, go to next step.
2. Install scan tool. Turn ignition on. Using scan tool, command A/C Relay ON and OFF in PCM Special Functions, Engine Output Controls list. If A/C Relay turns ON and OFF with each command, problem is intermittent. Check wiring and connections. If A/C Relay does not turn ON and OFF with each command, go to next step.
3. Turn ignition off. Disconnect A/C compressor clutch relay located in under right hood electrical center. Turn ignition on. Using a test light connected to ground, probe A/C compressor clutch relay battery positive voltage circuit. If test light illuminates, go to next step. If test light does not illuminate, go to step 10 .
4. Connect a test light between A/C compressor clutch relay control circuit and battery positive voltage circuit. Using scan tool, command A/C Relay on and off. If test light turns on and off with each command, go to step [8](#) . If test light does not turn on and off with each command, go to next step.
5. If test light remains illuminated with each command, go to step 7 . If test light does not remain illuminated with each command, go to next step.
6. Check A/C compressor clutch relay control circuit for a short to voltage or an open. Repair circuit as necessary, then go to step 13 . If circuit is okay, go to step 9 .
7. Check A/C compressor clutch relay control circuit for a short to ground. Repair circuit as necessary, then go to step 13 . If circuit is okay, go to step 9 .
8. Inspect A/C compressor clutch relay for loose wires and/or poor connections. Repair as necessary, then go to step 13 . If wiring and connections are okay, go to step 11 .
9. Inspect PCM harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 13 . If wiring and connections are okay, go to step 12 .
10. Repair A/C compressor clutch relay battery positive voltage circuit. After repairs are

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

complete, go to step 13 .

11. Replace A/C compressor clutch relay located in under right side hood electrical center. After repairs are complete, go to step 13 .
12. Replace and reprogram PCM. See POWERTRAIN CONTROL MODULE under **COMPUTERIZED ENGINE CONTROLS** in REMOVAL, OVERHAUL & INSTALLATION article in ENGINE PERFORMANCE.
13. Use scan tool to clear DTCs. Start engine. Check for DTCs. If DTC P0645 does not reset, system is okay. If DTC P0645 resets, go to step 2 .

DTC P1539: A/C COMPRESSOR CLUTCH RELAY

NOTE: For circuit reference, see **CONNECTOR IDENTIFICATION** and/or **WIRING DIAGRAMS** .

Circuit Description

The Powertrain Control Module (PCM) will activate the A/C clutch relay when the PCM detects that A/C has been requested. When the PCM activates the relay, voltage should be present at both the A/C compressor clutch and the A/C compressor clutch supply voltage circuit at the PCM. If voltage is detected when A/C is not requested this DTC sets.

Conditions for Running the DTC

Ignition is on.

Conditions for Setting the DTC

- The PCM detects a voltage on the A/C compressor clutch supply voltage circuit when the A/C is not requested.
- The condition is present for at least 20 seconds.

Action Taken When the DTC Sets

- The PCM will not illuminate the Malfunction Indicator Lamp (MIL).
- The PCM stores the failure records.
- The A/C compressor clutch is disabled.

Conditions for Clearing the DTC

- The DTC will become history if the PCM no longer detects a failure.
- The history DTC will clear after 40 fault-free ignition cycles.
- The DTC can be cleared with a scan tool.

Diagnostic Procedure

1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** under SELF-DIAGNOSTIC SYSTEM. After diagnostic system check, go to next step.

NOTE: If DTC P0645 is also set, diagnose that code first.

2. Install scan tool. Start engine. Turn A/C system off and let engine idle. Using scan tool, observe A/C REQUEST SIGNAL and A/C RELAY COMMAND parameters in the Powertrain, Engine Data 2 list. If A/C REQUEST SIGNAL displays YES and A/C RELAY COMMAND displays ON when A/C is not requested, go to **TEST A: A/C COMPRESSOR CLUTCH DOES NOT DISENGAGE** or **TEST B: A/C COMPRESSOR CLUTCH DOES NOT ENGAGE**. If A/C REQUEST SIGNAL displays NO and A/C RELAY COMMAND displays OFF when A/C is not requested, go to next step.
3. Using scan tool, observe A/C CLUTCH FEEDBACK SIGNAL parameter in Powertrain, Engine Data 2 list. If A/C CLUTCH FEEDBACK SIGNAL parameter displays ON, go to next step. If A/C CLUTCH FEEDBACK SIGNAL parameter displays OFF, problem is intermittent. Check wiring and connections.
4. Remove A/C compressor clutch relay located in under right side hood electrical center. If A/C CLUTCH FEEDBACK SIGNAL parameter displays OFF, go to step 6. If A/C CLUTCH FEEDBACK SIGNAL parameter displays ON, go to next step.
5. Check A/C compressor clutch supply voltage circuit for a short to voltage. Repair circuit as necessary, then go to step 8. If circuit is okay, go to step 7.
6. Replace A/C compressor clutch relay located in under right side hood electrical center. After repairs are complete, go to step 8.
7. Replace and reprogram PCM. See POWERTRAIN CONTROL MODULE under **COMPUTERIZED ENGINE CONTROLS** in REMOVAL, OVERHAUL & INSTALLATION article in ENGINE PERFORMANCE.
8. Use scan tool to clear DTCs. Turn ignition on. Check for DTCs. If DTC P1539 does not reset, system is okay. If DTC P1539 resets, go to step 2.

DTC P1546: A/C COMPRESSOR CLUTCH RELAY

NOTE: For circuit reference, see **CONNECTOR IDENTIFICATION** and/or **WIRING DIAGRAMS**.

Circuit Description

The Powertrain Control Module (PCM) will activate the A/C clutch relay when the PCM detects that A/C has been requested. When the PCM activates the relay, voltage should be present at both the A/C compressor clutch and the A/C compressor clutch supply voltage circuit at the PCM. If voltage is not detected when A/C is requested this DTC sets.

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

Conditions for Running the DTC

Ignition is on.

Conditions for Setting the DTC

- The PCM detects that A/C has been requested.
- The PCM commands the A/C compressor clutch driver.
- The PCM does not detect a voltage on the A/C compressor clutch supply voltage circuit that supplies voltage to the A/C compressor clutch.
- The condition is present for at least 20 seconds.

Action Taken When the DTC Sets

- The PCM will not illuminate the Malfunction Indicator Lamp (MIL).
- The PCM stores the failure records.
- The A/C compressor clutch is disabled.

Conditions for Clearing the DTC

- The DTC will become history if the PCM no longer detects a failure.
- The history DTC will clear after 40 fault-free ignition cycles.
- The DTC can be cleared with a scan tool.

Diagnostic Procedure

1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** under SELF-DIAGNOSTIC SYSTEM. After diagnostic system check, go to next step.

NOTE: If DTC P0645 is also set, diagnose that code first.

2. Install a scan tool. Start engine. Turn A/C on and let engine idle for 5 minutes. Using scan tool, observe A/C CLUTCH FEEDBACK SIGNAL parameter in Powertrain, Engine Data 2 list. If A/C CLUTCH FEEDBACK SIGNAL parameter displays ON when A/C clutch is engaged, problem is intermittent. Check wiring and connections. If A/C CLUTCH FEEDBACK SIGNAL parameter displays ON when A/C clutch is engaged, go to next step.
3. Turn ignition Off. Disconnect A/C compressor clutch relay from electrical center No. 2. Turn ignition on. Using a test light connected to ground, probe ignition 1 voltage circuit at A/C compressor relay terminal. If test light illuminates, go to next step. If test light does not illuminate, go to step 9 .
4. Install a 10-amp fused jumper wire between ignition 1 voltage circuit and A/C compressor clutch supply voltage circuit. If A/C compressor clutch engages, go to next

step. If A/C compressor clutch does not engage, go to step 10 .

NOTE: **Fused jumper wire should still be installed with ignition on.**

5. Using scan tool, observe A/C CLUTCH FEEDBACK SIGNAL parameter. If scan tool indicates A/C CLUTCH FEEDBACK SIGNAL parameter is ON, go to step 7 . If scan tool indicates A/C CLUTCH FEEDBACK SIGNAL parameter is OFF, go to next step.
6. Check for an open or high resistance in A/C compressor clutch supply voltage circuit. Repair circuit as necessary, then go to step 13 . If circuit is okay, go to step 8 .
7. Inspect A/C compressor relay for loose wires and/or poor connections. Repair as necessary, then go to step 13 . If wiring and connections are okay, go to step 11 .
8. Inspect PCM harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 13 . If wiring and connections are okay, go to step 12 .
9. Repair ignition 1 voltage circuit of A/C compressor clutch relay. After repair, go to step 13 .
10. Repair A/C compressor clutch supply voltage circuit between A/C compressor clutch relay and A/C compressor clutch. After repair, go to step 13 .
11. Replace A/C compressor clutch relay located in under right side hood electrical center. After replacement, go to step 13 .
12. Replace and reprogram PCM. See POWERTRAIN CONTROL MODULE under **COMPUTERIZED ENGINE CONTROLS** in REMOVAL, OVERHAUL & INSTALLATION article in ENGINE PERFORMANCE.
13. Use scan tool to clear DTCs. Turn ignition on. Check for DTCs. If DTC P1546 does not reset, system is okay. If DTC P1546 resets, go to step 2 .

SYSTEM TESTS

A/C PRESSURE ZONE "A" DIAGNOSIS

WARNING: Avoid contact with moving parts and hot surfaces while working around a running engine in order to prevent physical injury.

1. Were you sent here from the A/C PERFORMANCE TEST? If so, go to next step. If not, see A/C SYSTEM PERFORMANCE TEST under PERFORMANCE TESTS.
2. Refer to the air outlet temperatures recorded during the A/C PERFORMANCE TEST. Is there a 2-3°F difference or more in the discharge air temperature between the right and left center I/P outlets? If so, go to step [7](#) . If not, go to next step.
3. Did the customer concern mention that the A/C system output temperatures are good at first, but then turn warm during extended drives? If so, go to next step. If not, go to step 5 .

4. Increase engine speed to 2000 RPM. During extended operation of the A/C system, does the low side pressure decrease, possibly accompanied by heavy frost on the liquid line between the orifice tube and the evaporator? If so, See **A/C PRESSURE ZONE "D" DIAGNOSIS** . If not, go to next step.
5. Refer to the pressures recorded during the A/C SYSTEM PERFORMANCE TEST. Inspect for the following conditions:
 - The high side pressure slightly above the specified pressure ranges but still within zone A on the A/C Pressure-Zone Classification Chart. See **Fig. 3** .
 - The discharge line is hot.
 - The suction line is cool.

Do the listed conditions exist? If so, go to step 7 . If not, go to next step.

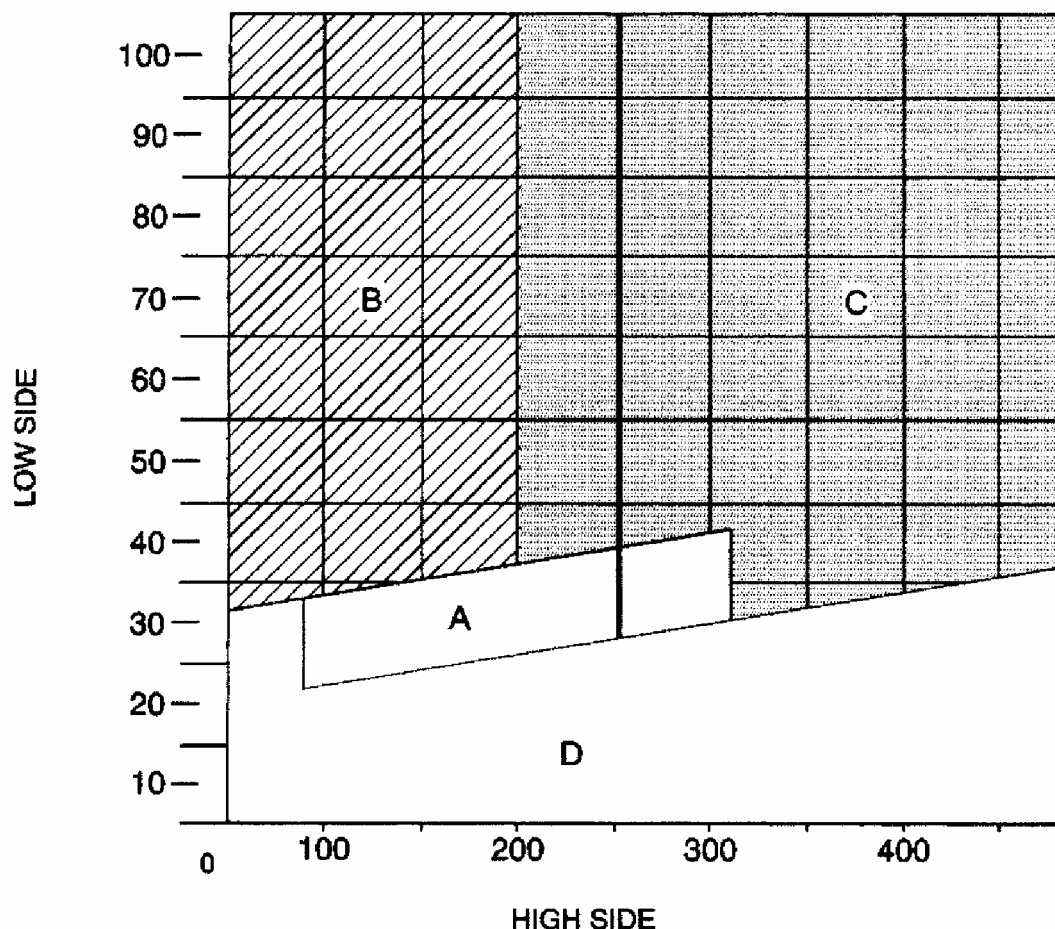
6. Refer to the pressures recorded during the A/C SYSTEM PERFORMANCE TEST. Inspect for the following conditions:
 - The low side pressure slightly lower than the specified pressure ranges but still within zone A on the A/C Pressure-Zone Classification Chart in the A/C System Performance Test. See **Fig. 3** .
 - The discharge line is warm-to-hot.
 - The suction line is cool-to-warm.

Do the listed conditions exist? If so, go to step 8 . If not, see **TOO HOT IN VEHICLE** in SYMPTOM TESTS.

7. The A/C system may be undercharged. Leak test A/C system. See LEAK TESTING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING. Recharge the A/C system to specifications. See RECOVERY, EVACUATION & RECHARGING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING. After repairs are complete, go to step 14 .
8. The A/C system may be contaminated. View the ACR 2000 Air Conditioning Service Center information screen for detection of foreign gases in the A/C system. Do foreign gases exist? If so, go to next step. If not, go to step 10 .
9. Evacuate the A/C system to a scavenging tank. See RECOVERY, EVACUATION & RECHARGING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING. Recharge the A/C system to specifications. After repairs are complete, go to step 14 .
10. The A/C system may contain too much moisture or air. Evacuate and recharge the A/C system to specifications. See RECOVERY, EVACUATION & RECHARGING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING. Operate the A/C system and check the outlet air temperatures. See **A/C SYSTEM PERFORMANCE TEST** under PERFORMANCE TESTS. Are the outlet temperatures within the specified ranges of the A/C Performance Test Table? If so, go to step 15 . If not, go to next step.
11. The A/C system may contain too much refrigerant oil. Recover the refrigerant from the

A/C system. See **RECOVERY, EVACUATION & RECHARGING** in **GENERAL SERVICING PROCEDURES** article in **GENERAL SERVICING**. Remove the accumulator. See **ACCUMULATOR** in **REMOVAL & INSTALLATION**. Drain and measure the refrigerant oil from the accumulator. Was there more than 5 oz. (148 ml.) of refrigerant oil drained from the accumulator? If so, go to next step. If not, go to step 13 .

12. Reinstall the accumulator. See **ACCUMULATOR** in **REMOVAL & INSTALLATION**. Flush the A/C system. See **FLUSHING PROCEDURES** in **GENERAL SERVICING PROCEDURES** article in **GENERAL SERVICING**. Add the specified amount of refrigerant oil to the accumulator. See **SPECIFICATIONS** . Recharge the A/C system. See **RECOVERY, EVACUATION & RECHARGING** in **GENERAL SERVICING PROCEDURES** article in **GENERAL SERVICING**. After repairs are complete, go to step 14 .
13. Add the specified amount of refrigerant oil to the accumulator. See **SPECIFICATIONS** . Install the accumulator. See **ACCUMULATOR** in **REMOVAL & INSTALLATION**. Recharge the A/C system. See **RECOVERY, EVACUATION & RECHARGING** in **GENERAL SERVICING PROCEDURES** article in **GENERAL SERVICING**. After repairs are complete, go to next step.
14. Record the low and high side pressures and the I/P outlet air temperature. Compare the outlet temperatures to those listed in the Performance Definitions table. See **A/C PERFORMANCE SPECIFICATIONS** table. Are the high and low side pressures and outlet temperatures within specifications? If so, go to next step. If not, See **A/C SYSTEM PERFORMANCE TEST** under **PERFORMANCE TESTS**.
15. Operate the system in order to verify the repair Did you correct the condition? If so, system is okay. If not, go to **SYMPTOM DIAGNOSIS** under **TROUBLE SHOOTING**.



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Fig. 3: A/C Pressure Zone Classification Chart
Courtesy of GENERAL MOTORS CORP.

A/C PRESSURE ZONE "B" DIAGNOSIS

WARNING: Avoid contact with moving parts and hot surfaces while working around a running engine in order to prevent physical injury.

1. Were you sent here from the A/C SYSTEM PERFORMANCE TEST? If so, go to next step. If not, see **A/C SYSTEM PERFORMANCE TEST** under PERFORMANCE TESTS.
2. After continued operation of the A/C system, do the low and high side pressures equalize or become static? If so, go to step 5. If not, go to next step.
3. Refer to the pressures recorded during the A/C PERFORMANCE TEST. Inspect for the following conditions:
 - The low side pressure equal to or above the specified pressure range of the A/C

Performance Table. See **A/C PERFORMANCE SPECIFICATIONS** table.

- The high side pressure is below the specified pressure range of the A/C Performance Table. See **A/C PERFORMANCE SPECIFICATIONS** table.
- The low side refrigerant line at the compressor feels cool-to-warm.
- The high side refrigerant line at the compressor feels warm-to-hot.

Do the listed conditions exist? If so, go to step 5 . If not, go to next step.

4. Refer to the pressures recorded during the A/C PERFORMANCE TEST. Inspect for the following conditions:

- The low side pressure is above the specified pressure range of the A/C Performance Table. See **A/C PERFORMANCE SPECIFICATIONS** table.
- The high side pressure is below the specified pressure range of the A/C Performance Table. See **A/C PERFORMANCE SPECIFICATIONS** table.
- The low side refrigerant line at the compressor feels warm.
- The high side refrigerant line at the compressor feels warm to hot.

Do the listed conditions exist? If so, go to next step. If not, go to **A/C SYSTEM PERFORMANCE TEST** .

5. The A/C system has a low refrigerant charge. Evacuate and recharge the A/C system. See RECOVERY, EVACUATION & RECHARGING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING. After repairs are complete, go to next step.
6. Record the low and high side pressures as well as the I/P outlet air temperature after repairs are performed. Compare the pressures and outlet temperature to those listed in the A/C Performance Chart. See **Fig. 3** . Are the readings within the specified ranges? If so, go to step 13 . If not, go to next step.
7. The A/C compressor is malfunctioning. Remove the orifice tube and inspect for contamination. See **ORIFICE TUBE** in REMOVAL & INSTALLATION. Are there metal flakes on the orifice tube? If so, go to step 9 . If not, go to next step.
8. Inspect the orifice tube for a Brown, powdery residue indicating desiccant in the A/C system. Is there a Brown, powdery residue present? If so, go to step 11 . If not, go to step 12 .
9. Remove the compressor hose from the compressor. See **COMPRESSOR HOSE ASSEMBLY** in REMOVAL & INSTALLATION. Inspect for metal flake contamination at the line connections and the compressor ports. Is there metal flake contamination present? If so, go to next step.
10. Replace the A/C compressor. See **COMPRESSOR** under REMOVAL & INSTALLATION. Install an A/C refrigerant filter. See **REFRIGERANT FILTER (INSTALLATION)** under REMOVAL & INSTALLATION. Replace the orifice tube. See **ORIFICE TUBE** under REMOVAL & INSTALLATION. Evacuate and recharge the A/C system. See RECOVERY, EVACUATION & RECHARGING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING. After repairs are

complete, go to step 13 .

11. Flush the A/C system. See **FLUSHING PROCEDURES** in **GENERAL SERVICING PROCEDURES** article in **GENERAL SERVICING**. Replace the orifice tube. See **ORIFICE TUBE** under **REMOVAL & INSTALLATION**. Replace the A/C compressor. See **COMPRESSOR** under **REMOVAL & INSTALLATION**. Replace the accumulator. See **ACCUMULATOR** in **REMOVAL & INSTALLATION**. Evacuate and recharge the A/C system. See **RECOVERY, EVACUATION & RECHARGING** in **GENERAL SERVICING PROCEDURES** article in **GENERAL SERVICING**. After repairs are complete, go to step 13 .
12. Replace the A/C compressor. See **COMPRESSOR** in **REMOVAL & INSTALLATION**. Evacuate and recharge the A/C system. See **RECOVERY, EVACUATION & RECHARGING** in **GENERAL SERVICING PROCEDURES** article in **GENERAL SERVICING**. After repairs are complete, go to next step.
13. Operate the system in order to verify the repair Did you correct the condition? If so, system is okay. If not, go to **SYMPTOM DIAGNOSIS** under **TROUBLE SHOOTING**.

A/C PRESSURE ZONE "C" DIAGNOSIS

WARNING: Avoid contact with moving parts and hot surfaces while working around a running engine in order to prevent physical injury.

1. Were you sent here from the A/C SYSTEM PERFORMANCE TEST? If so, go to next step. If not, see **A/C SYSTEM PERFORMANCE TEST** under **PERFORMANCE TESTS**.
2. With the engine idling, turn ON the A/C. Inspect for proper cooling fan operation. Are the cooling fans ON and operating properly? If so, go to next step. If not, go to step 5 .
3. Visually inspect for the following:
 - Restricted air flow.
 - Damaged condenser cooling fins.
 - Inspect for missing or misaligned air baffles.

Do the conditions exist? If so, go to next step. If not, go to step 6 .

4. Repair the air flow restriction. After repairs are complete, go to step 9 .
5. Repair the cooling fan operation fault. See appropriate **COOLING FANS** article in **ENGINE COOLING**. After repairs are complete, go to step 9 .
6. Feel the liquid line on both sides of the orifice tube. Is the temperature the same before and after the orifice tube? If so, go to next step. If not, go to step 8 .
7. Replace the damaged/faulty orifice tube. See **ORIFICE TUBE** under **REMOVAL & INSTALLATION**. After repairs are complete, go to step 9 .
8. Air is in the refrigerant system, or the system is overcharged. Refer to the view screen

on the ACR 2000 Air Conditioning Service Center for foreign gas content in the refrigerant. Recover and recharge the A/C system. See RECOVERY, EVACUATION & RECHARGING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING. After repairs are complete, go to next step.

9. Record the low and high side pressures and the I/P outlet air temperature after repairs are performed. Compare the pressures and outlet temperature to those listed in the A/C Performance Chart. See **Fig. 3** . Are the readings within the specified ranges? If so, go to next step. If not, go to **A/C SYSTEM PERFORMANCE TEST** under PERFORMANCE TESTS.
10. Operate the system in order to verify the repair Did you correct the condition? If so, system is okay. If not, go to **SYMPTOM DIAGNOSIS** under TROUBLE SHOOTING.

A/C PRESSURE ZONE "D" DIAGNOSIS

WARNING: Avoid contact with moving parts and hot surfaces while working around a running engine in order to prevent physical injury.

1. Were you sent here from the A/C SYSTEM PERFORMANCE TEST? If so, go to next step. If not, see **A/C SYSTEM PERFORMANCE TEST** under PERFORMANCE TESTS.
2. Feel the liquid line before the orifice tube. Is the liquid line cold before the orifice tube? If so, go to next step. If not, go to step 8 .
3. Feel along the surfaces of the following high side components for a sudden drop in temperature. The high side components should feel warm/hot from the compressor all the way to the orifice tube.
 - The compressor discharge hose.
 - The condenser.
 - The liquid line between the condenser and the orifice tube.

Is there an abrupt drop in temperature noted along the surfaces of any of the listed components? If so, go to step 7 . If not, go to next step.

4. Feel the liquid line at the orifice tube location for extreme cold, possibly accompanied by heavy frost. Feel along the liquid line after the orifice tube location for warm temperature. Is the liquid line extremely cold at the orifice tube location and warm after the orifice tube location? If so, go to step 11 . If not, go to next step.
5. Feel along the surfaces of the following low side components for a sudden change in temperature.
 - The evaporator inlet tube between the orifice tube and the evaporator core.
 - The evaporator outlet tube between the evaporator core and the compressor.
 - The accumulator.

- The compressor suction hose.

Is there an abrupt temperature change felt along the surfaces of any of the listed components? If so, go to step 7 . If not, go to next step.

6. Feel along the surfaces of low and high side components to compare the overall temperatures.
 - The evaporator inlet tube between the orifice tube and the evaporator core.
 - The evaporator outlet tube between the evaporator core and the accumulator.
 - The accumulator.
 - The compressor suction hose.
 - The compressor discharge hose.
 - The condenser.
 - The evaporator inlet tube between the condenser and the orifice tube.

Are the overall temperatures of the low and high side components close to the same, both only mildly warm? If so, go to step 14 . If not, go to step 8 .

7. Recover the refrigerant. See RECOVERY, EVACUATION & RECHARGING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING. Remove the restriction from the component, or replace the component which produced an abrupt temperature drop. After repairs are complete, go to step 9 .
8. Recover the refrigerant and evacuate the system. See RECOVERY, EVACUATION & RECHARGING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING. Record the weight of the recovered refrigerant. Is the weight of the recovered refrigerant charge equal to or above 1.12 lbs. (0.51 kg)? If so, go to next step. If not, go to next step.
9. Recharge the A/C system. Is the cooling performance improved? If so, go to step 21 . If not, go to next step.
10. Leak test the system. See LEAK TESTING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING. Repair any leaks. After repairs are complete, go to step 21 .
11. The orifice tube is restricted. See **ORIFICE TUBE** under REMOVAL & INSTALLATION. If the orifice tube was restricted, note the type of debris present. Are there metal flakes present? If so, go to next step. If not, go to step 13 .
12. Remove the compressor hose assembly from the vehicle. See **COMPRESSOR HOSE ASSEMBLY** under REMOVAL & INSTALLATION. Inspect the hose/line for debris by blowing shop air through one end of the hose while covering the other end with a shop towel. Note the amount of debris collected in the shop towel. Is there a large amount of debris collected in the shop towel? If so, go to step 18 . If not, go to step 20 .
13. If the orifice tube was restricted with a Brown/Black residue, perform the following:
 - Flush the A/C system. See FLUSHING PROCEDURES in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING.

- Replace the accumulator. See **ACCUMULATOR** under REMOVAL & INSTALLATION.

After repairs are complete, go to step 21 .

14. Recover the refrigerant. See RECOVERY, EVACUATION & RECHARGING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING. Disconnect the compressor hose from the compressor. See **COMPRESSOR HOSE ASSEMBLY** under REMOVAL & INSTALLATION. Inspect for the presence of debris in the compressor suction port. Is there debris present in the compressor suction port? If so, go to next step. If not, go to step 19 .
15. Remove the debris from the suction port. Inspect the orifice tube for damage or debris. See **ORIFICE TUBE** under REMOVAL & INSTALLATION. Is there evidence of damage or debris? If so, go to step 17 . If not, go to next step.
16. If the orifice tube does not show any signs of damage or debris, remove the compressor hose assembly from the vehicle. See **COMPRESSOR HOSE ASSEMBLY** under REMOVAL & INSTALLATION. Inspect the hose/line for debris by blowing shop air through one end of the hose while covering the other end with a shop towel. Note the amount of debris collected in the shop towel. Is there a large amount of debris collected in the shop towel? If so, go to step 18 . If not, go to step 19 .
17. Replace the orifice tube. See **ORIFICE TUBE** under REMOVAL & INSTALLATION. If the orifice tube was restricted, note the type of debris present. Are there metal flakes present? If so, go to step 12 . If not, go to step 13 .
18. If there was a large amount of debris collected in the shop towel from the compressor hose assembly, replace the accumulator. See **ACCUMULATOR** in REMOVAL & INSTALLATION. Install an A/C refrigerant filter. See **REFRIGERANT FILTER (INSTALLATION)** under REMOVAL & INSTALLATION. After repairs are complete, go to next step.
19. Install the compressor hose assembly. See **COMPRESSOR HOSE ASSEMBLY** under REMOVAL & INSTALLATION. After repairs are complete, go to step 21 .
20. Install the compressor hose assembly. See **COMPRESSOR HOSE ASSEMBLY** under REMOVAL & INSTALLATION. Install an A/C refrigerant filter. See **REFRIGERANT FILTER (INSTALLATION)** under REMOVAL & INSTALLATION. Recharge the A/C system. See RECOVERY, EVACUATION & RECHARGING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING. After repairs are complete, go to next step.
21. Record the low and high side pressures and the I/P outlet air temperature after repairs are performed. Compare the pressures and outlet temperature to those listed in the A/C Performance Chart. See **Fig. 3** . Are the readings within the specified ranges? If so, go to next step. If not, go to **A/C SYSTEM PERFORMANCE TEST** under PERFORMANCE TESTS.
22. Operate the system in order to verify the repair Did you correct the condition? If so, system is okay. If not, go to **SYMPTOM DIAGNOSIS** under TROUBLE

SHOOTING.

VACUUM CONTROL SYSTEM DIAGNOSTICS

1. Start the engine. Turn the blower motor fan ON and select an air outlet mode. Does air flow out of the selected HVAC outlet ducts? If so, go to step 3 . If not, go to next step.
2. Did the customer concern mention that the air discharges out the correct ducts at first, but then changes during higher engine RPM? If so, go to step 7 . If not, go to next step.
3. With the engine running, cycle the HVAC controls through all the modes. Does the air come out of the selected outlet ducts? If so, go to step 18 . If not, go to next step.
4. With the engine running, take a vacuum reading at the manifold vacuum port that supplies vacuum to the vacuum control assembly. Is there engine vacuum? If so, go to step 6 . If not, go to next step.
5. Repair the no vacuum condition. After repairs are complete, go to step 19 .
6. Take a vacuum reading at the vacuum supply line at the vacuum control assembly. Is the vacuum reading the same as the engine vacuum? If so, go to step 11 . If not, go to step 8 .
7. Disconnect the vacuum supply line from the vacuum control assembly. With the vacuum gage connected to the vacuum supply line, re-start the engine and turn the engine OFF. Does the system lose vacuum after turning OFF the engine? If so, go to next step. If not, go to step 11 .
8. Inspect for leaking or collapsed vacuum lines between the engine manifold vacuum port and the vacuum control assembly. Are the vacuum lines leaking? If so, go to next step. If not, go to step 10 .
9. Repair or replace the collapsed or leaking vacuum line. After repairs are complete, go to step 19 .
10. Replace the vacuum reservoir tank. See **VACUUM RESERVOIR** under REMOVAL & INSTALLATION. After repairs are complete, go to step 19 .
11. Using an external vacuum source, apply vacuum to the appropriate vacuum line at the vacuum control assembly connector. See **VACUUM DIAGRAMS** . Does the actuator retract? If so, go to step 17 . If not, go to next step.
12. Inspect for leaking or collapsed vacuum lines between the actuator and the vacuum control assembly connector. Are the vacuum lines leaking? If so, go to step 9 . If not, go to next step.
13. Disconnect the vacuum line from the actuator. Apply an external vacuum source to the actuator. Did the actuator retract? If so, go to next step. If not, go to step 16 .
14. With the actuator disconnected, inspect the door for. Does the door move freely? If so, go to step 16 . If not, go to next step.
15. Repair the binding door. See **DEFROSTER DOOR** , **MODE DOOR** , **RECIRCULATION DOOR** and **HEATER DOOR** under REMOVAL & INSTALLATION. After repair are complete, go to step 19 .

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

16. Replace the vacuum actuator. See **DEFROSTER ACTUATOR , MODE ACTUATOR** and **RECIRCULATION ACTUATOR** under REMOVAL & INSTALLATION. After repairs are complete, go to step 19 .
17. Test the operation of the vacuum control assembly. See **AIR DELIVERY IMPROPER** under SYMPTOM TESTS. Is the vacuum control assembly operating properly? If so, go to step 19 . If not, go to next step.
18. Replace the vacuum control assembly. See **VACUUM CONTROL ASSEMBLY** under REMOVAL & INSTALLATION. After the repairs are complete, go to next step.
19. Cycle the HVAC controls through all modes to verify proper operation. Did you correct the condition? If so, system is okay. If not, go to step 1 .

SYMPTOM TESTS

SYMPTOM TEST INDEX

Symptom	Perform Test
A/C Compressor Clutch Does Not Disengage	<u>A</u>
A/C Compressor Clutch Does Not Engage	<u>B</u>
Air Delivery Improper	<u>C</u>
Air Recirculation Malfunction	<u>D</u>
Blower Motor Always On	<u>E</u>
Blower Motor Inoperative	<u>F</u>
Blower Motor Malfunction	<u>G</u>
Defrosting Insufficient	<u>H</u>
Too Cold In Vehicle	<u>I</u>
Too Hot In Vehicle	<u>J</u>

TEST A: A/C COMPRESSOR CLUTCH DOES NOT DISENGAGE

NOTE: For circuit reference, see **CONNECTOR IDENTIFICATION** and/or **WIRING DIAGRAMS** .

1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** under SELF-DIAGNOSTIC SYSTEM. After diagnostic system check, go to next step.
2. Start engine. Place blower motor switch in OFF position. Place A/C request switch in OFF position. If A/C compressor operates, go to next step. If A/C compressor does not operate, problem is intermittent. Check wiring and connections.
3. Using scan tool, observe A/C RELAY COMMAND parameter in Powertrain data list. If scan tool indicates A/C RELAY COMMAND parameter is ON, go to next step. If scan tool indicates A/C RELAY COMMAND parameter is OFF, go to step 5 .
4. Using scan tool, observe A/C REQUEST SIGNAL parameter in Powertrain data list. If scan tool indicates A/C REQUEST SIGNAL parameter is YES, go to step 10 . If scan

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

tool indicates A/C REQUEST SIGNAL parameter is NO, go to step 11 .

5. Remove A/C compressor clutch relay. If A/C compressor clutch turns OFF, go to next step. If A/C compressor clutch does not turn OFF, go to step 8 .
6. Measure resistance between switch side A/C compressor clutch relay terminals. If resistance measurement equals infinity, go to next step. If resistance measurement does not equal infinity, go to step 9 .
7. Check for a short to ground in A/C clutch relay control circuit. Repair circuit as necessary, then go to step 16 . If circuit is okay, go to step 11 .
8. Check for a short to voltage in A/C compressor clutch supply voltage circuit. Repair circuit as necessary, then go to step 16 . If circuit is okay, go to step 13 .
9. Inspect A/C compressor clutch relay for loose wires and/or poor connections. Repair as necessary, then go to step 16 . If circuit is okay, go to step 12 .
10. Inspect HVAC control module harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 16 . If circuit is okay, go to step 14 .
11. Inspect PCM harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 16 . If circuit is okay, go to step 15 .
12. Replace A/C compressor clutch relay located in under right side hood electrical center. After repairs are complete, go to step 16 .
13. Replace A/C compressor clutch. See COMPRESSOR SERVICING article in GENERAL SERVICING. After repairs are complete, go to step 16 .
14. Replace HVAC control module. See **HVAC CONTROL ASSEMBLY** under REMOVAL & INSTALLATION. After repairs are complete, go to step 16 .
15. Replace and reprogram PCM. See POWERTRAIN CONTROL MODULE under **COMPUTERIZED ENGINE CONTROLS** in REMOVAL, OVERHAUL & INSTALLATION article in ENGINE PERFORMANCE.
16. Operate system to verify repair. If system does not operate properly, go to step 3 . If system operates properly, test is complete.

TEST B: A/C COMPRESSOR CLUTCH DOES NOT ENGAGE

NOTE: For circuit reference, see **CONNECTOR IDENTIFICATION** and/or **WIRING DIAGRAMS** .

1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** under SELF-DIAGNOSTIC SYSTEM. After diagnostic system check, go to next step.
2. Install scan tool. Start engine. Using scan tool, observe ENGINE COOLANT TEMPERATURE (ECT) parameter in Powertrain data list. If scan tool indicates ECT parameter is less than 250°F (121°C), go to next step. If scan tool indicates ECT parameter is greater than 250°F (121°C), check engine for overheating condition and repair as necessary.

NOTE: For A/C compressor operation, ambient air temperature must be greater than 38°F (3°C).

3. Start the engine. Place blower motor switch in maximum speed position. Place A/C request switch in ON position. Place air temperature switch in coldest position. If A/C compressor operates, problem is intermittent. Check wiring and connections. If A/C compressor does not operate, go to next step.
4. Perform A/C performance test. See **A/C PERFORMANCE TEST** under PERFORMANCE TESTS. After A/C System Performance is complete, go to next step.
5. Turn ignition on. Using scan tool, observe A/C HIGH SIDE PRESSURE parameter in Powertrain data list. Compare A/C HIGH SIDE PRESSURE parameter on scan tool to high side pressure value on manifold gauge set. If pressure values are within 15 psi (1.1 kg/cm) of each other, go to next step. If pressure values are not within 15 psi (1.1 kg/cm) of each other, go to step 16 .
6. If HVAC control module is inoperative, go to step 15 . If HVAC control module is operative, go to next step.
7. Start engine. Using scan tool, observe A/C REQUEST SIGNAL parameter in Powertrain data list. Place air temperature switch in coldest position. Place A/C request switch in ON position. If scan tool indicates A/C REQUEST SIGNAL parameter is YES, go to next step. If scan tool indicates A/C Request Signal parameter is NO, go to step 27 .
8. Using scan tool, observe A/C RELAY COMMAND status in Powertrain data list. If scan tool indicates A/C RELAY COMMAND status is ON, go to next step. If scan tool indicates A/C RELAY COMMAND status is OFF, go to step 28 .
9. Using scan tool, command A/C compressor clutch relay ON and OFF. If A/C compressor clutch relay turns ON and OFF with each command, go to step 13 . If A/C compressor clutch relay does not turn ON and OFF with each command, go to next step.
10. Turn ignition off. Disconnect A/C compressor clutch relay. Turn ignition on. Using a test light connected to ground, probe A/C compressor clutch relay coil side voltage supply circuit. See **WIRING DIAGRAMS** . If test light illuminates, go to next step. If test light does not illuminate, go to step 23 .
11. Connect a test light between A/C compressor clutch relay control circuit and coil side voltage supply circuit. Using scan tool, command A/C compressor clutch relay ON and OFF. If test light turns ON and OFF with each command, go to step 25 . If test light does not turn ON and OFF with each command, go to next step.
12. If test light remains illuminated with each command, go to step 19 . If test light does not remain illuminated with each command, go to step 18 .
13. Turn ignition off. Disconnect A/C compressor clutch relay. Using a test light connected to ground, probe A/C compressor clutch relay switch side voltage supply circuit. If test light illuminates, go to next step. If test light does not illuminate, go to step 22 .

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

14. Connect a 10-amp fused jumper wire between A/C compressor clutch relay switch side voltage circuit and A/C compressor clutch supply voltage circuit. Turn ignition on. If A/C compressor clutch engages, go to step 25 . If A/C compressor clutch does not engage, go to step 20 .
15. Check for a short to ground, a high resistance, or an open in HVAC control module ignition 3 voltage circuit. Repair circuit as necessary, then go to step 34 . If circuit is okay, go to step 17 .
16. Check for an open in A/C refrigerant pressure sensor low reference circuit. Repair circuit as necessary, then go to step 34 . If circuit is okay, go to step 24 .
17. Check for an open in HVAC control module ground circuit. Repair circuit as necessary, then go to step 34 . If circuit is okay, go to step 27 .
18. Check for an open in A/C compressor clutch relay control circuit. Repair circuit as necessary, then go to step 34 . If circuit is okay, go to step 28 .
19. Check for a short to ground in A/C compressor clutch relay control circuit. Repair circuit as necessary, then go to step 34 . If circuit is okay, go to step 28 .
20. Check for a short to ground, a high resistance, or an open in A/C compressor clutch supply voltage circuit. Repair circuit as necessary, then go to step 34 . If circuit is okay, go to next step.
21. Check for an open or high resistance in A/C compressor clutch ground circuit. Repair circuit as necessary, then go to step 34 . If circuit is okay, go to step 26 .
22. Repair A/C compressor clutch relay switch side voltage supply circuit. After repairs are complete, go to step 34 .
23. Repair A/C compressor clutch relay coil side voltage supply circuit. After repairs are complete, go to step 34 .
24. Inspect A/C high pressure sensor harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 34 . If wiring and connections are okay, go to step 29 .
25. Inspect A/C compressor clutch relay for loose wires and/or poor connections. Repair as necessary, then go to step 34 . If wiring and connections are okay, go to step 30 .
26. Inspect A/C compressor clutch harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 34 . If wiring and connections are okay, go to step 31 .
27. Inspect HVAC control module harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 34 . If wiring and connections are okay, go to step 32 .
28. Inspect PCM harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 34 . If wiring and connections are okay, go to step 33 .
29. Replace A/C refrigerant pressure sensor. See **A/C REFRIGERANT PRESSURE SENSOR** under REMOVAL & INSTALLATION. After repairs are complete, go to step 34 .

30. Replace A/C compressor clutch relay located in under right side hood electrical center. After repairs are complete, go to step 34 .
31. Replace A/C compressor clutch coil. See COMPRESSOR SERVICING article in GENERAL SERVICING. After repairs are complete, go to step 34 .
32. Replace HVAC control module. See **HVAC CONTROL ASSEMBLY** under REMOVAL & INSTALLATION. After repairs are complete, go to step 34 .
33. Replace and reprogram PCM. See POWERTRAIN CONTROL MODULE under **COMPUTERIZED ENGINE CONTROLS** in REMOVAL, OVERHAUL & INSTALLATION article in ENGINE PERFORMANCE.
34. Operate system to verify repair. If system does not operate properly, go to step 4 . If system operates properly, test is complete.

TEST C: AIR DELIVERY IMPROPER

NOTE: For circuit reference, see **CONNECTOR IDENTIFICATION** and/or **WIRING DIAGRAMS** .

1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** under SELF-DIAGNOSTIC SYSTEM. After diagnostic system check, go to next step.
2. Start engine. Place blower motor switch in OFF position. If blower motor is OFF, go to next step. If blower motor is ON, go to **TEST E: BLOWER MOTOR ALWAYS ON** .
3. Place blower motor switch in each speed position. If blower motor operates at all, go to next step. If blower motor does not operate at all, go to **TEST F: BLOWER MOTOR INOPERATIVE** .
4. If blower motor operates at desired speed in each speed position, go to next step. If blower motor does not operate at desired speed in each speed position go to **TEST G: BLOWER MOTOR MALFUNCTION** .
5. Install scan tool. Using scan tool, observe MODE BUTTON parameter in Heating and Air Conditioning data list. Activate mode switch. Observe FRONT DEFROST BUTTON parameter in Heating and Air Conditioning data list. Activate front defrost switch. If scan tool indicates both Mode Button and FRONT DEFROST Button parameters change state, go to next step. If scan tool indicates both Mode Button and Front Defrost Button parameters do not change state, go to step 15 .
6. Place blower motor switch in maximum speed position. Place mode switch in BI-LEVEL position. Place outside air switch in ON position. Place recirculation switch in ON position. If recirculation door operates properly, go to next step. If recirculation door does not operate properly, go to **TEST D: AIR RECIRCULATION MALFUNCTION** .
7. Place mode switch in each mode position. Place defrost switch in defrost position. If air flows from correct air distribution outlets in each mode position, problem is intermittent. Check wiring and connections. If air does not flow from correct air

distribution outlets in each mode position, go to next step.

8. Turn ignition on. Using scan tool, command each vacuum solenoid ON and OFF. If vacuum solenoid turns ON and OFF with each command, go to **VACUUM CONTROL SYSTEM DIAGNOSTICS** under SYSTEM TESTS. If vacuum solenoid does not turn ON and OFF with each command, go to next step.
9. Turn ignition off. Disconnect vacuum control assembly. Turn ignition on. Using a test light connected to ground, probe vacuum control assembly ignition 3 voltage circuit. If test light illuminates, go to next step. If test light does not illuminate, go to step 16 .
10. Measure voltage between vacuum control assembly ignition 3 voltage circuit and the applicable control circuit. Using scan tool, command applicable solenoid ON and OFF. If voltage measures near 12 volts when solenoid is commanded ON, and zero volts when solenoid is commanded OFF, go to step 14 . If voltage does not measure near 12 volts when solenoid is commanded ON, and zero volts when solenoid is commanded OFF, go to next step.
11. If voltage remains near 12 volts each command, go to step 13 . If voltage does not remain near 12 volts each command, go to next step.
12. Check for a short to voltage or an open in appropriate control circuit of vacuum control assembly. Repair circuit as necessary, then go to step 19 . If circuit is okay, go to step 15 .
13. Check for a short to ground in appropriate control circuit of vacuum control assembly. Repair circuit as necessary, then go to step 19 . If circuit is okay, go to next step.
14. Inspect vacuum control assembly for loose wires and/or poor connections. Repair as necessary, then go to step 19 . If wiring and connections are okay, go to step 17 .
15. Inspect HVAC control module harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 19 . If wiring and connections are okay, go to step 18
16. Repair vacuum control assembly ignition 3 voltage circuit. After repairs are complete, go to step 19 .
17. Replace vacuum control assembly. See **VACUUM CONTROL ASSEMBLY** under REMOVAL & INSTALLATION. After repairs are complete, go to step 19 .
18. Replace HVAC control module. See **HVAC CONTROL ASSEMBLY** under REMOVAL & INSTALLATION. After repairs are complete, go to next step.
19. Operate system to verify repair. If system does not operate properly, go to step 2 . If system operates properly, test is complete.

TEST D: AIR RECIRCULATION MALFUNCTION

NOTE: For circuit reference, see **CONNECTOR IDENTIFICATION** and/or **WIRING DIAGRAMS** .

1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** under

SELF-DIAGNOSTICS. After diagnostic system check, go to next step.

2. Install scan tool. Using scan tool, observe OUTSIDE AIR BUTTON parameter in Heating and Air Conditioning data list. Activate outside air switch. Using scan tool, observe RECIRCULATE BUTTON parameter in Heating and Air Conditioning data list. Activate recirculation switch. If scan tool indicates both Outside Air Button and Recirculate Button parameters change state, go to next step. If scan tool indicates both Outside Air Button and Recirculate Button parameters do not change state, go to step 11 .
3. Start engine. Place blower motor switch in maximum speed position. Place mode switch in bi-level position. Place outside air switch in ON position. Place recirculation switch in ON position. If recirculation door operates properly, problem is intermittent. Check wiring and connections. If recirculation door does not operate properly, go to next step.
4. Using scan tool, command Recirculation Mode Valve Solenoid (SOL. 4-AIR INLET) ON and OFF. If recirculation mode valve solenoid turns ON and OFF, go to **VACUUM CONTROL SYSTEM DIAGNOSTIC** under SYSTEM TESTS. If recirculation mode valve solenoid does not turn ON and OFF, go to next step.
5. Turn ignition off. Disconnect vacuum control assembly. Turn ignition on. Using a test light connected to ground, probe vacuum control assembly ignition 3 voltage circuit. If test light illuminates, go to next step. If test light does not illuminate, go to step 12 .
6. Measure voltage between vacuum control assembly ignition 3 voltage circuit and recirculation mode valve solenoid control circuit. Using scan tool, command Recirculation Mode Valve Solenoid ON and OFF. If voltage measures near 12 volts when solenoid is commanded ON, and zero volt when solenoid is commanded OFF, go to step 10 . If voltage does not measure near 12 volts when solenoid is commanded ON, and zero volt when solenoid is commanded OFF, go to next step.
7. If voltage remains near 12 volts each command, go to step 9 . If voltage does not remain near 12 volts each command, go to next step.
8. Check for a short to voltage or an open in vacuum control assembly recirculation mode valve solenoid control circuit. Repair circuit as necessary, then go to step 15 . If circuit is okay, go to step 11 .
9. Check for a short to ground in vacuum control assembly recirculation mode valve solenoid control circuit. Repair circuit as necessary, then go to step 15 . If circuit is okay, go to next step.
10. Inspect vacuum control assembly for loose wires and/or poor connections. Repair as necessary, then go to step 15 . If wiring and connections are okay, go to step 13 .
11. Inspect HVAC control module harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 15 . If wiring and connections are okay, go to step 14 .
12. Repair vacuum control assembly ignition 3 voltage circuit. After repair, go to step 15 .
13. Replace vacuum control assembly. See **VACUUM CONTROL ASSEMBLY** under

REMOVAL & INSTALLATION. After repairs are complete, go to step 15 .

14. Replace HVAC control module. See **HVAC CONTROL MODULE** under REMOVAL & INSTALLATION. After repairs are complete, go to next step.
15. Operate system to verify repair. If system does not operate properly, go to step 4 . If system operates properly, test is complete.

TEST E: BLOWER MOTOR ALWAYS ON

NOTE: For circuit reference, see **CONNECTOR IDENTIFICATION** and/or **WIRING DIAGRAMS** .

1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** under SELF-DIAGNOSTIC SYSTEM. After diagnostic system check, go to next step.
2. Turn ignition on. Turn HVAC controls off. If blower motor is off, problem is intermittent. Check wiring and connections. If blower motor is on, go to next step.
3. Using scan tool, observe DESIRED BLOWER MTR SPEED parameter in Heating and Air Conditioning data list. If scan tool indicates DESIRED BLOWER MTR SPEED parameter is near zero counts, go to next step. If scan tool indicates DESIRED BLOWER MTR SPEED parameter is not near zero counts, go to step 7 .
4. Disconnect HVAC control module. If blower motor continues to operate, go to next step. If blower motor does not continue to operate, go to step 7 .
5. Check for a short to ground in blower motor harness control circuit. Repair circuit as necessary, then go to step 10 . If circuit is okay, go to next step.
6. Inspect blower motor control processor harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 10 . If wiring and connections are okay, go to step 8 .
7. Inspect HVAC control module harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 10 . If wiring and connections are okay, go to step 9 .
8. Replace blower motor control processor. See **BLOWER MOTOR CONTROL PROCESSOR** under REMOVAL & INSTALLATION. After repairs are complete, go to step 10 .
9. Replace HVAC control module. See **HVAC CONTROL MODULE** under REMOVAL & INSTALLATION. After repairs are complete, go to next step.
10. Operate system to verify repair. If system does not operate properly, go to step 3 . If system operates properly, test is complete.

TEST F: BLOWER MOTOR INOPERATIVE

NOTE: For circuit reference, see **CONNECTOR IDENTIFICATION** and/or **WIRING DIAGRAMS** .

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** under SELF-DIAGNOSTIC SYSTEM. After diagnostic system check, go to next step.
2. Turn ignition switch to ON position. Place blower switch in each position. If blower motor operates in any of the speed positions, go to **TEST G: BLOWER MOTOR MALFUNCTION** . If blower motor does not operate in any of the speed positions, go to next step.
3. Place blower switch in maximum speed position. Using scan tool, observe DESIRED BLOWER MTR SPEED parameter in Heating and Air Conditioning data list. If scan tool indicates DESIRED BLOWER MTR SPEED parameter is near 111 counts, go to next step. If scan tool indicates DESIRED BLOWER MTR SPEED parameter is not near 111 counts, go to step 12 .
4. Turn ignition off. Disconnect blower motor connector. Turn ignition on. Connect a test light between blower motor supply voltage circuit and blower motor control circuit. Place blower switch in minimum speed position. If test light illuminates, go to step 10 . If test light does not illuminate, go to next step.
5. Check blower motor control processor battery positive voltage circuit for an open, high resistance or short to ground. Repair circuit as necessary, then go to step 16 . If circuit is okay, go to next step.
6. Check blower motor control processor ground circuit for an open or high resistance. Repair circuit as necessary, then go to step 16 . If circuit is okay, go to next step.

NOTE: **The blower motor control processor connector and HVAC control module connectors must be connected to correctly perform this test.**

7. Backprobe and measure voltage from blower speed control circuit at the HVAC control module to ground. Using scan tool, command blower motor OFF and ON. If voltage measures near 5 volts when blower motor is commanded OFF, and one volt when blower motor is commanded ON, go to step 11 . If voltage does not measure near 5 volts when blower motor is commanded OFF, and one volt when blower motor is commanded ON, go to next step.
8. Turn ignition off. Disconnect HVAC control module. Turn ignition on. Measure voltage from blower speed control circuit of the HVAC control module to ground. If voltage measures near 5 volts, go to step 12 . If voltage does not measure near 5 volts, go to next step.
9. Check for an open, short to ground or short to voltage in HVAC control module blower speed control circuit. Repair circuit as necessary, then go to step 16 . If circuit is okay, go to step 11 .
10. Inspect blower motor harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 16 . If wiring and connections are okay, go to step 13 .

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

11. Inspect blower motor control processor harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 16 . If wiring and connections are okay, go to step 14 .
12. Inspect HVAC control module harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 16 . If wiring and connections are okay, go to step 15 .
13. Replace blower motor. See **BLOWER MOTOR** under REMOVAL & INSTALLATION. After repairs are complete, go to step 16 .
14. Replace blower motor control processor. See **BLOWER MOTOR CONTROL PROCESSOR** under REMOVAL & INSTALLATION. After repairs are complete, go to step 16 .
15. Replace HVAC control module. See **HVAC CONTROL ASSEMBLY** under REMOVAL & INSTALLATION. After repairs are complete, go to next step.
16. Operate system to verify repair. If system does not operate properly, go to step 2 . If system operates properly, test is complete.

TEST G: BLOWER MOTOR MALFUNCTION

NOTE: For circuit reference, see **CONNECTOR IDENTIFICATION** and/or **WIRING DIAGRAMS** .

1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** under SELF-DIAGNOSTIC SYSTEM. After diagnostic system check, go to next step.
2. Turn ignition on. Place blower motor switch in each speed position. If blower motor operates at desired speed in each speed position, problem is intermittent. Check wiring and connections. If blower motor does not operate at desired speed in each speed position, go to next step.
3. Using scan tool, observe DESIRED BLOWER MTR SPEED parameter in Heating and Air Conditioning data list. Gradually adjust blower motor switch from minimum speed position to maximum speed position. If scan tool indicates DESIRED BLOWER MTR SPEED parameter continuously increases within 15-111 counts, go to next step. If scan tool indicates DESIRED BLOWER MTR SPEED parameter does not continuously increase within 15-111 counts, go to step 10 .
4. Turn ignition off. Disconnect blower motor connector. Turn ignition on. Connect a test light between blower motor supply voltage circuit and blower motor control circuit. Adjust blower motor switch from minimum speed position to maximum speed position. If test light illuminates and increases in intensity, go to step 8 . If test light does not illuminate and increase in intensity, go to next step.
5. Check for high resistance in blower motor control processor battery positive voltage circuit and ground circuit. Repair circuit as necessary, then go to step 14 . If circuit is okay, go to next step.

NOTE: **The blower motor control processor and HVAC control module connectors must be connected to correctly perform this test.**

6. Backprobe and measure voltage from blower speed control circuit at the HVAC control module to ground. Gradually adjust blower motor switch from minimum speed position to maximum speed position. If measured voltage continuously decreases between 4.7-1.0 volts, go to step 9 . If measured voltage does not continuously decrease between 4.7-1.0 volts, go to next step.
7. Turn ignition off. Disconnect HVAC control module. Turn ignition on. Measure voltage from HVAC control module blower speed control circuit to ground. If voltage measures near 5 volts, go to step 10 . If voltage does not measure near 5 volts, go to step 9 .
8. Inspect blower motor harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 14 . If wiring and connections are okay, go to step 11 .
9. Inspect blower motor control processor harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 14 . If wiring and connections are okay, go to step 12 .
10. Inspect HVAC control module harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 14 . If wiring and connections are okay, go to step 13 .
11. Replace blower motor. See **BLOWER MOTOR** under REMOVAL & INSTALLATION. After repairs are complete, go to step 14 .
12. Replace blower motor control processor. See **BLOWER MOTOR CONTROL PROCESSOR** under REMOVAL & INSTALLATION. After repairs are complete, go to step 14 .
13. Replace HVAC control module. See **HVAC CONTROL ASSEMBLY** under REMOVAL & INSTALLATION. After repairs are complete, go to next step.
14. Operate system to verify repair. If system does not operate properly, go to step 2 . If system operates properly, test is complete.

TEST H: DEFROSTING INSUFFICIENT

NOTE: **For circuit reference, see CONNECTOR IDENTIFICATION and/or WIRING DIAGRAMS .**

1. Start engine. Select DEFROST mode. Select maximum blower speed. If airflow from defroster outlets is sufficient, go to next step. If airflow from defroster outlets is not sufficient, go to step 9 .
2. Measure engine operating temperature. If engine reaches normal operating temperature, go to next step. If engine does not reach normal operating temperature, go to step 4 .

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

3. Select minimum blower speed. Select maximum temperature setting. Feel temperature of inlet and outlet hoses at heater core. If inlet hose feels warmer than outlet hose, go to next step. If inlet hose does not feel warmer than outlet hose, go to step 11 .
4. Repair low engine temperature concern. After repairs are complete, go to step 13 .
5. Test operation of A/C compressor clutch. If A/C compressor clutch engages, go to step 7 . If A/C compressor clutch does not engage, go to next step.
6. Repair A/C compressor clutch. See **TEST B: A/C COMPRESSOR CLUTCH DOES NOT ENGAGE** . After repairs are complete, go to step 13 .
7. Perform A/C system performance test. See **A/C SYSTEM PERFORMANCE** under PERFORMANCE TESTS. If A/C system operates within specifications, go to next step. If A/C system does not operate within specifications, go to step 10 .
8. Inspect for proper operation of recirculation door. If recirculation door operates properly, go to step 13 . If recirculation door does not operate properly, go to step 12 .
9. Repair air delivery concern. See **TEST C: AIR DELIVERY IMPROPER** . After repairs are complete, go to step 13 .
10. Repair A/C performance concern. See **SYMPTOM TEST INDEX** table. After repairs are complete, go to step 13 .
11. Repair heating concern. See **HEATER PERFORMANCE DIAGNOSTIC** in MANUAL A/C-HEATER SYSTEMS - CORVETTE article. After repairs are complete, go to step 13 .
12. Repair recirculation door concern. See **TEST D: AIR RECIRCULATION MALFUNCTION** . After repairs are complete, go to next step.
13. Operate system to verify repair. If system does not operate properly, go to step 1 . If system operates properly, test is complete.

TEST I: TOO COLD IN VEHICLE

NOTE: For circuit reference, see **CONNECTOR IDENTIFICATION** and/or **WIRING DIAGRAMS** .

1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** under SELF-DIAGNOSTICS SYSTEM. After diagnostic system check, go to next step.
2. Recalibrate actuators. See ACTUATOR CALIBRATION under PROGRAMMING. Install scan tool. Turn ignition on. Observe Diagnostic Trouble Code (DTC) List in Heating and Air Conditioning. If scan tool displays DTC B0361, B0363, B0365, B0367, B0441 or B0446, go to DIAGNOSTIC TROUBLE CODE DEFINITION table under SELF-DIAGNOSTIC SYSTEM. If scan tool does not display DTC B0361, B0363, B0365, B0367, B0441 or B0446, go to next step.

NOTE: Ambient (outside) air temperature must be above 38°F (3° C).

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

3. Start engine. Turn HVAC controls to OFF position. If A/C compressor operates, go to **TEST A: A/C COMPRESSOR CLUTCH DOES NOT DISENGAGE** . If A/C compressor does not operate, go to next step.
4. Place blower motor switch in each speed position. If blower motor operates in each speed position, go to next step. If blower motor does not operate in each speed position, go to **TEST F: BLOWER MOTOR INOPERATIVE** .
5. If blower motor provides sufficient air flow, go to next step. If blower motor does not provide sufficient air flow, go to **TEST G: BLOWER MOTOR MALFUNCTION** .
6. Place blower motor switch in maximum speed position. Place mode switch in BI-LEVEL position. Place outside air switch in ON position. Place recirculation switch in ON position. If recirculation door operates properly, go to next step. If recirculation door does not operate properly, go to **TEST D: AIR RECIRCULATION MALFUNCTION** .
7. Inspect cooling system for the following conditions: low coolant level, a loose or worn accessory drive belt, leaking radiator hose or heater hose, kinked radiator hose or heater hose, missing radiator cap pressure seal or leaking radiator cap. Repair as necessary, then go to step 20 . If cooling system visual inspection is satisfactory, go to next step.
8. Install thermometer near inside air temperature sensor. Using scan tool, observe INSIDE TEMP SENSOR data parameters in Heating and Air Conditioning data list. If scan tool indicates sensor temperatures are within 5°F (3°C) of thermometer temperatures, go to step 10 . If scan tool indicates sensor temperatures are not within 5°F (3°C) of thermometer temperatures, go to next step.
9. Inspect for a blocked, malfunctioning, or incorrectly installed inside air temperature sensor. Repair as necessary, then go to step 20 . If sensor is okay, go to step 13 .
10. Turn ignition off. Install scan tool. Cover sunload sensor. Start engine. Adjust driver side temperature to 72°F (22°C). Using scan tool, observe SUNLOAD SENSOR parameter in Heating and Air Conditioning data list. If scan tool indicates SUNLOAD SENSOR parameter is greater than 4.3 volts, go to next step. If scan tool indicates SUNLOAD SENSOR parameter is less than 4.3 volts, go to step 15 .
11. Uncover sunload sensor. Direct a light source at sunload sensor. If voltage changes, go to next step. If voltage does not change, go to step 15 .
12. Perform the Heating Performance Diagnostic. See **HEATER PERFORMANCE DIAGNOSTIC** under PERFORMANCE TESTS. When diagnostic is complete, go to step 20 .
13. Inspect inside air temperature sensor harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 20 . If wiring and connections are okay, go to next step.
14. Turn ignition off. Test inside air temperature sensor resistance. See SENSOR RESISTANCE under COMPONENT TESTS. If resistance is approximately equal to specified value, go to step 16 . If resistance is not approximately equal to specified value, go to step 17 .

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

15. Inspect sunload sensor harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 20 . If wiring and connections are okay, go to step 18 .
16. Inspect HVAC control module harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 20 . If wiring and connections are okay, go to step 19 .
17. Replace inside air temperature sensor. See **INSIDE AIR TEMPERATURE SENSOR** under REMOVAL & INSTALLATION. After repairs are complete, go to step 20 .
18. Replace sunload sensor. See **SUN LOAD SENSOR** under REMOVAL & INSTALLATION. After repairs are complete, go to step 20 .
19. Replace HVAC control module. See **HVAC CONTROL MODULE** under REMOVAL & INSTALLATION. After repairs are complete, go to next step.
20. Operate system to verify repair. If system does not operate properly, go to step 3 . If system operates properly, test is complete.

TEST J: TOO HOT IN VEHICLE

NOTE: For circuit reference, see **CONNECTOR IDENTIFICATION** and/or **WIRING DIAGRAMS** .

1. Perform diagnostic system check. See **DIAGNOSTIC SYSTEM CHECK** under SELF-DIAGNOSTIC SYSTEM. After diagnostic system check, go to next step.
2. Recalibrate actuators. See ACTUATOR CALIBRATION under PROGRAMMING. Install scan tool. Turn ignition on. Observe Diagnostic Trouble Code (DTC) List in Heating and Air Conditioning. If scan tool displays DTC B0361, B0363, B0365, B0367, B0441 or B0446, go to **DIAGNOSTIC TROUBLE CODE DEFINITION** table under SELF-DIAGNOSTIC SYSTEM. If scan tool does not display DTC B0361, B0363, B0365, B0367, B0441 or B0446, go to next step.

NOTE: Ambient (outside) air temperature must be above 38°F (3° C).

3. Cover sunload sensor. Start engine. Fully open all panel outlets. Adjust temperature control to maximum cooling. Select PANEL (upper) mode. Adjust blower speed to maximum. Ensure VENT (outside air) mode indicator is not illuminated. If A/C compressor operates, go to next step. If A/C compressor does not operate, go to **TEST B: A/C COMPRESSOR CLUTCH DOES NOT ENGAGE** .
4. Place blower motor switch in each speed position. If blower motor operates correctly for each speed position, go to next step. If blower motor does not operate correctly for each speed position, go to **TEST F: BLOWER MOTOR INOPERATIVE** .
5. If blower motor provides sufficient air flow, go to next step. If blower motor does not provide sufficient air flow, go to **TEST G: BLOWER MOTOR MALFUNCTION** .

6. Place blower motor switch in maximum speed position. Place mode switch in BI-LEVEL position. Place outside air switch in ON position. Place recirculation switch in ON position. If recirculation door operates properly, go to next step. If recirculation door does not operate properly, go to **TEST D: AIR RECIRCULATION MALFUNCTION** .
7. Perform A/C system performance test. See **A/C PERFORMANCE TEST** under PERFORMANCE TESTS. If low side and high side pressures are within specifications, go to next step. If low and high side pressures are not within specification, leak test A/C system. See LEAK TESTING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING.
8. Install thermometer near inside air temperature sensor. Using scan tool, observe INSIDE TEMP SENSOR data parameters in Heating and Air Conditioning data list. If scan tool indicates sensor temperatures are within 5°F (3°C) of thermometer temperatures, go to step 10 . If scan tool indicates sensor temperatures are not within 5°F (3°C) of thermometer temperatures, go to next step.
9. Inspect for a blocked or malfunctioning inside air temperature sensor. Replace as necessary, then go to step 19 . If sensor is okay, go to step 12 .
10. Turn ignition off. Install scan tool. Cover SUNLOAD SENSOR. Start engine. Adjust driver side temperature to 72°F (22°C). Using scan tool, observe SUNLOAD SENSOR data parameter in Heating and Air Conditioning data list. If scan tool indicates SUNLOAD SENSOR parameter is greater than 4.3 volts, go to next step. If scan tool indicates sunload sensor parameter is less than 4.3 volts, go to 14 .
11. Uncover sunload sensor. Direct a light source at sunload sensor. If voltage changes, system is okay. If voltage does not change, go to step 14 .
12. Inspect inside air temperature sensor harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 19 . If wiring and connections are okay, go to next step.
13. Turn ignition off. Test inside air temperature sensor resistance. If resistance is approximately equal to specified value, go to step 15 . If resistance is not approximately equal to specified value, go to step 16 .
14. Inspect sunload sensor harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 19 . If wiring and connections are okay, go to step 17 .
15. Inspect HVAC control module harness connector for loose wires and/or poor connections. Repair as necessary, then go to step 19 . If wiring and connections are okay, go to step 18 .
16. Replace inside air temperature sensor. See **INSIDE AIR TEMPERATURE SENSOR** under REMOVAL & INSTALLATION. After repairs are complete, go to step 19 .
17. Replace sunload sensor. See **SUNLOAD SENSOR** under REMOVAL & INSTALLATION. After repairs are complete, go to step 19 .
18. Replace HVAC control module. See **HVAC CONTROL ASSEMBLY** under

REMOVAL & INSTALLATION. After repairs are complete, go to next step.

19. Operate system to verify repair. If system does not operate properly, go to step 3 . If system operates properly, test is complete.

REMOVAL & INSTALLATION

WARNING: Vehicle is equipped with Supplemental Inflatable Restraint (SIR) system. When servicing vehicle, use care to avoid accidental air bag deployment. SIR system-related components are located in various locations throughout interior and exterior of vehicle, depending on application. Do not use electrical test equipment on or near these circuits. If necessary, deactivate SIR system before servicing components. See appropriate AIR BAG RESTRAINT SYSTEMS article in RESTRAINTS.

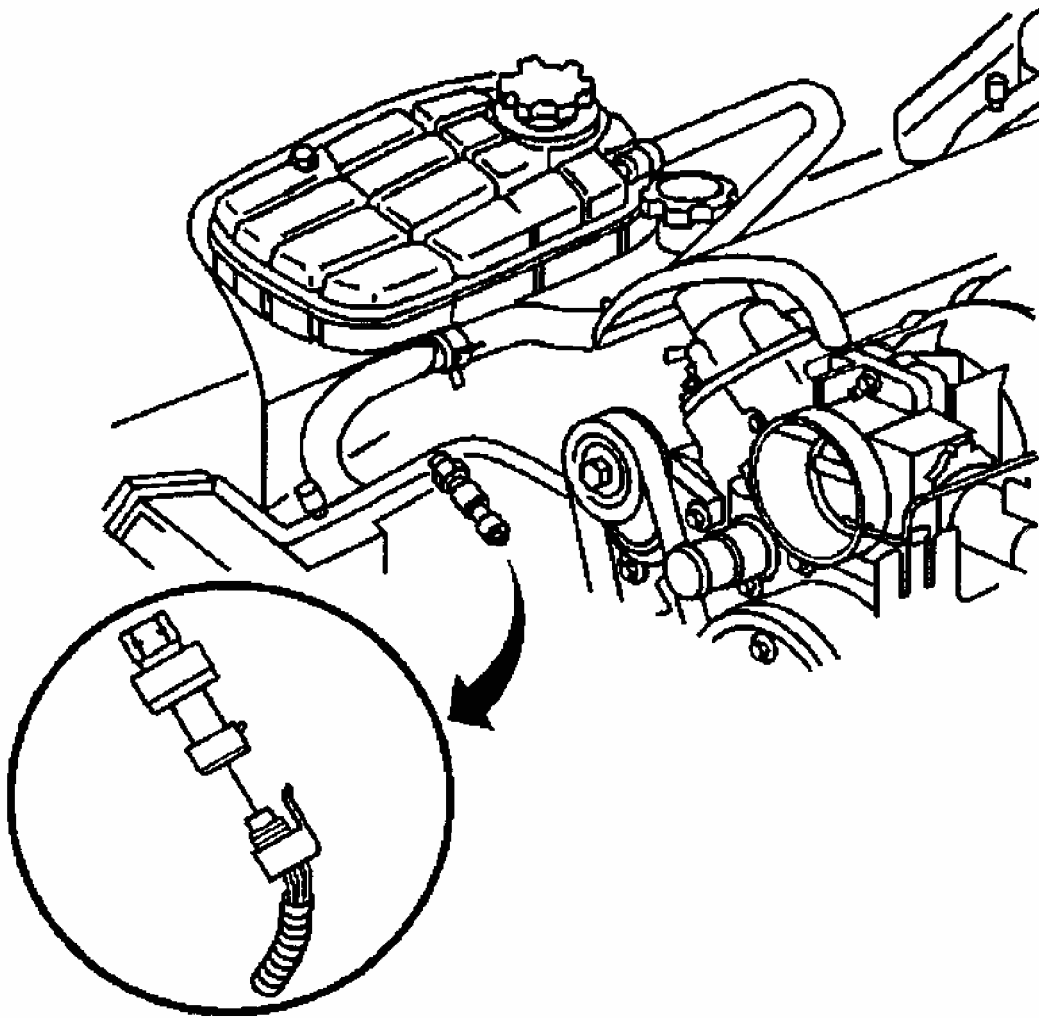
CAUTION: When battery is disconnected, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle. See COMPUTER RELEARN PROCEDURES article in GENERAL INFORMATION before disconnecting battery.

NOTE: For all compressor repair operations, See COMPRESSOR SERVICING article in GENERAL SERVICING.

A/C REFRIGERANT PRESSURE SENSOR

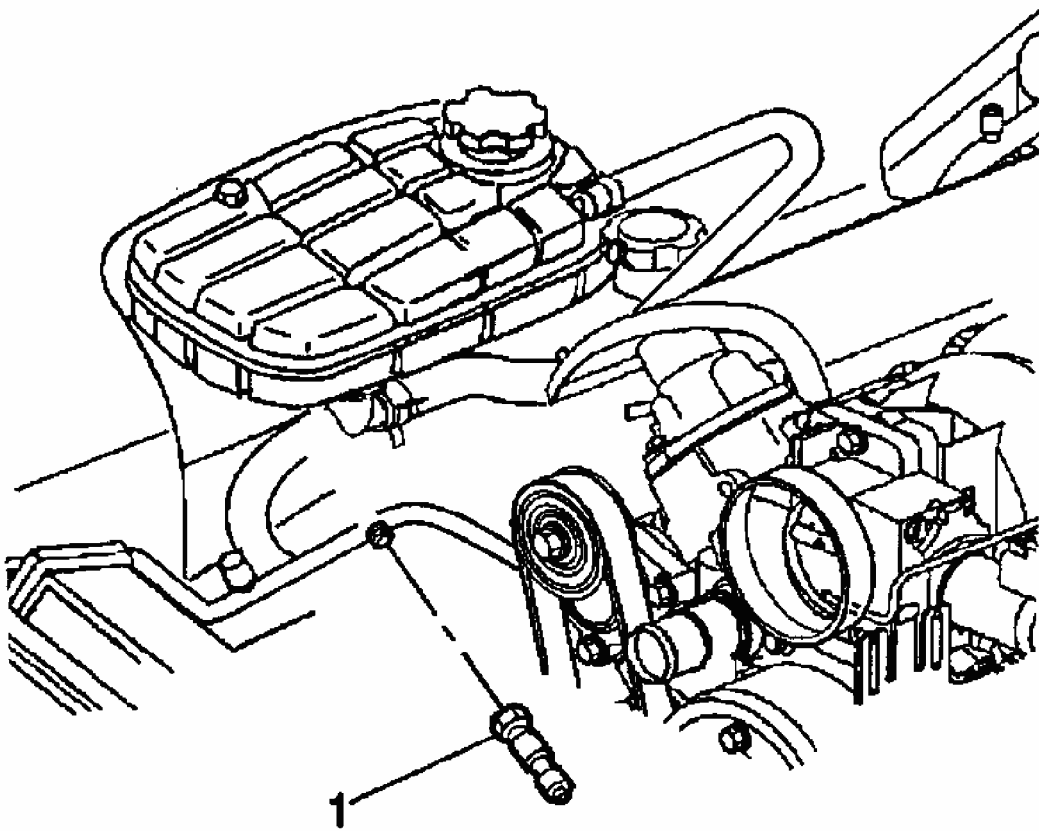
Removal

1. Disconnect the refrigerant pressure sensor electrical connector. See **Fig. 4** .
2. Remove the pressure sensor from the evaporator tube. Remove and discard the O-ring seal from the sensor port on the evaporator tube. See **Fig. 5** .



G00203733

Fig. 4: Removing & Installing Refrigerant Pressure Sensor Electrical Connector
Courtesy of GENERAL MOTORS CORP.



G00203734

Fig. 5: Removing & Installing Pressure Sensor From Evaporator Tube
Courtesy of GENERAL MOTORS CORP.

Installation

1. Install a NEW O-ring. Install the pressure sensor to the evaporator tube. See **Fig. 5** . Tighten to specified torque, see **TORQUE SPECIFICATIONS** .
2. Connect the pressure sensor electrical connector. See **Fig. 4** .

ACCUMULATOR

Removal

1. Recover the refrigerant from the A/C system. See RECOVERY, EVACUATION & RECHARGING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING. Remove the battery. See **Fig. 6** . Remove the battery heat shield. See **Fig. 7** .
2. Remove the nut retaining the heater pipe bracket to the cowl. See **Fig. 8** . Reposition the heater pipe bracket to access the refrigerant lines. Remove the compressor hose to

accumulator retaining bolt. See **Fig. 9** .

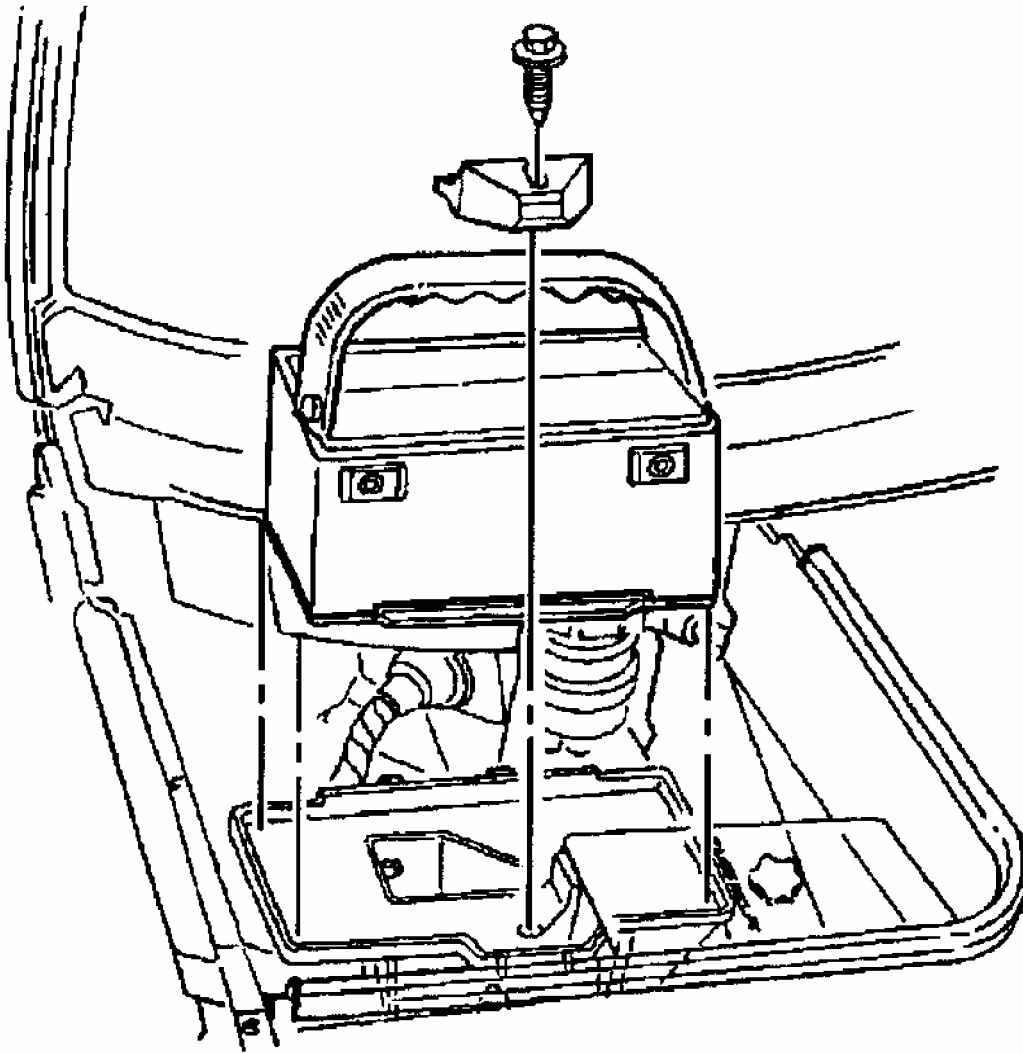
NOTE: **Cap or tape the open compressor hose and the accumulator immediately to prevent contamination.**

3. Disconnect the compressor hose from the accumulator. Discard the O-ring. Reposition the compressor hose end. Remove the accumulator bracket mounting nuts. See **Fig. 10** .

NOTE: **Prior to removal, take note of the accumulator alignment to the accumulator hose and the rear evaporator tube.**

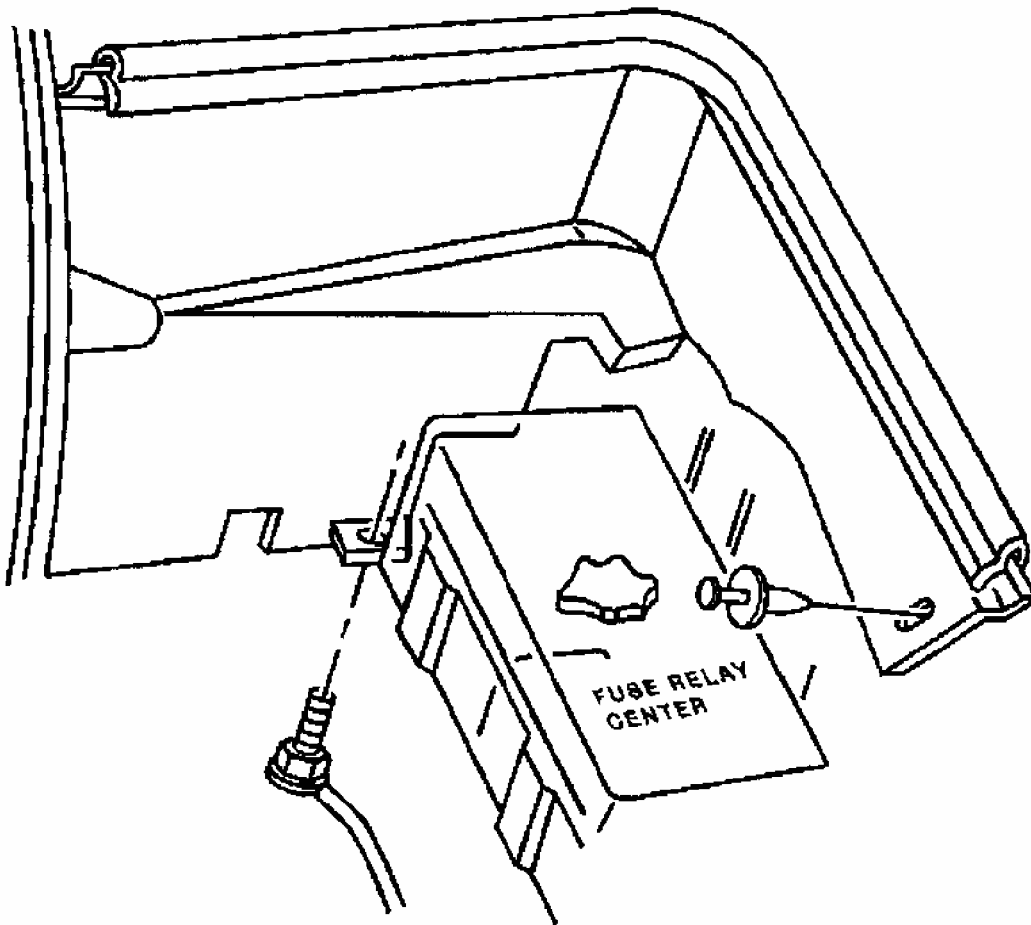
NOTE: **Cap or tape the open accumulator hose and the accumulator immediately to prevent contamination.**

4. Reposition the accumulator slightly to access the accumulator hose to accumulator fitting. Using a back-up wrench on the accumulator fitting, loosen the accumulator hose fitting from the accumulator. See **Fig. 11** .
5. Disconnect the accumulator hose from the accumulator. See **Fig. 12** . Discard the O-ring. Remove the accumulator from the vehicle. Loosen the accumulator bracket clamp bolt. Remove the accumulator from the accumulator bracket. See **Fig. 13** . Inspect the accumulator bracket insulator and the accumulator lower insulator for wear or damage. Drain and measure oil from accumulator.



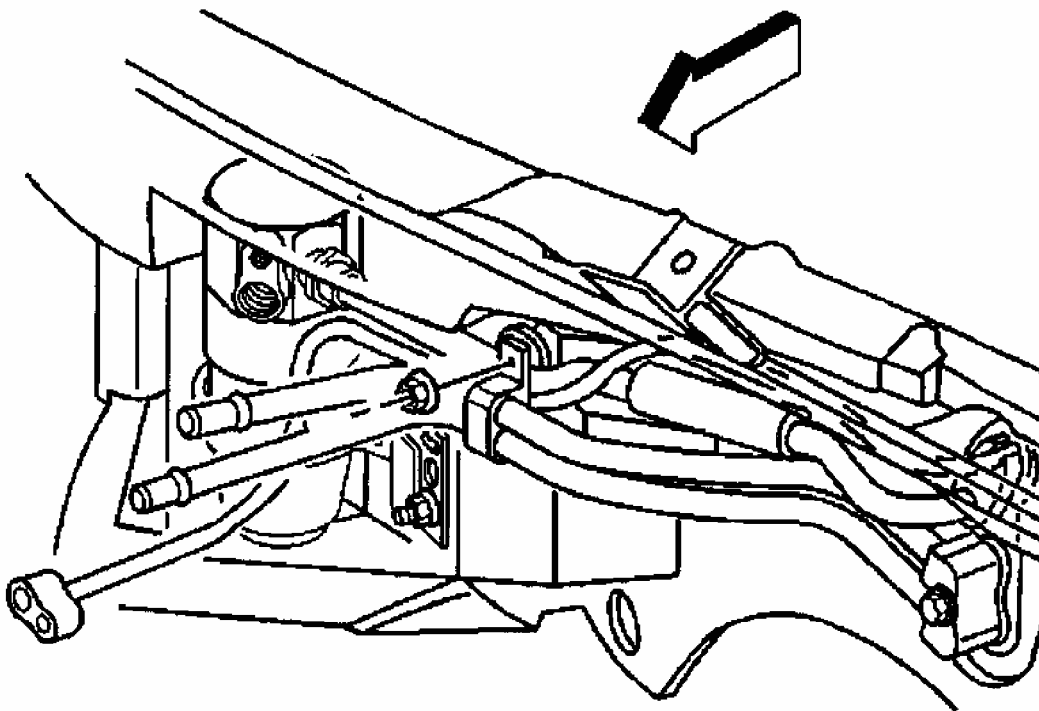
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Fig. 6: Removing & Installing Battery
Courtesy of GENERAL MOTORS CORP.



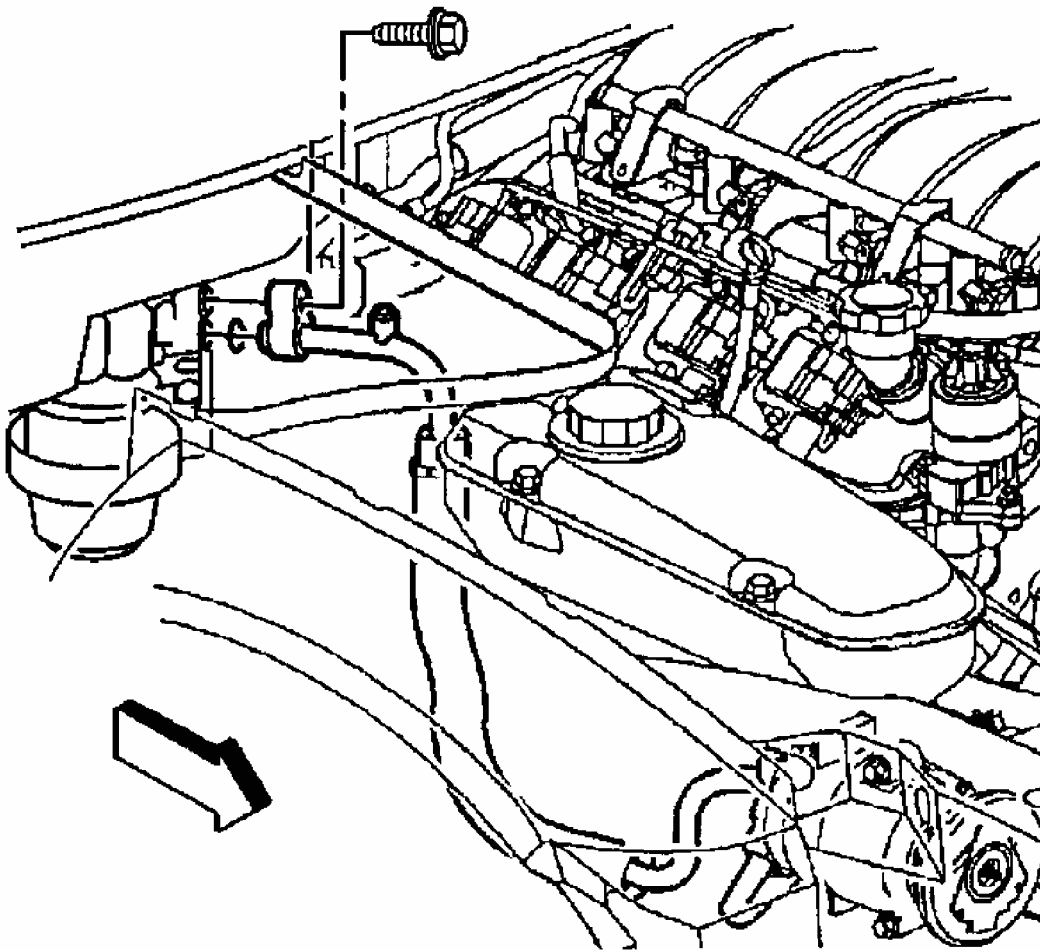
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Fig. 7: Removing Battery Heat Shield
Courtesy of GENERAL MOTORS CORP.



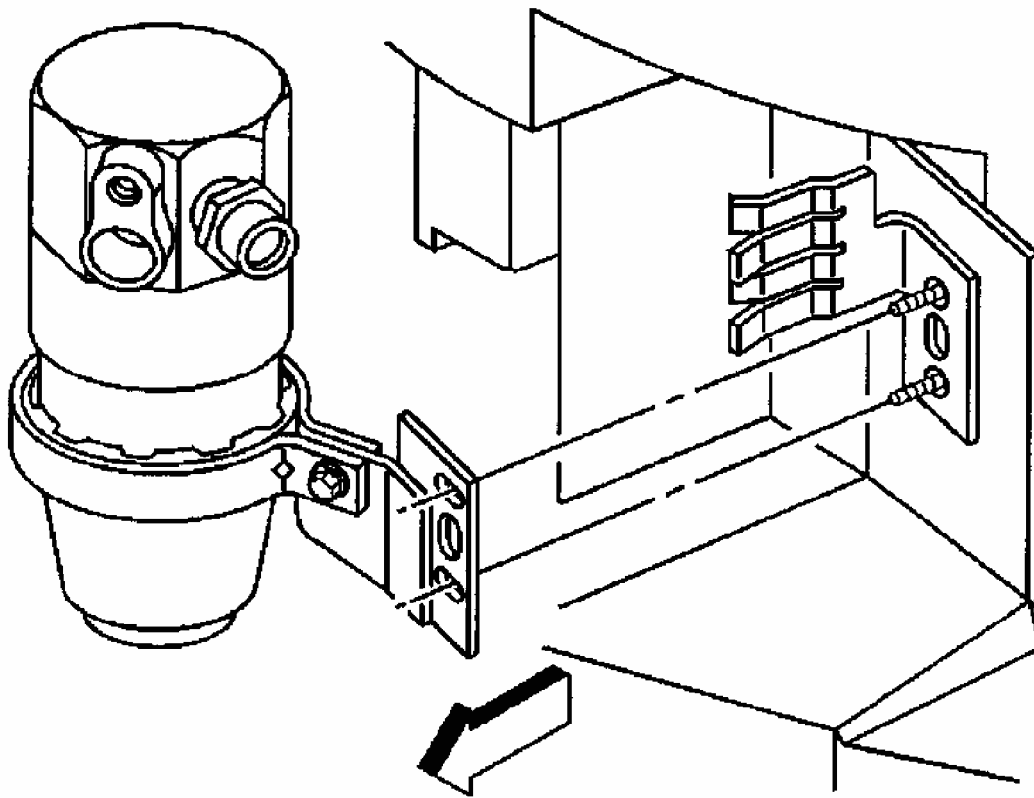
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Fig. 8: Removing & installing Heater Pipe Bracket
Courtesy of GENERAL MOTORS CORP.



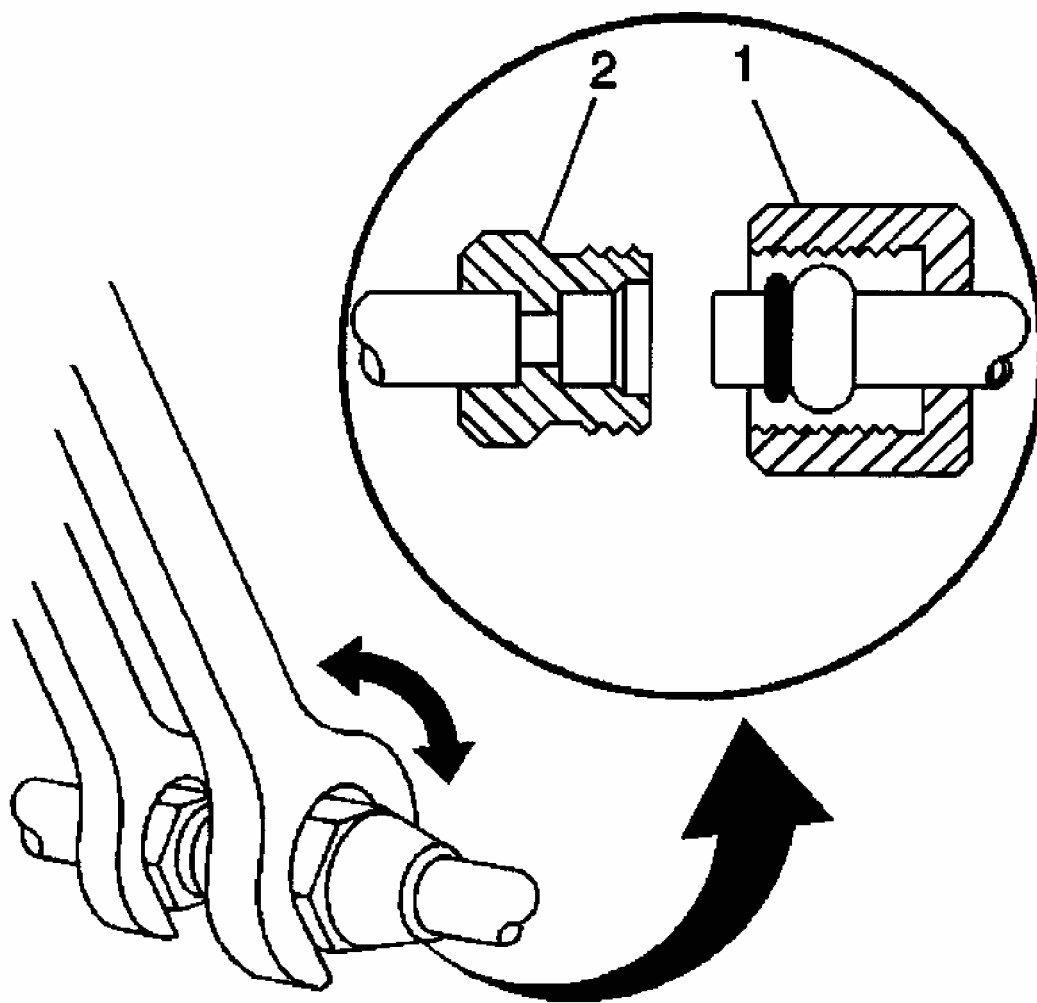
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Fig. 9: Removing & Installing Compressor Hose To Accumulator Retaining Bolt
Courtesy of GENERAL MOTORS CORP.



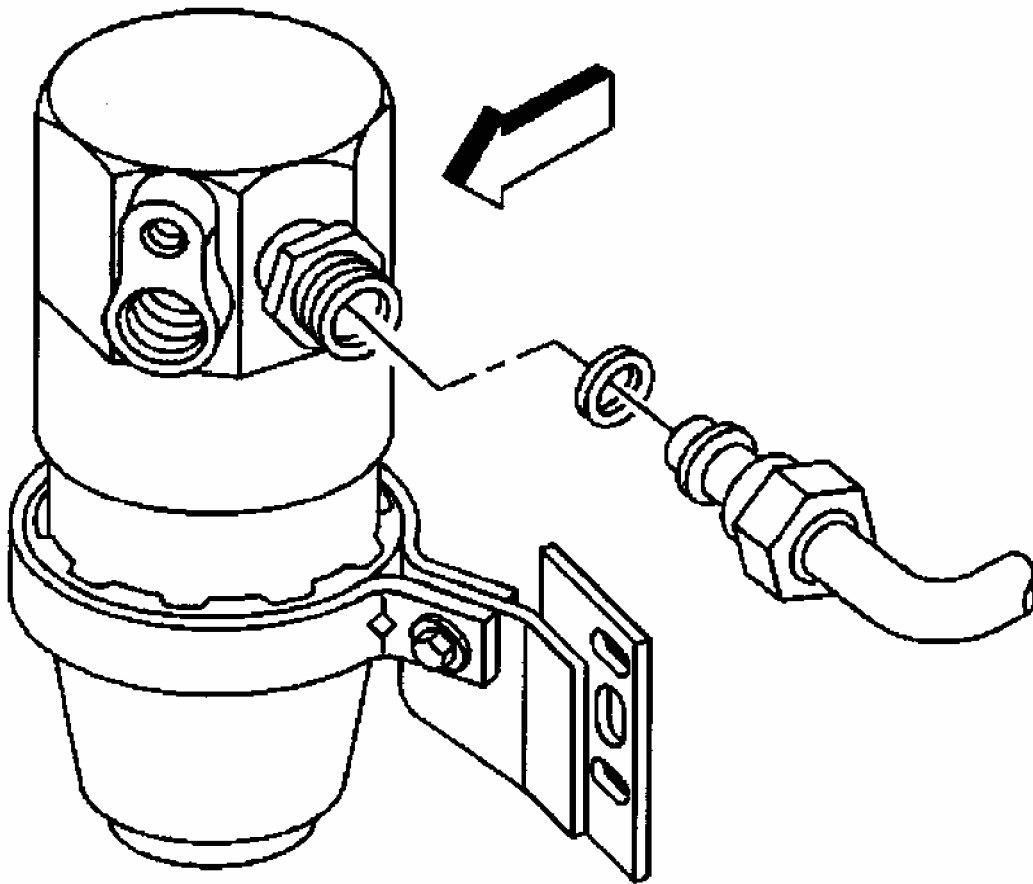
G00203724

Fig. 10: Removing & Installing Accumulator Mounting Nuts
Courtesy of GENERAL MOTORS CORP.



G00203725

Fig. 11: Disconnecting Accumulator Fittings
Courtesy of GENERAL MOTORS CORP.

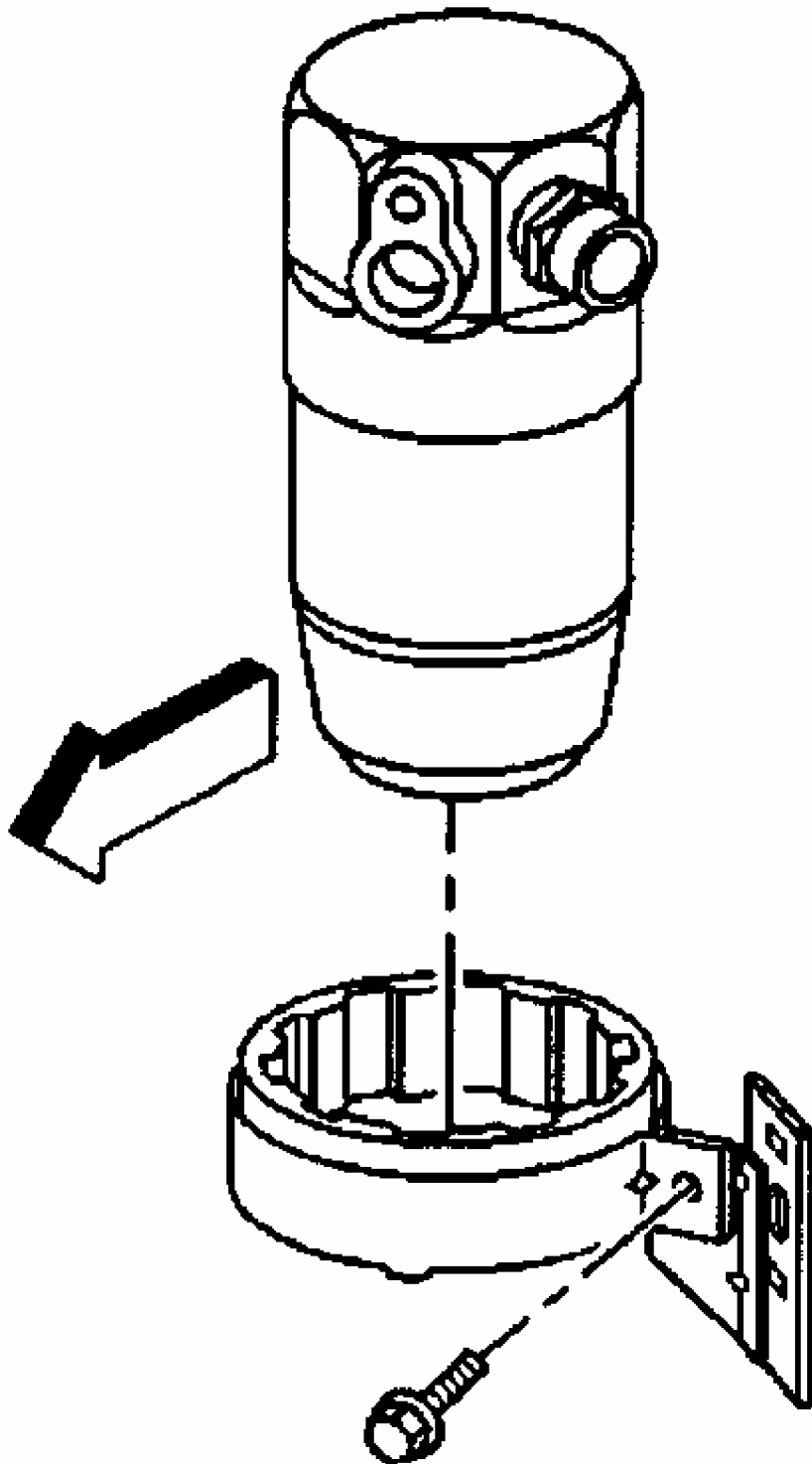


G00203726

Fig. 12: Removing & Installing Accumulator Hose From Accumulator
Courtesy of GENERAL MOTORS CORP.

2002 Chevrolet Corvette

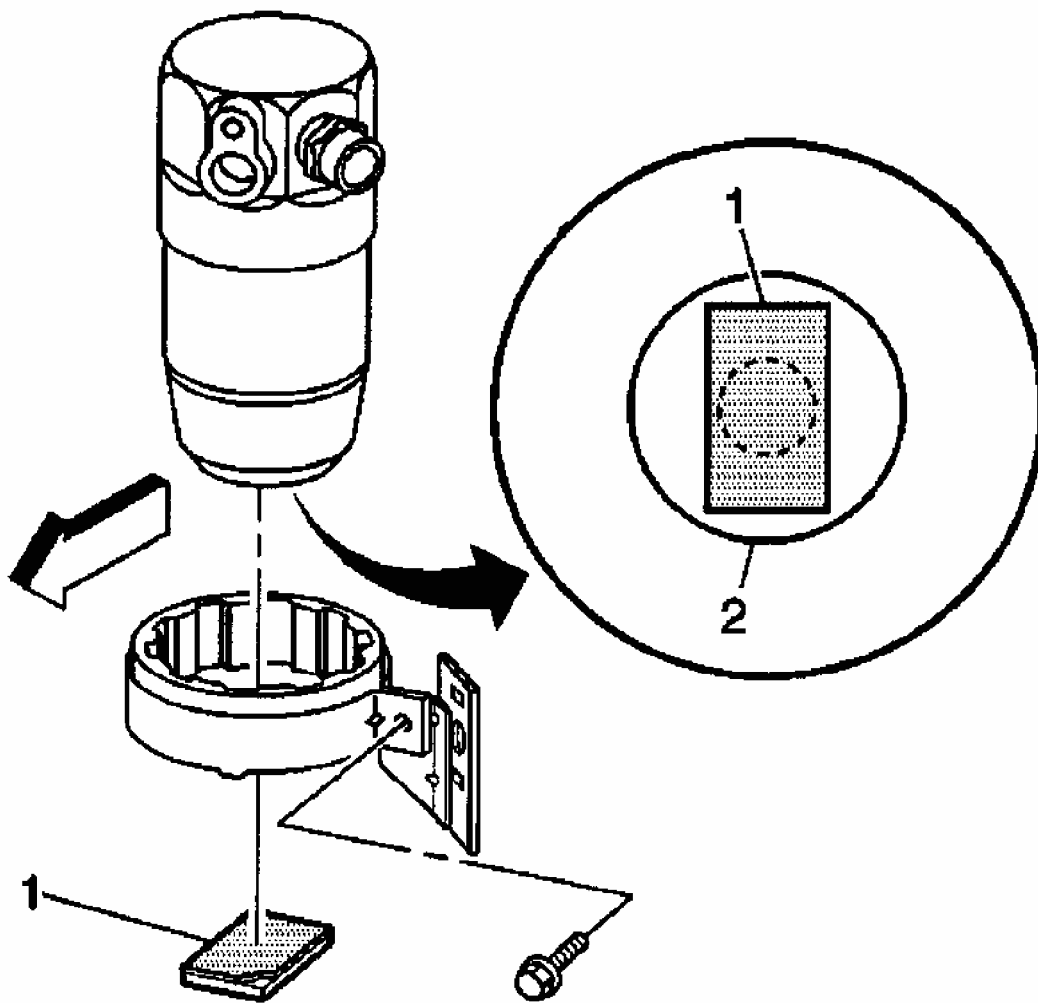
2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette



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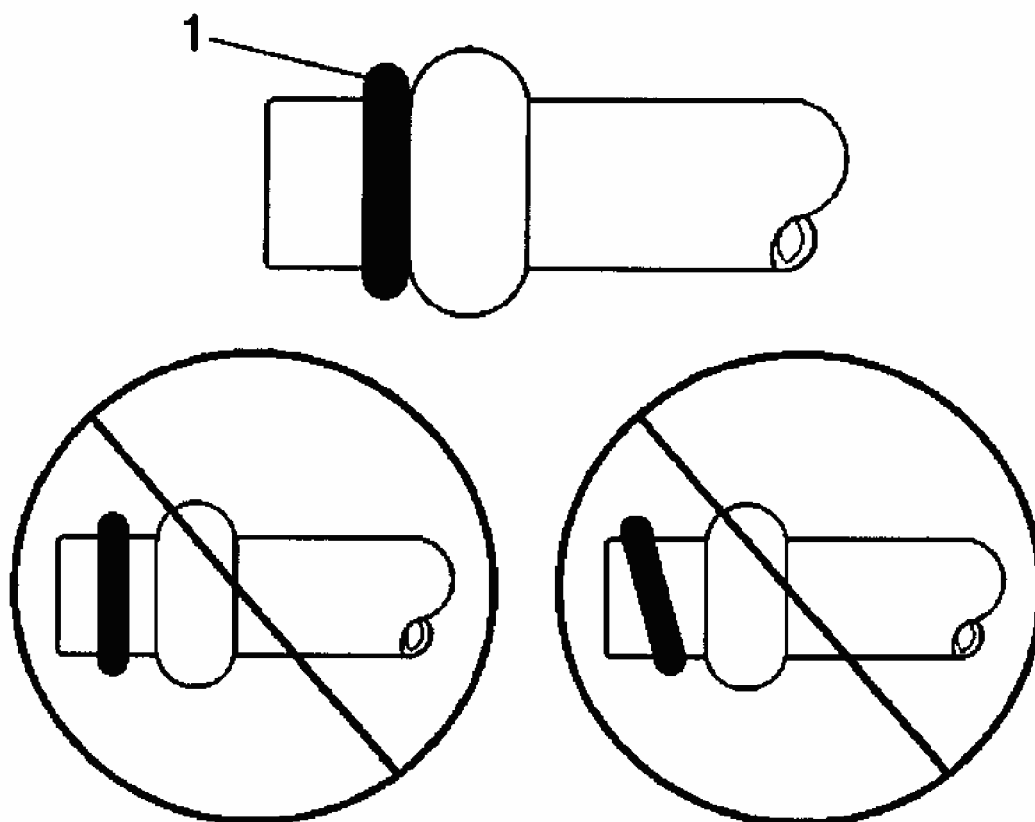
Fig. 13: Removing & Installing Accumulator Bracket Clamp
Courtesy of GENERAL MOTORS CORP.**Installation**

1. Add 2 oz. (60 ml) more than amount drained from old accumulator. Replace the accumulator bracket insulator, if necessary.
2. Replace the accumulator lower insulator, if necessary: Remove the paper backing from the lower insulator . Position and install the insulator to the bottom of the accumulator . See **Fig. 14** .
3. Install the accumulator to the accumulator bracket. Tighten the accumulator bracket clamp bolt just enough to provide some resistance in rotating the accumulator.
4. Install the accumulator and bracket to the vehicle. Remove the cap or tape from the accumulator hose and the accumulator. Install NEW O-rings to the accumulator hose. See **Fig. 15** .
5. Install the accumulator hose to the accumulator. See **Fig. 12** . Align the accumulator to the accumulator hose and the rear evaporator tube as noted prior to removal.
6. Using a back-up wrench on the accumulator fitting, secure the accumulator hose fitting to the accumulator. See **Fig. 11** . Tighten to specified torque, **TORQUE SPECIFICATIONS** .
7. Install the accumulator and bracket into position. Install the accumulator bracket mounting nuts. See **Fig. 10** . Tighten the accumulator bracket clamp bolt. Tighten to specified torque, see **TORQUE SPECIFICATIONS** .
8. Remove the cap or tape from the compressor hose and the accumulator. Install NEW O-rings to the compressor hose. See **Fig. 15** .
9. Install the compressor hose to the accumulator. See **Fig. 9** . Install the compressor hose to accumulator retaining bolt. Tighten to specified torque, see **TORQUE SPECIFICATIONS** .
10. Install the heater pipe bracket to the cowl stud. See **Fig. 8** . Install the heater pipe bracket retaining nut. Tighten to specified torque, see **TORQUE SPECIFICATIONS** .
11. Install the battery heat shield. Install the battery. Evacuate and recharge the A/C system. See RECOVERY, EVACUATION & RECHARGING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING.



G00203728

Fig. 14: Installing Accumulator Lower Insulator
Courtesy of GENERAL MOTORS CORP.



G00203729

Fig. 15: Installing New O-Rings To Accumulator Hose
Courtesy of GENERAL MOTORS CORP.

ACCUMULATOR TUBE

Removal

1. Recover the refrigerant from the A/C system. See RECOVERY, EVACUATION & RECHARGING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING. Remove the battery. Remove the battery heat shield. See **Fig. 7**.
2. Remove the intake manifold. See **INTAKE MANIFOLD** under REMOVAL & INSTALLATION in 5.7L V8 - CORVETTE article in ENGINES. Remove the nut retaining the heater pipe bracket to the dash cowl. Reposition the heater pipe bracket to access the refrigerant lines. See **Fig. 8**.

NOTE: Cap or tape the open evaporator tubes immediately to prevent contamination.

3. Remove the front evaporator tube to rear evaporator tube retaining bolt. Disconnect the

evaporator tubes, and discard the O-ring. Remove the compressor hose to accumulator retaining bolt. See **Fig. 9** .

NOTE: **Cap or tape the open compressor hose, accumulator hose and the accumulator immediately to prevent contamination.**

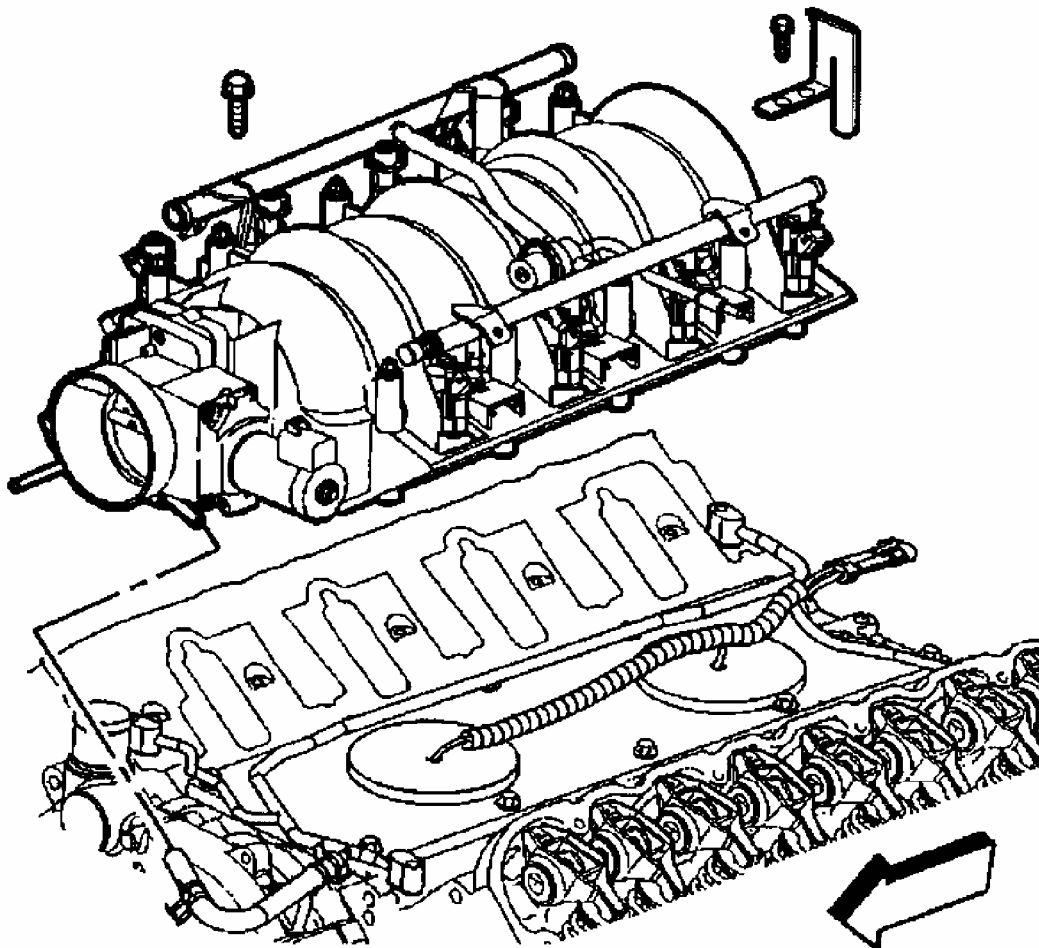
4. Disconnect the compressor hose from the accumulator to access the accumulator hose, and discard the O-ring. Reposition the compressor hose end. Using a back-up wrench on the accumulator fitting, loosen the accumulator hose fitting from the accumulator. See **Fig. 11** .

NOTE: **Cap or tape the open accumulator hose, rear evaporator tube, and the evaporator immediately to prevent contamination.**

5. Disconnect the accumulator hose from the accumulator, discard the O-ring. See **Fig. 12** . Remove the accumulator hose to evaporator retaining bolt. See **Fig. 17** . Disconnect the accumulator hose from the evaporator.

NOTE: **Prior to removal, take note of the accumulator hose orientation to the accumulator and the rear evaporator tube.**

6. Discard the O-ring. Carefully remove the accumulator hose, separating it from the rear evaporator tube. See **Fig. 18** .



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Fig. 16: Removing & Installing Intake Manifold
Courtesy of GENERAL MOTORS CORP.

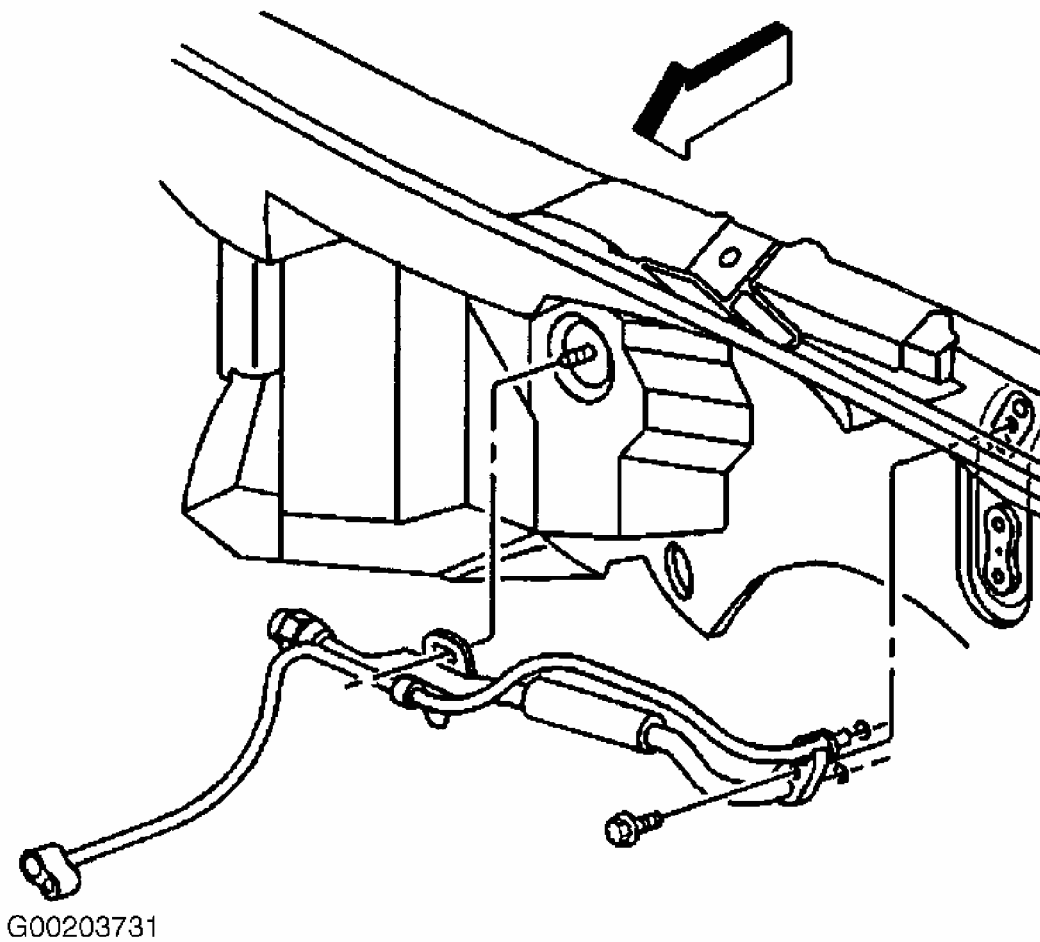


Fig. 17: Removing & Installing Accumulator Hose
Courtesy of GENERAL MOTORS CORP.

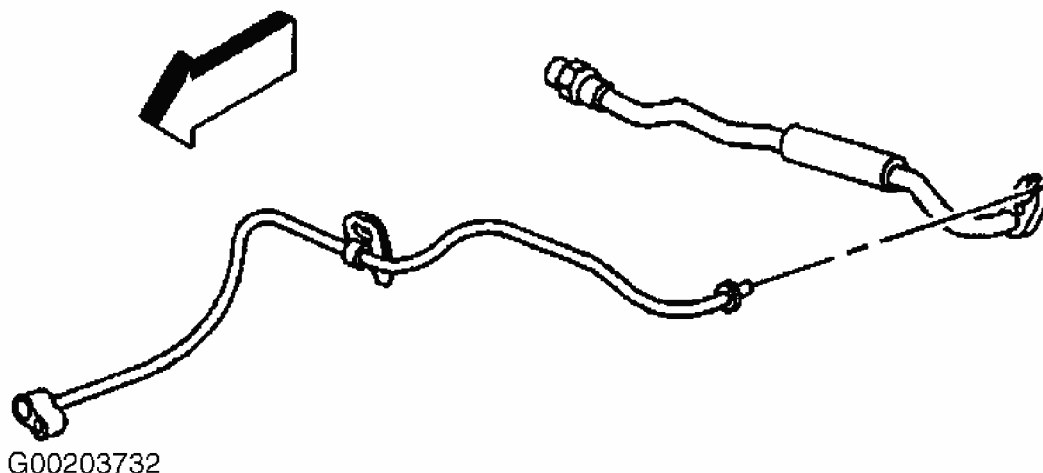


Fig. 18: Disconnect Accumulator Hose From Rear Evaporator
Courtesy of GENERAL MOTORS CORP.

Installation

1. Remove the cap or tape from the accumulator hose, rear evaporator tube and the evaporator. Using a lint-free clean, dry cloth, carefully clean the sealing surfaces of the accumulator hose, rear evaporator tube and the evaporator.

NOTE: Do not allow any of the mineral base 525 viscosity refrigerant oil on the O-ring to enter the refrigerant system.

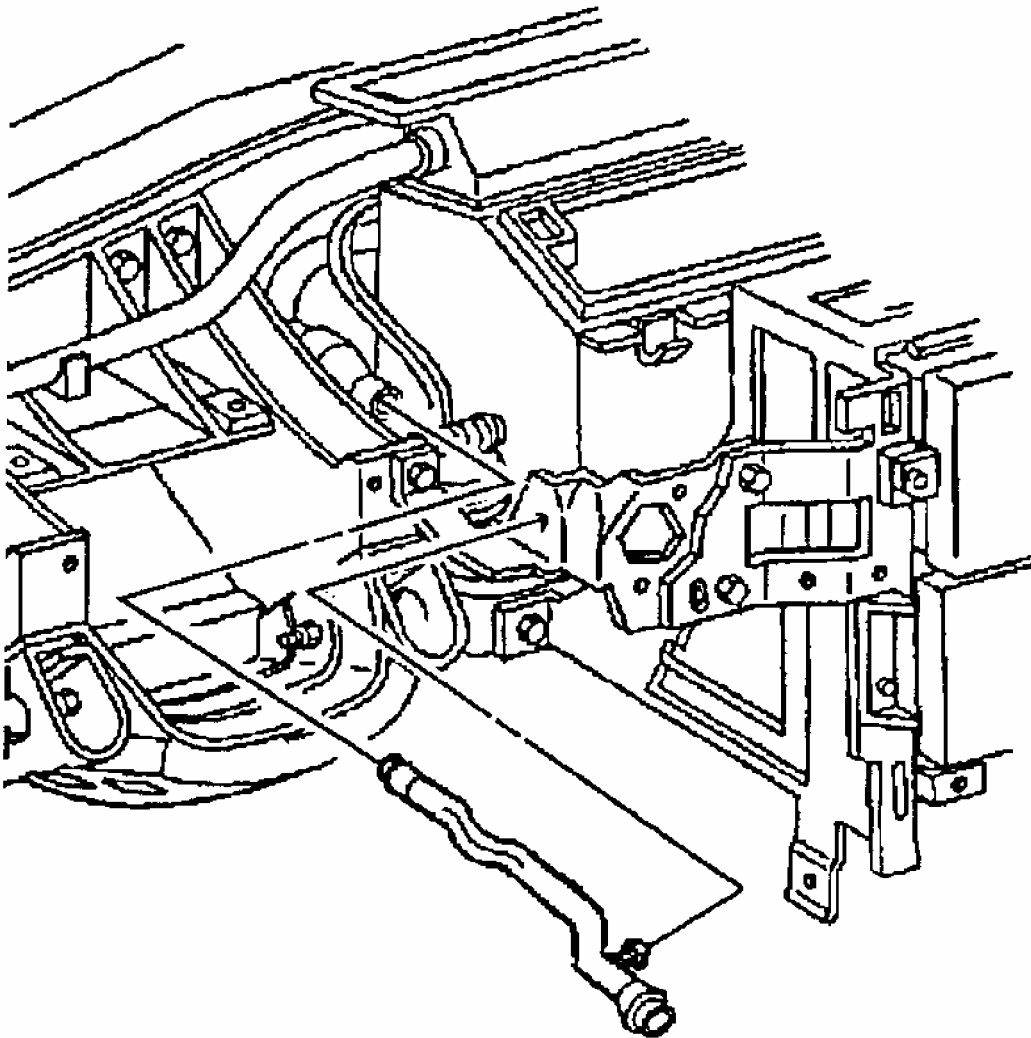
2. Lightly coat the NEW O-rings with mineral base 525 viscosity refrigerant oil. Carefully slide the NEW O-rings onto the accumulator hose and the rear evaporator tube until seated. See **Fig. 15**.
3. Position the accumulator hose with the rear evaporator tube and install the assembly to the evaporator. See **Fig. 18**. Install the accumulator hose to evaporator retaining bolt. See **Fig. 17**. Tighten to specified torque, see **TORQUE SPECIFICATIONS**.
4. Remove the cap or tape from the accumulator. Using a lint-free clean, dry cloth, carefully clean the sealing surfaces of the accumulator hose and the accumulator. Lightly coat the NEW O-ring seal with mineral base 525 viscosity refrigerant oil. See **Fig. 15**.
5. Install the accumulator hose to the accumulator. See **Fig. 12**. Using a back-up wrench on the accumulator fitting, secure the accumulator hose fitting to the accumulator. See **Fig. 11**. Tighten to specified torque, see **TORQUE SPECIFICATIONS**. Remove the cap or tape from the compressor hose.
6. Remove the cap or tape from the compressor hose. Using a lint-free clean, dry cloth, carefully clean the sealing surfaces of the compressor hose and the accumulator.

7. Lightly coat the O-ring seal with mineral base 525 viscosity refrigerant oil. Carefully slide the NEW O-ring seal onto the compressor hose until seated. Leave a light coating on the refrigerant oil on the compressor hose in the area indicated only. See **Fig. 15** .
8. Install the compressor hose to the accumulator with retaining bolt. See **Fig. 9** . Tighten to specified torque See **TORQUE SPECIFICATIONS** . Remove the cap or tape from the front evaporator tube and the rear evaporator tube. Using a lint-free clean, dry cloth, carefully clean the sealing surfaces of the evaporator tubes.
9. Lightly coat the O-ring seal with mineral base 525 viscosity refrigerant oil. Carefully slide the NEW O-ring seal onto the front evaporator tube until seated. Leave a light coating of the refrigerant oil on the front evaporator tube in the area indicated ONLY. See **Fig. 15** .
10. Install the front evaporator tube to the rear evaporator tube with retaining bolt. See **Fig. 9** . Tighten to specified torque. See **TORQUE SPECIFICATIONS** .
11. Install the heater pipe bracket to the cowl stud. See **Fig. 8** . Install the heater pipe bracket retaining nut. Tighten to specified torque. See **TORQUE SPECIFICATIONS** . Install the intake manifold. See **Fig. 16** .
12. Install the battery heat shield. See **Fig. 7** . Install the battery. See **Fig. 6** . Evacuate and recharge the A/C system. See RECOVERY, EVACUATION & RECHARGING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING.

AIR TEMPERATURE ACTUATOR

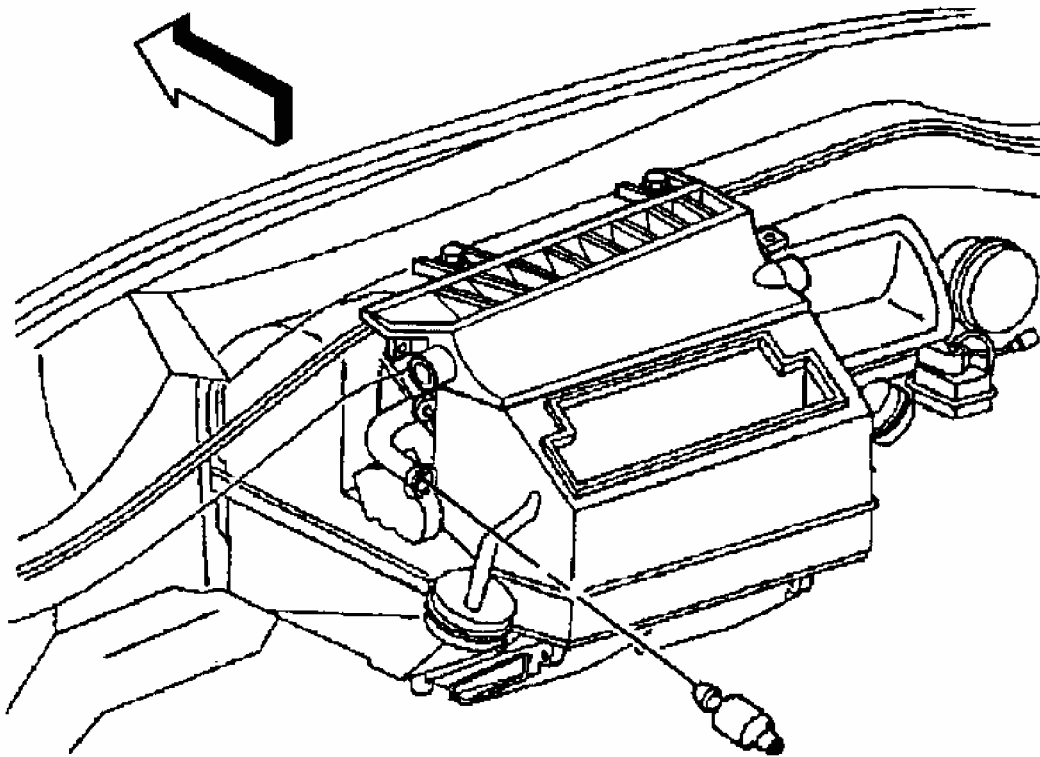
Removal (Left)

1. Remove the front floor kick-up panel. Remove the Bose module.
2. Disconnect the inside air temperature sensor aspirator duct. See **Fig. 19** . Depress the duct retaining tab and remove the duct from the ignition switch housing bracket. Use a twisting motion to release the duct from the duct muffler.
3. Remove the inside air temperature sensor aspirator duct muffler. Use a twisting motion to release the duct muffler. See **Fig. 20** . Disconnect the air temperature actuator electrical connector. See **Fig. 21** .
4. Remove the air temperature actuator screws. Remove the air temperature actuator. See **Fig. 22** .



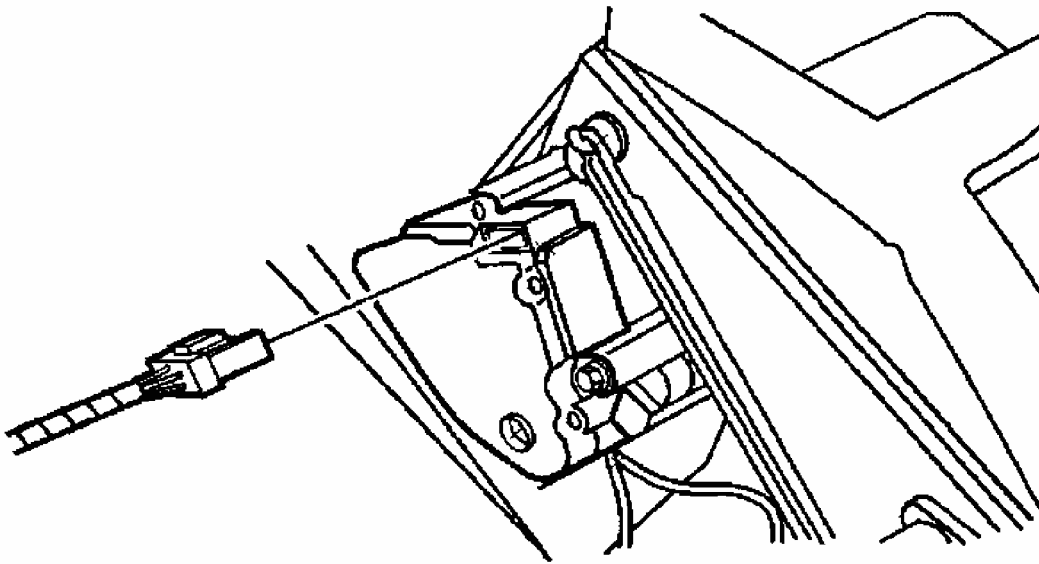
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Fig. 19: Removing Air Temperature Sensor Aspirator Duct
Courtesy of GENERAL MOTORS CORP.



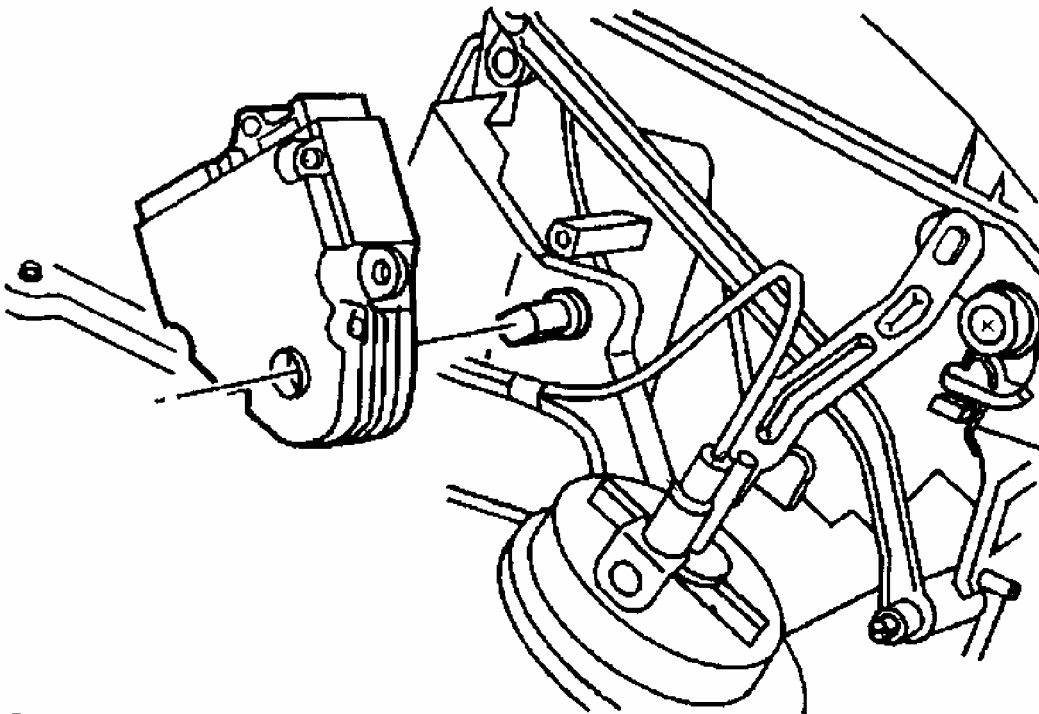
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Fig. 20: Disconnect DRL Sensor Electrical Connector
Courtesy of GENERAL MOTORS CORP.



G00209277

Fig. 21: Disconnect Electrical Connector From LH Temperature Actuator
Courtesy of GENERAL MOTORS CORP.



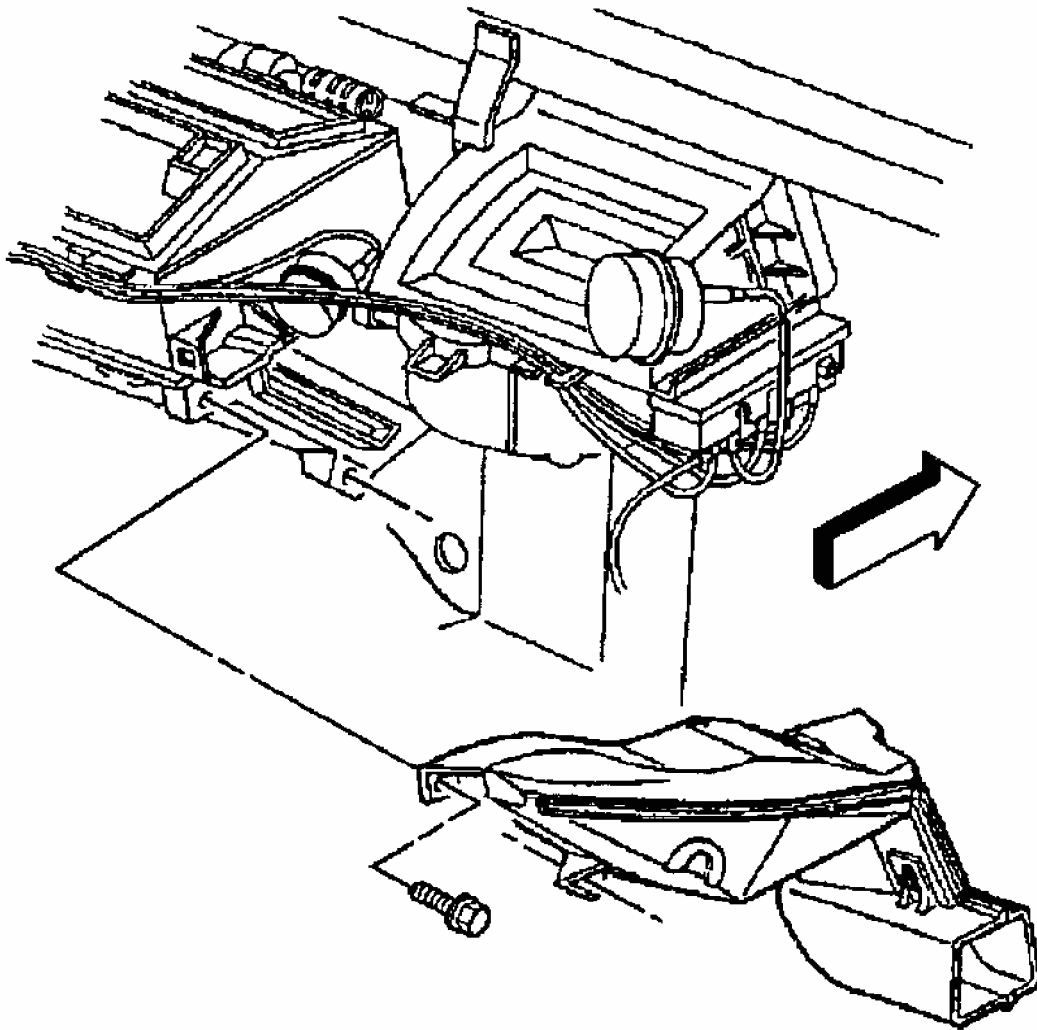
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Fig. 22: Exploded View Of Air LH Temperature Actuator

Courtesy of GENERAL MOTORS CORP.

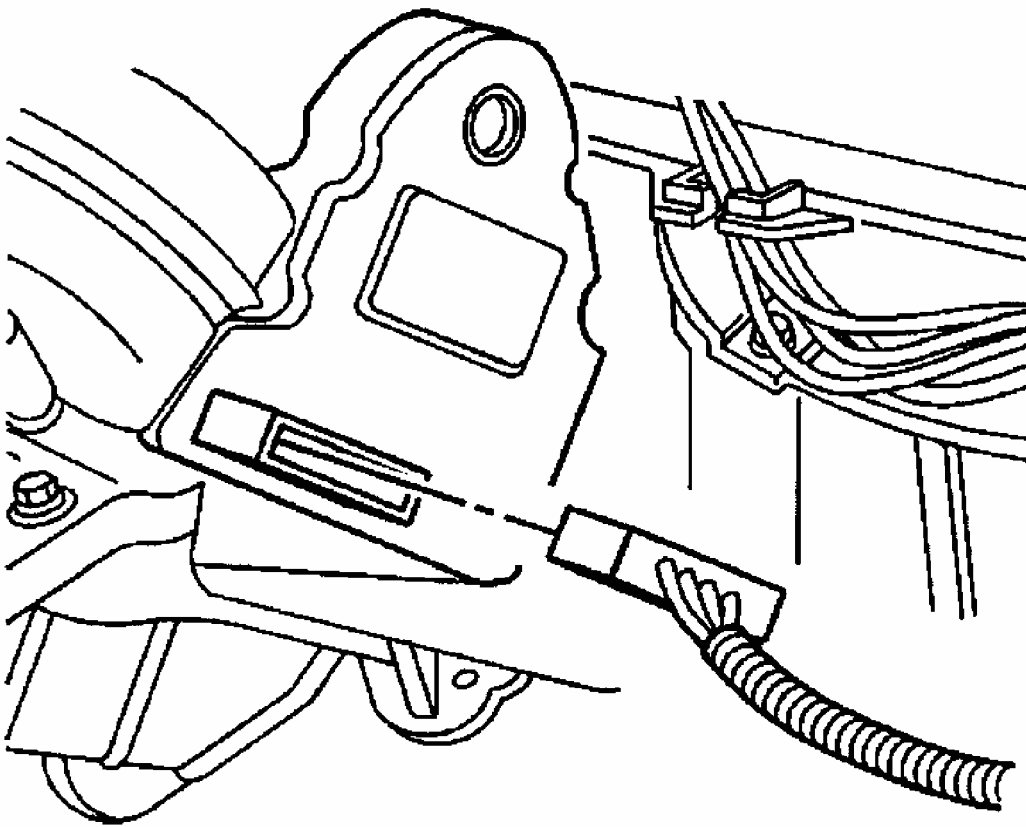
Removal (Right)

1. Remove the front floor kick-up panel. Remove the cover from the I/P electrical center. Remove the I/P upper trim pad.
2. Disconnect the right side lower window defogger outlet duct from the windshield defroster duct, then reposition the side window defogger outlet duct forward. Remove the defroster door actuator. Remove the I/P lower right insulator panel.
3. Remove the lower half of the right floor air outlet duct. Using a flat bladed tool, release the retaining tabs, then remove the lower duct. Remove the floor air outlet duct retaining screws. Reposition the floor air outlet duct downward to better access the air temperature actuator. See **Fig. 23** .
4. Disconnect the air temperature actuator electrical connector. See **Fig. 24** . Remove the air temperature actuator screws. Remove the air temperature actuator. See **Fig. 25** .



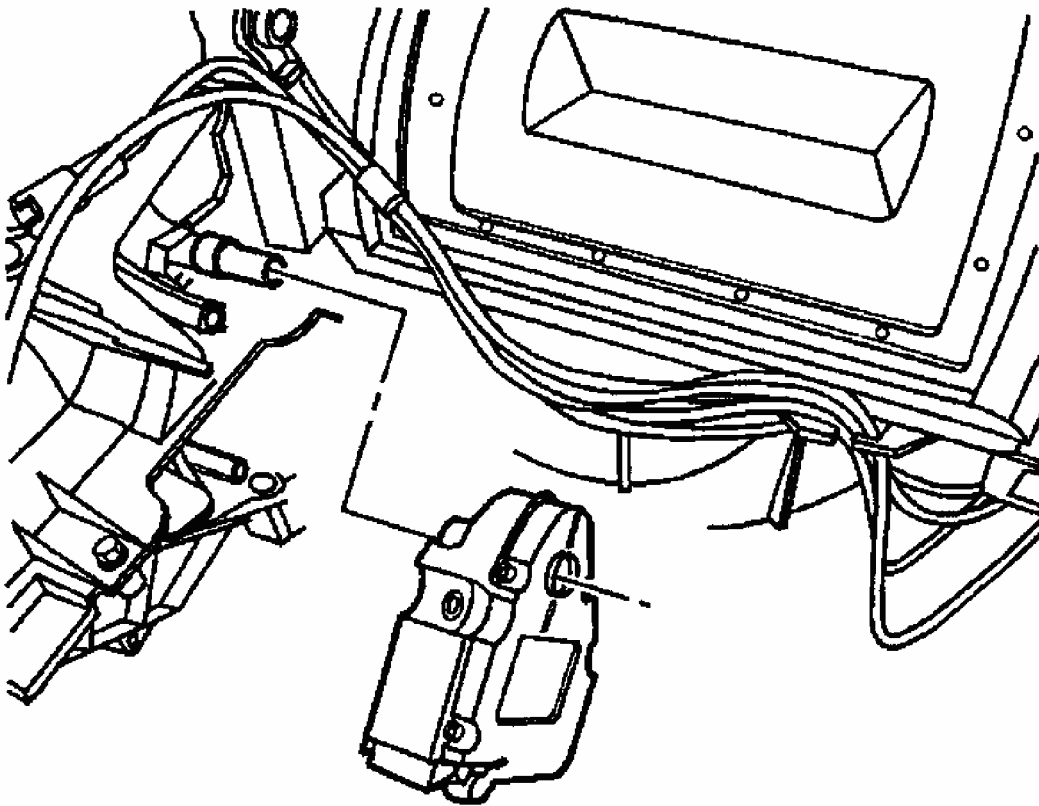
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Fig. 23: Removing right Floor Air Outlet Duct
Courtesy of GENERAL MOTORS CORP.



G00209281

Fig. 24: Disconnecting right Temperature Actuator Electrical Connector
Courtesy of GENERAL MOTORS CORP.



G00192054

Fig. 25: Removing & Installing Passenger Side Temperature Actuator
Courtesy of GENERAL MOTORS CORP.

Installation (Left)

1. Position the air temperature actuator, then align the slots in the actuator driver to the flats on the temperature door shaft. Slide the air temperature actuator onto the shaft, while aligning the actuator locating hole to the forward alignment pin on the HVAC module case. The actuator should be completely seated onto the temperature door shaft and the actuator mounting holes should be flush with the mounting bosses on the HVAC module case. See **Fig. 22**.
2. Install the temperature actuator retaining screws. Tighten to specified torque. See **TORQUE SPECIFICATIONS**. Connect the air temperature actuator electrical connector. See **Fig. 21**.
3. Install the inside air temperature sensor aspirator duct muffler. Use a twisting motion to secure the duct muffler. See **Fig. 20**. Install the inside air temperature sensor aspirator duct. See **Fig. 19**. Use a twisting motion to secure the duct to the duct muffler. Install the duct retaining tab to the ignition switch housing bracket.
4. Install the Bose amplifier. Install the front floor kick-up panel. Recalibrate the

actuators. See **RE-CALIBRATING ACTUATORS** under TROUBLESHOOTING.

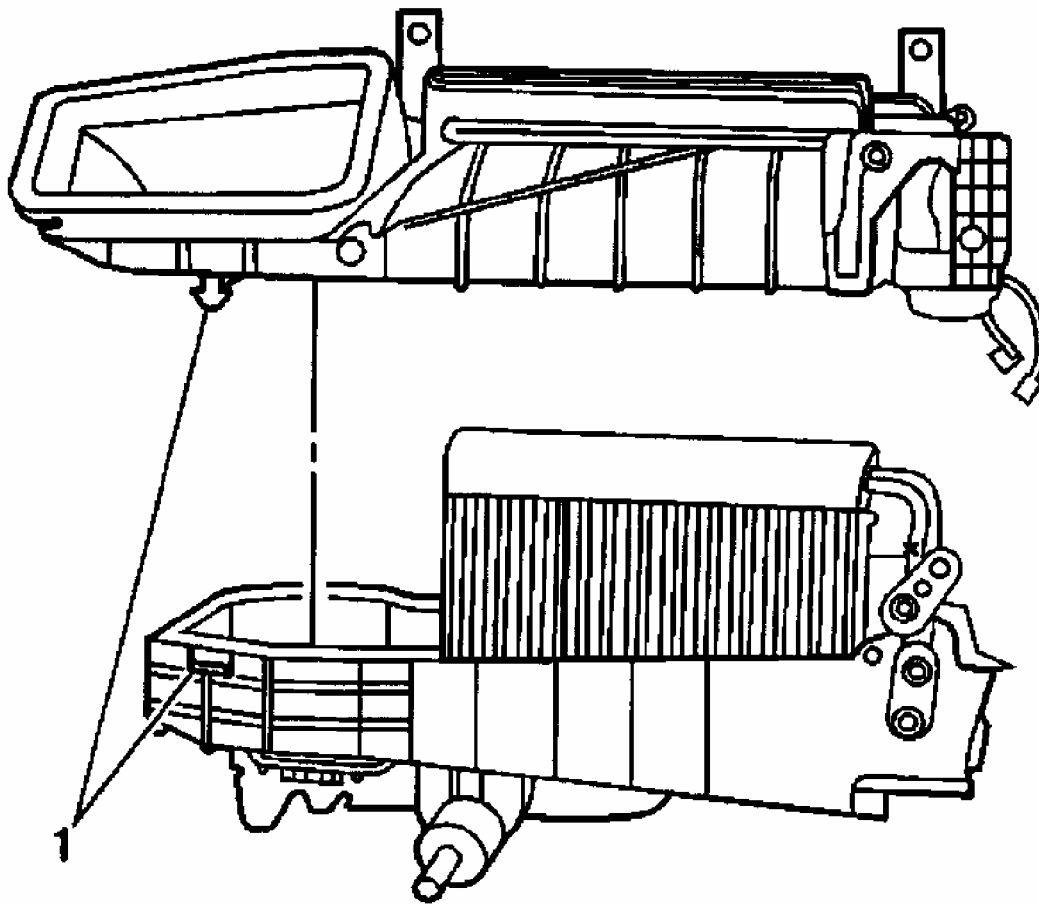
Installation (Right)

1. Position the air temperature actuator, then align the slots in the actuator driver to the flats on the right temperature door shaft. Slide the air temperature actuator onto the shaft, while aligning the actuator locating hole to the forward alignment pin on the HVAC module case. The actuator should be completely seated onto the temperature door shaft and the actuator mounting holes should be flush with the mounting bosses on the HVAC module case. See **Fig. 25** .
2. Install the air temperature actuator retaining screws. Tighten to specified torque. See **TORQUE SPECIFICATIONS** . Connect the air temperature actuator electrical connector. See **Fig. 24** .
3. Position the floor air outlet duct to the HVAC module case. See **Fig. 23** . Install the floor air outlet duct retaining screws. Tighten to specified torque. See **TORQUE SPECIFICATIONS** .
4. Install the lower half of the right floor air outlet duct. Align the retaining tabs and snap into place. Install the right I/P lower insulator panel. Install the defroster door actuator. Position and connect the right side lower window defogger outlet duct to the windshield defroster duct.
5. Install the I/P upper trim pad. Install the cover to the I/P electrical center. Install the front floor kick-up panel. Recalibrate the actuators. See **RE-CALIBRATING ACTUATORS** under ADJUSTMENTS.

AIR TEMPERATURE DOOR

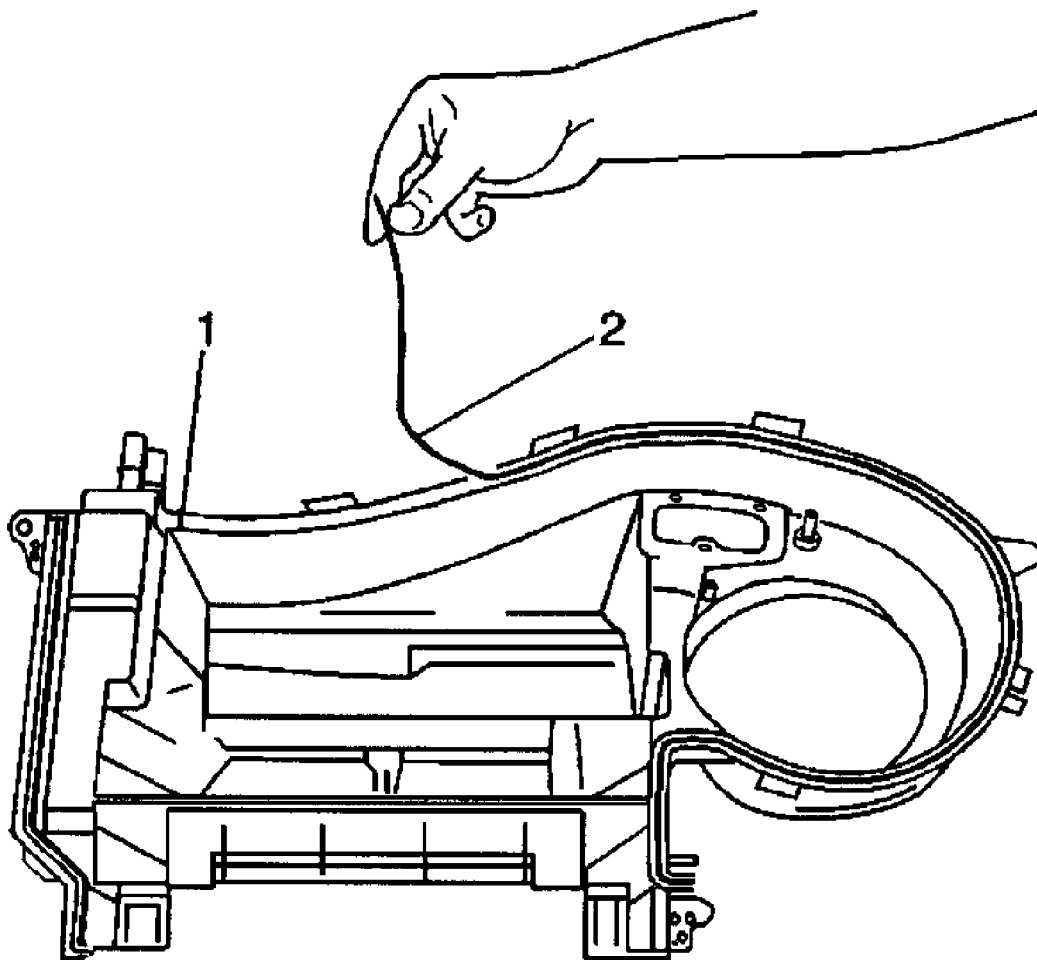
Removal

1. Remove the HVAC module. See **HVAC MODULE** under REMOVAL & INSTALLATION. Remove the temperature actuator. Remove the air inlet housing retaining screws.
2. Remove the air inlet housing. Remove the HVAC module upper mounting screws. Release the retaining tab securing the HVAC module halves. See **Fig. 26** . Separate the upper and lower module halves.
3. Remove the HVAC module seal. See **Fig. 27** . Remove the temperature door. See **Fig. 28** .



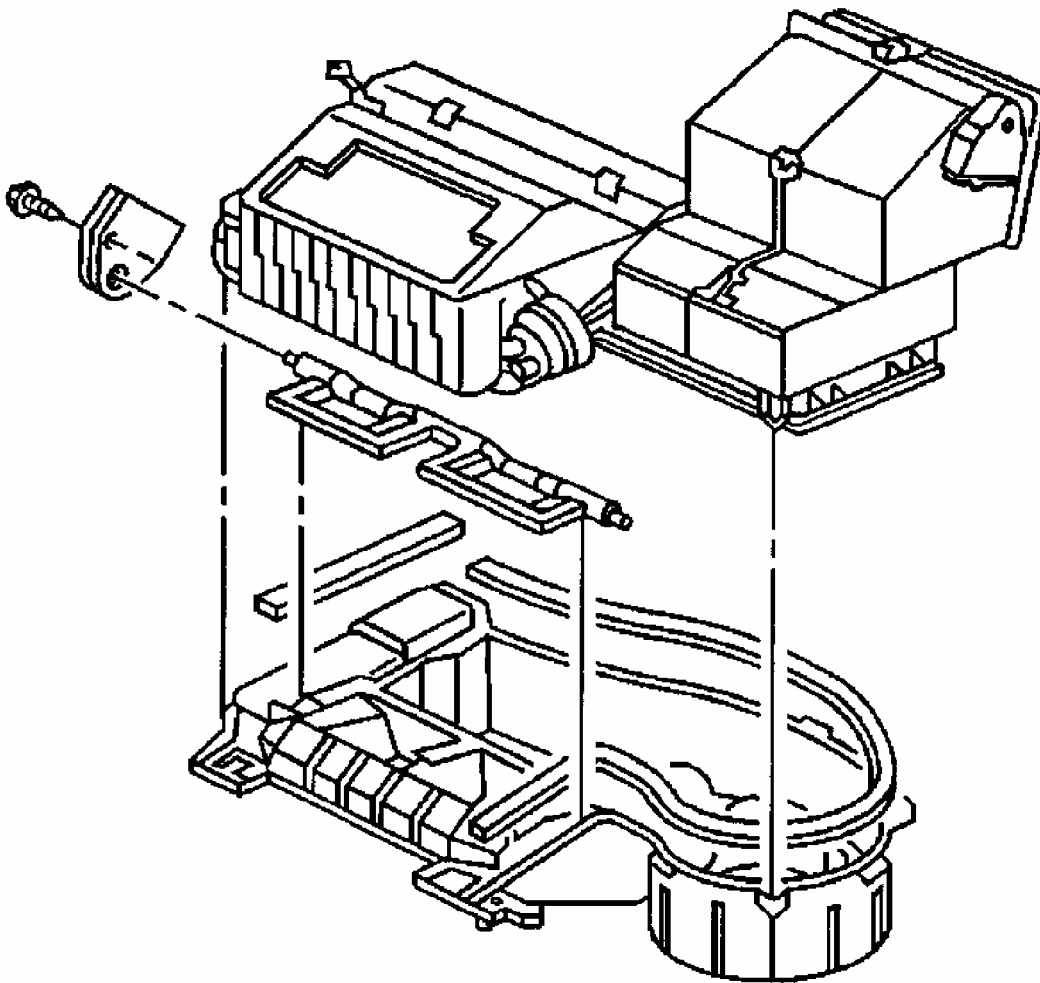
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Fig. 26: Separating Upper & Lower HVAC Module Halves
Courtesy of GENERAL MOTORS CORP.



G00203736

Fig. 27: Removing HVAC Module Seal
Courtesy of GENERAL MOTORS CORP.



G00203737

Fig. 28: Removing Temperature Door
Courtesy of GENERAL MOTORS CORP.

Installation

1. Install the temperature door. See **Fig. 28** . Install the NEW case seal to the HVAC module case. See **Fig. 27** . Wet the upper evaporator core seal with water.

NOTE: **Inspect the condition of the retaining tab on the upper module case prior to installing the lower module case. If the retaining tab is broken or damaged, install an external retaining clip GM P/N (52458793, or equivalent).**

2. Align and install the upper module case to the lower module case. See **Fig. 26** . Align and secure the retaining tab. Install the HVAC module upper mounting screws. Tighten

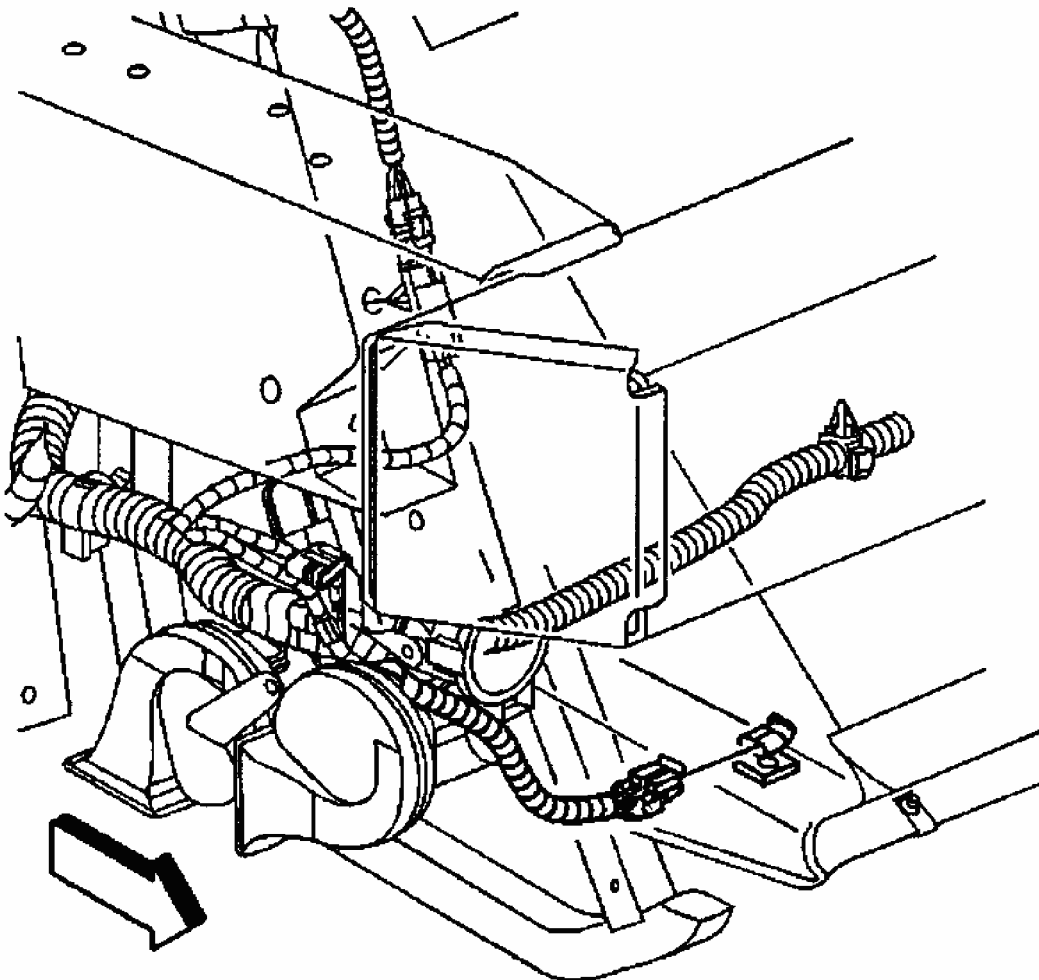
to specified torque, see **TORQUE SPECIFICATIONS** . Install the air inlet housing.

3. Install the air inlet housing retaining screws. Tighten to specified torque, see **TORQUE SPECIFICATIONS** . Install the temperature actuator. Install the HVAC module. See **HVAC MODULE** under REMOVAL & INSTALLATION.

AMBIENT AIR TEMPERATURE SENSOR

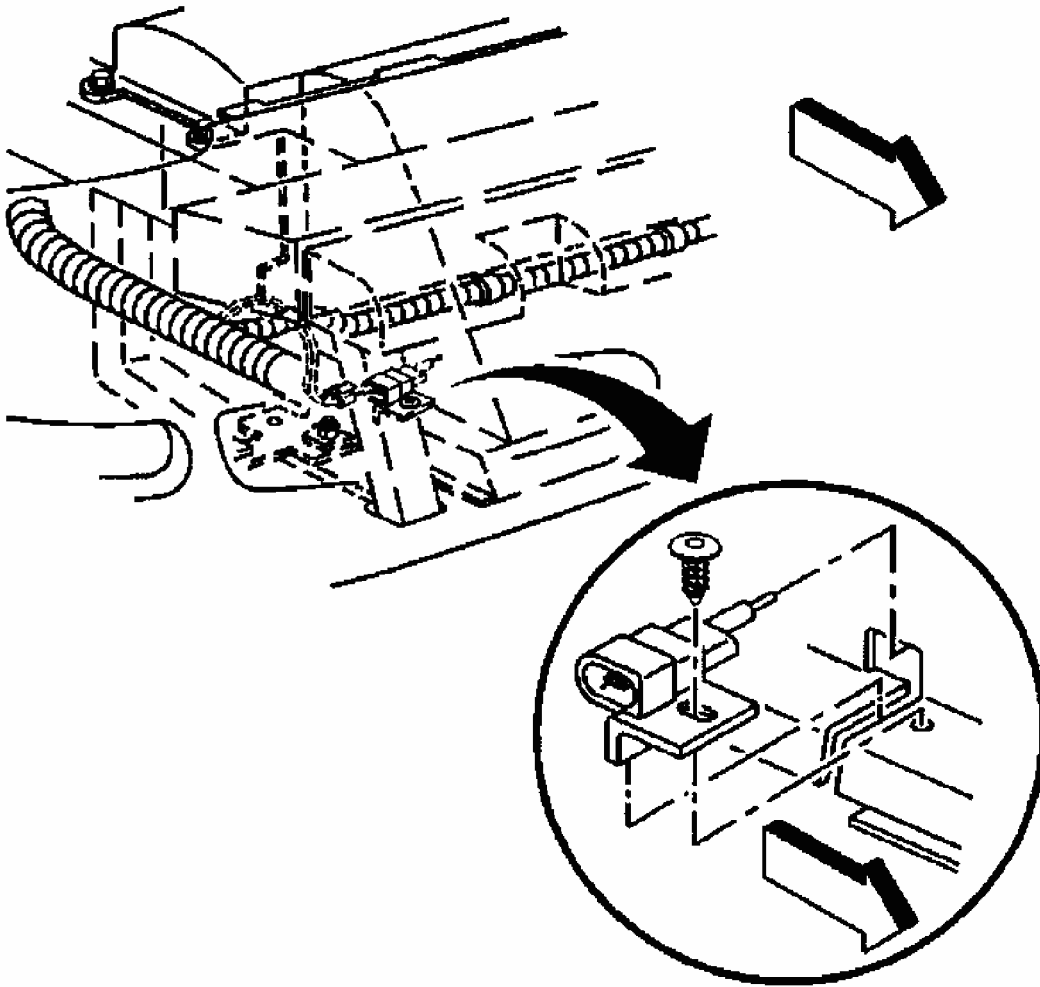
Removal & Installation

Disconnect the ambient air temperature sensor electrical connector. See **Fig. 29** . Remove the push-in retainer securing the ambient air temperature sensor to the lower right side of the radiator support. Remove the ambient air temperature sensor from the radiator support. See **Fig. 30** .



G00213918

Fig. 29: Removing & Installing Ambient Air Temperature Sensor Electrical Connector
Courtesy of GENERAL MOTORS CORP.



G00213919

Fig. 30: Removing & Installing Ambient Air Temperature Sensor
Courtesy of GENERAL MOTORS CORP.

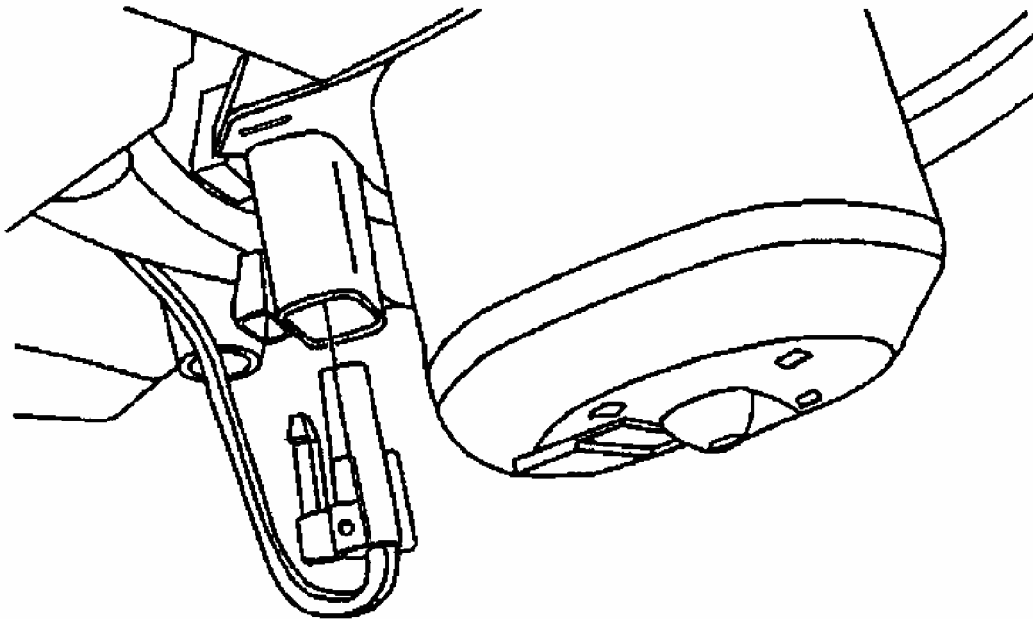
BLOWER MOTOR

WARNING: Unplug the blower motor before removal. Blower motor case contact with any ground may start the fan and cause personal injury.

Removal

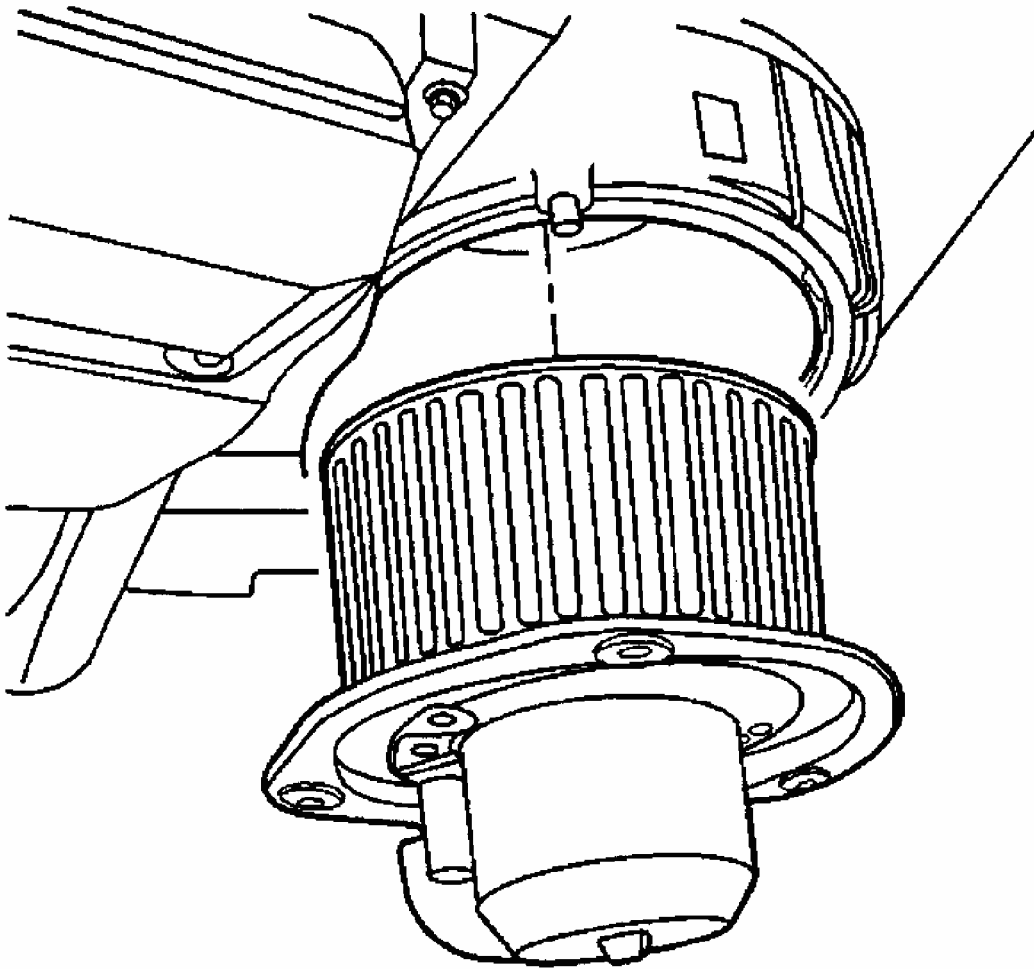
1. Remove the I/P lower right side insulator panel. Disconnect the blower motor electrical connector. See **Fig. 31**.
2. Disconnect the blower motor cooling tube from the HVAC module. See **Fig. 32**.
Remove the blower motor retaining screws. Remove the blower motor from the HVAC

module.



G00209241

Fig. 31: Disconnecting Blower Motor Electrical Connector
Courtesy of GENERAL MOTORS CORP.



G00209242

Fig. 32: Removing & Installing Blower Motor Cooling Tube
Courtesy of GENERAL MOTORS CORP.

Installation

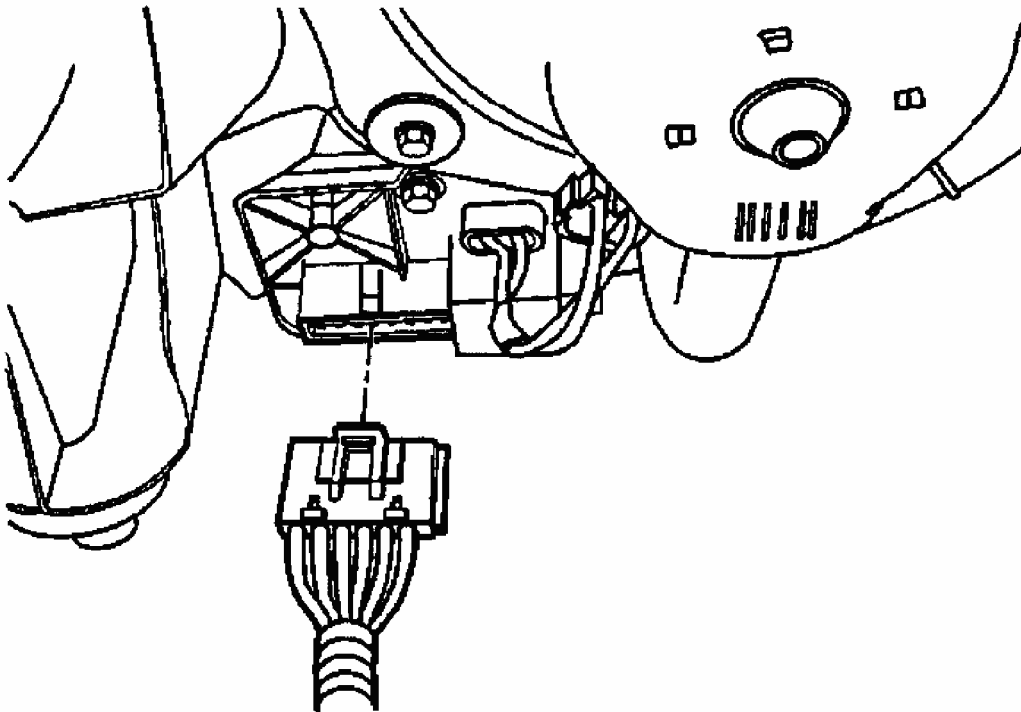
1. Install the blower motor to the HVAC module. Install the blower motor retaining screws. Tighten to specified torque, see **TORQUE SPECIFICATIONS** . Connect the blower motor cooling tube to the HVAC module. See **Fig. 32** .
2. Connect the blower motor electrical connector. See **Fig. 31** . Install the I/P right side lower insulator panel.

BLOWER MOTOR CONTROL PROCESSOR

WARNING: Unplug the blower motor before removal. Blower motor case contact with any ground may start the fan and cause personal injury.

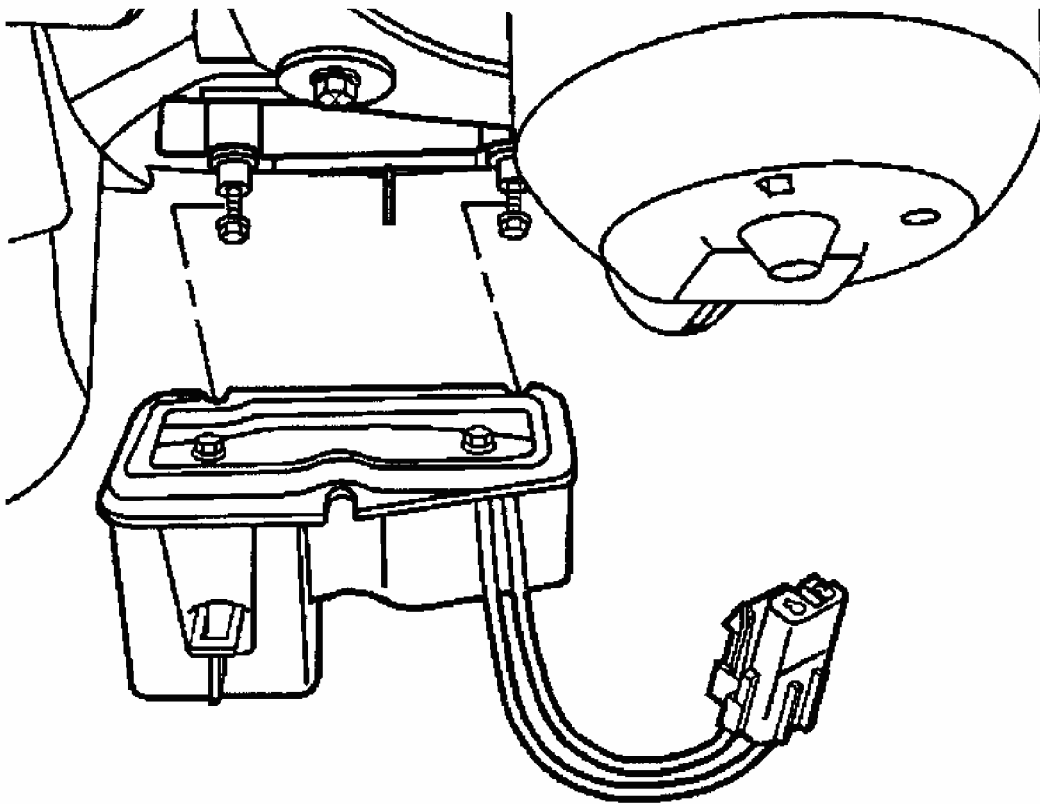
Removal

1. Remove the right I/P lower insulator panel. Disconnect the blower motor control module electrical connector. See **Fig. 33** .
2. Disconnect the blower motor control module electrical connector from the blower motor. See **Fig. 31** . Loosen the blower motor control module forward two retaining screws (nearest the dash mat) approximately 0.197 in (5 mm). The control module is slotted at the forward retaining locations.
3. Remove the rear blower motor control module retaining screw. Tilt down the rear of the blower motor control module. Remove the blower motor control module from the HVAC module. See **Fig. 34** .



G00209243

Fig. 33: Disconnecting Wiring Harness From Blower Motor
Courtesy of GENERAL MOTORS CORP.



G00213920

Fig. 34: Removing Blower Motor Control Module
Courtesy of GENERAL MOTORS CORP.

Installation

1. Install the blower motor control module to the HVAC module. Position the blower motor control module forward retaining slots onto the forward retaining screws.
2. Align and seat the blower control module to the HVAC module. Install the rear blower motor control module retaining screw. See **Fig. 33** . Tighten all the blower motor control module retaining screws. Tighten to specified torque, see **TORQUE SPECIFICATIONS** .
3. Connect the blower motor electrical connector. See **Fig. 31** . Connect the blower motor control module electrical connector. See **Fig. 33** . Install the right I/P lower insulator panel.

BLOWER MOTOR RELAY

Removal & Installation

Blower motor relay is mounted on the multi use relay and fuse bracket, above the Body

Control Module (BCM). To remove, lower right side instrument panel sound insulator. Remove multi use relay cover and remove blower relay. To install, reverse removal procedure.

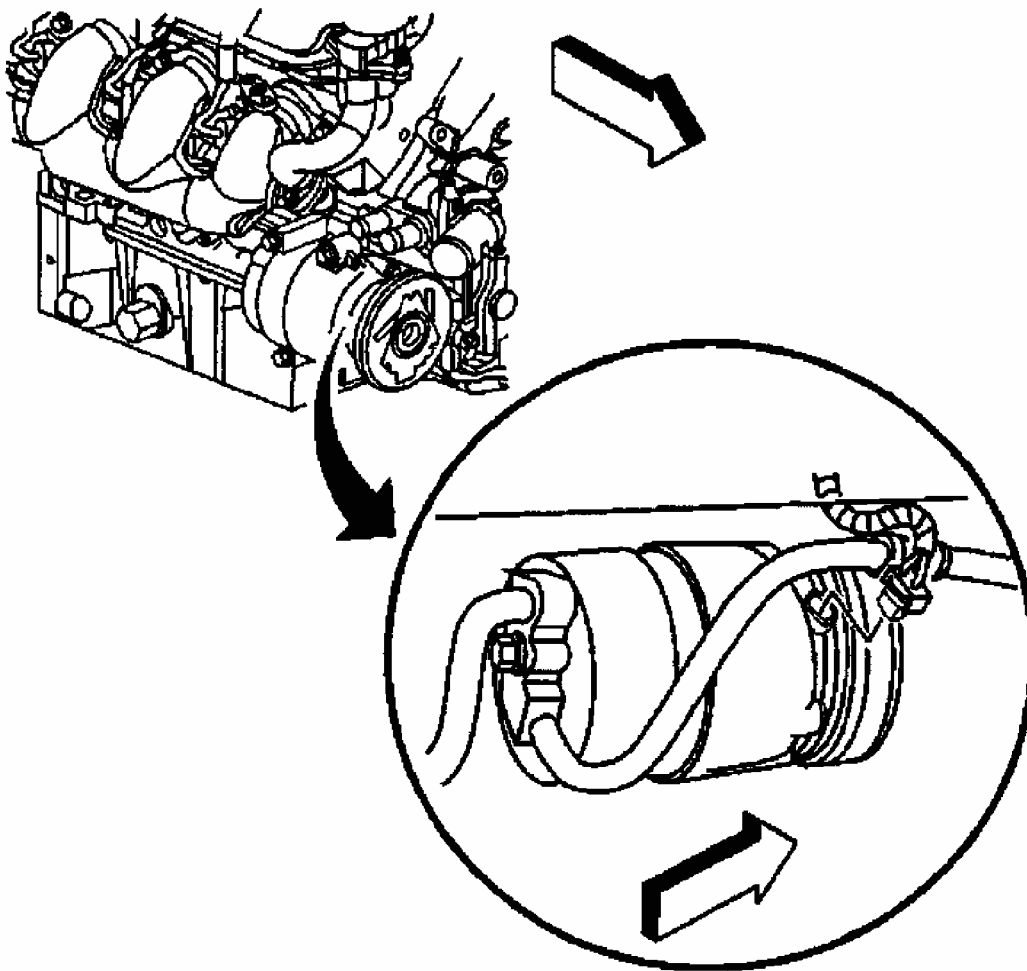
COMPRESSOR

Removal

1. Recover the refrigerant from the A/C system. See RECOVERY, EVACUATION & RECHARGING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING. Remove the battery heat shield. Remove the water pump.
2. Remove the compressor drive belt. Disconnect the compressor clutch electrical connector. See **Fig. 35** . Raise and support the vehicle.

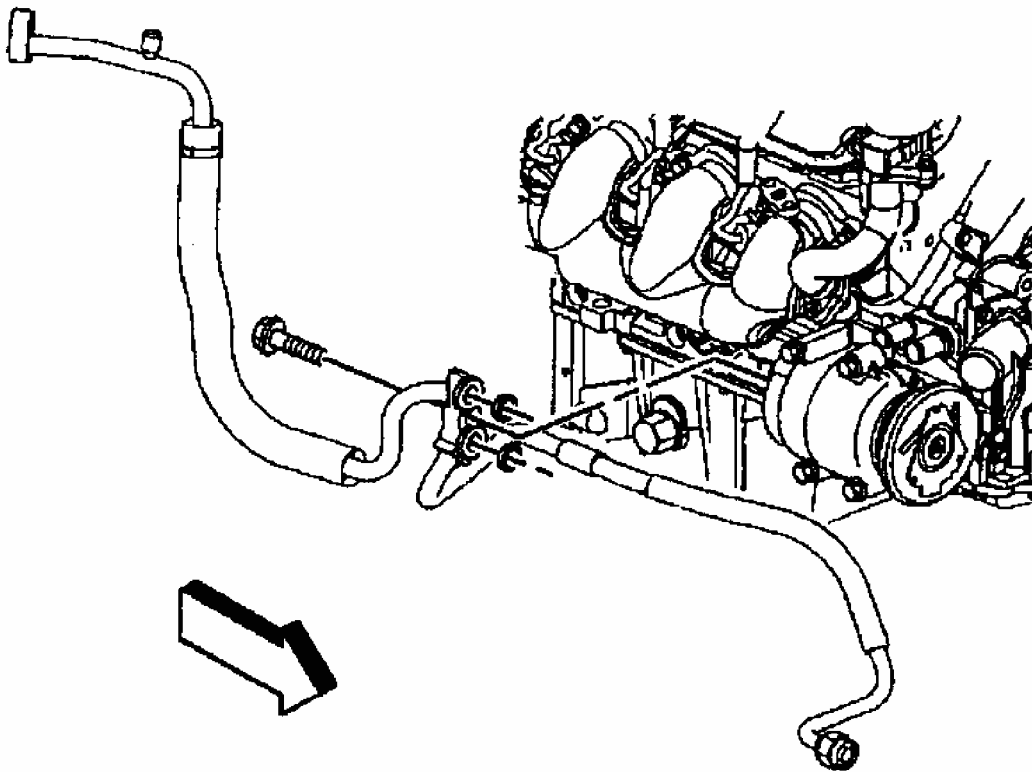
NOTE: Cap or tape the open compressor hose immediately to prevent contamination.

3. Remove the compressor hose retaining bolt. See **Fig. 36** . Disconnect the compressor hose from the compressor, discard the seal washers and cap or tape the hose end to prevent contamination.
4. Remove the lower compressor mounting bolts. See **Fig. 37** . Lower the vehicle.
5. Remove the compressor mounting nut. See **Fig. 38** . Fully loosen the compressor mounting stud.
6. Remove the upper compressor mounting bolt. Remove the compressor and the mounting stud from the engine block. Remove the compressor mounting stud from the compressor.
7. If replacing the compressor, drain and measure as much of the oil as possible from the removed compressor: Drain the oil from both the suction and discharge ports of the removed compressor into a clean container. Remove the compressor crankcase oil drain plug and drain the crankcase oil into the same container. See **Fig. 39** .
8. Measure and record the amount of oil drained from the removed compressor. This measurement will be used during installation of the replacement compressor. Properly discard the used PAG oil.



G00203715

Fig. 35: Disconnecting Compressor Clutch Electrical Connector
Courtesy of GENERAL MOTORS CORP.



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Fig. 36: Removing & Installing Compressor Hose Retaining Bolt
Courtesy of GENERAL MOTORS CORP.

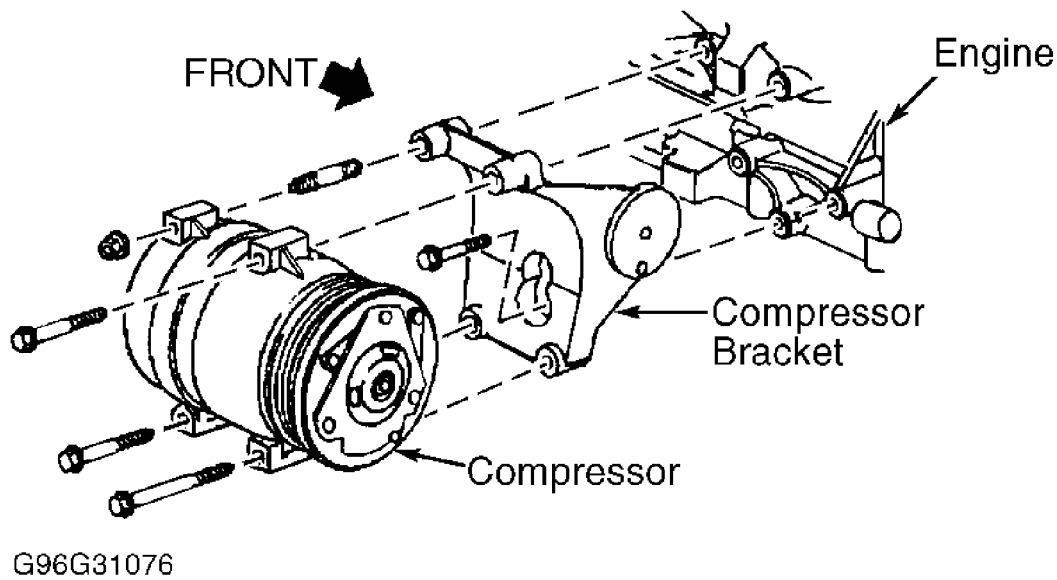


Fig. 37: Removing & Installing A/C Compressor
Courtesy of GENERAL MOTORS CORP.

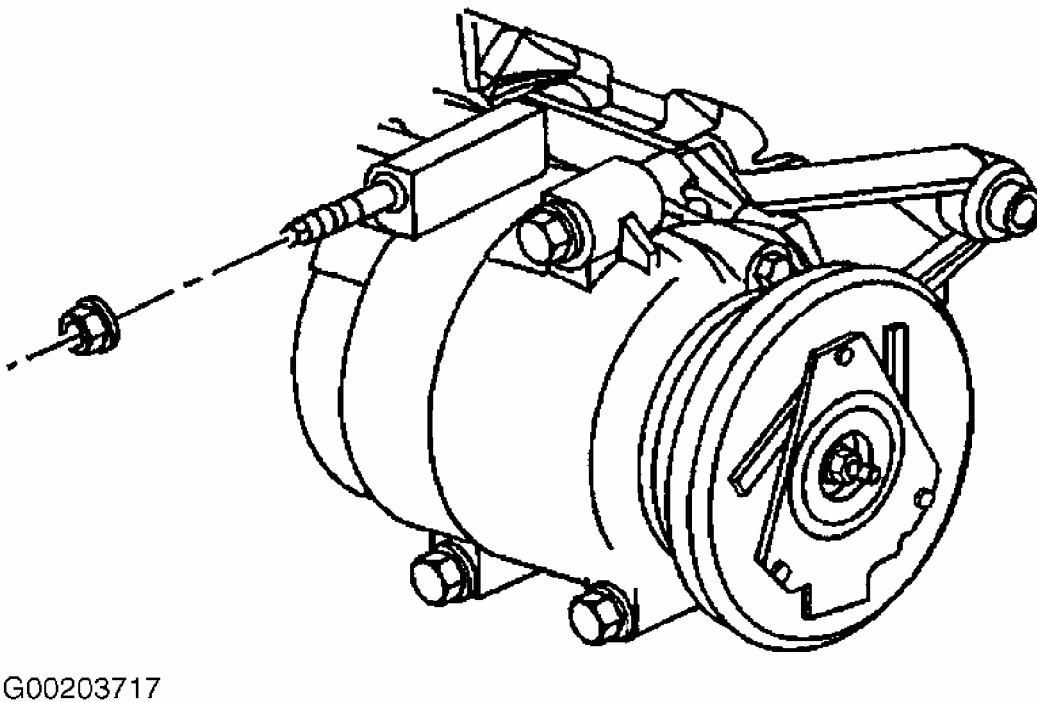
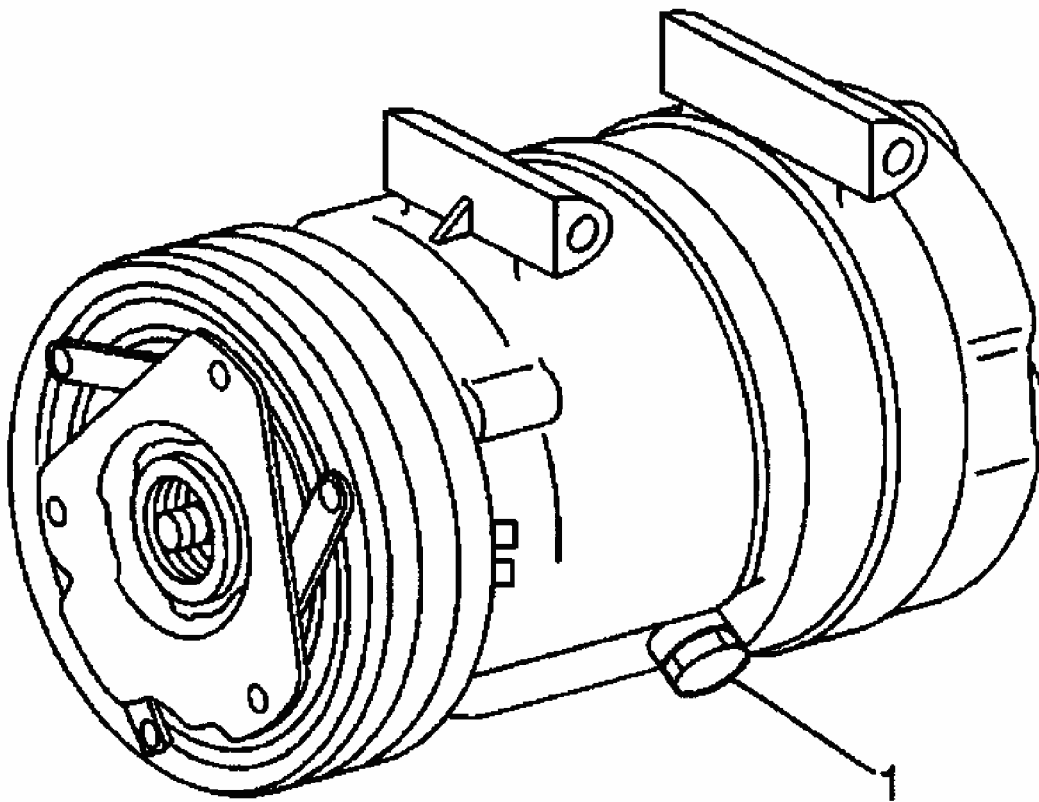


Fig. 38: Removing & Installing Compressor Mounting Nut
Courtesy of GENERAL MOTORS CORP.



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Fig. 39: Removing & Installing Compressor Crankcase Oil Drain Plug
Courtesy of GENERAL MOTORS CORP.

Installation

1. Add the proper amount of PAG oil to the compressor crankcase. Install the compressor drain plug. See **Fig. 39** . Tighten the compressor drain plug. Tighten to specified torque, see **TORQUE SPECIFICATIONS** .
2. Install the compressor mounting stud to the compressor. Install the compressor into position on the compressor mounting bracket. Install the compressor mounting stud to the engine block. Install the upper compressor mounting bolt. See **Fig. 37** .
3. Raise and support the vehicle. Install the lower compressor mounting bolts. Lower the vehicle.
4. Tighten the compressor mounting stud. See **Fig. 38** . Tighten to specified torque, see **TORQUE SPECIFICATIONS** . Tighten the compressor mounting bolts in the following sequence:
 1. Front upper.
 2. Front lower.

3. Rear lower.

Tighten the bolts in sequence to specified torque, see **TORQUE SPECIFICATIONS** .

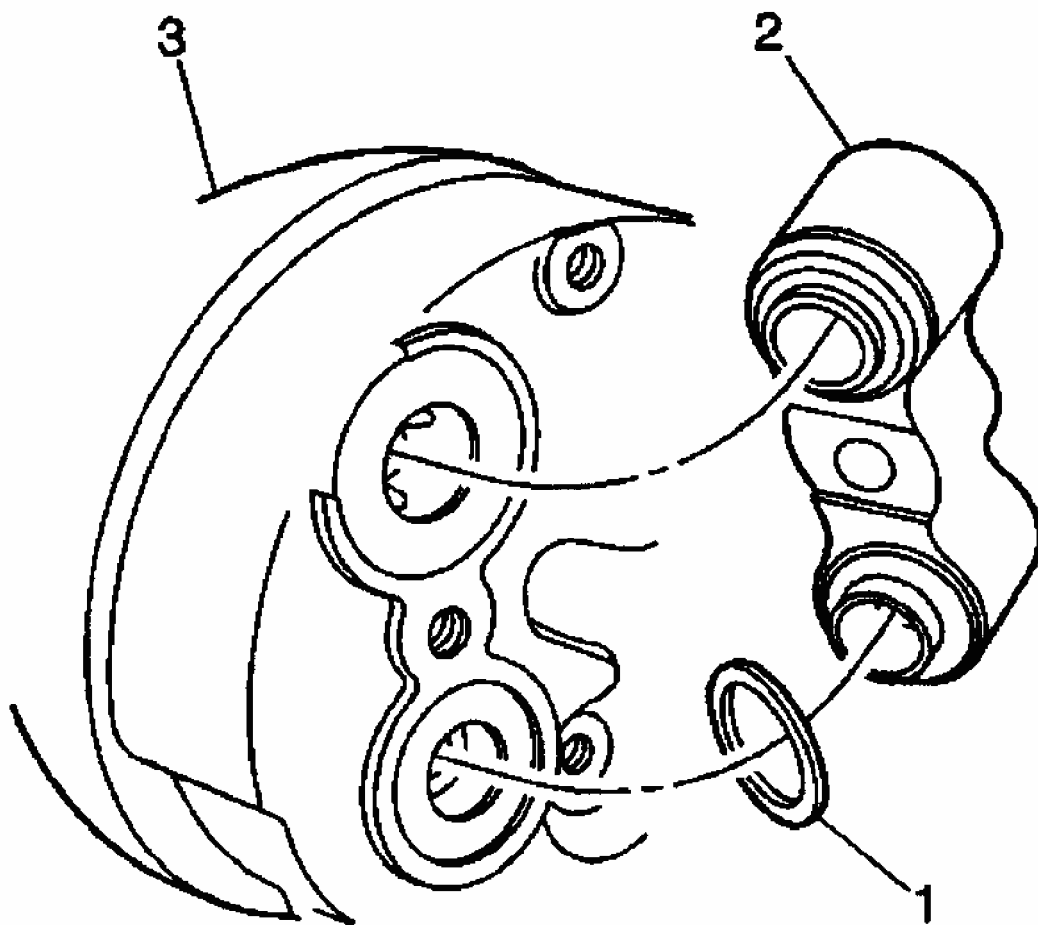
5. Install the compressor mounting nut. Tighten to specified torque, see **TORQUE SPECIFICATIONS** .
6. Raise and support the vehicle. Remove the cap or tape from the compressor hose end. Using a lint-free clean, dry cloth, carefully clean the sealing surfaces of the compressor hose and the compressor. See **Fig. 40** .

NOTE: **Do not allow any of the mineral base 525 viscosity refrigerant oil on the seal washers to enter the refrigerant system**

7. Lightly coat the NEW sealing washers with mineral base 525 viscosity refrigerant oil. Carefully slide the NEW sealing washers onto the compressor hose until seated. See **Fig. 40** .

NOTE: **After tightening the compressor hose to the compressor, there should be a slight sealing washer gap of approximately 3/64 in (1.2 mm) between the compressor hose and the compressor.**

8. Install the compressor hose to the compressor. See **Fig. 36** . Install the compressor hose to compressor retaining bolt. Tighten the compressor hose to compressor retaining bolt. Tighten to specified torque, see **TORQUE SPECIFICATIONS** . Lower the vehicle.
9. Connect the compressor clutch electrical connector. See **Fig. 35** . Install the compressor drive belt. See SERPENTINE BELT ROUTING & ALIGNMENT in **COOLING SYSTEM SPECIFICATIONS & DRIVE BELT ROUTING - ALL MODELS** article in ENGINE COOLING. Install the water pump.
10. Install the battery heat shield. Refill the cooling system.
11. Evacuate and recharge the A/C system. See RECOVERY, EVACUATION & RECHARGING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING.



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Fig. 40: Installing Compressor Hose
Courtesy of GENERAL MOTORS CORP.

COMPRESSOR HOSE ASSEMBLY

Removal

1. Recover the refrigerant from the A/C system. See RECOVERY, EVACUATION & RECHARGING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING. Remove the battery heat shield. Remove the compressor drive belt.
2. Disconnect the compressor clutch electrical connector. Raise and support the vehicle. Remove the compressor hose assembly retaining bolt. See **Fig. 36** .

NOTE: Prior to removal, take note of the compressor hose routing and orientation between the compressor and condenser.

3. Using a back-up wrench on the condenser fitting, loosen the compressor hose fitting

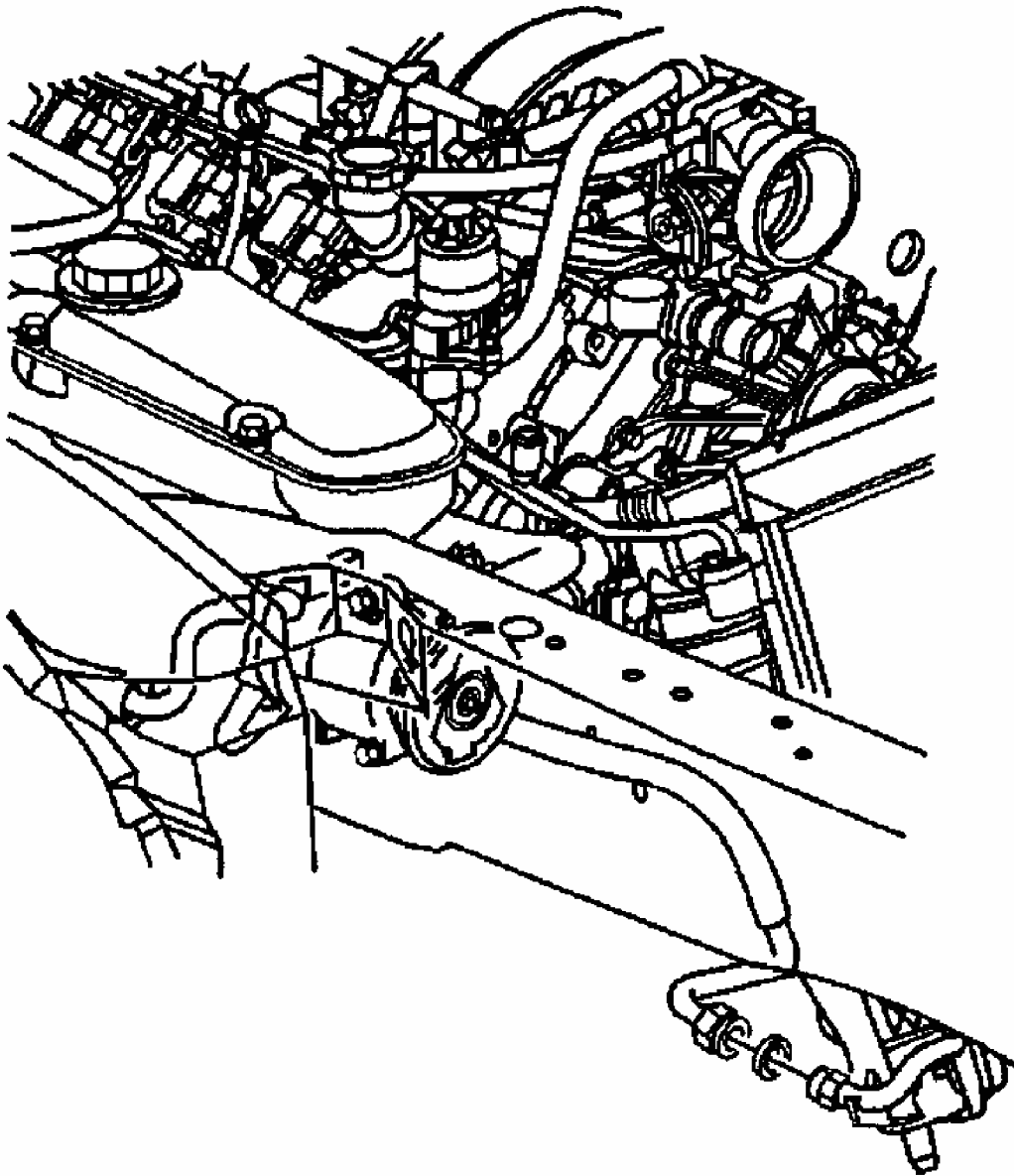
from the condenser. See **Fig. 11** . Remove the lower compressor mounting bolts. See **Fig. 37** .

NOTE: Cap or tape the open compressor hose and the condenser immediately to prevent contamination.

4. Remove the compressor hose assembly from the condenser. See **Fig. 41** . Discard the O-ring seal and cap or tape the compressor hose and the condenser. Lower the vehicle.

NOTE: Cap or tape the open compressor hose and the accumulator immediately.

5. Remove the compressor hose assembly to accumulator retaining bolt. See **Fig. 9** . Remove the compressor hose assembly from the accumulator, discard the O-ring seal and cap or tape the compressor hose assembly and the accumulator to prevent contamination.
6. Remove the compressor mounting nut. See **Fig. 38** . Fully loosen the compressor mounting stud. Reposition the A/C compressor forward. Remove the compressor hose assembly from the vehicle.



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Fig. 41: Removing Compressor Hose From Condenser
Courtesy of GENERAL MOTORS CORP.

Installation

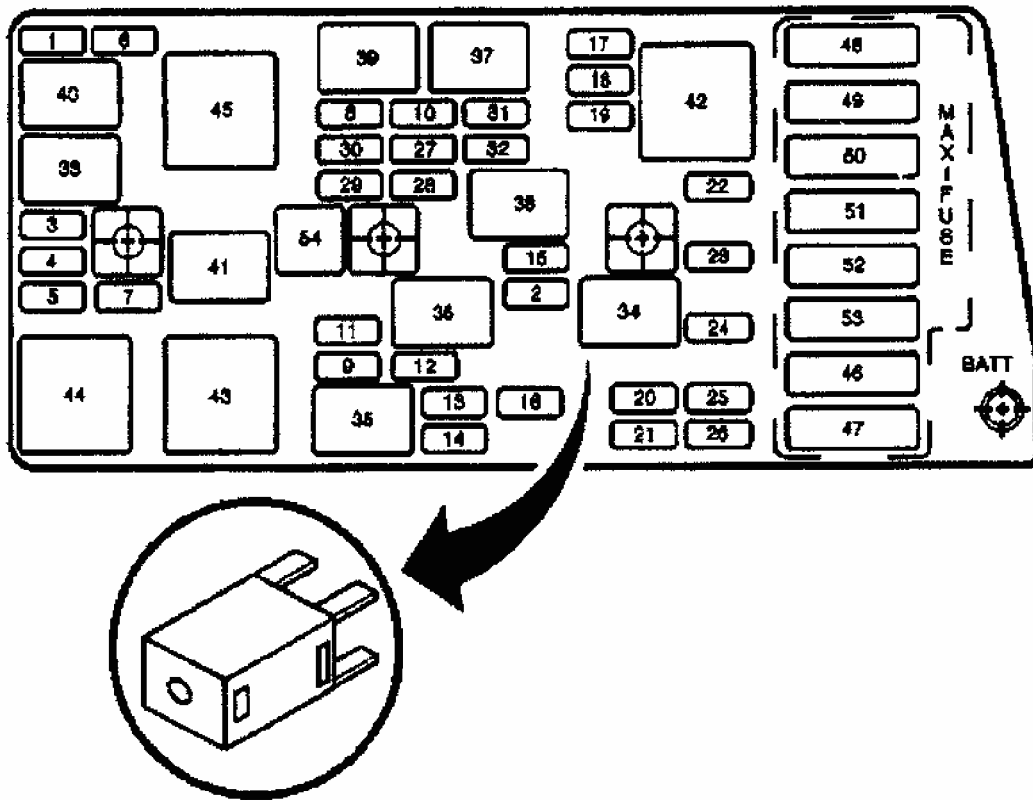
1. Install the compressor hose assembly into position in the vehicle. Install the compressor into position on the compressor mounting bracket. Install the compressor mounting stud to the engine block. Install the compressor mounting bolt in the upper, forward position (net locating hole).

2. Remove the cap or tape from the compressor hose assembly and the accumulator. Install the NEW O-ring to the compressor hose assembly. See **Fig. 15** . Install the compressor hose to the accumulator. See **Fig. 9** .
3. Install the compressor hose assembly to accumulator retaining bolt. Tighten to specified torque, see **TORQUE SPECIFICATIONS** . Remove the cap or tape from the compressor hose assembly end and the compressor. See **Fig. 40** . Install the NEW seal washers to the compressor hose assembly.
4. Raise and support the vehicle. Route the compressor hose assembly to the condenser. Remove the cap or tape from the compressor hose assembly and the condenser. Install the NEW O-rings to the compressor hose assembly. See **Fig. 15** .
5. Install the lower compressor mounting bolts. See **Fig. 37** . Install the compressor hose assembly to the condenser. See **Fig. 41** . Align the compressor hose assembly to the condenser.
6. Using a back-up wrench on the condenser fitting, secure the compressor hose assembly fitting to the condenser. See **Fig. 11** . Tighten to specified torque, see **TORQUE SPECIFICATIONS** . Lower the vehicle.
7. Tighten the compressor mounting stud. See **Fig. 38** . Tighten to specified torque. Tighten the compressor mounting bolts in the following sequence, front upper, front lower, rear lower. Tighten to specified torque, see **TORQUE SPECIFICATIONS** .
8. Install the compressor mounting nut. Tighten to specified torque, see **TORQUE SPECIFICATIONS** . Connect the compressor clutch electrical connector. Install the compressor drive belt.
9. Install the battery heat shield. Recharge the A/C system. See RECOVERY, EVACUATION & RECHARGING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING.

COMPRESSOR RELAY

Removal & Installation

Remove the under hood electrical center cover. See **Fig. 7** . Remove the A/C compressor relay from the electrical center. See **Fig. 42** .



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Fig. 42: Removing Compressor Relay
 Courtesy of GENERAL MOTORS CORP.

CONDENSER

Removal

1. Recover the refrigerant from the A/C system. See RECOVERY, EVACUATION & RECHARGING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING. Remove the upper radiator support. Remove the front evaporator tube to condenser bolt. See **Fig. 43** .

NOTE: Cap or tape the open evaporator tube and the condenser immediately to prevent contamination.

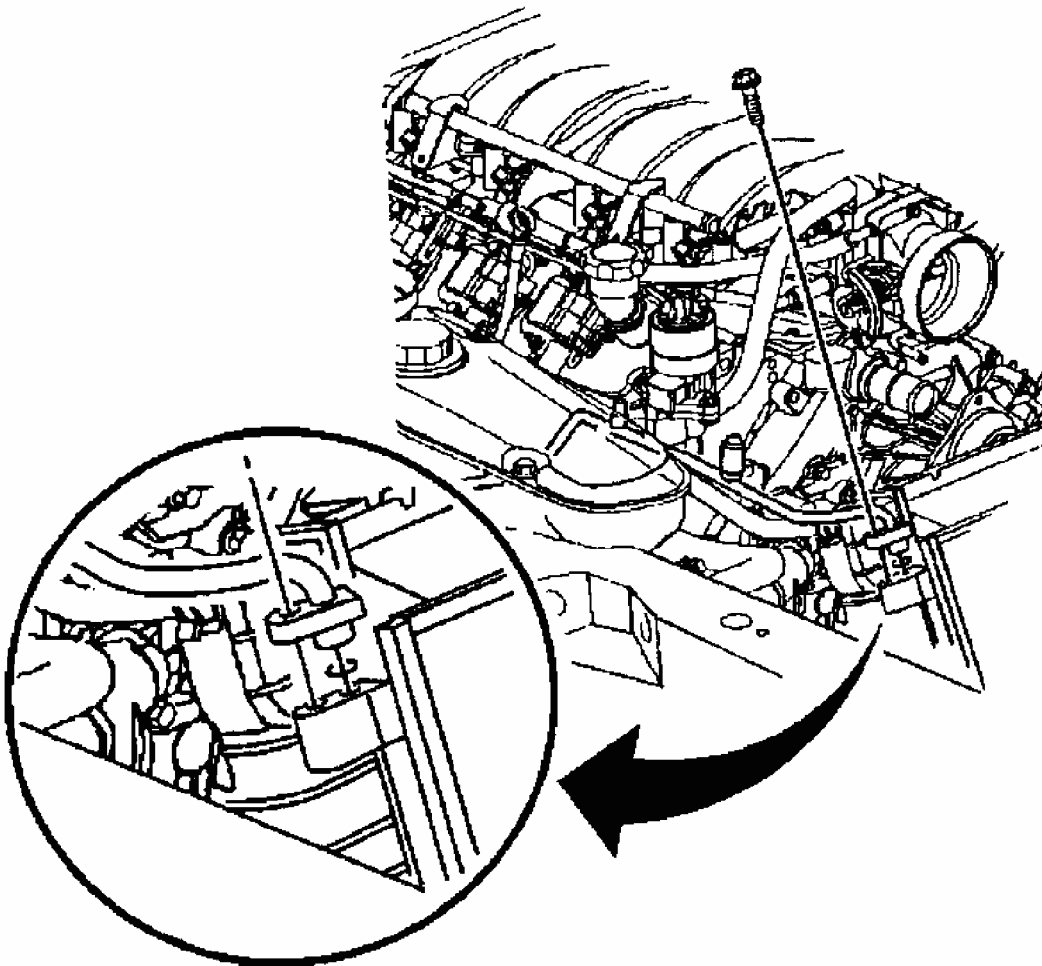
2. Disconnect the front evaporator tube from the condenser, discard the O-ring. Reposition the front evaporator tube. Raise and support the vehicle.

NOTE: Prior to removal, take note of the compressor hose routing

and orientation between the compressor and condenser.

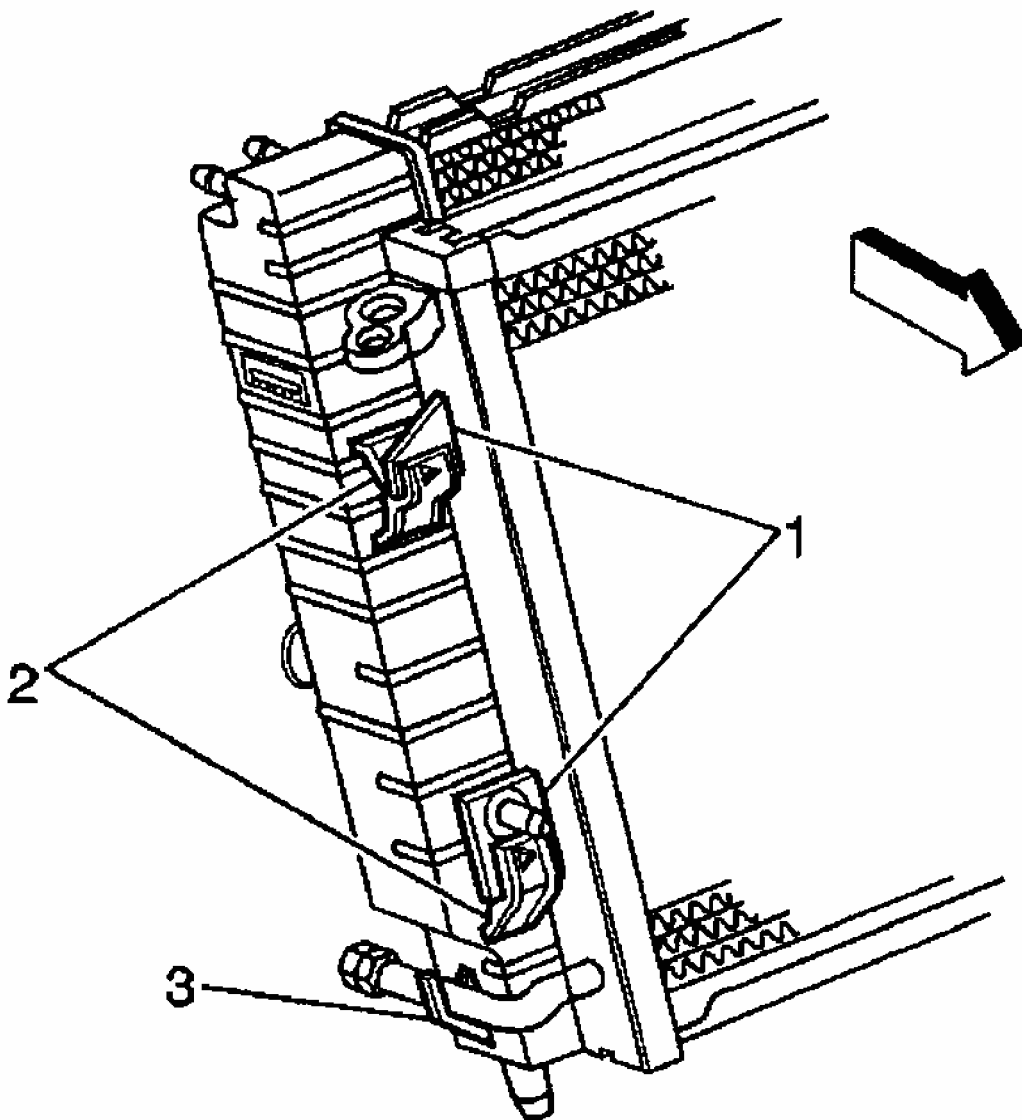
NOTE: Cap or tape the open compressor hose and the condenser immediately to prevent contamination.

3. Using a back-up wrench on the condenser fitting, loosen the compressor hose fitting from the condenser. See **Fig. 11** . Disconnect the compressor hose from the condenser. See **Fig. 41** . Discard the O-ring.
4. Lower the vehicle. Remove the radiator air baffle. Raise the condenser along the radiator to release the condenser tabs from the radiator slots. See **Fig. 44** .
5. Remove the condenser from the vehicle. See **Fig. 45** . Inspect the condenser insulators along the left side and right side front edges of the condenser for wear or damage.



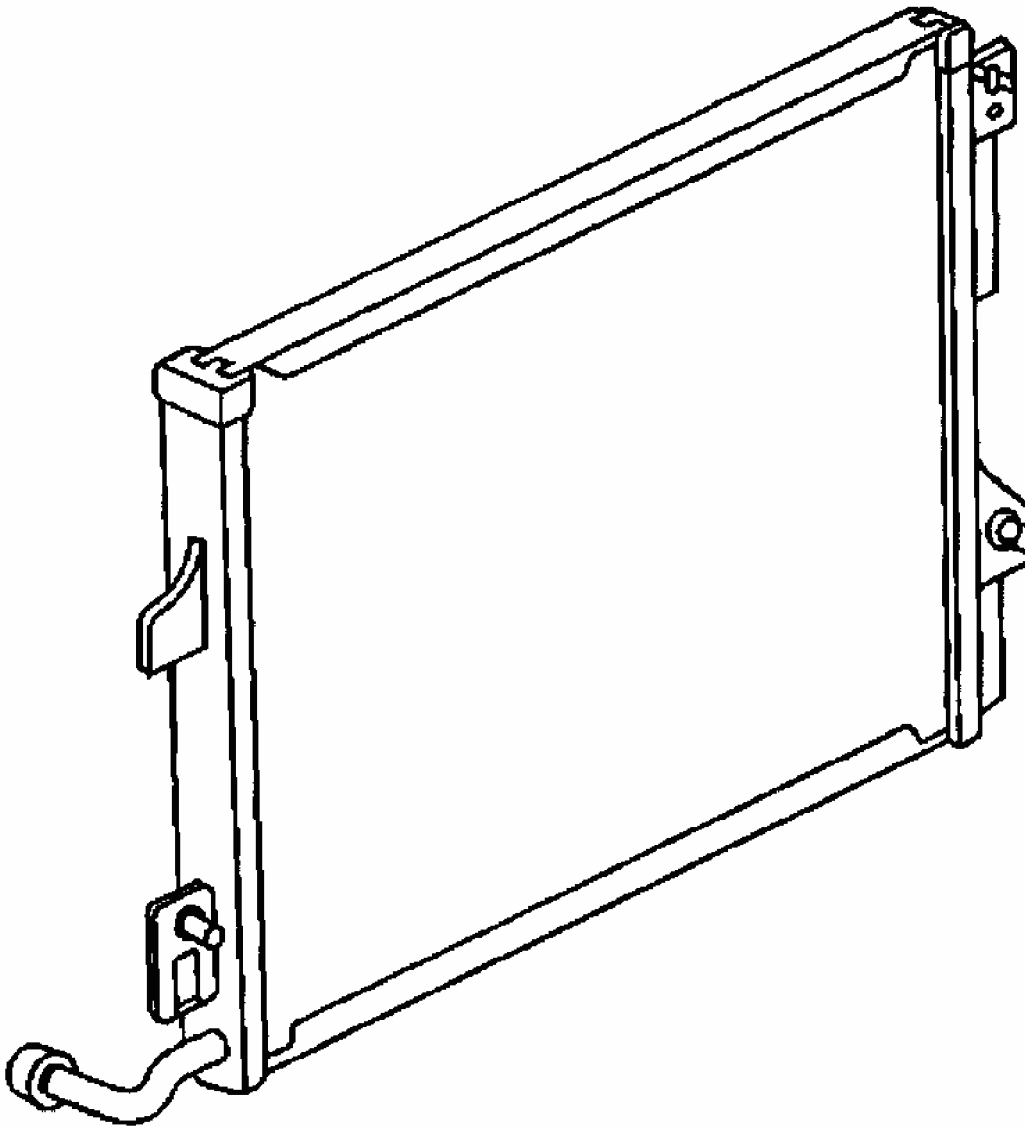
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Fig. 43: Removing Evaporator To Condenser Bolt
Courtesy of GENERAL MOTORS CORP.



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Fig. 44: Releasing Condenser Tabs From Radiator Slots
Courtesy of GENERAL MOTORS CORP.



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Fig. 45: Removing Condenser From Vehicle
Courtesy of GENERAL MOTORS CORP.

Installation

NOTE: If replacing the condenser, add the refrigerant oil to the condenser.

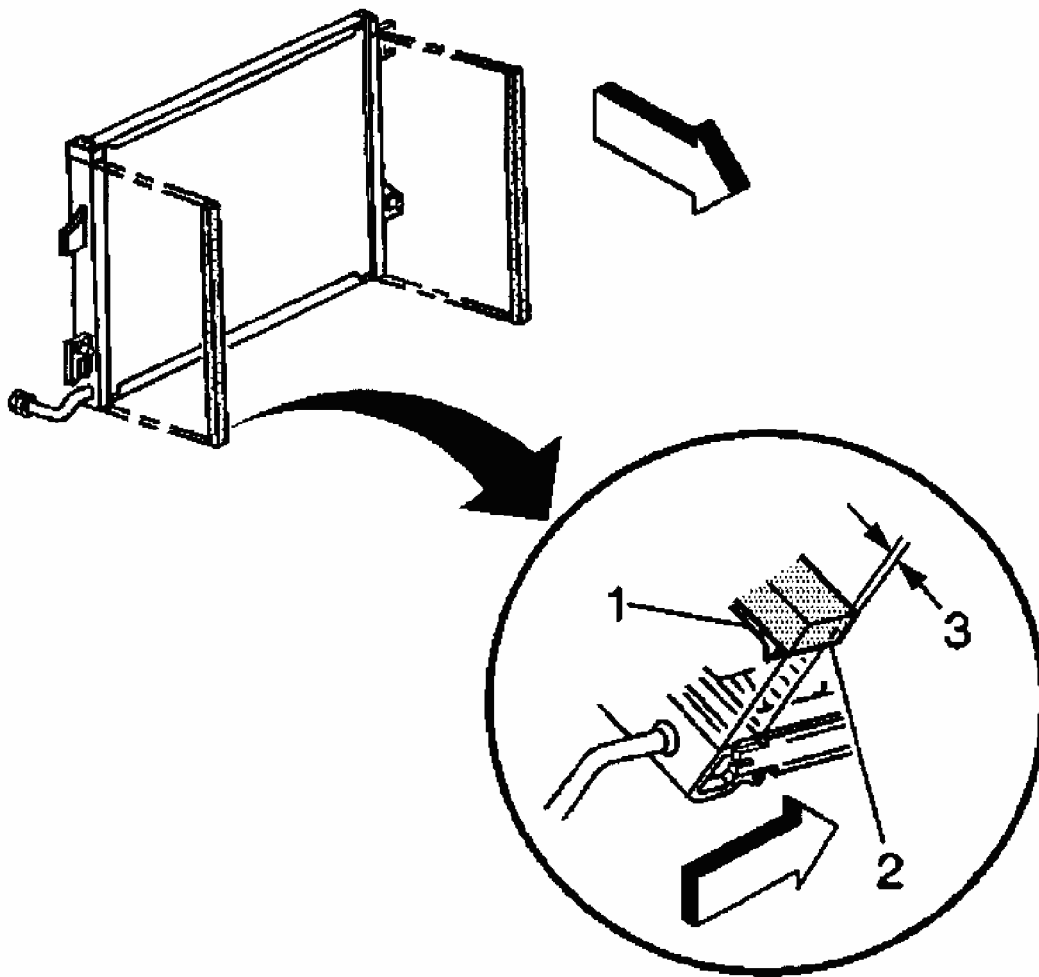
1. Replace the condenser insulators, if necessary. Remove all traces of the old insulators. Using isopropyl alcohol, or equivalent, wipe clean the front surface of the condenser left side and right side edges. Remove the paper backing from the NEW insulators.

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

Align and install the insulators while keeping a gap of 0.039 in (1 mm) between the insulators and the inner edges of the condenser. See **Fig. 46** .

2. Position the condenser into the vehicle. Install the condenser to the radiator so that the condenser is above the installed position. See **Fig. 45** . Lower the condenser to secure the condenser tabs to the radiator slots. See **Fig. 44** . Install the radiator air baffle.
3. Raise and support the vehicle. Remove the cap or tape from the compressor hose and the condenser. Install NEW O-rings to the compressor hose. See **Fig. 43** .
4. Install the compressor hose to the condenser. See **Fig. 41** . Using a back-up wrench on the condenser fitting, secure the compressor hose fitting to the condenser. See **Fig. 11** . Tighten to specified torque, see **TORQUE SPECIFICATIONS** . Lower the vehicle.
5. Remove the cap or tape from the front evaporator tube and the condenser. See **Fig. 15** . Install NEW O-rings to the evaporator tube.
6. Install the front evaporator tube to the condenser. See **Fig. 43** . Install the evaporator tube to condenser bolt. Tighten to specified torque, see **TORQUE SPECIFICATIONS** . Install the upper radiator support.



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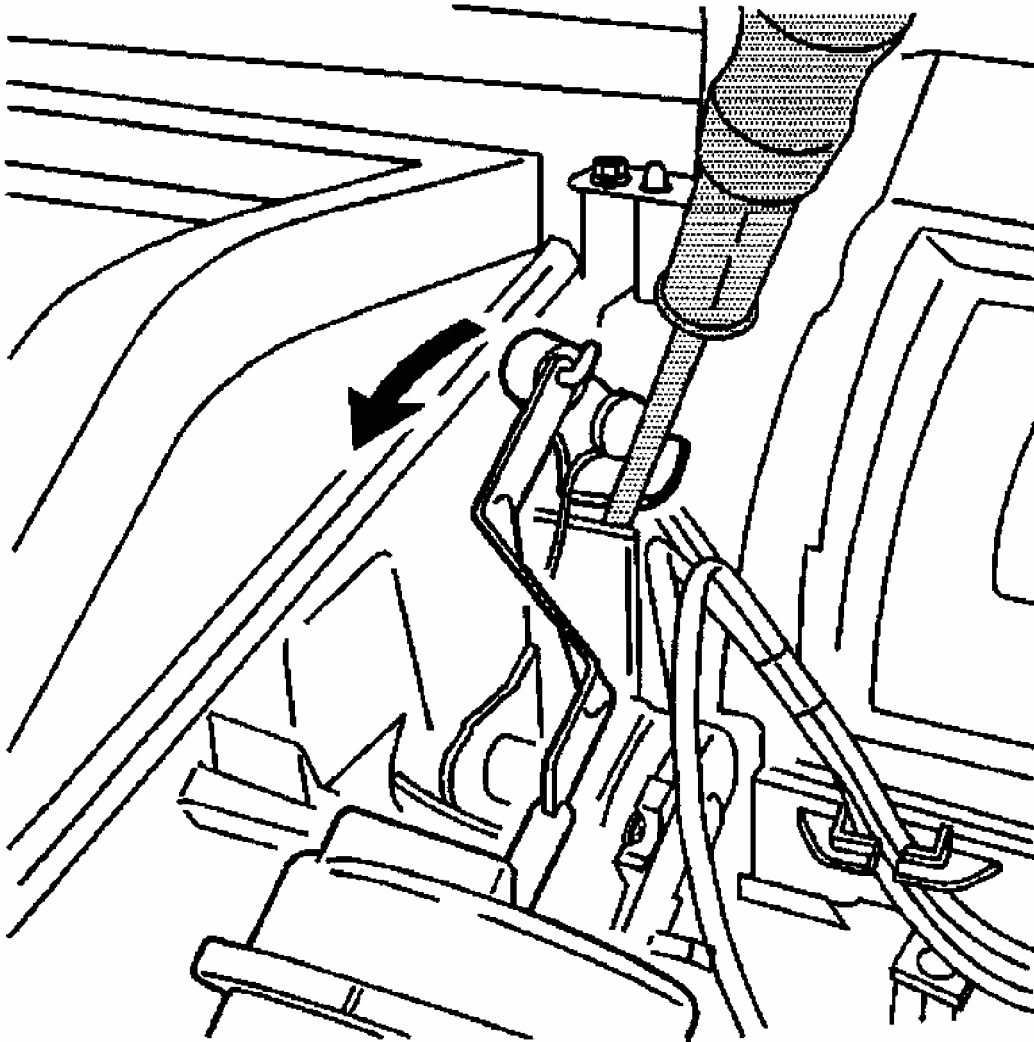
Fig. 46: Replacing Condenser Insulators
Courtesy of GENERAL MOTORS CORP.

DEFROSTER ACTUATOR

Removal

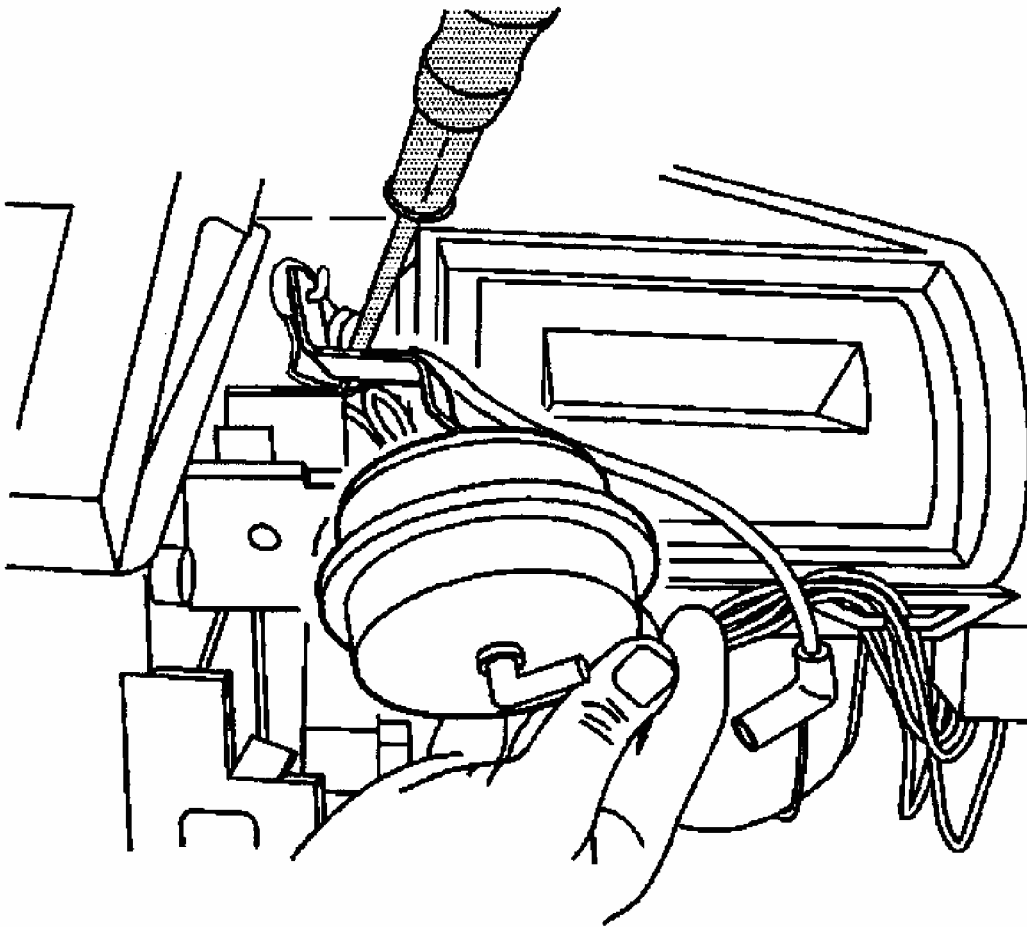
1. Remove the I/P upper trim pad. Disconnect the right side window defogger lower outlet duct from the windshield defroster duct, then reposition the side window defogger duct forward. Disconnect the vacuum harness connectors from the defroster actuator.
2. Rotate the defrost door lever fully rearward/counterclockwise, then carefully insert a flat bladed tool between the bottom of the defrost door lever and the protruding wall of the HVAC module case below the door lever in order to keep the door lever in place. See **Fig. 47**.
3. Lift to release the defroster actuator retaining tab and begin to slide the actuator toward

the passenger SIR bracket. Carefully rotate the actuator upward and forward until the actuator clears the passenger SIR bracket. See **Fig. 48** . Disconnect the actuator pushrod from the defrost door lever and remove the actuator. See **Fig. 49** .



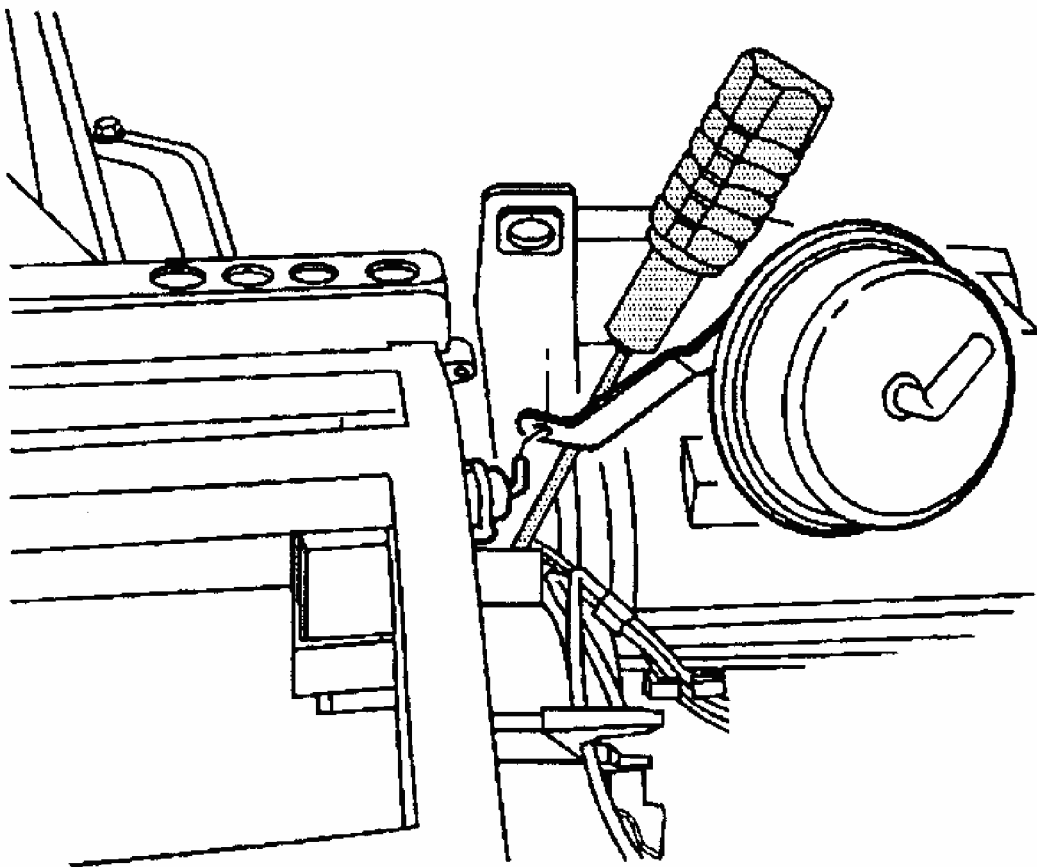
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Fig. 47: Stabilizing Defrost Door Lever
Courtesy of GENERAL MOTORS CORP.



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Fig. 48: Removing Defroster Actuator
Courtesy of GENERAL MOTORS CORP.



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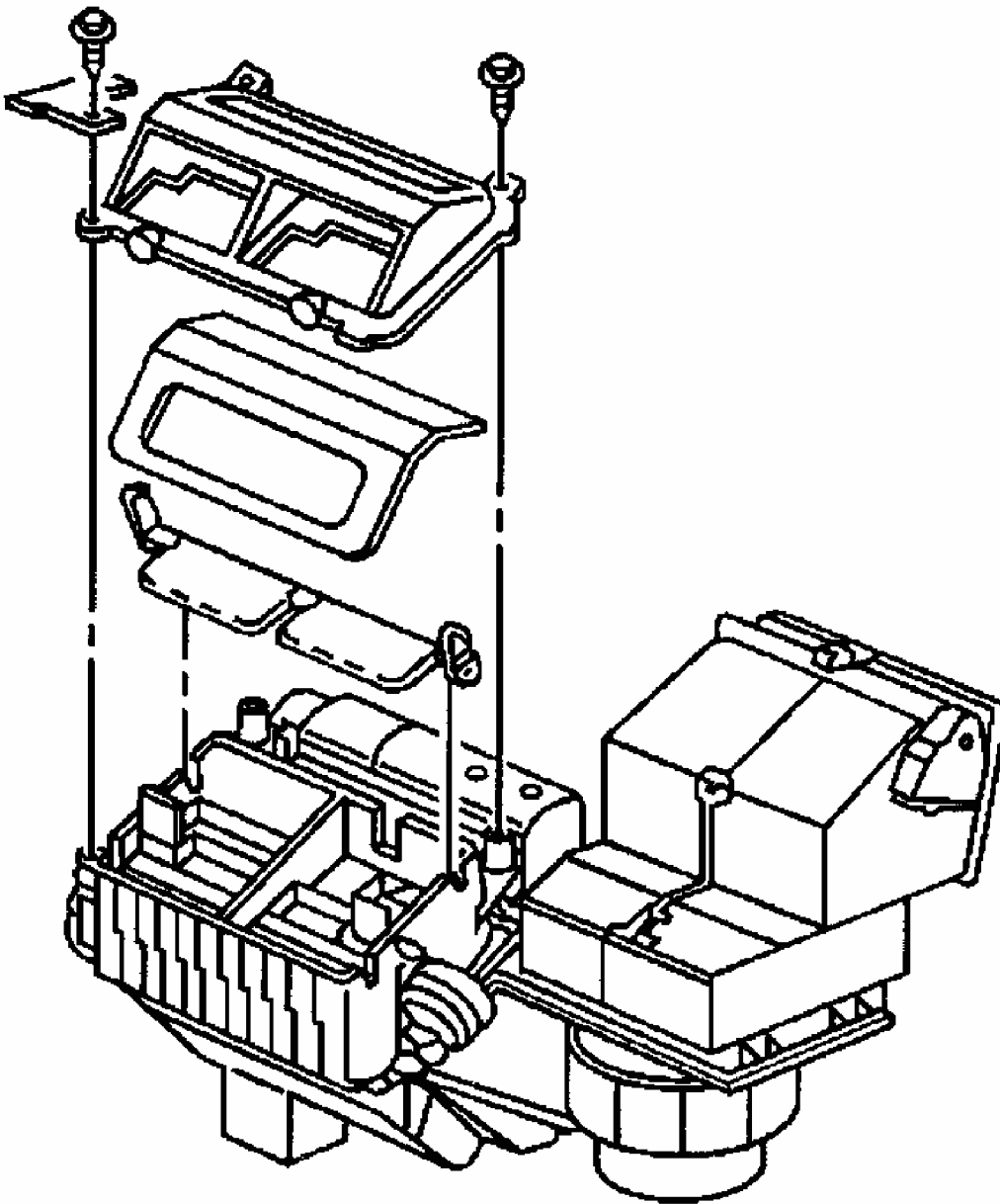
Fig. 49: Exploded View Of Defroster Door Actuator
Courtesy of GENERAL MOTORS CORP.

Installation

1. Connect the defroster actuator pushrod to the defrost door lever. See **Fig. 49** . Position the actuator along side of the passenger SIR bracket in line with the mounting pins on the HVAC module case. Carefully rotate the actuator past the passenger SIR bracket, rearward and downward, until the actuator slots align with the HVAC module mounting pins.
2. Inspect that the actuator pushrod is not binding on the defrost door lever. Push the actuator toward the HVAC module case to secure the retaining tab. See **Fig. 48** .
3. Remove the flat bladed tool maintaining the defrost door lever in position. See **Fig. 47** . Connect the vacuum harness connectors to the defroster actuator. Position and connect the right side window defogger lower outlet duct to the windshield defroster duct.
4. Install the I/P upper trim pad. Recalibrate the actuators. See **RE-CALIBRATING ACTUATORS** under ADJUSTMENTS.

DEFROSTER DOOR**Removal & Installation**

1. Remove the I/P trim pad. Remove the defroster door vacuum actuator. Remove the air distribution case cover retaining screws. Remove the air distribution case cover. Remove and discard the air distribution case seal. See [Fig. 50](#) .
2. Remove the linkage between the air temperature door and the heater door on the left side of the HVAC module assembly. Remove the defroster door. To install, reverse removal procedure.



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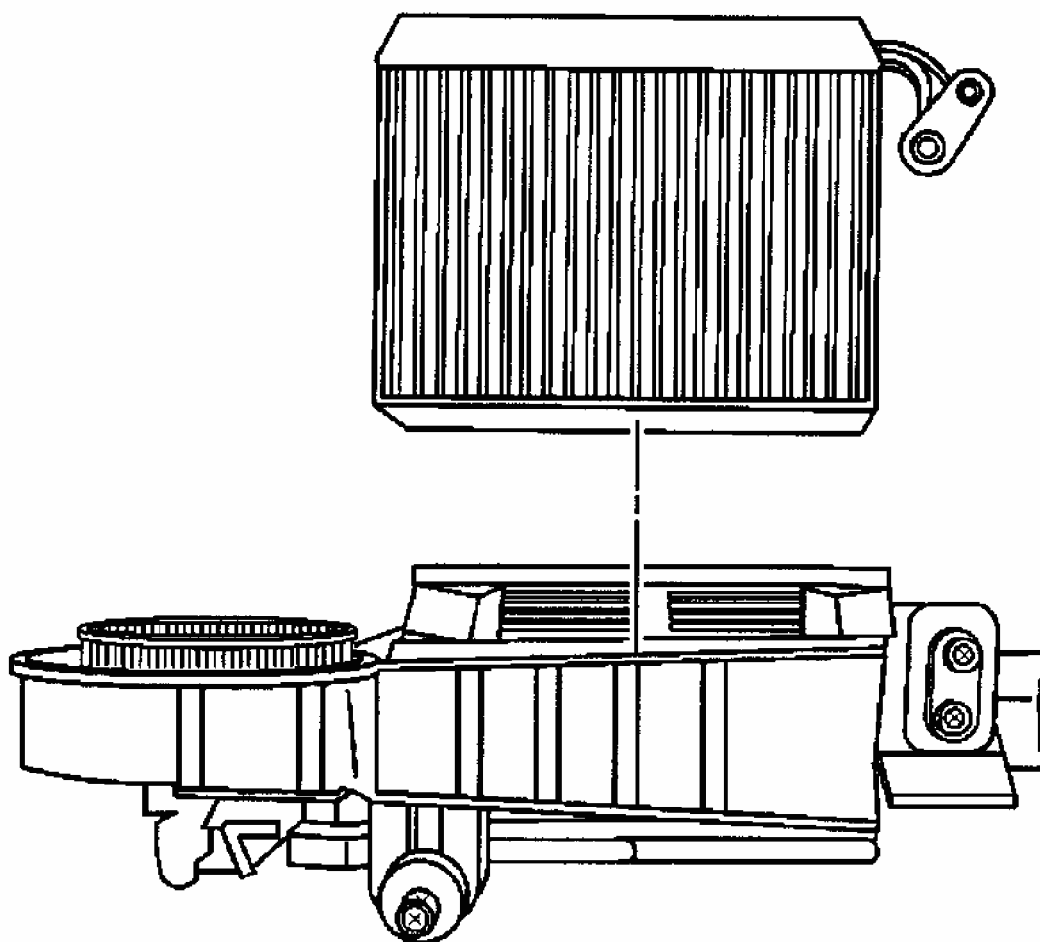
Fig. 50: Removing & Installing Defroster Door
Courtesy of GENERAL MOTORS CORP.

EVAPORATOR CORE

Removal

1. Remove the HVAC module. See **HVAC MODULE** under REMOVAL & INSTALLATION. Disconnect the vacuum harness from both of the harness retainers

- on the HVAC module case. Remove the defroster actuator.
2. Remove the screws retaining the HVAC module upper case to the HVAC lower module case. To access the screw hidden under the air inlet door, open the door and retain in the open position. Release the retaining tab securing the HVAC module upper case to the HVAC module lower case. See **Fig. 26** . Separate the HVAC module case halves.
 3. Remove and discard the HVAC module case seals. Start to remove the HVAC module case primary (blower motor side of case) seal from the HVAC module lower case at the position shown. See **Fig. 27** . Remove the evaporator core from the HVAC module lower case. See **Fig. 51** .



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Fig. 51: Removing Evaporator Core From HVAC Module
Courtesy of GENERAL MOTORS CORP.

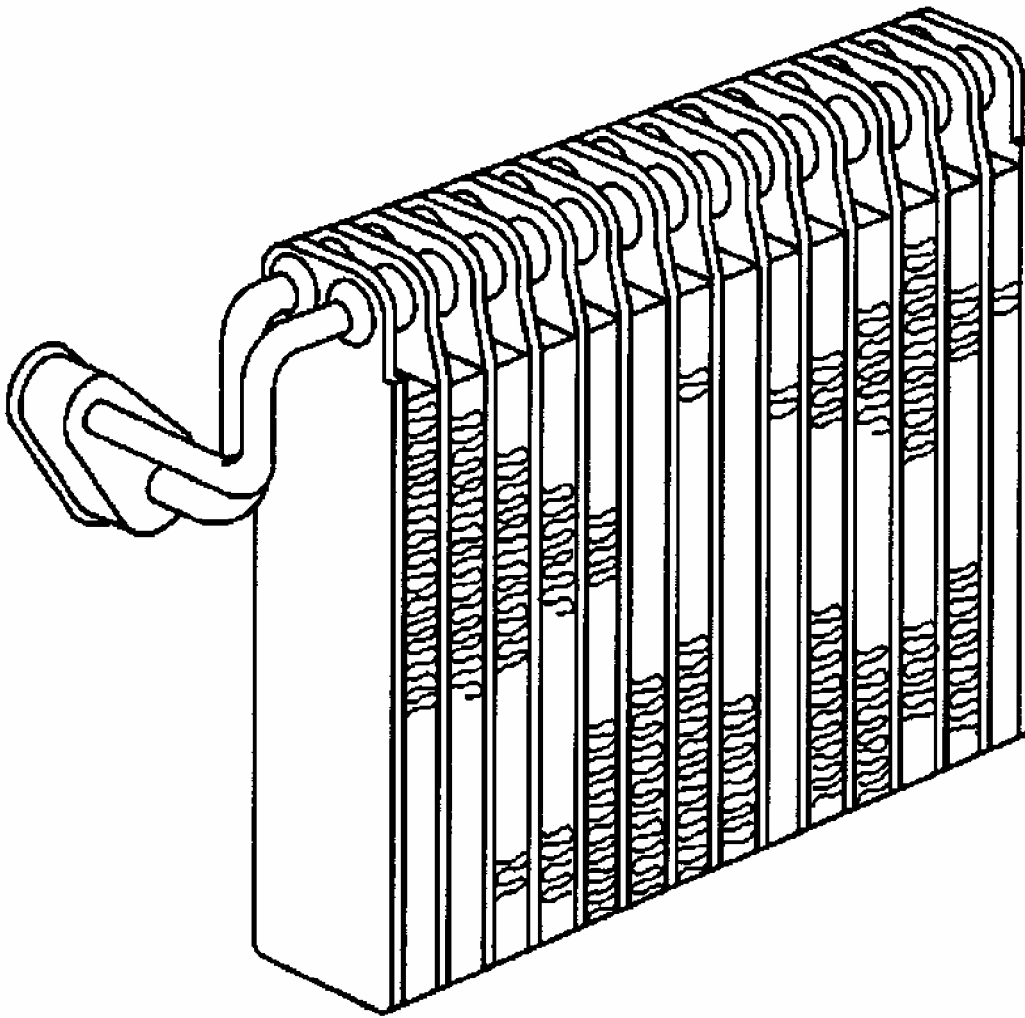
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1. If installing a replacement evaporator core, add 3 oz. (90 ml) of refrigerant oil in the evaporator core. See **Fig. 52** . Install a NEW water core filter to the evaporator core. See **Fig. 53** .
2. Install a NEW side seal to the evaporator core. Line the evaporator core side seal up with the corners of the evaporator core. See **Fig. 54** . Install a NEW upper seal to the evaporator core. See **Fig. 55** .
3. Install 2 NEW lower seals to the evaporator core. Locate the seals at the outer corners (or edges) of the evaporator core. See **Fig. 56** . Install the evaporator core to the HVAC module lower case. See **Fig. 51** .

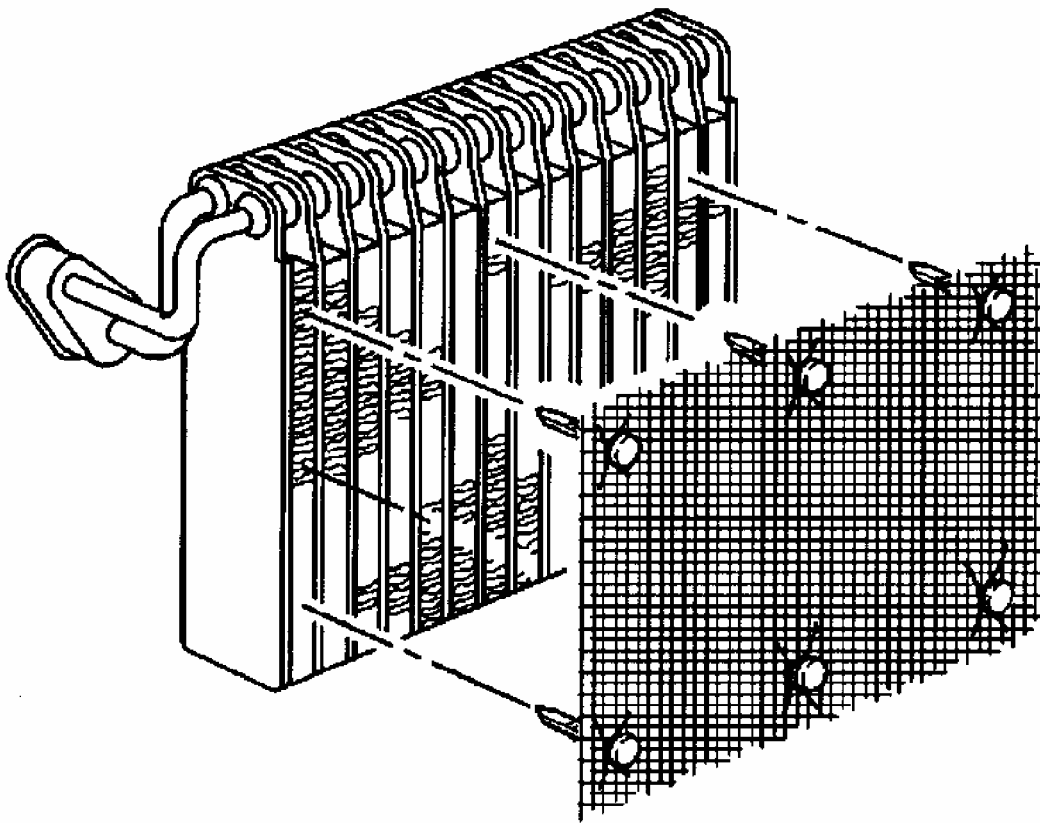
NOTE: **Inspect the condition of the retaining tab on the HVAC module upper case prior to installing to the HVAC module upper case to the HVAC module lower case. If the retaining tab is broken or damaged, install an external retaining clip.**

4. Install NEW case seals to the HVAC module lower case. Start to install the HVAC module case primary (blower motor side of case) seal to the HVAC module lower case from the position shown. See **Fig. 27** . Align and install the HVAC module case halves together. Align and secure the retaining tab on the HVAC module upper case to the retaining slot on the HVAC module lower case. See **Fig. 26** .
5. Install the HVAC module case retaining screws. Tighten to specified torque, see **TORQUE SPECIFICATIONS** . Install the defroster actuator. Secure the vacuum harness to both of the harness retainers on the HVAC module case. Install the HVAC module to the vehicle.



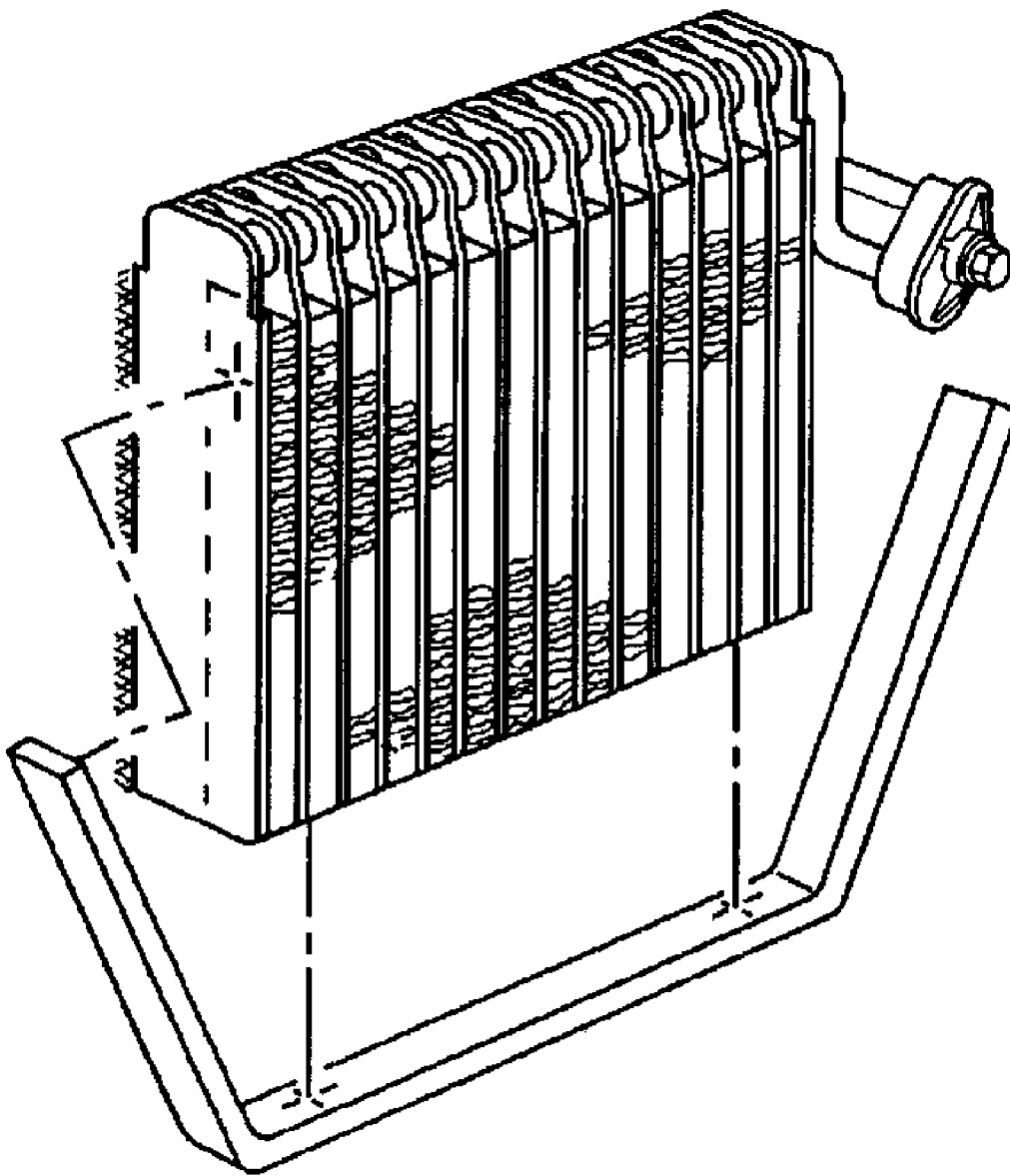
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Fig. 52: Installing Evaporator Core
Courtesy of GENERAL MOTORS CORP.



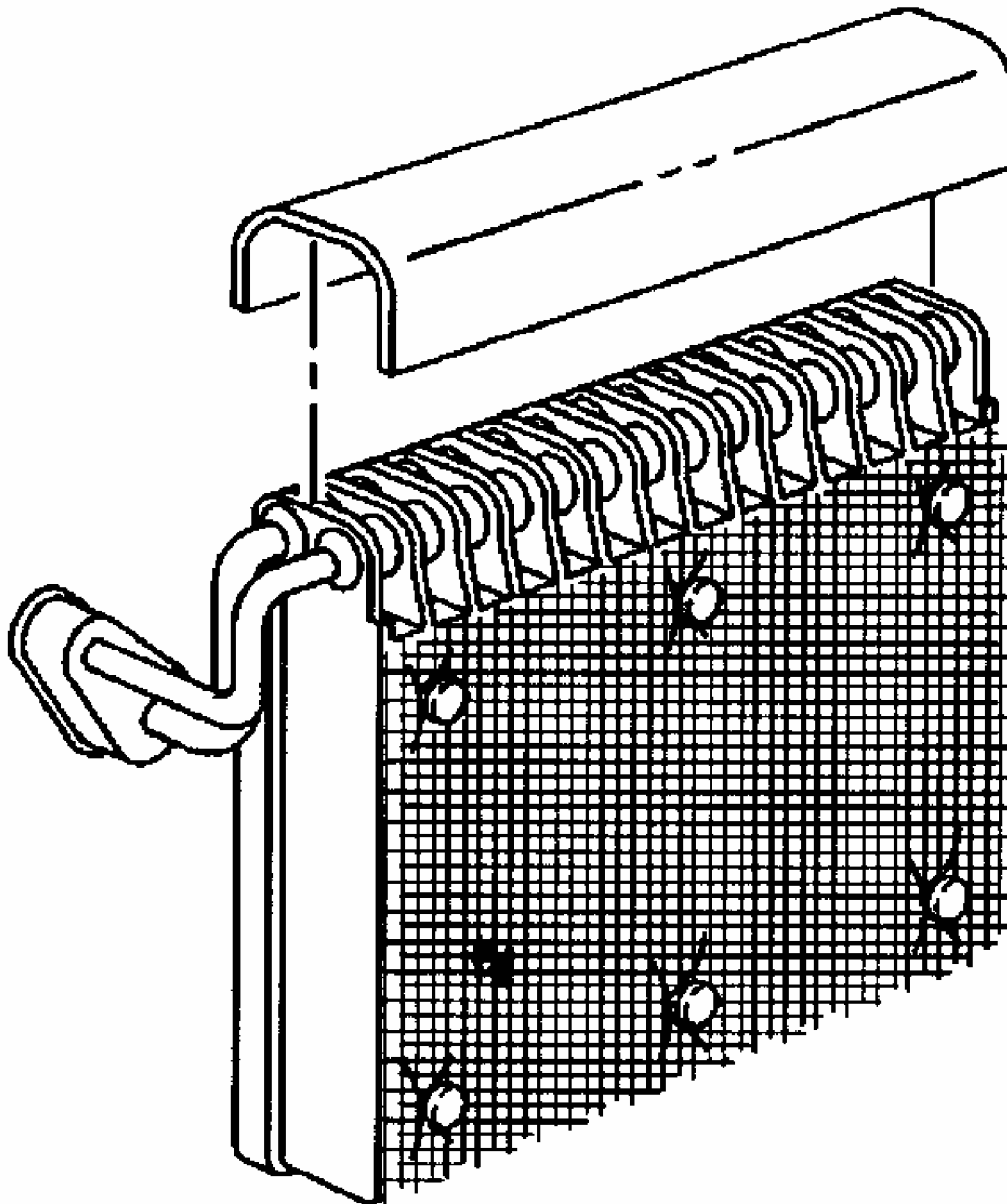
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Fig. 53: Installing Water Core Filter
Courtesy of GENERAL MOTORS CORP.



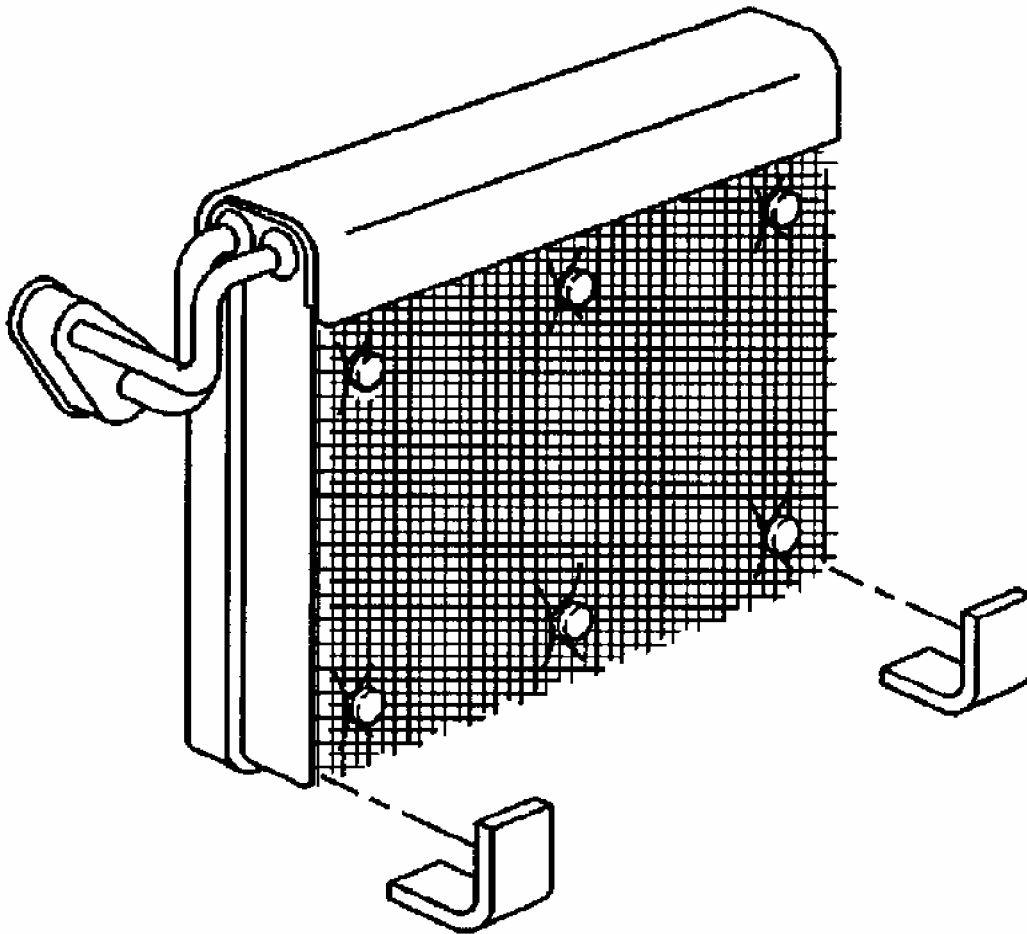
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Fig. 54: Installing Side Seal
Courtesy of GENERAL MOTORS CORP.



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Fig. 55: Installing Upper Seal
Courtesy of GENERAL MOTORS CORP.



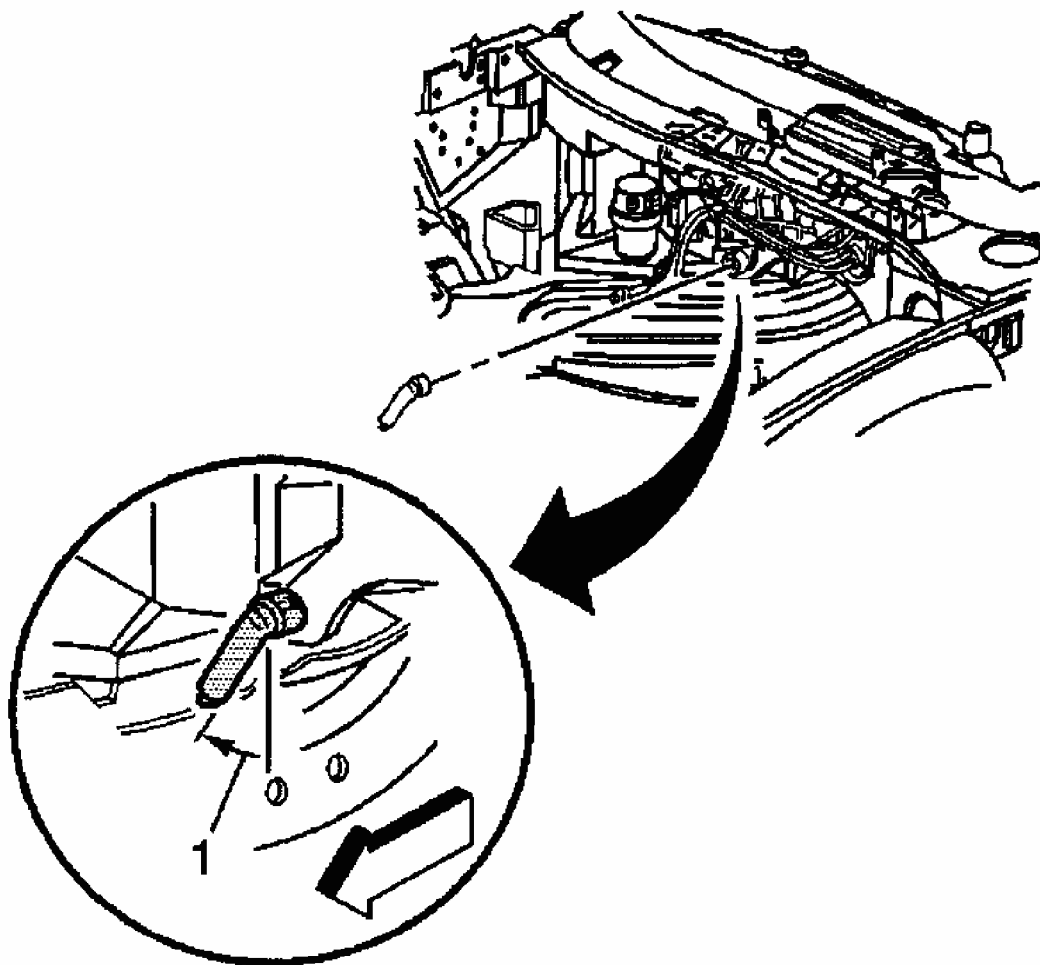
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Fig. 56: Installing Lower Seals
Courtesy of GENERAL MOTORS CORP.

EVAPORATOR DRAIN HOSE

Removal & Installation

Remove the battery. Remove the battery heat shield. Remove the HVAC module drain tube from the HVAC module. See **Fig. 57** . To install, reverse removal procedure.



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Fig. 57: Removing HVAC Module Drain Tube
 Courtesy of GENERAL MOTORS CORP.

EVAPORATOR TUBE (FRONT)

NOTE: Cap or tape the open front evaporator tube and the condenser immediately to prevent contamination.

Removal

1. Recover the refrigerant from the A/C system. Remove the battery heat shield. Remove the upper radiator support. Disconnect the refrigerant pressure sensor electrical connector. See **Fig. 4**.
2. Remove the front evaporator tube to condenser retaining bolt. See **Fig. 43**. Disconnect the front evaporator tube from the condenser. Remove the front evaporator tube to rear evaporator tube retaining bolt. See **Fig. 9**.

3. Disconnect the front evaporator tube from the rear evaporator tube. Remove the front evaporator tube from the vehicle. Remove the A/C refrigerant pressure sensor from the evaporator tube. See **Fig. 5** . Discard the O-rings.

Installation

NOTE: **Do not allow any of the mineral base 525 viscosity refrigerant oil on the O-ring seal to enter the refrigerant system.**

1. Install the A/C refrigerant pressure sensor to the evaporator tube. See **Fig. 5** . Tighten to specified torque, see **TORQUE SPECIFICATIONS** . Remove the cap or tape from the evaporator tubes. Using a lint-free clean, dry cloth, carefully clean the sealing surfaces of the front evaporator tube and the rear evaporator tube.
2. Lightly coat the NEW O-ring seal with mineral base 525 viscosity refrigerant oil. Carefully slide the NEW O-ring onto the front evaporator tube until seated. Leave a light coating of the refrigerant oil on the front evaporator tube in the area indicated ONLY. See **Fig. 15** . Install the front evaporator tube to the vehicle.
3. Install the front evaporator tube to the rear evaporator tube. Install the front evaporator tube to rear evaporator tube retaining bolt. Tighten to specified torque, see **TORQUE SPECIFICATIONS** . Remove the cap or tape from the front evaporator tube and the condenser. See **Fig. 9** .

NOTE: **Do not allow any of the mineral base 525 viscosity refrigerant oil on the O-ring to enter the refrigerant system.**

4. Using a lint-free clean, dry cloth, carefully clean the sealing surfaces of the front evaporator tube and the condenser. Lightly coat the NEW O-ring seal with mineral base 525 viscosity refrigerant oil. Carefully slide the NEW O-ring onto the front evaporator tube until seated. Leave a light coating of the refrigerant oil on the evaporator tube in the area indicated only. See **Fig. 15** .
5. Install the front evaporator tube to the condenser. See **Fig. 43** . Install the front evaporator tube to condenser retaining bolt. Tighten to specified torque, see **TORQUE SPECIFICATIONS** .
6. Connect the refrigerant pressure sensor electrical connector. See **Fig. 4** . Install the upper radiator support. Evacuate and recharge the A/C system. See RECOVERY, EVACUATION & RECHARGING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING. Install the battery heat shield.

EVAPORATOR TUBE (REAR)

NOTE: **Cap or tape the open rear evaporator tube and the evaporator immediately to prevent contamination.**

Removal

1. Recover the refrigerant from the A/C system. See RECOVERY, EVACUATION & RECHARGING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING. Remove the battery. Remove the battery heat shield. See **Fig. 7** . Remove the intake manifold. See INTAKE MANIFOLD under **REMOVAL & INSTALLATION** in 5.7L V8 - CORVETTE article in ENGINES.
2. Remove the nut retaining the heater pipe bracket to the cowl. See **Fig. 8** . Reposition the heater pipe bracket to access the refrigerant lines. Remove the front evaporator tube to rear evaporator tube retaining bolt. See **Fig. 9** .
3. Disconnect the evaporator tubes, discard the O-ring. Loosen the accumulator hose to evaporator retaining bolt. See **Fig. 17** . Disconnect the rear evaporator tube from the accumulator hose bracket at the evaporator, discard the O-ring.

Installation

NOTE: **Do not allow any of the mineral base 525 viscosity refrigerant oil on the O-ring to enter the refrigerant system.**

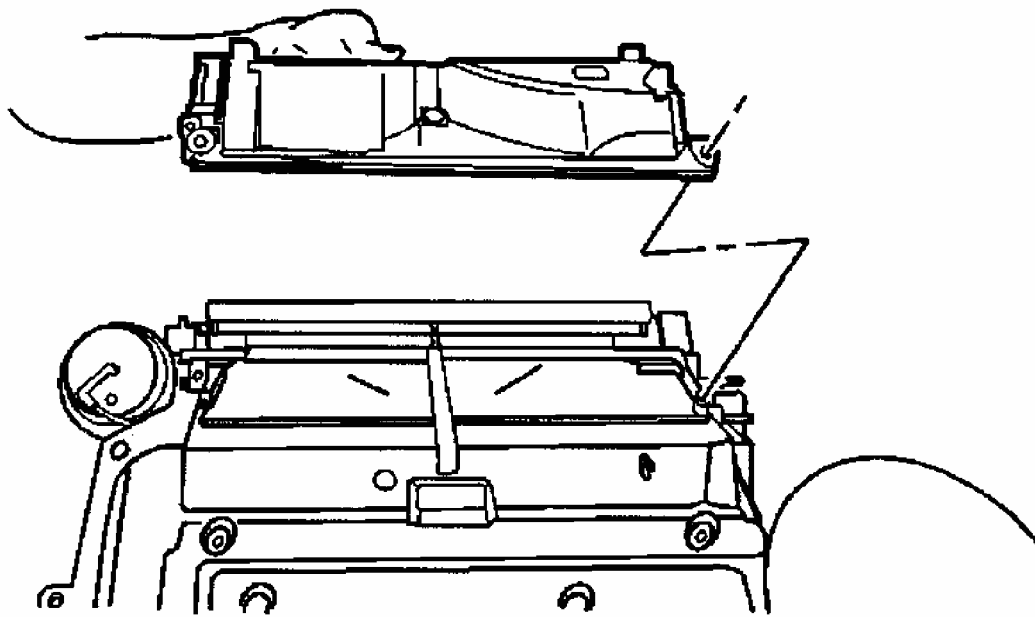
1. Remove the cap or tape from the rear evaporator tube and evaporator. Using a lint-free clean, dry cloth, carefully clean the sealing surfaces of the rear evaporator tube and evaporator. Lightly coat the NEW O-ring with mineral base 525 viscosity refrigerant oil. See **Fig. 15** .
2. Carefully slide the NEW O-rings onto the rear evaporator tube and evaporator until seated. Position the rear evaporator tube with the accumulator hose bracket and install the assembly to the evaporator. See **Fig. 18** . Tighten the accumulator hose to evaporator retaining bolt. See **Fig. 17** . Tighten to specified torque, see **TORQUE SPECIFICATIONS** .
3. Remove the cap or tape from the front evaporator tube. Using a lint-free clean, dry cloth, carefully clean the sealing surfaces of the front evaporator tube where it connects to the rear evaporator tube. Lightly coat the O-ring with mineral base 525 viscosity refrigerant oil. See **Fig. 15** .
4. Carefully slide the NEW O-ring onto the front evaporator tube until seated. Leave a light coating of the refrigerant oil on the front evaporator tube in the area indicated only. See **Fig. 15** . Install the front evaporator tube to the rear evaporator tube with retaining bolt. See **Fig. 9** . Tighten to specified torque, see **TORQUE SPECIFICATIONS** .
5. Install the heater pipe bracket to the cowl stud. Install the heater pipe bracket retaining nut. See **Fig. 8** . Tighten to specified torque, see **TORQUE SPECIFICATIONS** .
6. Install the intake manifold. See INTAKE MANIFOLD under **REMOVAL & INSTALLATION** in 5.7L V8 - CORVETTE article in ENGINES. See **Fig. 16** . Install the battery heat shield. See **Fig. 7** .
7. Install the battery. See **Fig. 6** . Evacuate and recharge the A/C system. See

RECOVERY, EVACUATION & RECHARGING in GENERAL SERVICING
PROCEDURES article in GENERAL SERVICING.

HEATER CORE

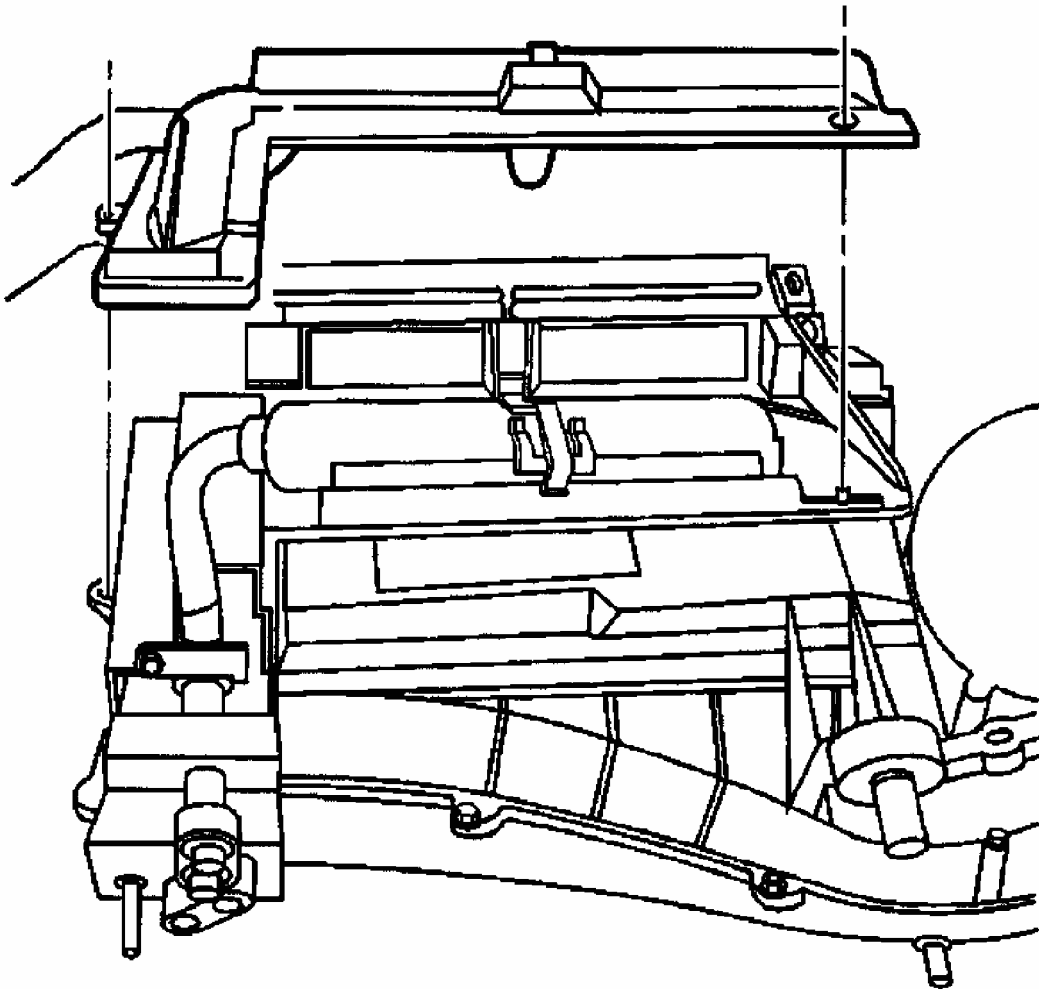
Removal & Installation

1. Remove the HVAC module. See **HVAC MODULE** under REMOVAL & INSTALLATION. Remove the heater core outlet cover screws. Remove the heater core outlet cover. See **Fig. 58** .
2. Remove the heater core cover screws. Remove the heater core cover. See **Fig. 59** . Remove and discard the seals from the heater core cover. See **Fig. 60** .
3. Remove and discard the heater core outer seal from the heater core. See **Fig. 61** . Remove the heater core retaining clamp screw. Remove the heater core retaining clamp. Remove the heater core pipe retainer clamp screw. See **Fig. 62** .
4. Remove the heater core from the HVAC module lower case. See **Fig. 63** . Remove and discard the heater core lower seal from the HVAC module lower case. See **Fig. 64** .
5. Remove and discard the heater core center seal from the HVAC module lower case. See **Fig. 65** . Remove and discard the heater core upper seal from the HVAC module lower case. See **Fig. 66** .
6. Remove and discard the heater core side seals (1) from the HVAC module lower case. See **Fig. 67** . Remove the heater core pipe retainer clamp from the heater core pipes. Using a flat bladed tool, release the retaining tab and open the clamp. See **Fig. 68** .
7. To install, reverse removal procedure.



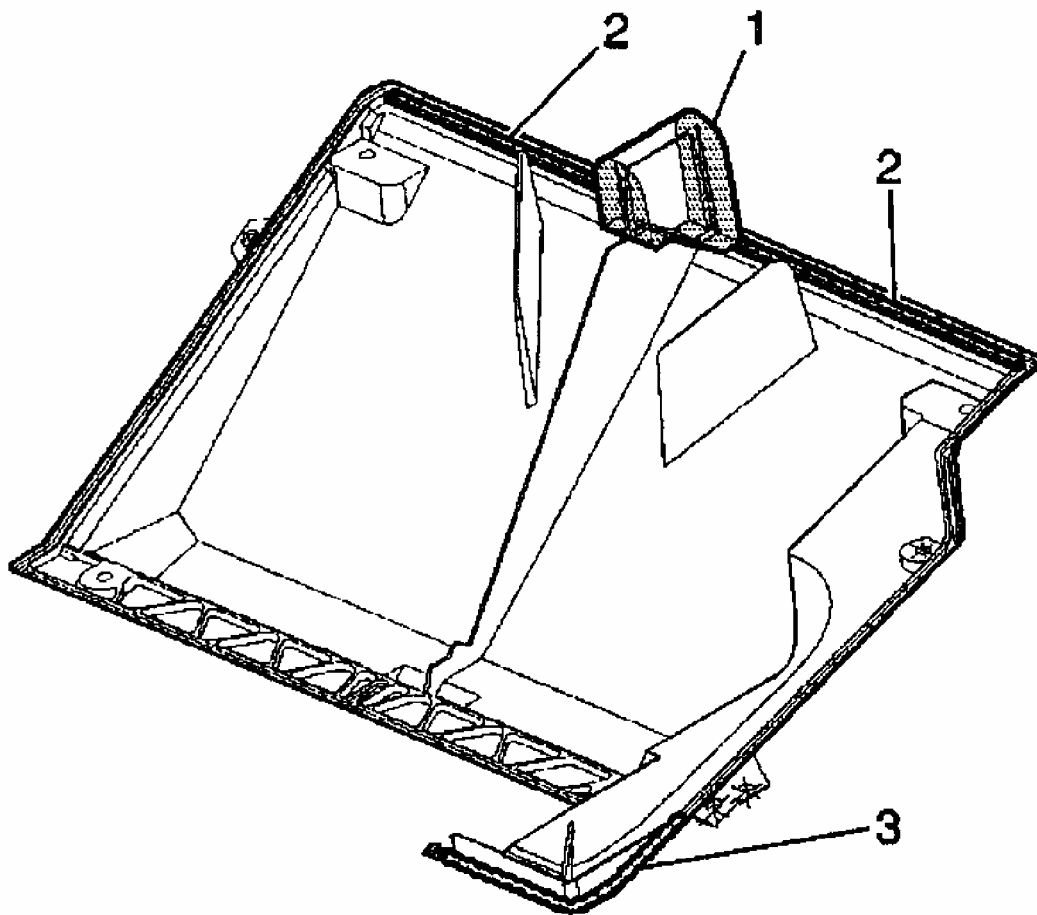
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Fig. 58: Removing Heater Core Outlet Cover
Courtesy of GENERAL MOTORS CORP.



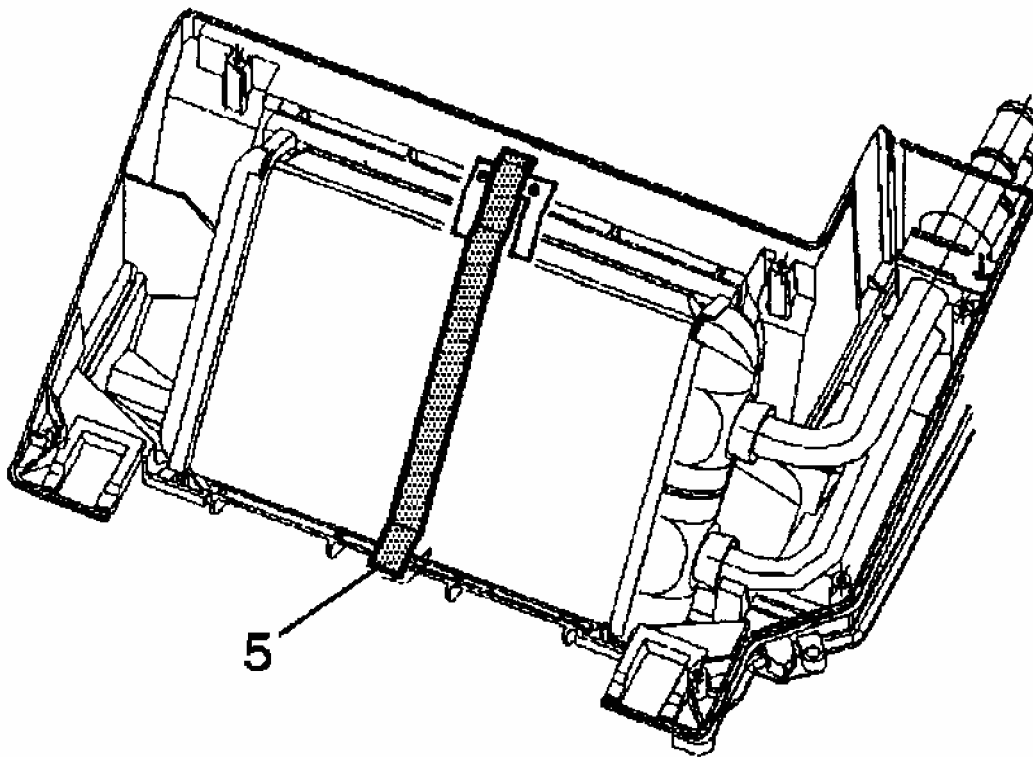
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Fig. 59: Removing & Installing Heater Core Cover
Courtesy of GENERAL MOTORS CORP.



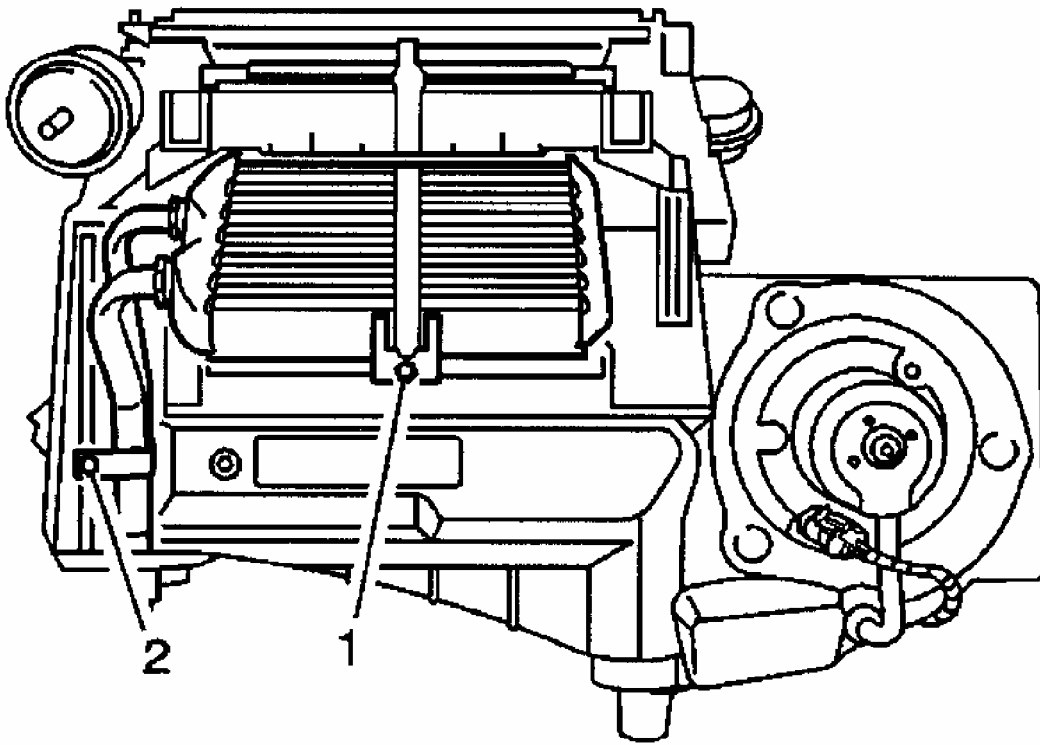
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Fig. 60: Removing & Installing Heater Core Cover Seal
Courtesy of GENERAL MOTORS CORP.



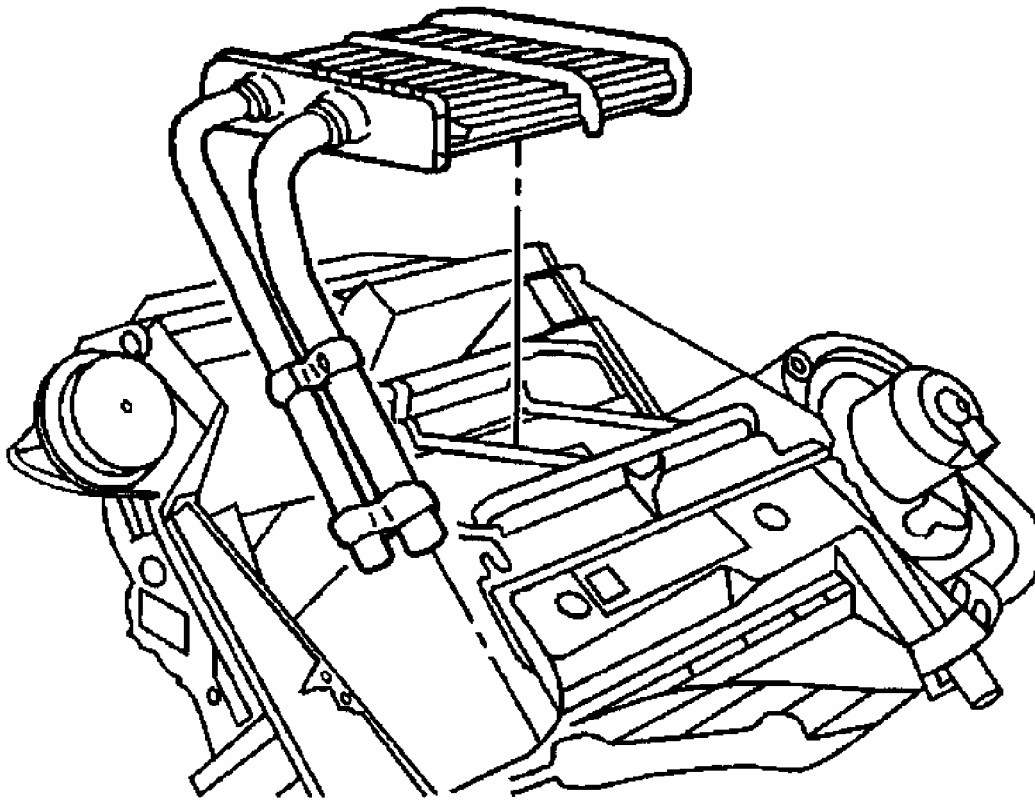
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Fig. 61: Removing & Installing Heater Core Outlet Seal
Courtesy of GENERAL MOTORS CORP.



G00209265

Fig. 62: Removing & Installing Heater Core Retaining Clamp
Courtesy of GENERAL MOTORS CORP.

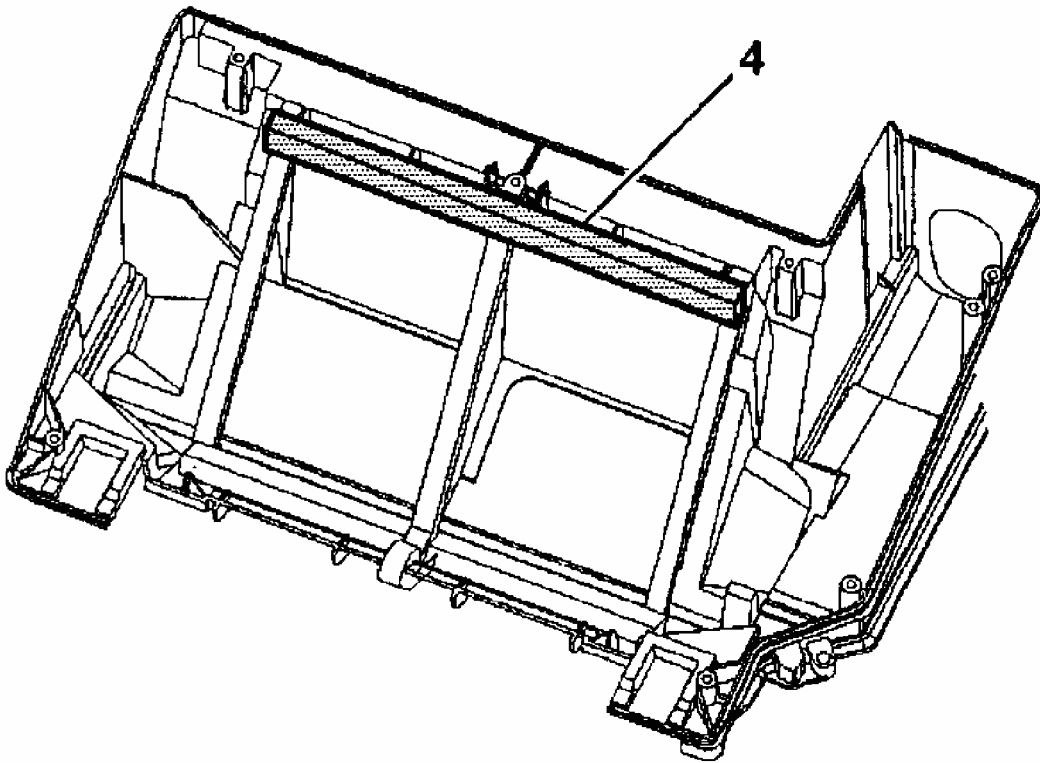


G00209266

Fig. 63: Removing & Installing Heater Core
Courtesy of GENERAL MOTORS CORP.

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

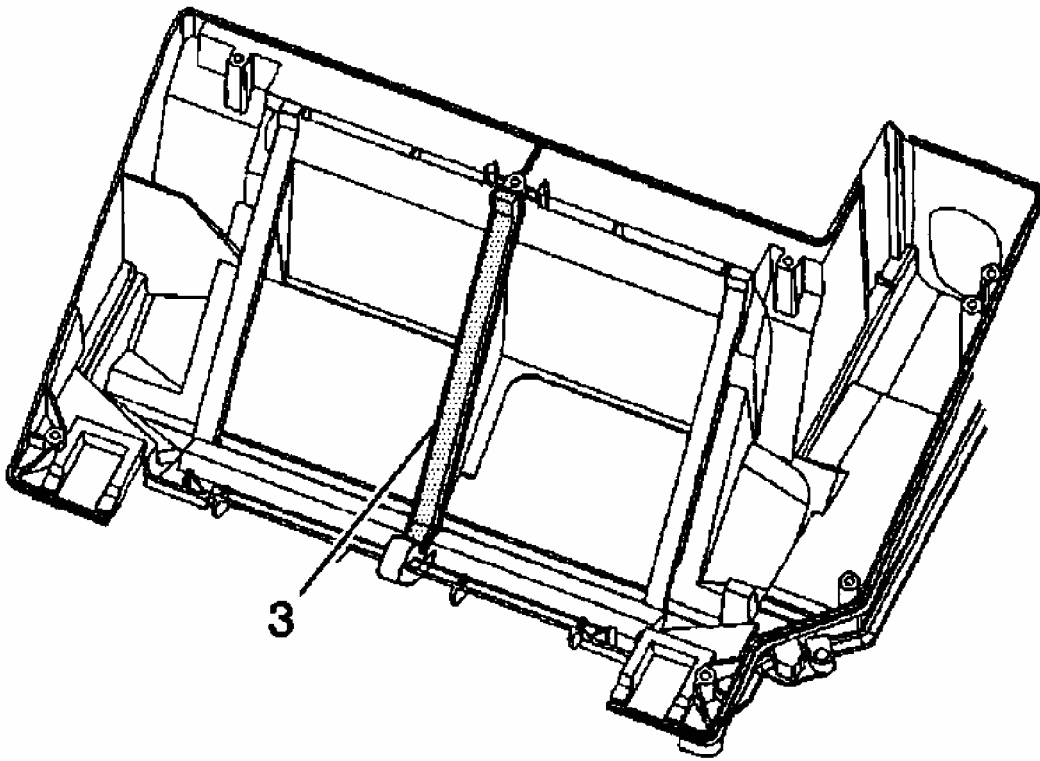


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Fig. 64: Removing & Installing Heater Core Lower Seal
Courtesy of GENERAL MOTORS CORP.

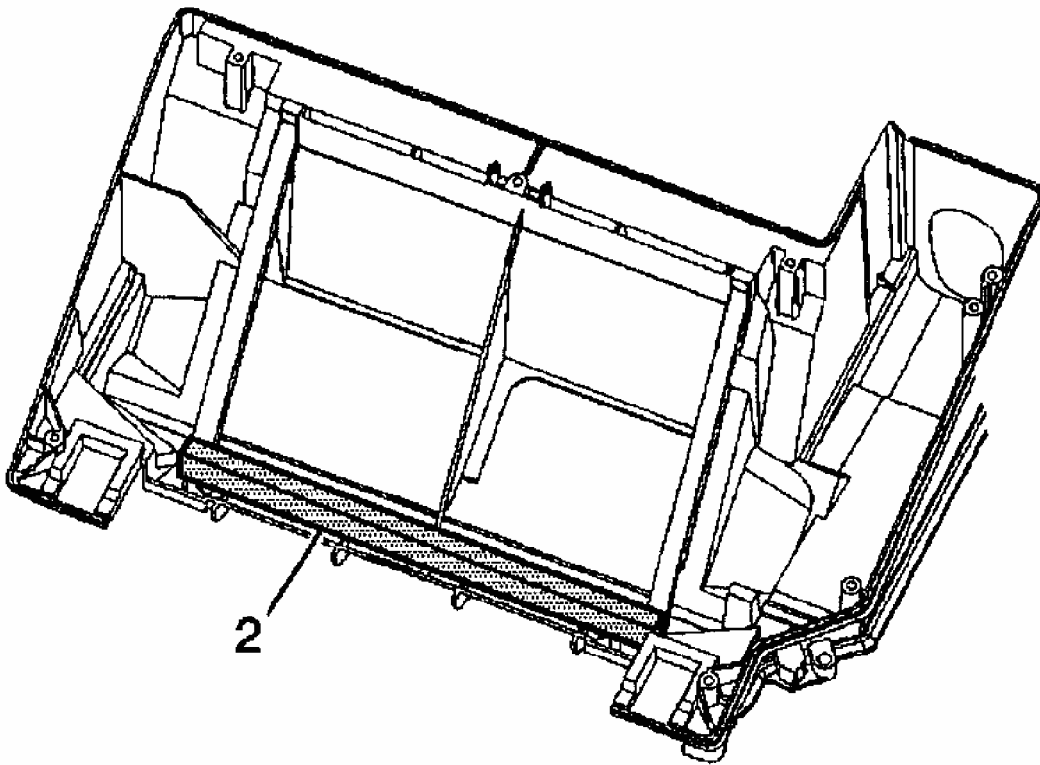
2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette



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Fig. 65: Removing & Installing Heater Core Center Seal
Courtesy of GENERAL MOTORS CORP.

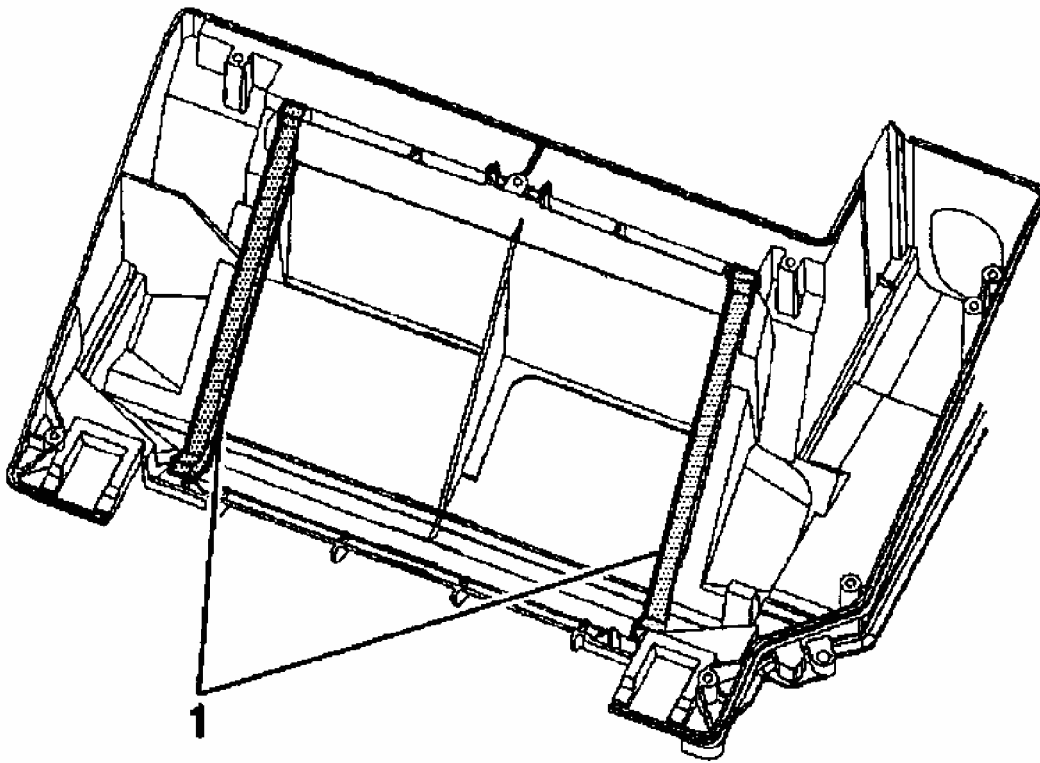


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Fig. 66: Removing & Installing Heater Core Upper Seal
Courtesy of GENERAL MOTORS CORP.

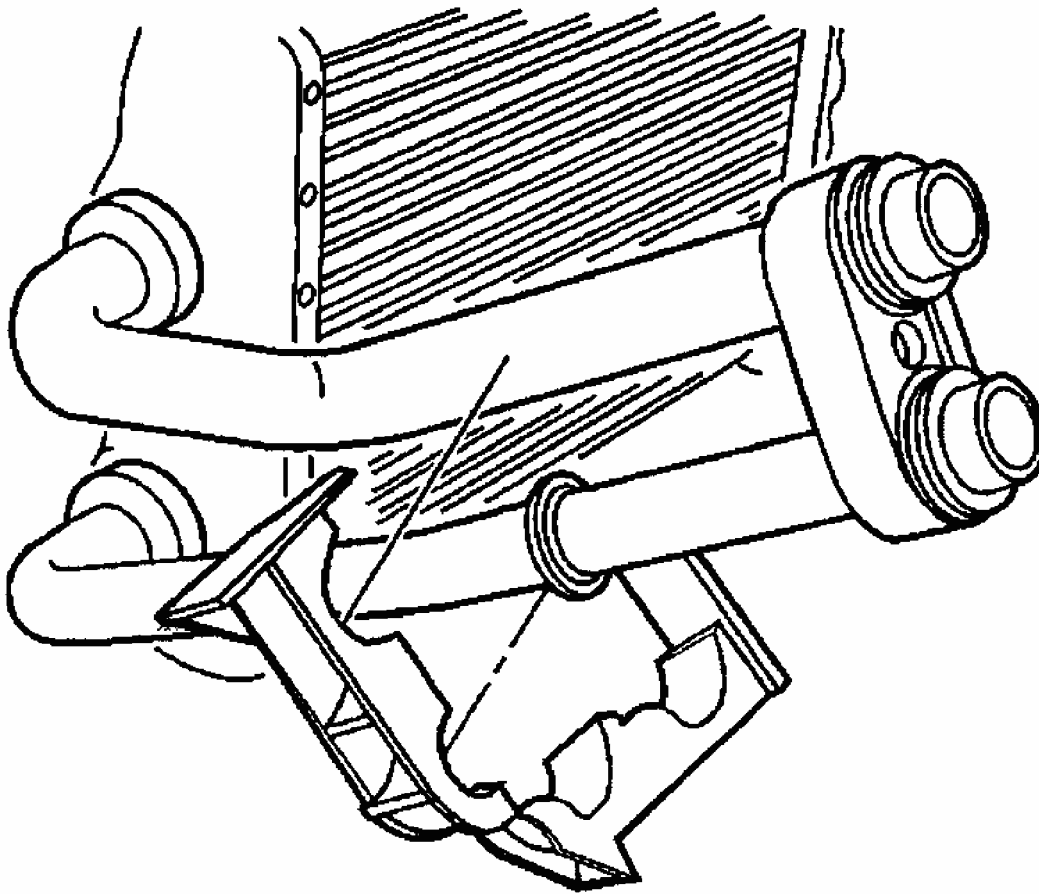
2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette



G00209270

Fig. 67: Removing & Installing Heater Core Side Seals
Courtesy of GENERAL MOTORS CORP.



G00209271

Fig. 68: Removing & Installing Heater Core Pipe Retaining Clamp
Courtesy of GENERAL MOTORS CORP.

HEATER DOOR

Removal & Installation

1. Remove the HVAC module. See **HVAC MODULE** . Remove the defroster actuator tie strap. Remove the defroster actuator. Remove the heater door linkage.
2. Remove the HVAC case retaining screws. Separate the HVAC case halves. Remove and discard the case seal. Remove the heater door. To install, reverse removal procedure.

HVAC CONTROL ASSEMBLY

Removal

1. Remove the I/P accessory trim plate. Remove the HVAC control module retaining screws. Pull the HVAC control module out from the I/P center support bracket. See

Fig. 69 .

2. Disconnect the electrical connector from the HVAC control module. See **Fig. 70** .
Remove the HVAC control module from the vehicle.

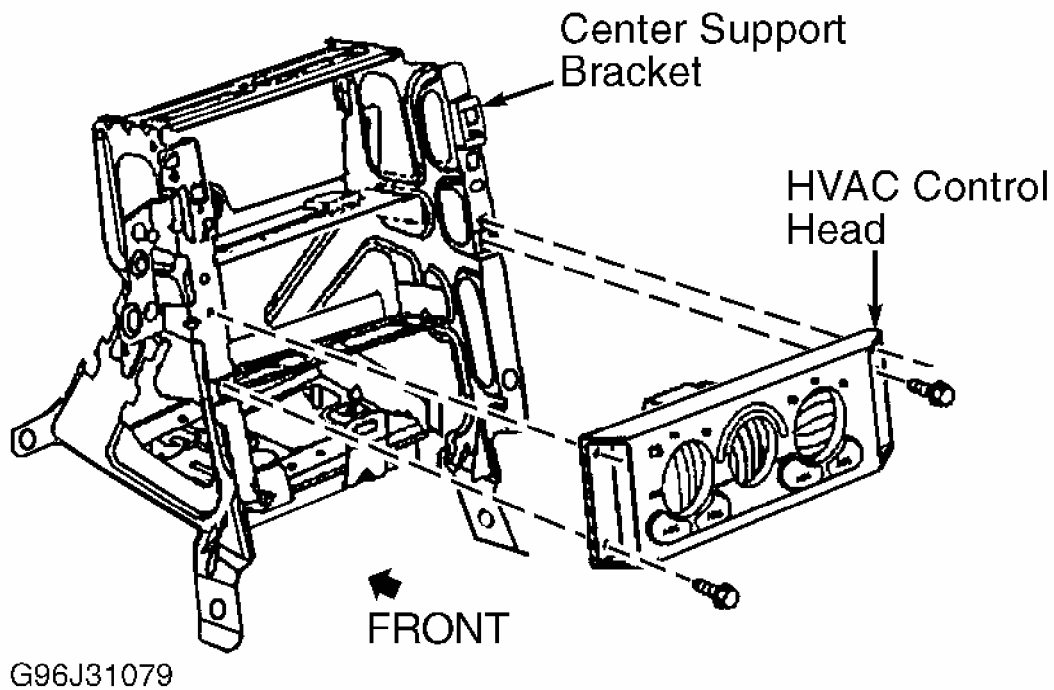
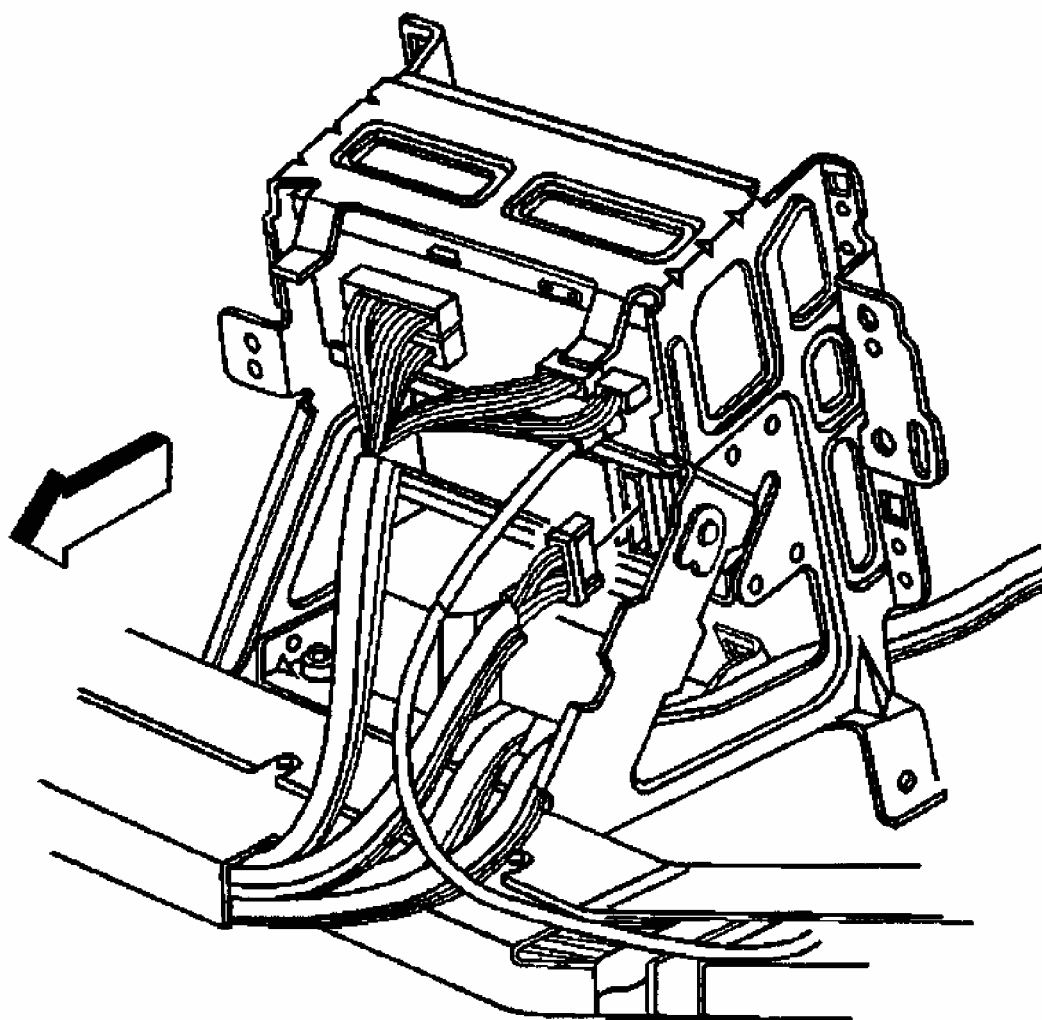


Fig. 69: Control Panel Removal
Courtesy of GENERAL MOTORS CORP.



G00213921

Fig. 70: Disconnecting HVAC Control Module Electrical
Courtesy of GENERAL MOTORS CORP.

Installation

NOTE: The key should be in the off position when connecting the HVAC control module electrical connector to ensure proper calibration.

1. Install the HVAC control module to the vehicle. Connect the electrical connector to the HVAC control module. See **Fig. 70** .
2. Install the HVAC control module to the I/P center support bracket. See **Fig. 69** . Install the HVAC control module retaining screws. Tighten to specified torque. See **TORQUE SPECIFICATIONS** .

NOTE: Do not adjust any controls on the HVAC control module while the HVAC control module is self-calibrating. If interrupted, improper HVAC performance will result. The engine must be running for proper calibration to occur.

3. Install the I/P accessory trim plate. Start and allow the engine to run for a least one minute.

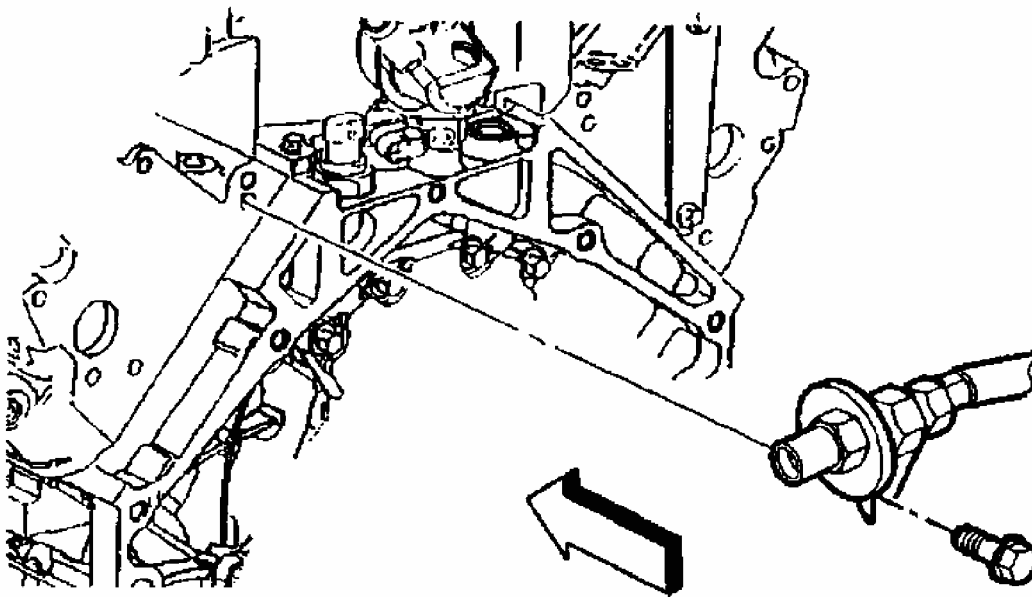
HVAC MODULE

NOTE: Be sure to cap or plug the open heater pipe assembly and the heater core to prevent contamination.

Removal & Installation

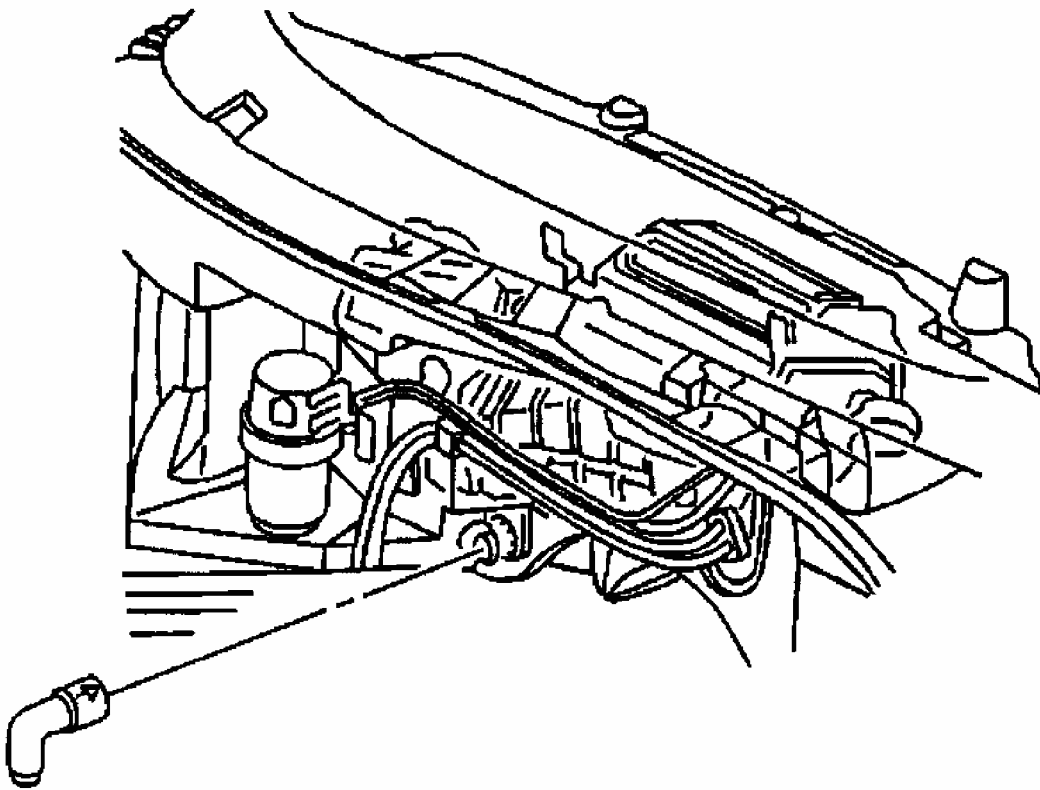
1. Recover the refrigerant from the A/C system. See RECOVERY, EVACUATION & RECHARGING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING. Remove the battery heat shield. Remove the intake manifold. Disconnect the hose clamp and hose from the right side air injection check valve (if equipped).
2. Remove the right side air injection check valve to left side cylinder head bolt. If equipped. Remove the right side air injection check valve to right side cylinder head bolts. If equipped Remove the right side air injection pipe. If equipped. See **Fig. 71** .
3. Remove the nut retaining the heater pipe bracket to the cowl. Reposition the heater pipe bracket. Remove the heater pipe to heater core retaining bolt. See **Fig. 8** .
4. Disconnect the heater pipe assembly from the heater core. Allow any remaining coolant to drain, Discard the sealing washers, Cap or plug the heater pipe assembly and the heater core to prevent contamination. Remove the accumulator hose to evaporator retaining bolt. See **Fig. 17** .
5. Disconnect the accumulator hose and the rear evaporator tube from the evaporator. Discard the O-ring seals. Cap or tape the hose end, the tube end and the evaporator to prevent contamination. Remove the HVAC module drain tube from the HVAC module. See **Fig. 72** .
6. Remove the console. Remove the I/P accessory trim plate. Remove the I/P compartment. Remove the right side lower insulator panel. Remove the knee bolster trim panel. Remove the left side lower insulator panel. Remove the I/P upper trim pad. Remove the Instrument Panel Cluster (IPC) to steering column bracket retaining screws. Reposition the IPC to allow room for the HVAC module to be removed. See **Fig. 73** .
7. Remove the left side window defogger lower outlet duct. Remove the push-in retainer. Use a twisting motion to release the defogger lower outlet duct from the windshield defroster duct, then from the defogger upper outlet duct. See **Fig. 22** .
8. Remove the inside air temperature sensor aspirator duct. Depress the duct retaining tab and remove the duct from the ignition switch housing bracket. Use a twisting motion to

- release the duct from the duct muffler. See [Fig. 19](#) .
9. Disconnect the Daytime Running Lamps (DRL) sensor electrical connector, if equipped. Disconnect the electrical connector from the left side temperature actuator. See [Fig. 20](#) .
 10. Remove the I/P center support bracket and the ignition switch housing bracket. Remove the left side floor air outlet duct retaining screws. Remove the left side floor air outlet duct. See [Fig. 74](#) .
 11. Remove the left side floor air rear outlet duct. Rotate the duct 1/4 turn clockwise to release. See [Fig. 75](#) . Remove the right side window defogger lower outlet duct. Depress the defogger lower outlet duct retaining tabs and release the duct from the passenger SIR bracket. Use a twisting motion to release the defogger lower outlet duct from the windshield defroster duct, then from the defogger upper outlet duct. See [Fig. 76](#) .
 12. Remove the passenger SIR bracket and the passenger knee bolster bracket. Disconnect the sunload sensor electrical connector. Disconnect the electrical connector from the right side temperature actuator. See [Fig. 24](#) .
 13. Remove the right side floor air outlet duct retaining screws. Remove the right side floor air outlet duct. See [Fig. 23](#) . Reposition the carpet away from the right side of the driveline tunnel to access the carpet air outlet duct. Use a rotating motion to release the carpet air outlet duct from the floor air rear outlet duct. See [Fig. 77](#) .
 14. Remove the right side floor air rear outlet duct. Rotate the rear duct 1/4 turn counterclockwise to release. See [Fig. 78](#) . Disconnect the electrical connector from the blower motor control module. See [Fig. 33](#) . Remove the blower motor. See **BLOWER MOTOR** under REMOVAL & INSTALLATION.
 15. Disconnect the I/P harness vacuum supply line from the HVAC module vacuum harness. See [Fig. 79](#) . Disconnect the electrical connector from the vacuum electric solenoid. See [Fig. 80](#) .
 16. Remove the windshield defroster duct retaining screws. Remove the windshield defroster duct. See [Fig. 81](#) . Remove the HVAC module retaining and sealing nuts from the cowl. Reposition the refrigerant lines slightly, if necessary. Remove the HVAC module retaining bolts from the I/P upper support beam. Carefully remove the HVAC module from the vehicle. See [Fig. 82](#) .
 17. Remove and discard the HVAC module air inlet, drain and plumbing seals. See [Fig. 83](#) .
 18. To install, reverse removal procedure.



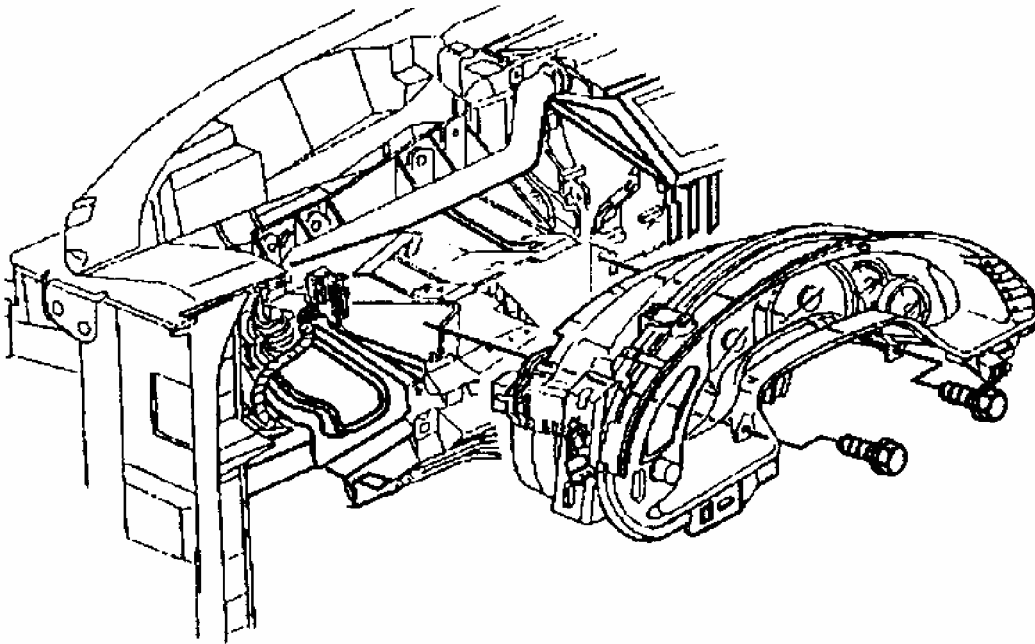
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Fig. 71: Removing & Installing Air Injection Check Valve
Courtesy of GENERAL MOTORS CORP.



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Fig. 72: Removing & Installing HVAC Drain Tube
Courtesy of GENERAL MOTORS CORP.

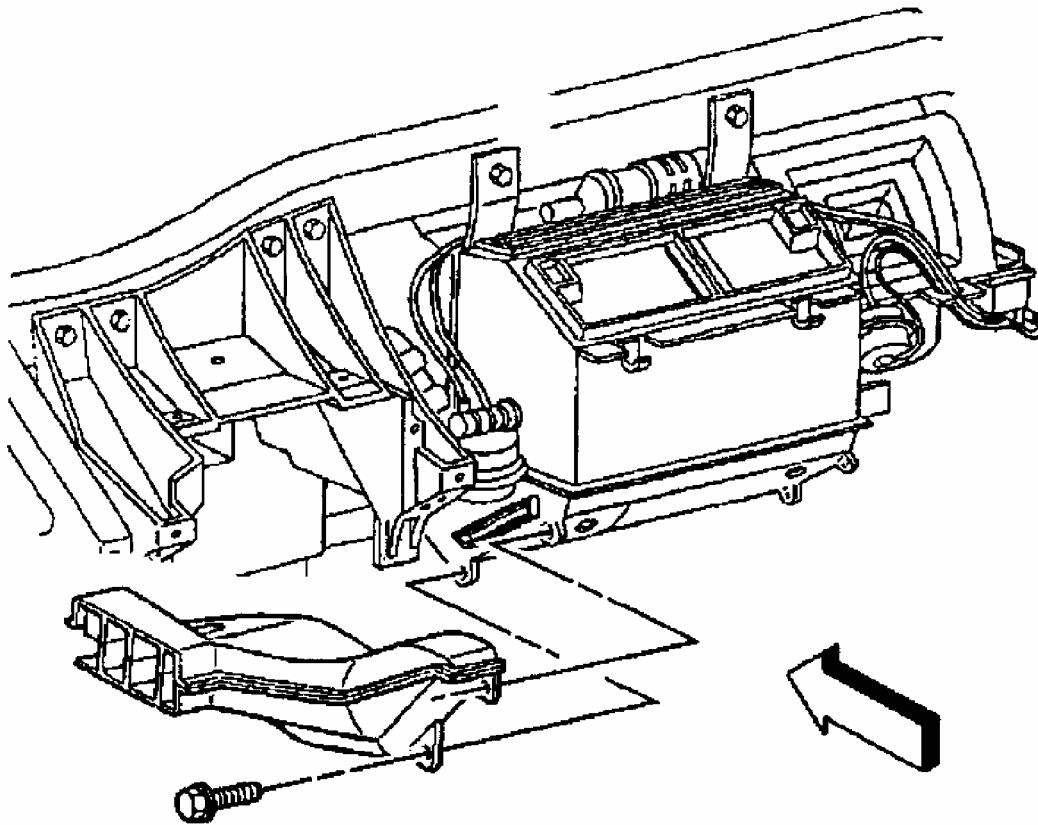


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Fig. 73: Exploded View Of Instrument Cluster
Courtesy of GENERAL MOTORS CORP.

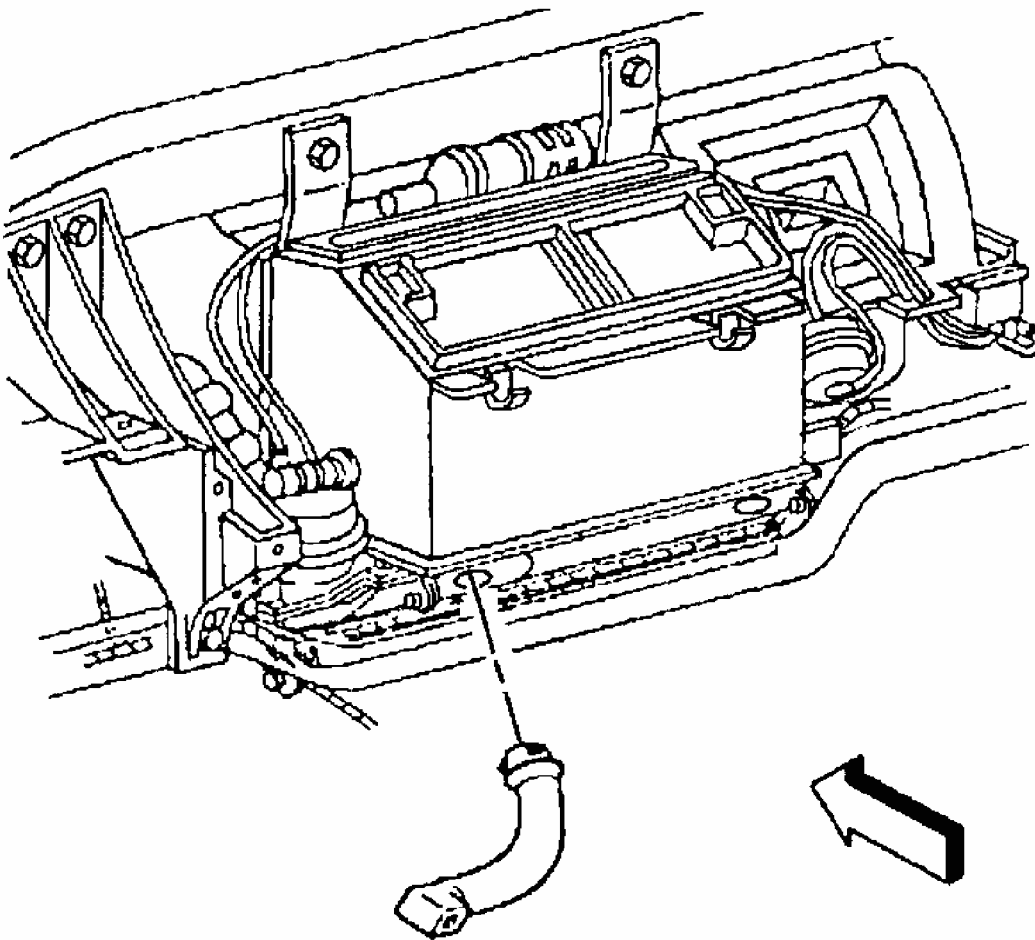
2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette



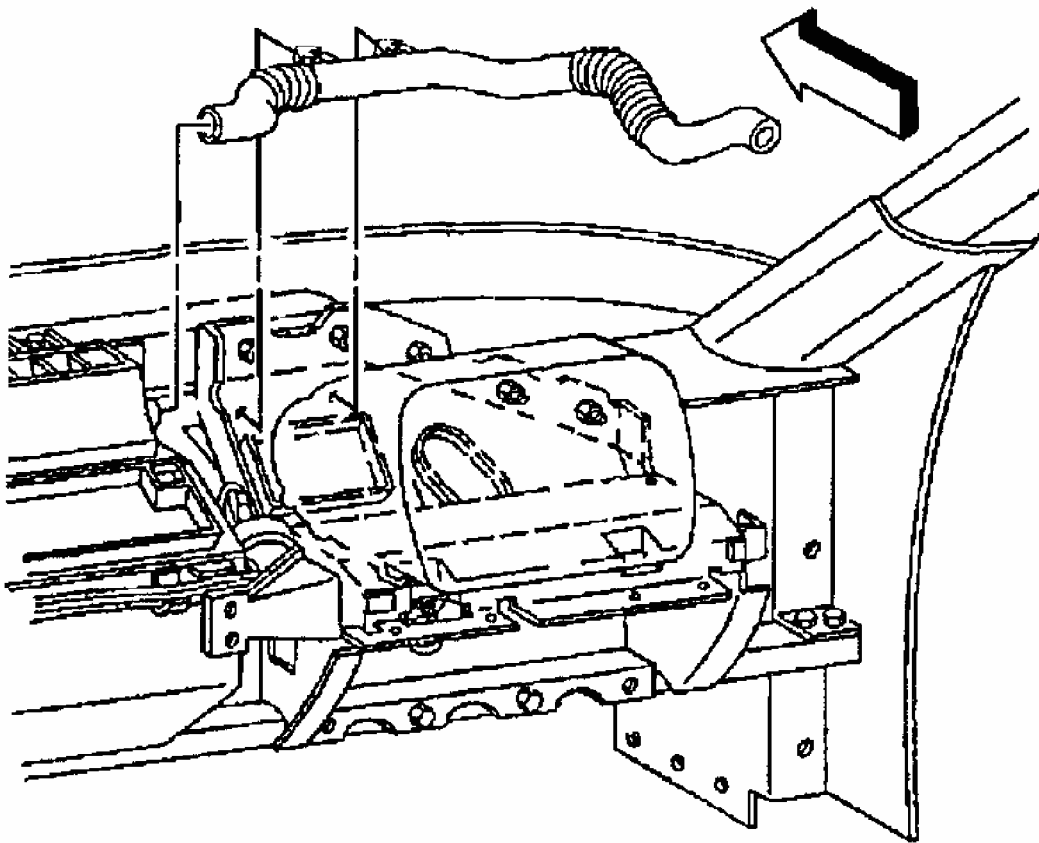
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Fig. 74: Removing & Installing LH Floor Air Outlet Duct
Courtesy of GENERAL MOTORS CORP.



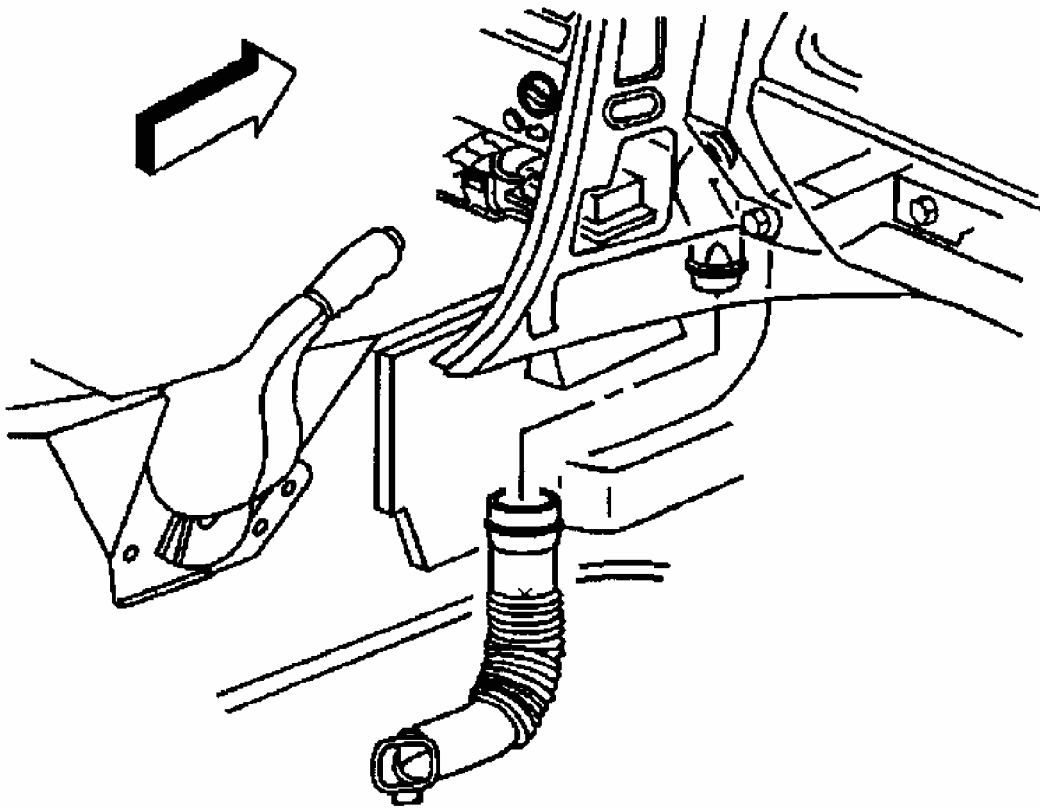
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Fig. 75: Removing & Installing Rear Floor Air Outlet Duct
Courtesy of GENERAL MOTORS CORP.



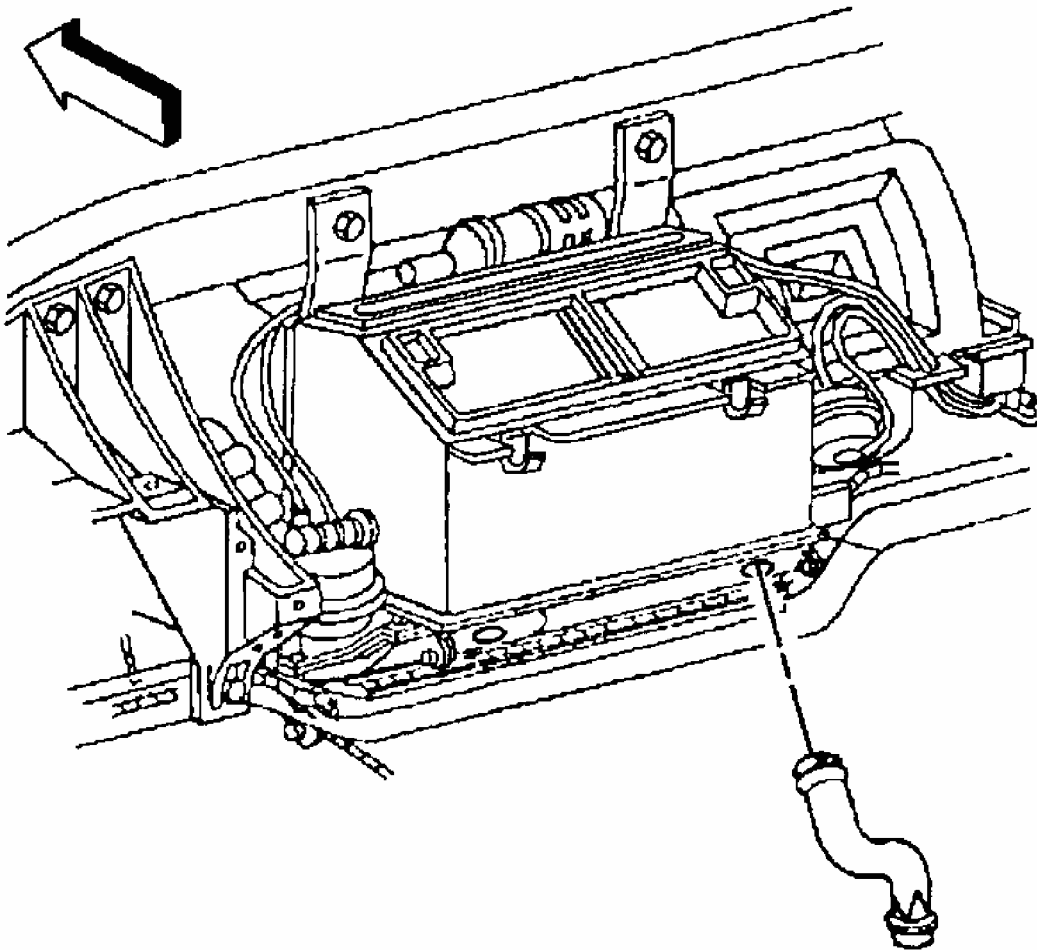
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Fig. 76: Removing & Installing Lower Window Defogger Outlet Duct
Courtesy of GENERAL MOTORS CORP.



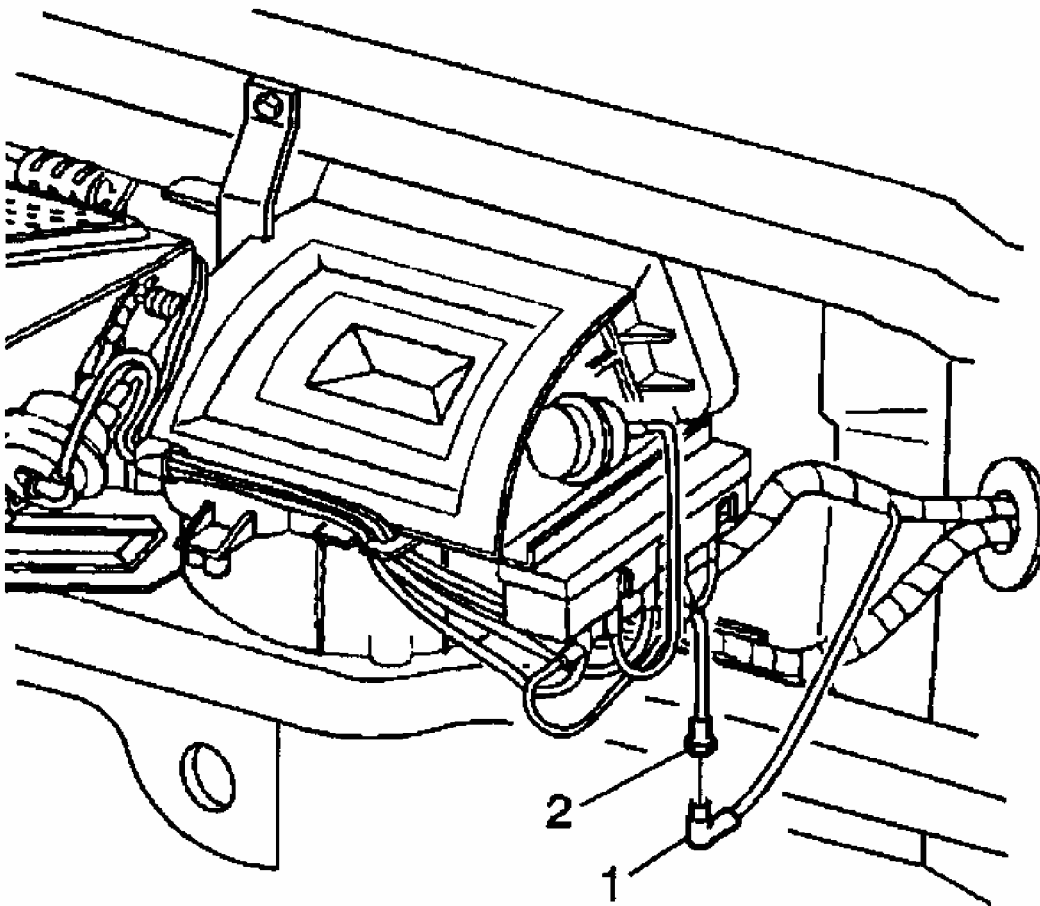
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Fig. 77: Removing & Installing Carpet Outlet Duct
Courtesy of GENERAL MOTORS CORP.



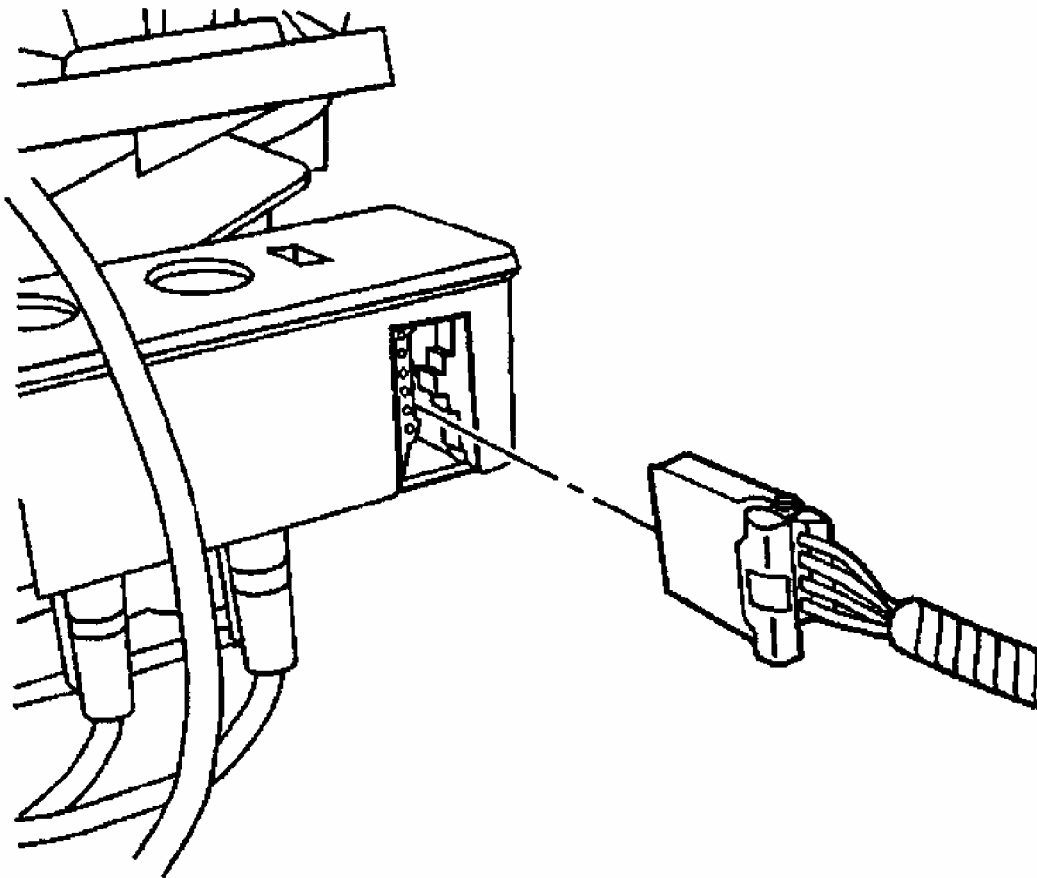
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Fig. 78: Removing & Installing Rear right Floor Air Outlet Duct
Courtesy of GENERAL MOTORS CORP.



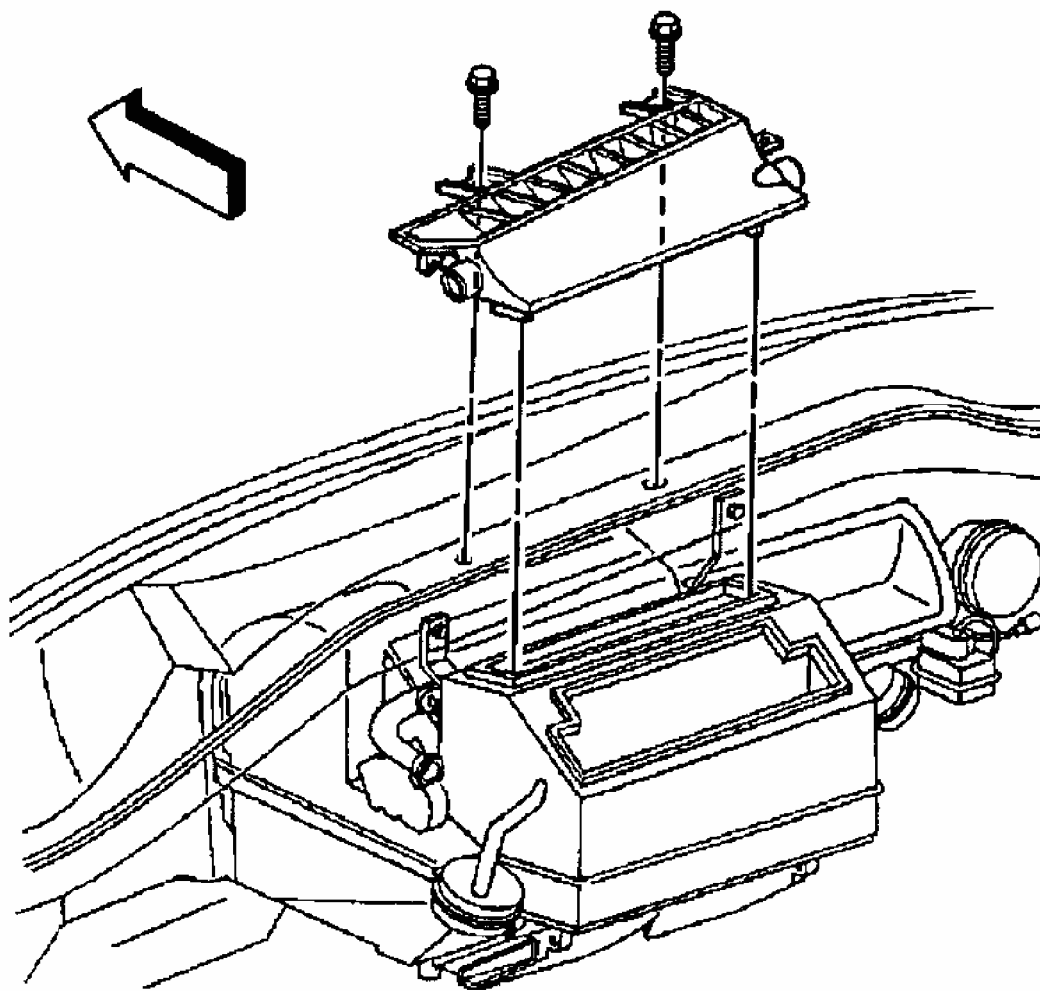
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Fig. 79: Disconnecting I/P Harness Vacuum Supply Line
Courtesy of GENERAL MOTORS CORP.



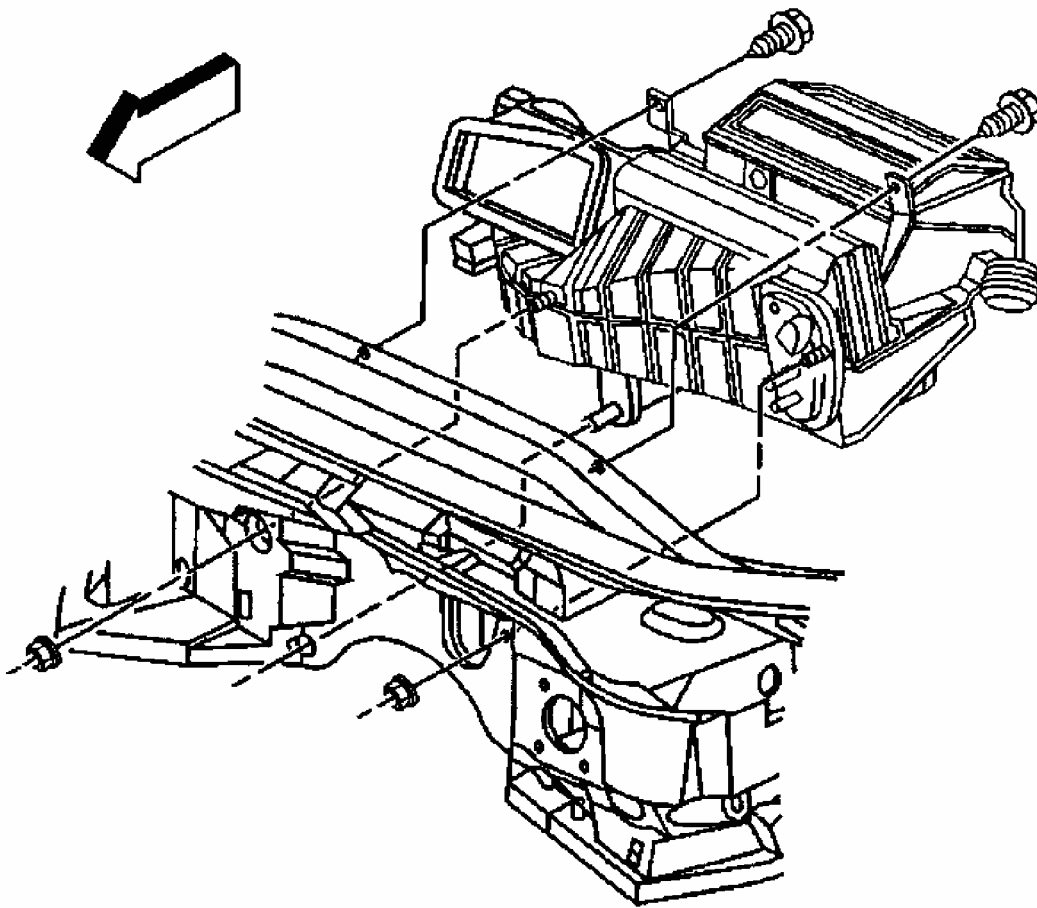
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Fig. 80: Disconnecting Vacuum Solenoid Electrical Connector
Courtesy of GENERAL MOTORS CORP.



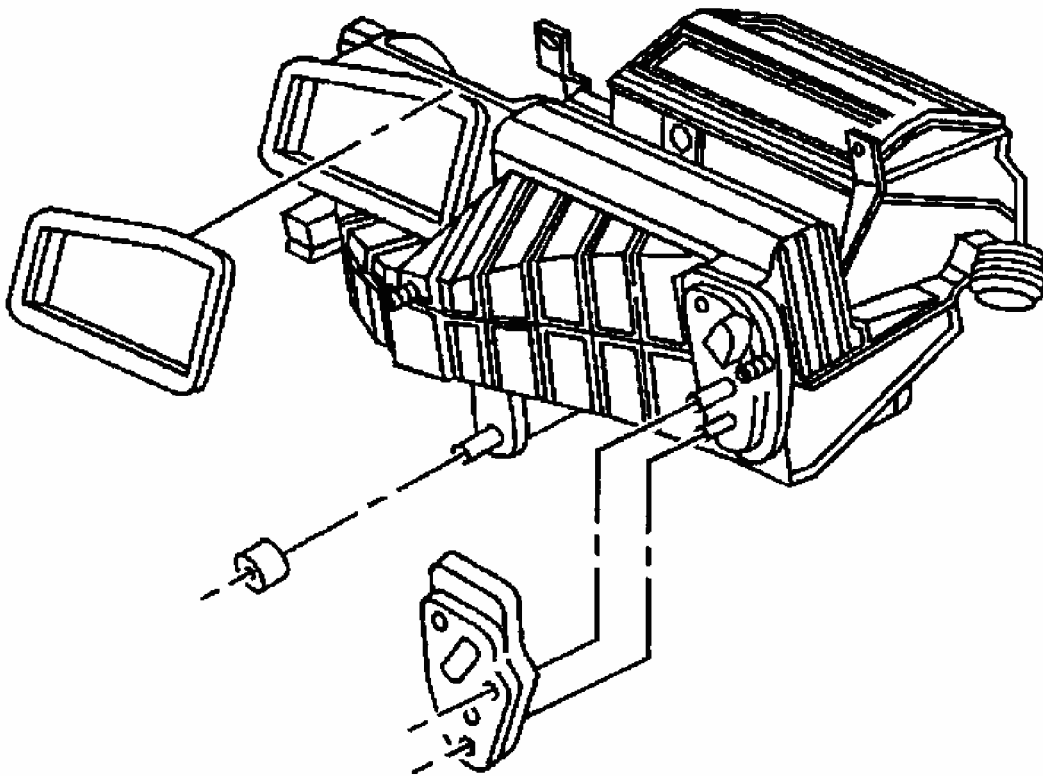
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Fig. 81: Removing & Installing Windshield Defroster Duct
Courtesy of GENERAL MOTORS CORP.



G00209288

Fig. 82: Removing & Installing HVAC Module From Vehicle
Courtesy of GENERAL MOTORS CORP.



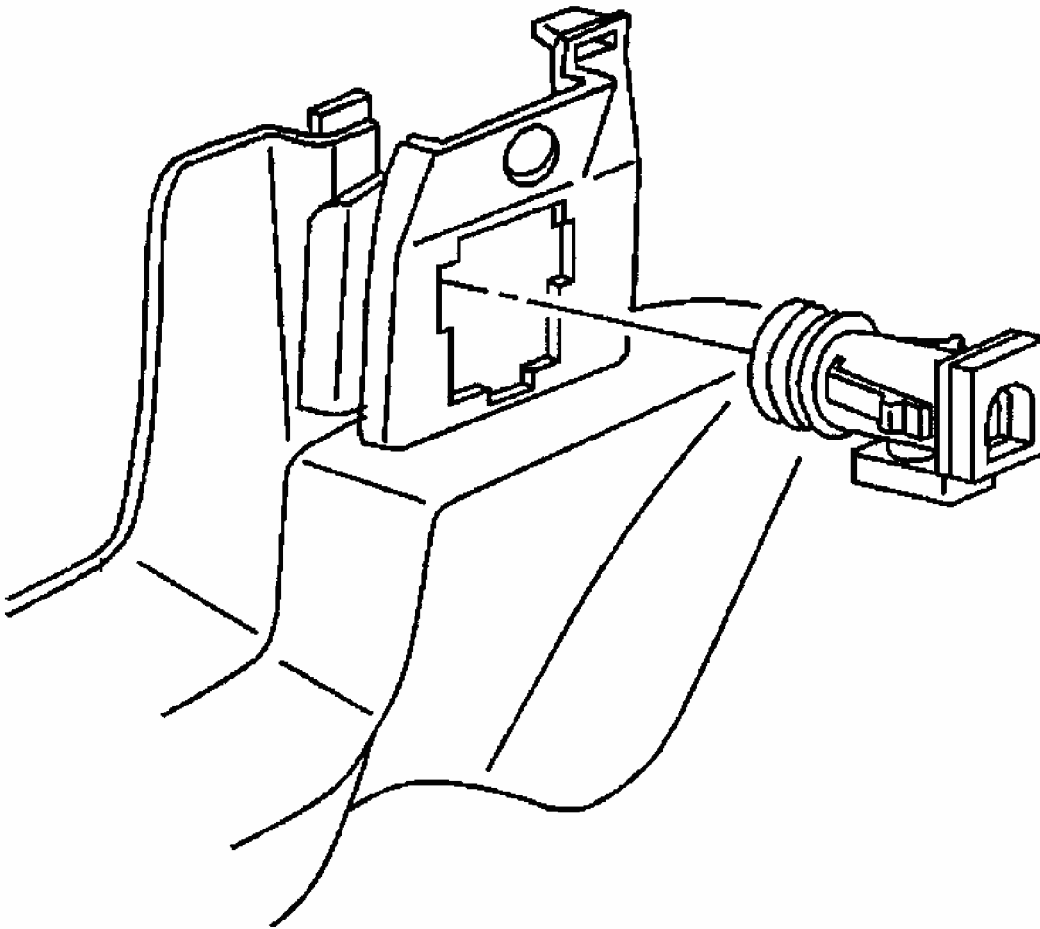
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Fig. 83: Removing & Installing HVAC Seals
Courtesy of GENERAL MOTORS CORP.

INSIDE AIR TEMPERATURE SENSOR

Removal

Remove the center instrument panel accessory trim plate. Remove the driver knee bolster trim panel. Carefully depress the sensor retaining tabs and remove the inside air temperature sensor from the driver knee bolster trim panel. See **Fig. 84** .



G00218131

Fig. 84: Removing Inside Air Temperature Sensor
Courtesy of GENERAL MOTORS CORP.

Installation

NOTE: The inside air temperature sensor must be aligned with and fit into the end of the inside air temperature sensor aspirator duct.

1. Align the inside air temperature sensor to the driver knee bolster trim panel, then push to secure the retaining tabs. See **Fig. 84** . Be sure to align the inside air temperature sensor with the inside air temperature sensor aspirator duct, while installing the driver knee bolster trim panel.
2. Install the drivers knee bolster trim panel. Install the I/P accessory trim plate.

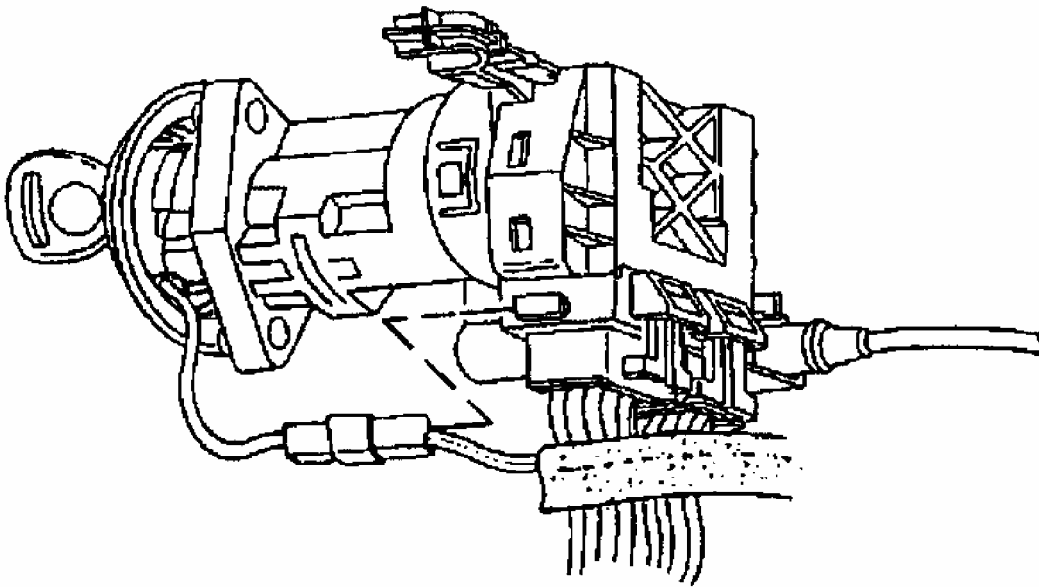
MODE ACTUATOR

Removal

1. Remove the I/P upper trim pad. Remove the Instrument Panel Cluster (IPC) to steering column bracket retaining screws. Reposition the IPC to better access the inside air temperature sensor duct. See **Fig. 21** .
2. Remove the inside air temperature sensor aspirator duct. Depress the duct retaining tab and remove the duct from the ignition switch housing bracket. Use a twisting motion to release the duct from the duct muffler. See **Fig. 19** .
3. Remove the driver knee bolster bracket. Disconnect the ignition switch lock cylinder electrical connector from the retaining tab on the side of the ignition switch. See **Fig. 85** .

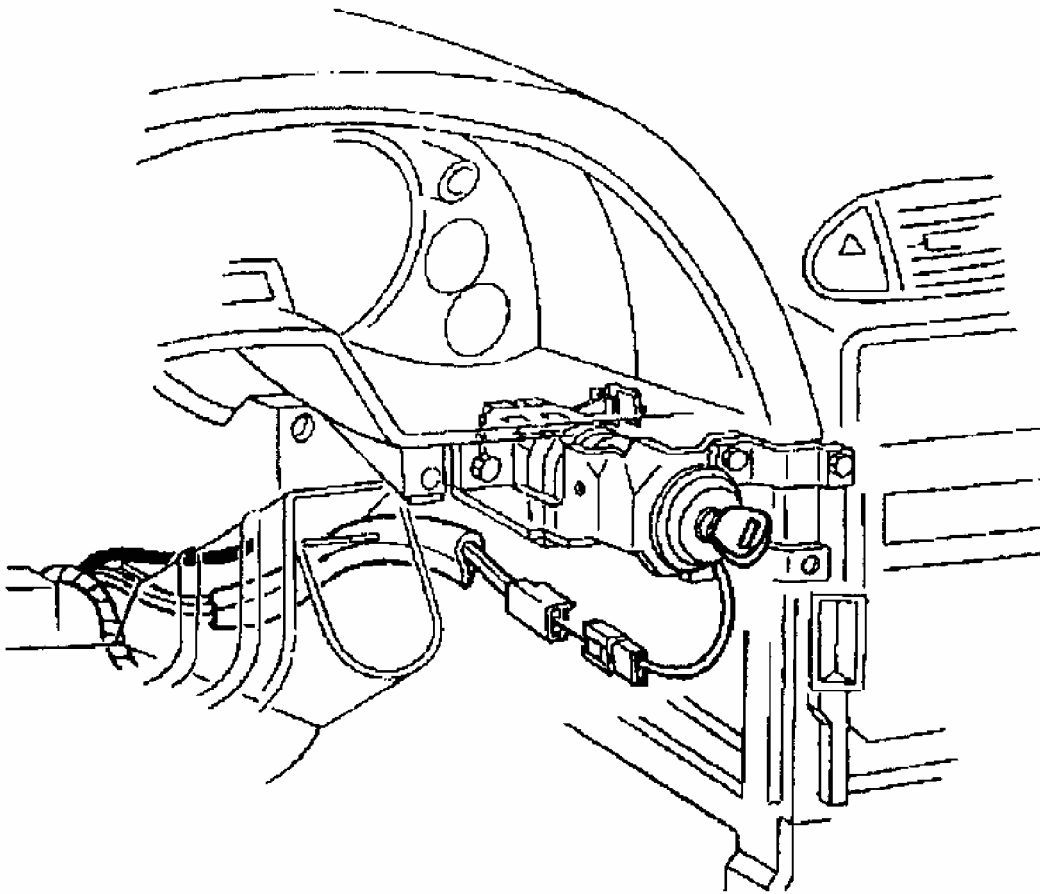
NOTE: **Take note of how the ignition switch lock cylinder wire is wrapped around the base of the ignition switch bezel**

4. Disconnect the lock cylinder electrical connector. Remove the ignition switch bezel. Carefully pull to unsnap. See **Fig. 86** .
5. Remove the hazard warning switch wiring harness from the ignition switch retainer. See **Fig. 87** . Remove the ignition switch retaining bolts. Reposition the ignition switch downward. See **Fig. 88** .
6. Disconnect the vacuum harness connectors from the mode actuator. Cut and remove the adjustable plastic tie strap from the base of the mode actuator. See **Fig. 89** .
7. Lift to release the mode actuator retaining tab and just begin to slide the actuator toward the steering column bracket. Remove the air distribution case cover screws. See **Fig. 90** . Remove the air distribution case cover with the mode actuator attached. Remove the mode actuator from the mode door lever.



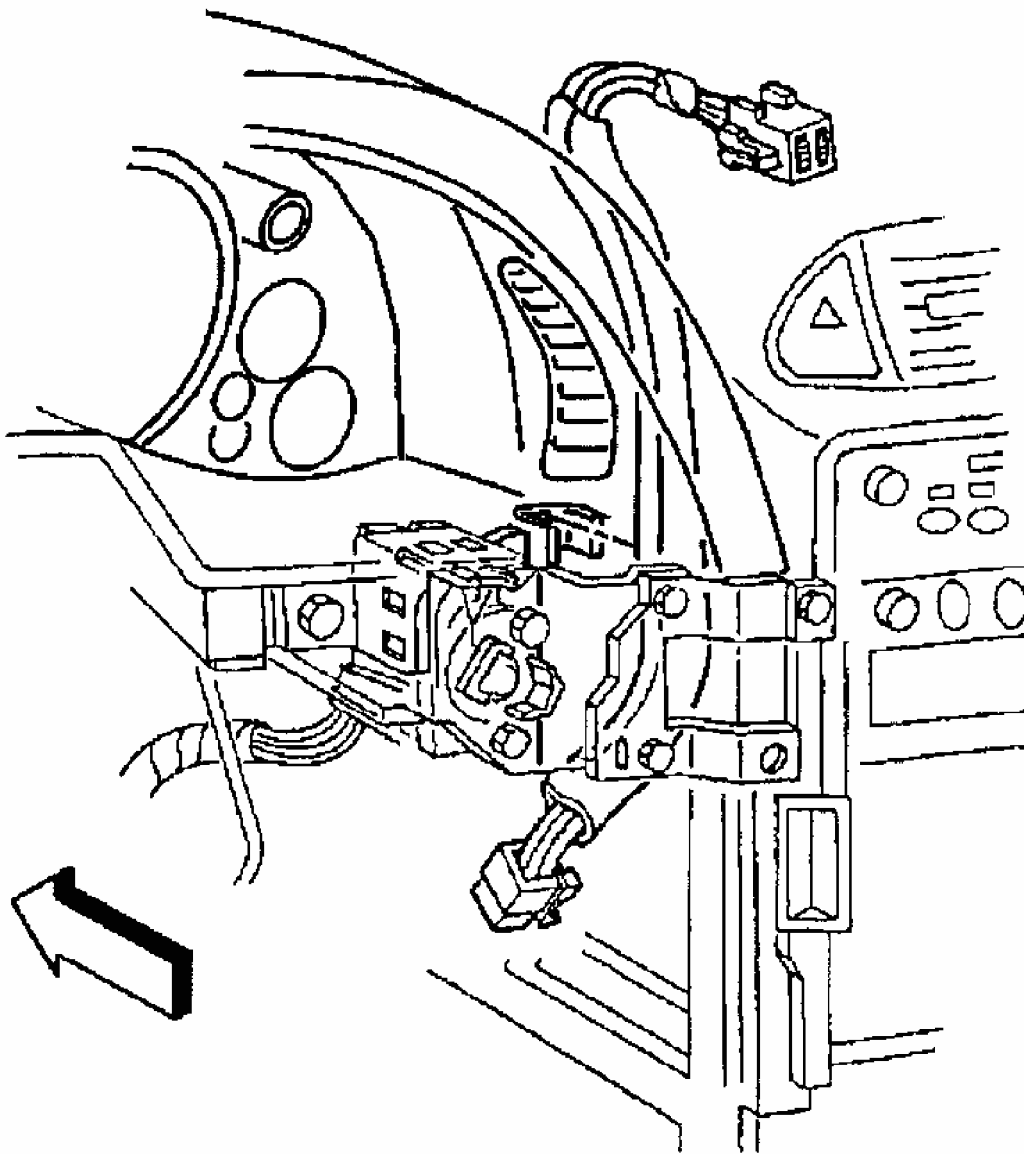
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Fig. 85: Disconnecting Ignition Switch Lock Cylinder Electrical Connector
Courtesy of GENERAL MOTORS CORP.



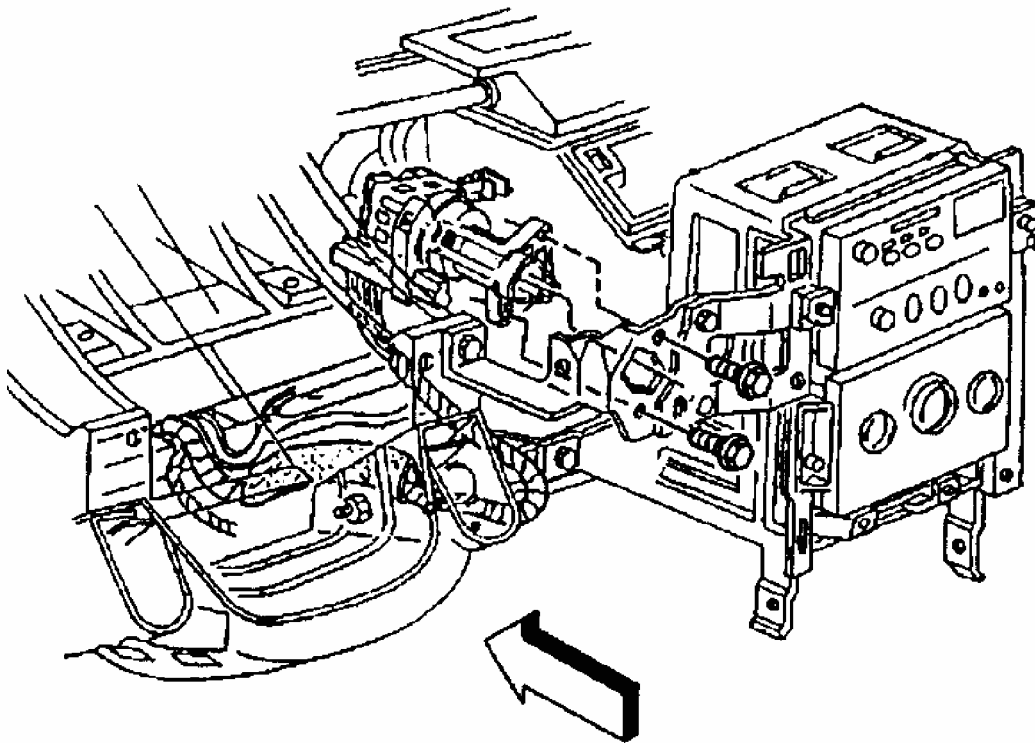
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Fig. 86: Disconnecting Lock Cylinder Electrical Connector
Courtesy of GENERAL MOTORS CORP.



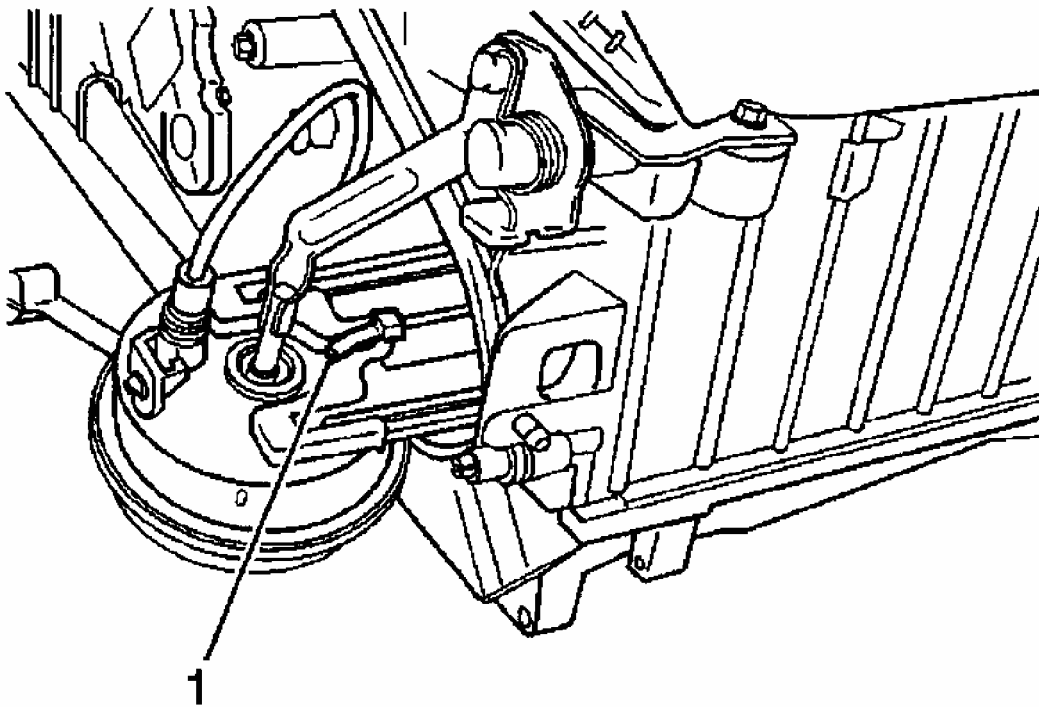
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Fig. 87: Disconnecting Hazard Switch Wiring Harness
Courtesy of GENERAL MOTORS CORP.



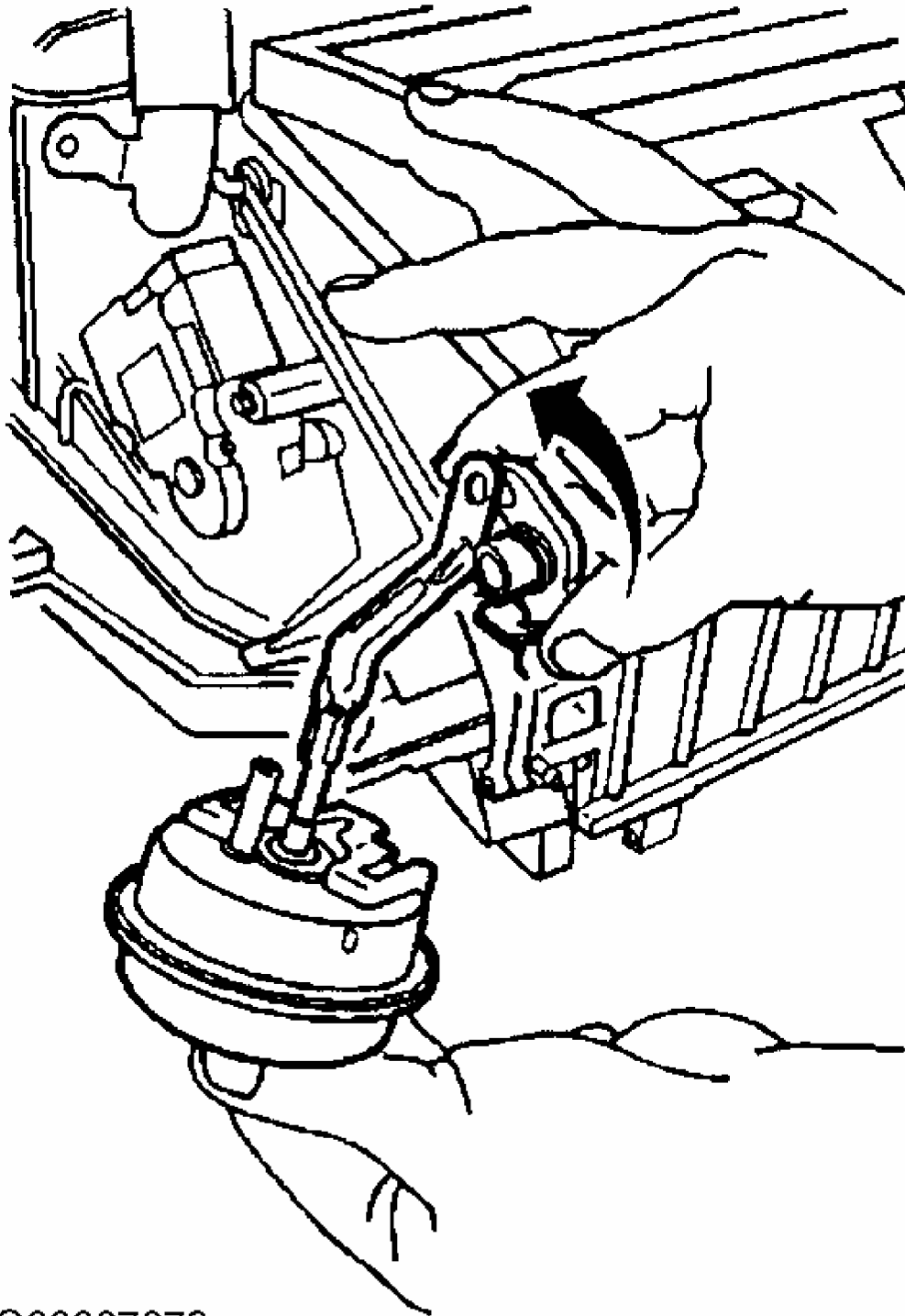
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Fig. 88: Removing & Installing Ignition Switch Bolts
Courtesy of GENERAL MOTORS CORP.



G00203713

Fig. 89: Disconnecting Vacuum Harness Connector From Actuator
Courtesy of GENERAL MOTORS CORP.



G00067679

Fig. 90: Exploded View Of Mode Door Actuator
Courtesy of GENERAL MOTORS CORP.

Installation

1. Connect the mode actuator pushrod to the mode door lever. Install the air distribution case cover with the mode actuator attached. Install the air distribution case cover screws. Tighten to specified torque. See **TORQUE SPECIFICATIONS** .
2. Position the pod of the mode actuator between the steering column bracket and the ignition switch housing bracket. Inspect that the actuator pushrod is not binding on the mode door lever. Push the actuator toward the HVAC module case to secure the retaining tab. See **Fig. 90** .
3. Install a new adjustable plastic tie strap to the base of the mode actuator. See **Fig. 89** . Connect the vacuum harness connectors to the mode actuator.
4. Position the ignition switch to the ignition switch housing bracket. Install the ignition switch retaining bolts. Tighten to specified torque. See **TORQUE SPECIFICATIONS** .
5. Install the hazard warning switch wiring harness to the ignition switch retainer. See **Fig. 88** . Install the ignition switch bezel to the switch. Wrap the ignition switch lock cylinder wire around the base of the ignition switch bezel, as noted during removal. Align the bezel slots to the lock cylinder pins, then push to secure.
6. Connect the lock cylinder electrical connector. See **Fig. 87** . Connect the lock cylinder electrical connector to the retaining tab on the side of the ignition switch. Install the driver knee bolster bracket.
7. Install the inside air temperature sensor aspirator duct. See **Fig. 19** . Use a twisting motion to secure the duct to the duct muffler. Install the duct retaining tab to the ignition switch housing bracket. See **Fig. 85** .
8. Install the IPC into position. See **Fig. 21** . Install the IPC to steering column bracket retaining screws. Tighten to specified torque. See **TORQUE SPECIFICATIONS** . Install the I/P upper trim pad. Recalibrate the actuators. See **RE-CALIBRATING ACTUATORS** under ADJUSTMENTS.

MODE DOOR**Removal & Installation**

1. Remove the I/P trim pad. Remove the mode door actuator. Remove the air distribution case cover retaining screws. See **Fig. 50** .
2. Remove the air distribution case cover. Remove and discard the air distribution case seal. Remove the mode door.

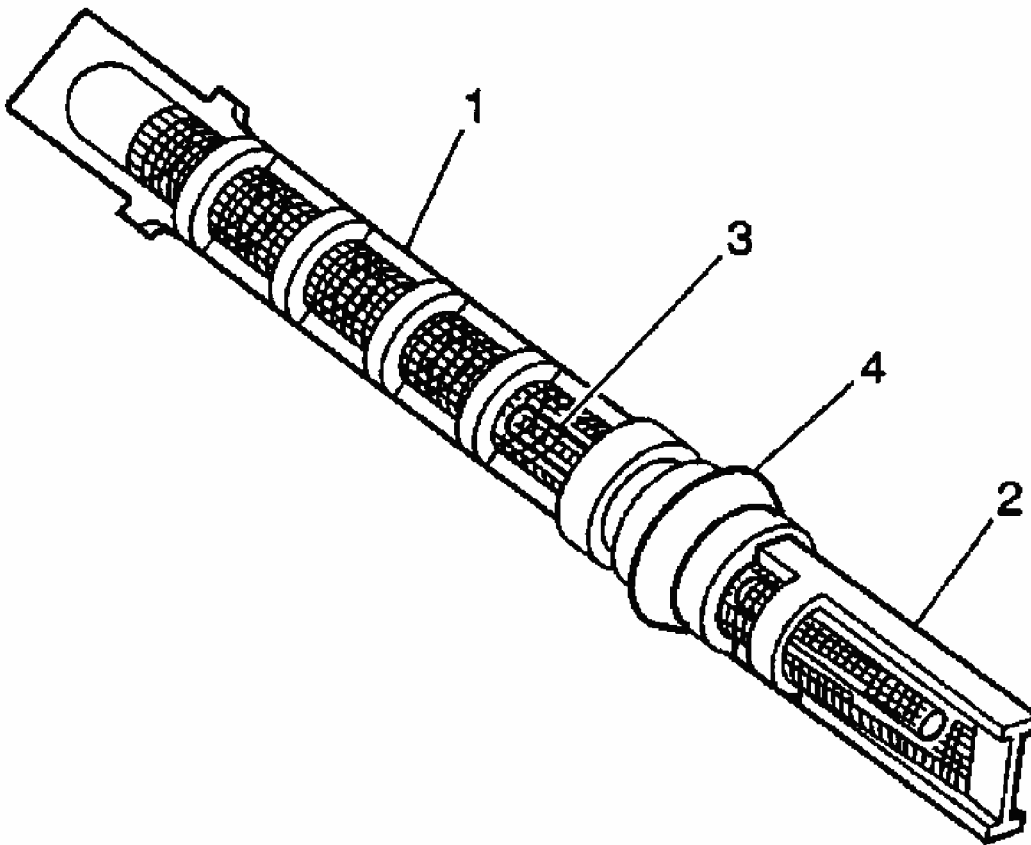
ORIFICE TUBE

NOTE: Cap or tape the open rear evaporator tube immediately to prevent contamination.

Removal

1. Recover the refrigerant from the A/C system. See RECOVERY, EVACUATION & RECHARGING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING. Remove the front evaporator tube to rear evaporator tube retaining bolt. See **Fig. 9** . Disconnect the front evaporator tube from the rear evaporator tube, discard the O-ring.
2. Remove the orifice tube. Inspect the orifice tube for the following conditions and clean or replace with a NEW tube as indicated
 - Broken plastic frame - Replace the orifice tube assembly.
 - Torn, damaged or plugged with fine gritty material - Replace the orifice tube assembly.
 - Damaged or plugged - Replace the orifice tube assembly.
 - Filter screen coated with metal chips, flakes or slivers - Coating may be removed with low pressure shop air and reused if cleaned satisfactorily.

If reusing the orifice tube, install a NEW O-ring (4). See **Fig. 91** .



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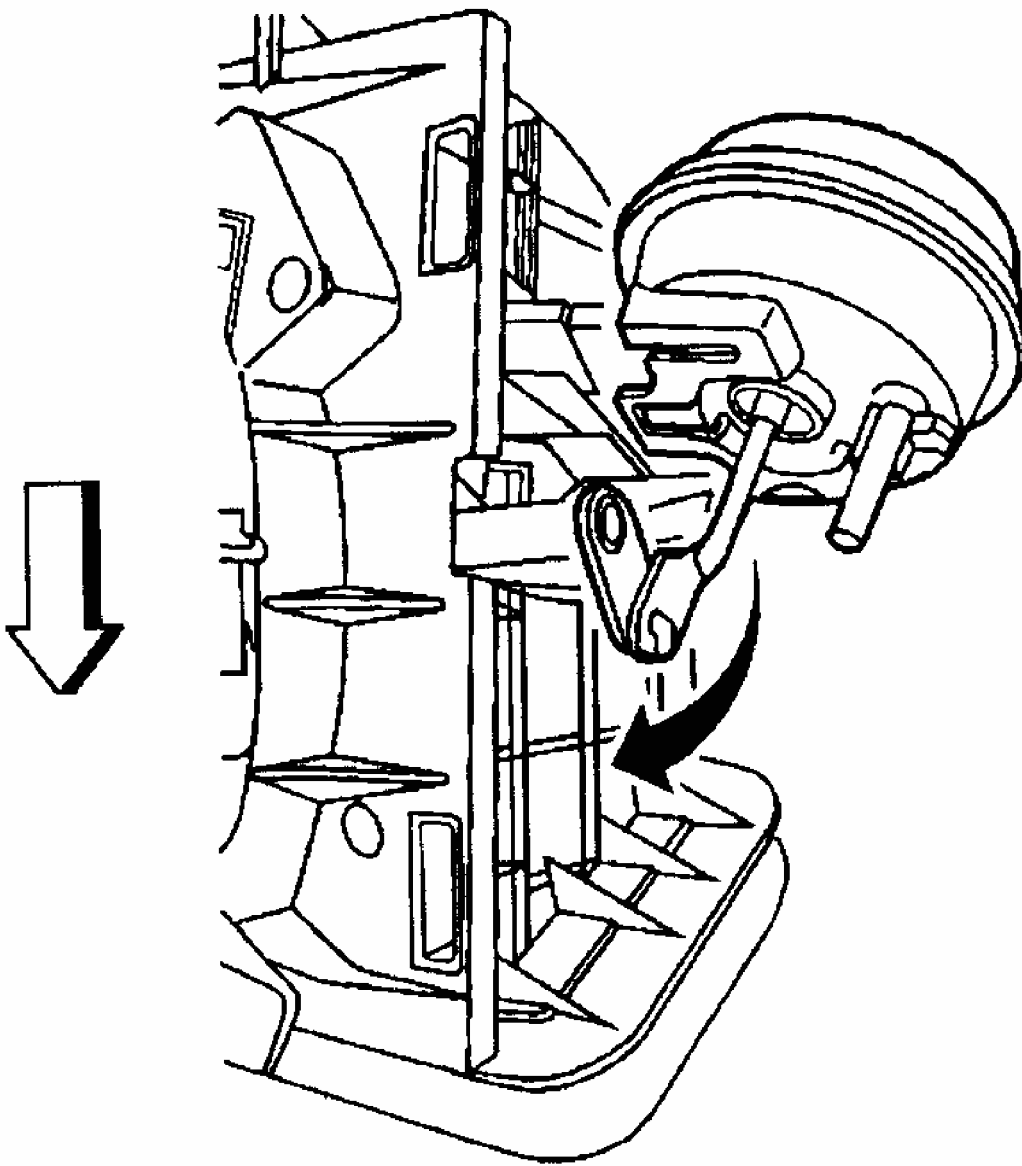
Fig. 91: Removing Orifice Tube

Courtesy of GENERAL MOTORS CORP.**Installation**

1. Remove the cap or tape from the front evaporator tube. Install the tube (short filter screen outlet side first) fully into the front evaporator tube. Remove the cap or tape from the rear evaporator tube. Install NEW O-rings to the orifice tube. See **Fig. 15** .
2. Install the front evaporator tube to the rear evaporator tube. Install the front evaporator tube to rear evaporator tube retaining bolt. Tighten to specified torque, see TORQUE SPECIFICATIONS. Evacuate and recharge the A/C system. See RECOVERY, EVACUATION & RECHARGING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING.

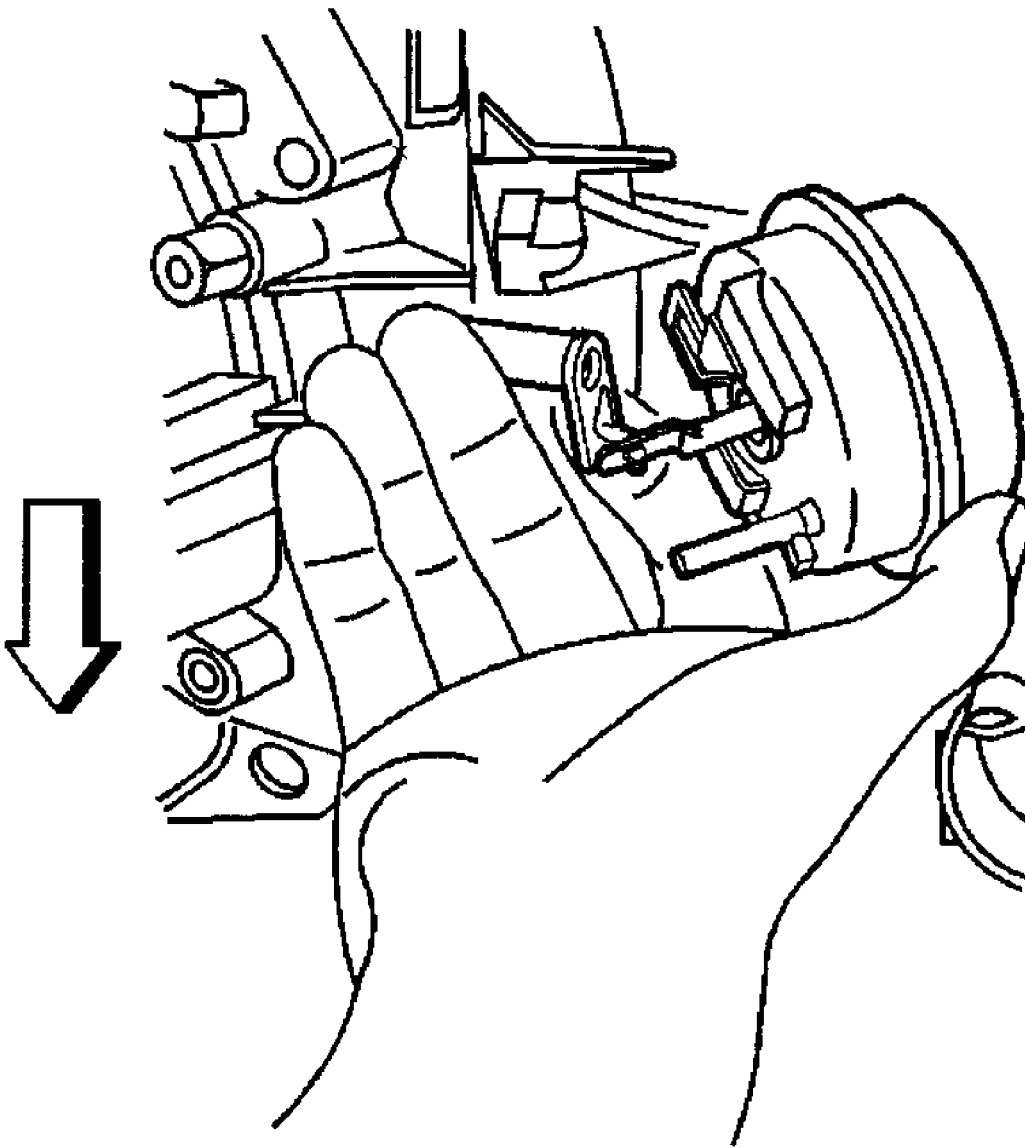
RECIRCULATION ACTUATOR**Removal**

1. Remove the SIR bracket. Disconnect the vacuum harness connector from the recirculation actuator. Lift to release the recirculation actuator retaining tab and begin to slide the recirculation actuator toward the outside of the vehicle. See **Fig. 92** .
2. Rotate the recirculation door lever fully forward/clockwise, to extend the actuator plunger. Disconnect the recirculation actuator from the recirculation door lever and remove the vacuum actuator. Release the recirculation door lever. See **Fig. 93** .



G00067682

Fig. 92: Exploded View Of Recirculation Door Actuator
Courtesy of GENERAL MOTORS CORP.



G00203714

Fig. 93: Removing Actuator Plunger Rod From Recirculation Door Actuator
Courtesy of GENERAL MOTORS CORP.

Installation

1. Rotate the recirculation door lever fully forward/clockwise and hold in place. Connect the recirculation actuator to the recirculation door lever, then extend the plunger. See **Fig. 93** .
2. Inspect that the actuator pushrod is not binding on the recirculation door lever. Push the actuator toward the HVAC module case to secure the retaining tab. Release the recirculation door lever. See **Fig. 92** .

3. Connect the vacuum harness connector to the recirculation actuator. Install the SIR bracket. Recalibrate the actuators. See **RE-CALIBRATING ACTUATORS** under TROUBLESHOOTING.

RECIRCULATION DOOR

Removal & Installation

1. Remove the I/P trim pad. Remove the SIR bracket. Disconnect the recirculation actuator vacuum hose.
2. Remove the recirculation housing screws. Tilt the recirculation housing away from the HVAC module and lift housing from the tab slots in the module case. Remove the recirculation actuator. Remove the recirculation door from the recirculation housing.

REFRIGERANT FILTER (INSTALLATION)

NOTE: Use this procedure when installing a filter in a vehicle does not have a refrigerant filter.

NOTE: The filter, AC-Delco P/N (1760) must be installed to the A/C evaporator tube (liquid line) between the condenser and the evaporator. The installation of this in-line filter eliminates the need for flushing the A/C system.

Installation

1. Recover the A/C refrigerant. See RECOVERY, EVACUATION & RECHARGING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING. Raise and support the vehicle. Remove the right front fender liner. Immediately cap or tape the open end of the condenser and evaporator line in order to prevent contamination of the A/C system.
2. Remove the evaporator line bolt at the condenser fitting. It may be necessary to turn the wheel all of the way to the right. The AC-Delco P/N (1760) filter will have an orifice contained in it. Remove and discard the orifice tube.
3. Make 2 marks 1.5" (38 mm) apart on the liquid line, approximately 2" (50 mm) from the first line hanger and after the Black foam line insulation. See **Fig. 94** . Do not allow metal burrs to drop into the liquid line. Use a line cutter in order to cut the liquid line at the marked position. Remove any burrs. Connect the evaporator line at the condenser fitting. Install the evaporator hose bolt. Tighten the evaporator hose bolt to specification. See **TORQUE SPECIFICATIONS** .

NOTE: Do Not install the O-rings at this step.

4. Remove the following components from the A/C refrigerant filter:

- The nuts.
- The ferrules.
- The O-rings.

Push the nuts and the ferrules over each of the liquid line halves. See **Fig. 95** . Install the ferrules with the small end toward the nut. Install the liquid line into the A/C refrigerant filter. Ensure to bottom out the liquid line.

5. While holding the liquid line bottomed out in the A/C refrigerant filter, tighten the nuts securely. Disassemble the A/C refrigerant filter from the liquid line. Lubricate the O-rings with clean 525 viscosity refrigerant oil. Install the O-rings onto the liquid line.
6. Install the liquid line into the A/C refrigerant filter. Ensure to bottom out the liquid line. While holding the liquid line bottomed out in A/C refrigerant filter, tighten the nuts to specification. See **TORQUE SPECIFICATIONS** .
7. Evacuate and charge the refrigerant system. Install the right front fender liner. Lower the vehicle.

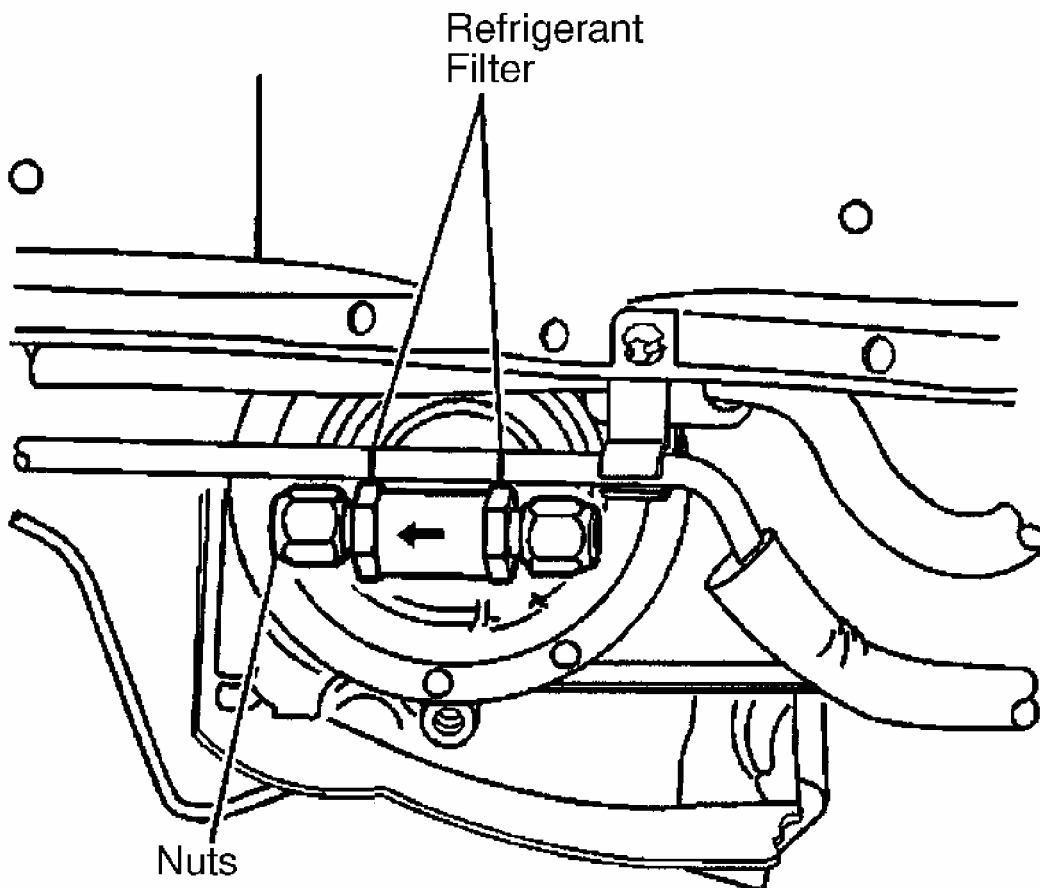
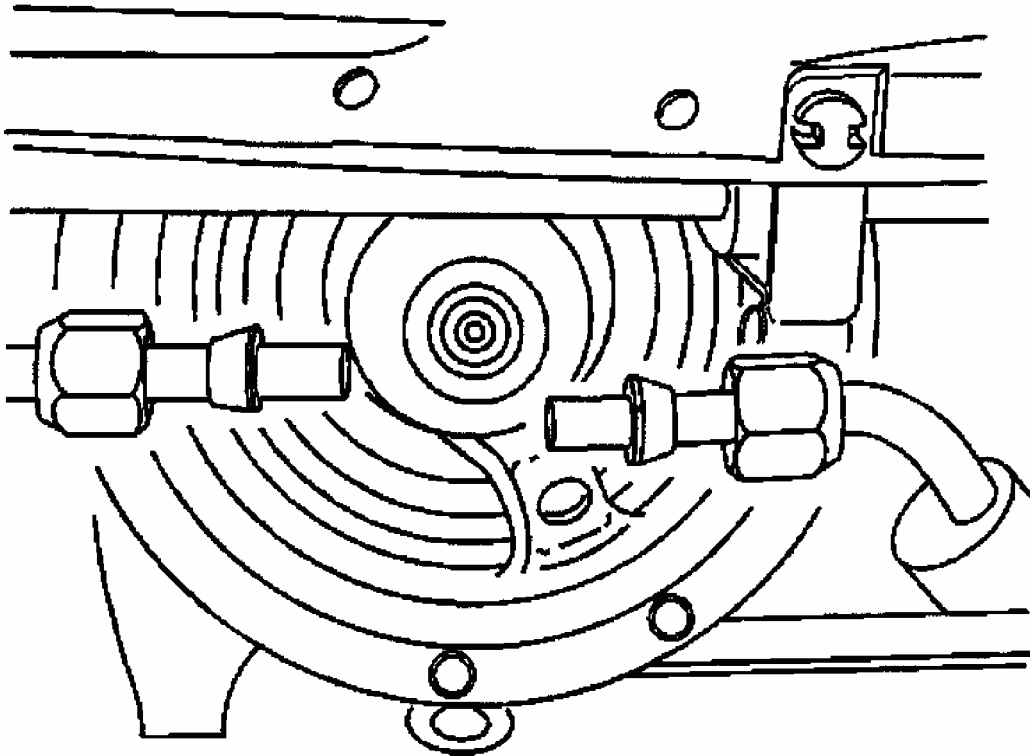


Fig. 94: Locating Refrigerant Filter
Courtesy of GENERAL MOTORS CORP.



G00189628

Fig. 95: Installing Ferrules & Nuts
Courtesy of GENERAL MOTORS CORP.

REFRIGERANT FILTER (REPLACEMENT)

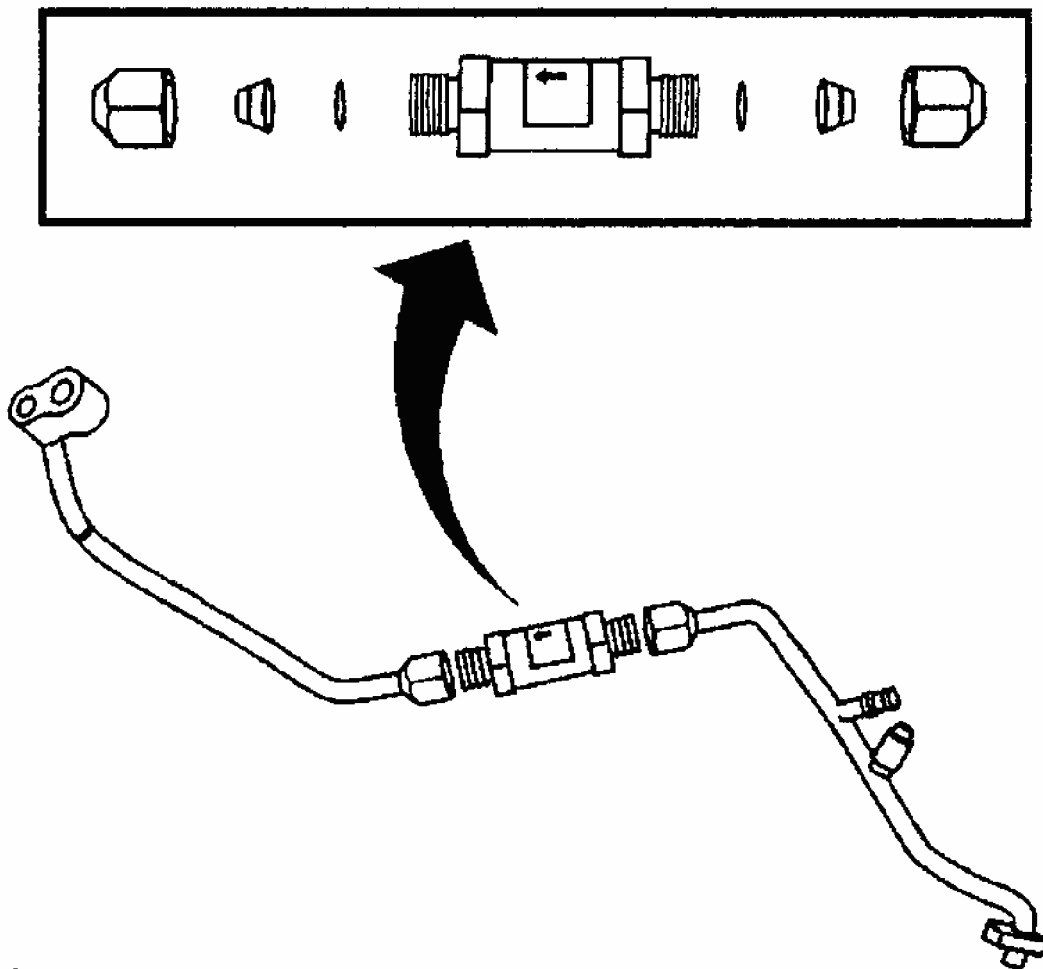
- NOTE:** Use this procedure when replacing a filter in a vehicle that has one installed.
- NOTE:** Immediately cap or tape the open front evaporator tube and the condenser in order to prevent contamination.

Removal

1. Recover the refrigerant from the A/C system. See RECOVERY, EVACUATION & RECHARGING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING. Loosen the A/C refrigerant filter flare nuts. Remove A/C refrigerant filter from the evaporator tube. Discard the O-rings. See **Fig. 96**.

NOTE: Fully seat the A/C filter to the ferrules in order to ensure that the O-rings seat inside the filter housing.

2. Remove the cap or the tape from the evaporator tubes. Install NEW O-rings to each end of the evaporator tube. Install the A/C refrigerant filter to the evaporator tube with the arrow pointing toward the evaporator. Tighten to specified torque, see **TORQUE SPECIFICATIONS**.
3. Evacuate and recharge the A/C system. See RECOVERY, EVACUATION & RECHARGING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING.



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Fig. 96: Exploded View Of A/C Refrigerant Filter
Courtesy of GENERAL MOTORS CORP.

NOTE: The A/C refrigerant filter, ACDelco P/N 151697 must be installed to the A/C evaporator tube between the condenser and evaporator. The installation of the A/C refrigerant filter eliminates the need for flushing.

1. Recover the refrigerant from the A/C system. See RECOVERY, EVACUATION & RECHARGING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING. Remove the front evaporator tube. See **EVAPORATOR TUBE (FRONT)** or **EVAPORATOR TUBE (REAR)** under REMOVAL & INSTALLATION.

NOTE: Measure from the condenser end of the evaporator tube. Cut the tube with a tubing cutter.

2. Measure 16.5" (420 mm). Cut the plastic insulation and remove enough insulation to install the A/C refrigerant filter. Measure 15.7" (400 mm) and mark the evaporator tube. Measure 17.7" (450 mm) and mark the evaporator tube.

NOTE: Do not allow metal shavings to enter the evaporator tube during cutting or when removing the burrs.

3. Cut the evaporator tube at each marking. Remove any burrs from the cut ends of the evaporator tube.

NOTE: You must first remove the O-rings from the filter before you seat the ferrules to the evaporator tube.

4. Remove the O-rings from the A/C refrigerant filter. Install one flare nut and one ferrule to the evaporator tube with the tapered end of the ferrule facing the flare nut.

NOTE: Fully seat the A/C refrigerant filter onto the evaporator tube.

5. Install the A/C refrigerant filter to the evaporator tube with the arrow pointing toward the evaporator. Tighten to specified torque, see **TORQUE SPECIFICATIONS**. Install one flare nut and one ferrule to the other half of the evaporator tube with the tapered end of the ferrule facing the flare nut.
6. Install the A/C refrigerant filter to the evaporator tube. Tighten to specified torque, see **TORQUE SPECIFICATIONS**. Loosen the flare nuts and remove the A/C refrigerant filter from the evaporator tube. Lubricate and install the O-rings to each end of the evaporator tube.

NOTE: Fully seat the filter to the ferrules in order to ensure that the

O-rings seat inside of the filter housing.

7. Install the A/C refrigerant filter to the evaporator tube with the arrow pointing toward the evaporator. Tighten to specified torque, see **TORQUE SPECIFICATIONS** . Install the front evaporator tube. See **EVAPORATOR TUBE (FRONT)** or **EVAPORATOR TUBE (REAR)** under REMOVAL & INSTALLATION.
8. Evacuate and recharge the A/C system. See RECOVERY, EVACUATION & RECHARGING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING.

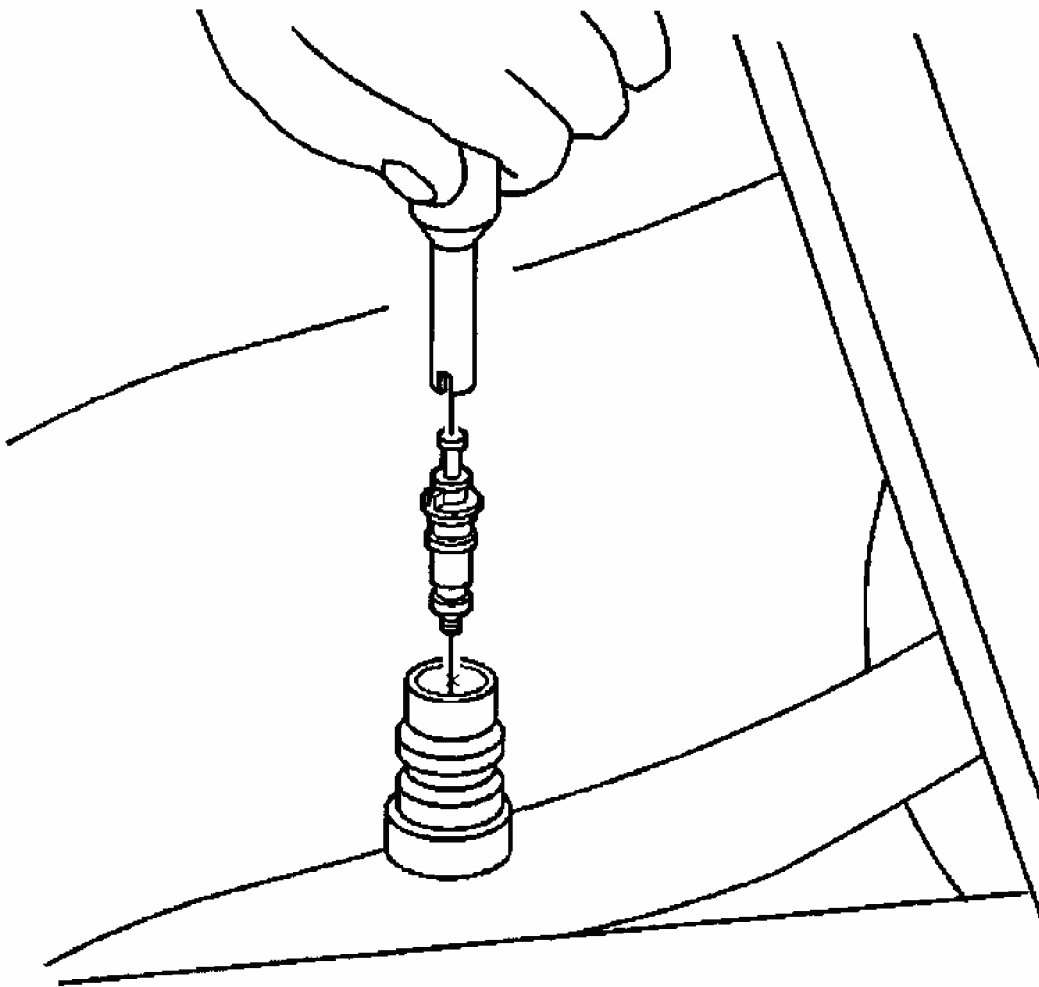
SERVICE PORTS

NOTE: **Tools Required: Schrader Valve Remover/Installer (J-34611A).**

Removal & Installation

Remove the service port valve caps. See **Fig. 97** . Recover the refrigerant from the A/C system. See RECOVERY, EVACUATION & RECHARGING in GENERAL SERVICING PROCEDURES article in GENERAL SERVICING. Using Schrader Valve Remover/Installer, remove the valve core from the service port.

To install, reverse removal procedure.



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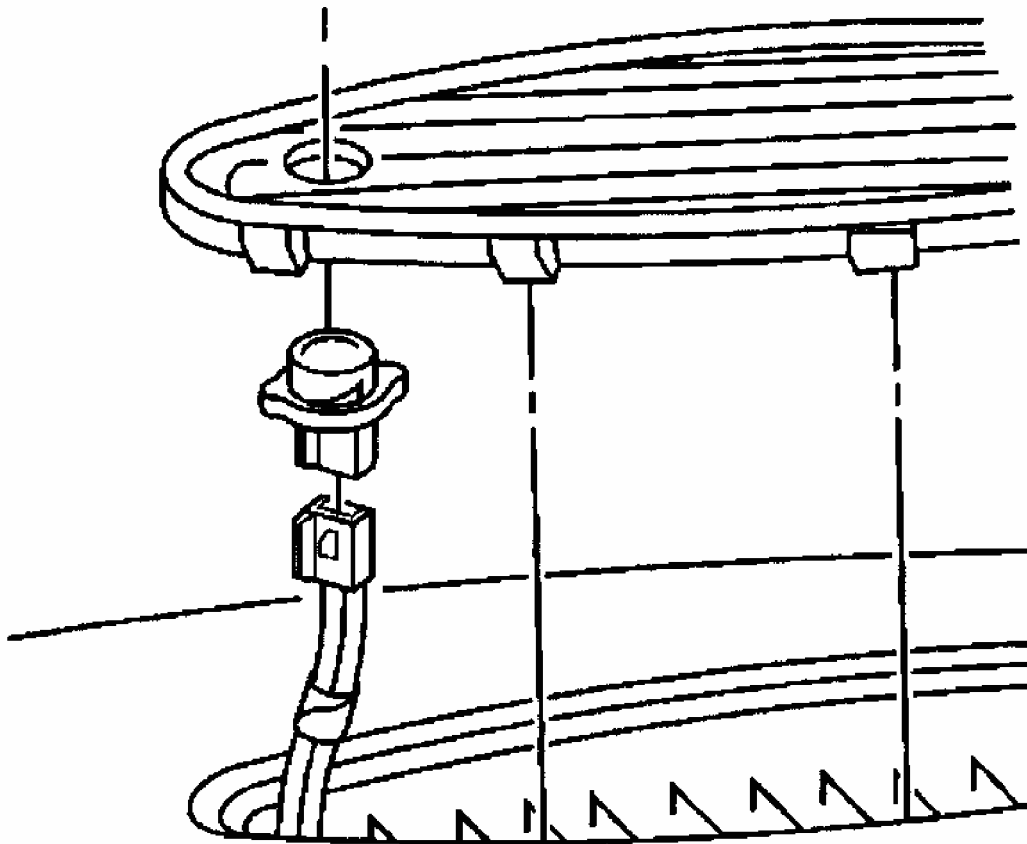
Fig. 97: Removing Service Port Valve Core
Courtesy of GENERAL MOTORS CORP.

SUN LOAD SENSOR

Removal

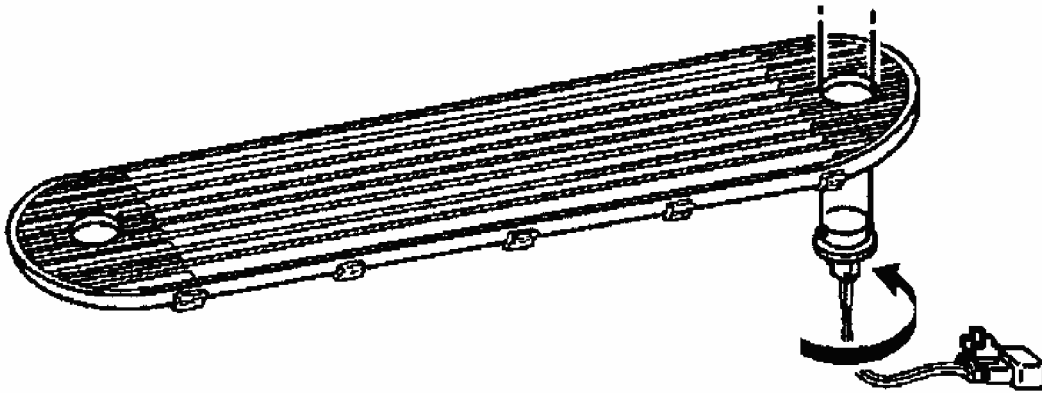
1. Release and lift the windshield defroster grille from the I/P upper trim pad. Insert 2 small flat bladed tools, close to each other between the rear edge of the defroster grille and the upper trim pad near one corner of the grille. Begin to carefully lift the grille up from the trim pad. Work the flat bladed tools gradually to the other corner of the grille while continuing to carefully pry the grille up. See **Fig. 98**.
2. Lift the grille to access the sun load sensor, and/or DRL sensor, if equipped. Rotate to release the DRL sensor from the grille, if equipped.
3. Rotate to release the sun load sensor from the grille. Disconnect the sun load sensor

electrical connector. Remove the sun load sensor from the vehicle. See **Fig. 99** .



G00218132

Fig. 98: Removing & Installing Defroster Grille
Courtesy of GENERAL MOTORS CORP.



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Fig. 99: Removing & Installing Sun Load Sensor
Courtesy of GENERAL MOTORS CORP.

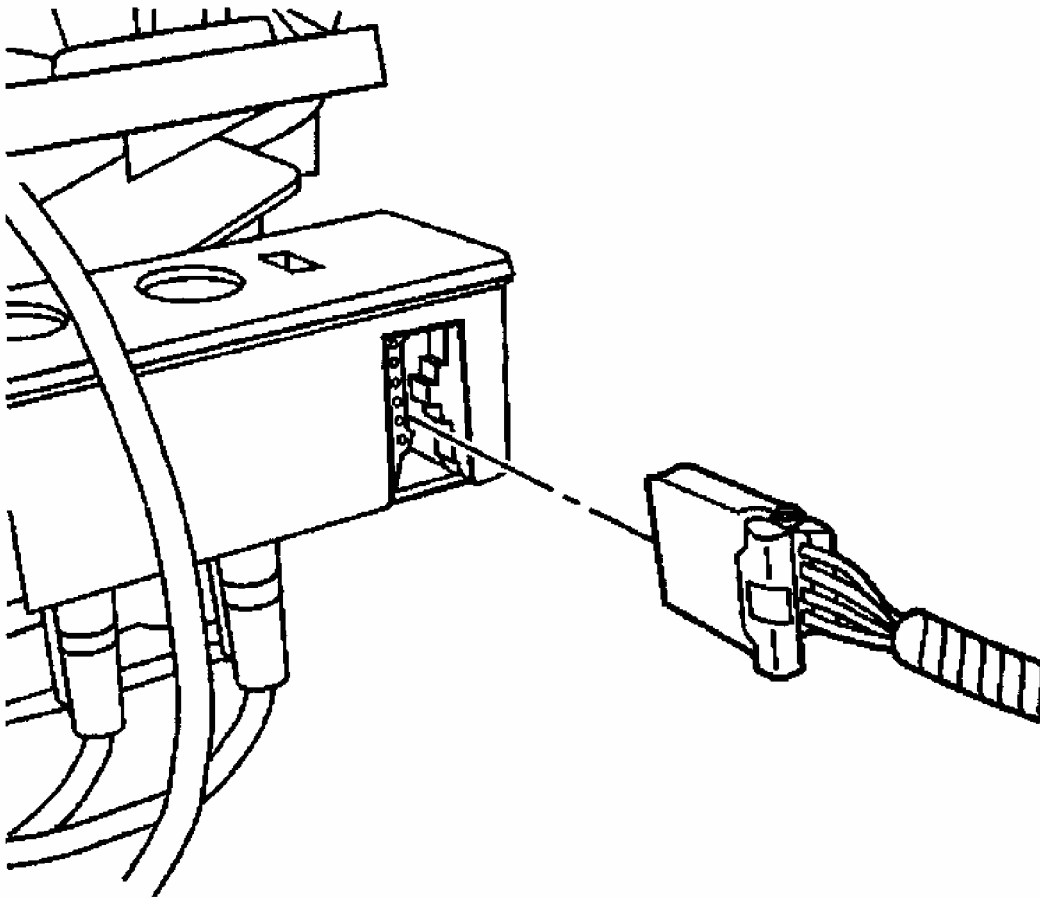
Installation

1. Install the sun load sensor to the vehicle. Connect the sun load sensor electrical connector. See **Fig. 99** . Rotate to secure the sun load sensor to the defroster grille.
2. Rotate to secure the DRL sensor to the defroster grille, if equipped. Position the tabs along the front edge of the defroster grille down into the slots in the upper trim pad. Lower the rear edge of the grille into position, then carefully press the rear tabs into place. See **Fig. 98** .

VACUUM CONTROL ASSEMBLY

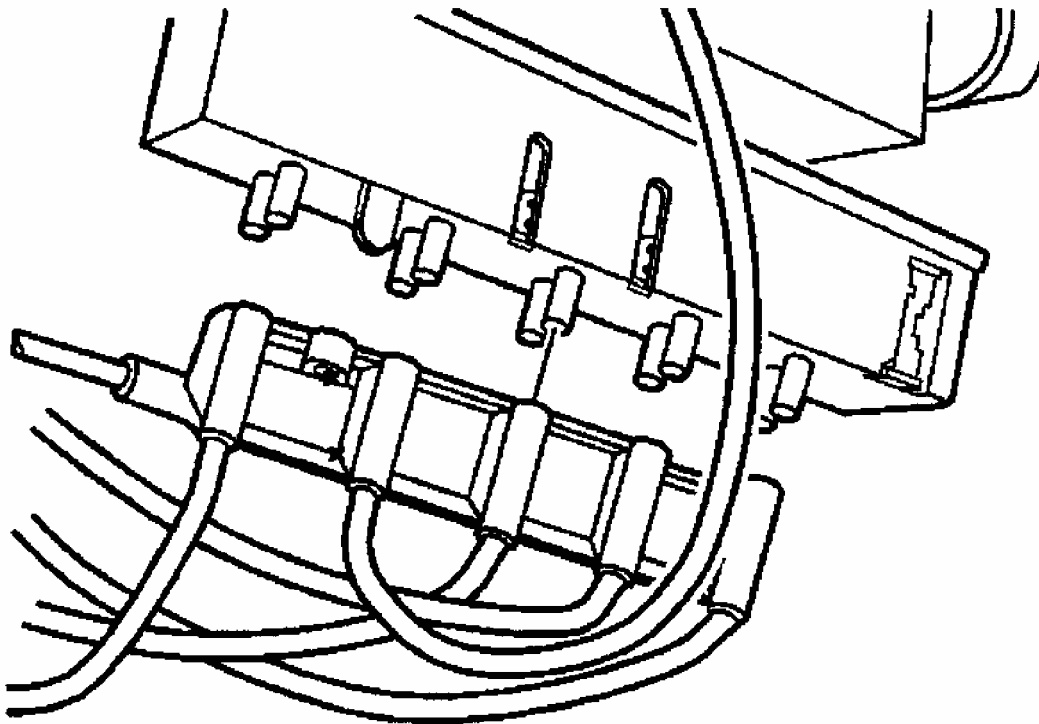
Removal

1. Remove the right Instrument Panel (I/P) lower insulator panel. Disconnect the electrical connector from the vacuum control solenoid. See **Fig. 100** .
2. Disconnect the vacuum harness connector from the vacuum control solenoid. See **Fig. 101** . Remove the vacuum control solenoid valve retaining screws. See **Fig. 102** . Remove the control solenoid. Pull the control solenoid straight down to release the tab from the slot in the HVAC module case.



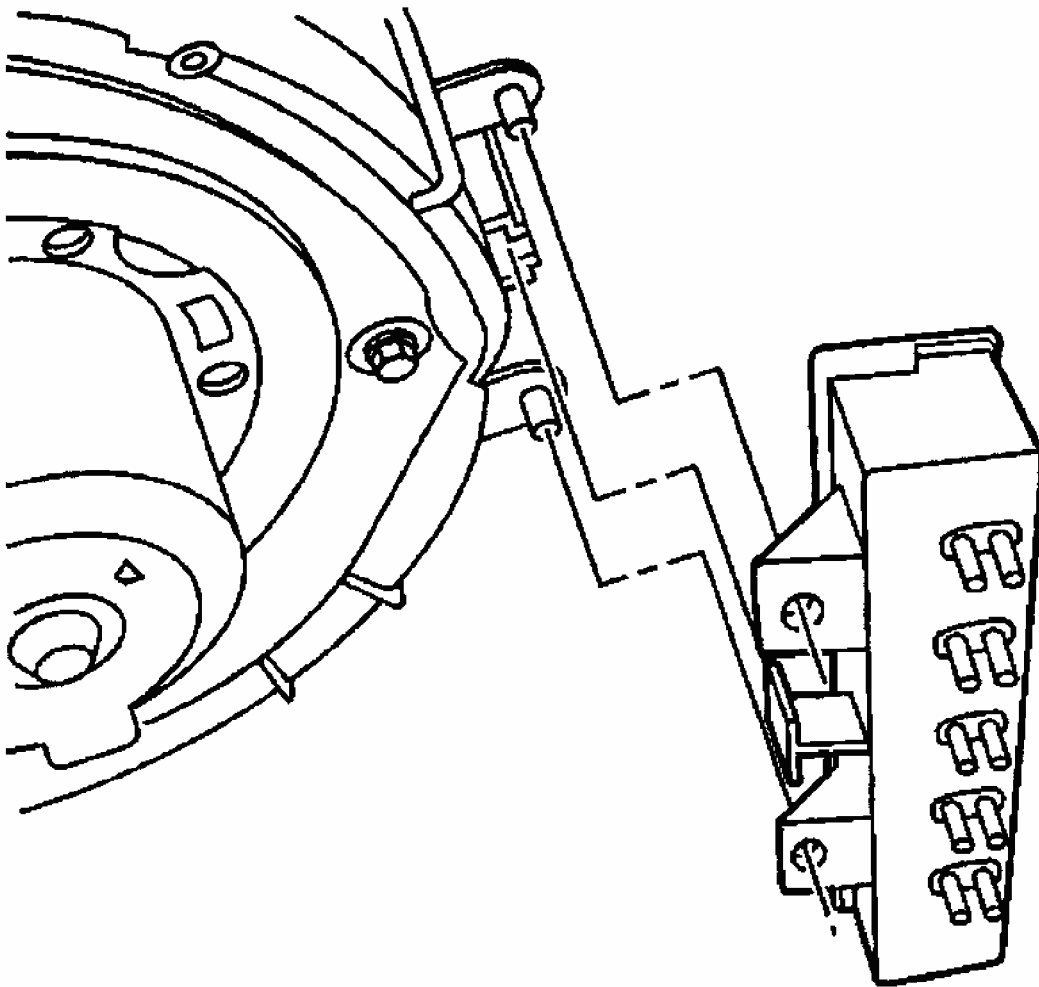
G00218134

Fig. 100: Disconnecting Vacuum Control Assembly Electrical Connector
Courtesy of GENERAL MOTORS CORP.



G00218136

Fig. 101: Removing & Installing Vacuum Harness Connector
Courtesy of GENERAL MOTORS CORP.



G00218135

Fig. 102: Removing & Installing Vacuum Control Solenoid Valve
Courtesy of GENERAL MOTORS CORP.

Installation

1. Align the vacuum control solenoid tab to the slot in the HVAC module case, then push up to seat the control solenoid. See **Fig. 102** . Install the vacuum control solenoid retaining screws. Tighten to specified torque. See **TORQUE SPECIFICATIONS** .
2. Connect the vacuum harness connector to the vacuum control solenoid. See **Fig. 101** . Connect the electrical connector to the vacuum control solenoid. See **Fig. 100** . Install the right I/P lower insulator panel.

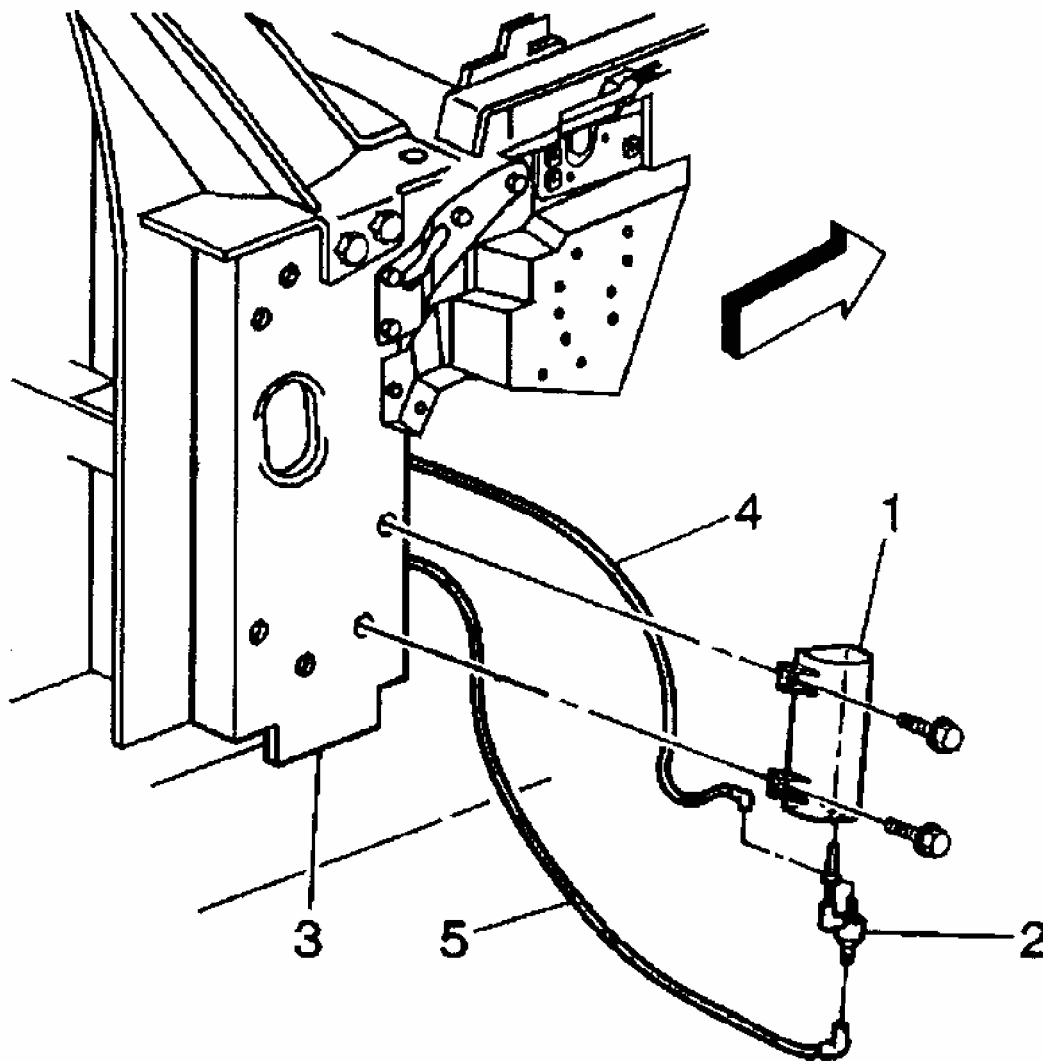
VACUUM RESERVOIR

Removal

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

1. Remove the right front tire and wheel assembly. Remove the right front wheelhouse filler panel. Remove the PCM. See POWERTRAIN CONTROL MODULE under **COMPUTERIZED ENGINE CONTROLS** in REMOVAL, OVERHAUL & INSTALLATION article in ENGINE PERFORMANCE. Tape off the rear edge of the right fender and the front edge of the right door to prevent scuffing.
2. Open the right door. Utilizing the opening between the fender and the door, remove the screws retaining the vacuum tank to the hinge pillar. Working through the wheelhouse opening, disconnect the I/P harness vacuum connector from the vacuum check valve. See **Fig. 103** .
3. Disconnect the engine harness vacuum connector from the vacuum check valve. Remove the vacuum tank from the vehicle. Disconnect the vacuum check valve from the vacuum tank. See **Fig. 103** .



1. Vacuum Reservoir Tank
2. Vacuum Check Valve
3. Door Hinge Pillar
4. Vacuum Hose To Instrument Panel
5. Vacuum Hose To Engine

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Fig. 103: Exploded View Of Vacuum Reservoir Tank
Courtesy of GENERAL MOTORS CORP.

Installation

1. Connect the vacuum check valve to the vacuum tank. Position the vacuum tank to the vehicle. Connect the engine harness vacuum connector to the vacuum check valve. See **Fig. 103**.

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

2. Connect the I/P harness vacuum connector to the vacuum check valve. Have an assistant position and hold the vacuum tank against the hinge pillar. Utilizing the opening between the fender and the door, install the vacuum tank to hinge pillar upper retaining screw first (net locating position), then install the lower screw. See **Fig. 103** . Tighten to specified torque.
3. Close the right door. Remove the protective tape from the edges of the right fender and door. Install the PCM. See POWERTRAIN CONTROL MODULE under **COMPUTERIZED ENGINE CONTROLS** in REMOVAL, OVERHAUL & INSTALLATION article in ENGINE PERFORMANCE.
4. Install the wheelhouse filler panel. Install the tire and wheel assembly.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

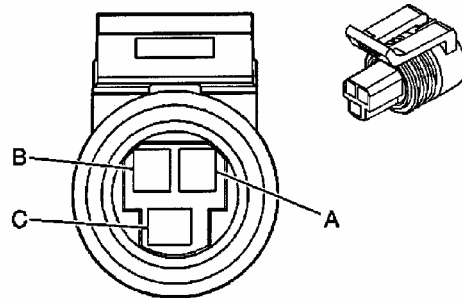
Application	Ft. Lbs. (N.m)
A/C Compressor Hose Assembly Bolt	19 (26)
A/C Compressor Mounting Bolts	30 (41)
Accumulator-To-Evaporator Retaining Bolt	12 (16)
Accumulator Line Fitting	30 (41)
Compressor Drain Plug	15 (20)
Compressor-To-Accumulator Retaining Bolt	15 (20)
Compressor Mounting Bolts	30 (40)
Compressor Mounting Nut	30 (40)
Compressor Retaining Bolt	19 (26)
Compressor-To-Condenser Line Fitting	17 (23)
Evaporator-To-Condenser Line Fitting	20 (27)
Front Evaporator Tube-To-Rear Evaporator Tube Retaining Bolt	18 (25)
INCH Lbs. (N.m)	
A/C Pressure Sensor	42 (5)
Accumulator Bracket Mounting Nut	89 (10)
Accumulator Clamp Bracket Bolt	89 (10)
Air Distribution Case Screws	14 (1.6)
Air Inlet Housing Retaining Screws	14 (1.6)
Air Temperature Actuator	13 (1.5)
Blower Motor Resistor Screw	14 (2)
Compressor Mounting Stud	80 (9)
Distributor Case Retaining Screws	14 (1.6)
Heater Pipe Bracket Retaining Nut	89 (10)
Heater Core Cover & Outlet Cover Screws	14 (1.6)

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

Heater Core Pipe Retaining Clamp	14 (1.6)
HVAC Upper Mounting Screws	14 (1.6)
Ignition Switch Retaining Bolts	49 (5.5)
Refrigerant Filter To Evaporator Tube	133 (15)
Refrigerant Pressure Sensor To Evaporator Tubes	42 (4.75)
Steering Column Bracket Retaining Screw	31 (3.5)
Vacuum Tank Retaining Screws	31 (3.5)

CONNECTOR IDENTIFICATION



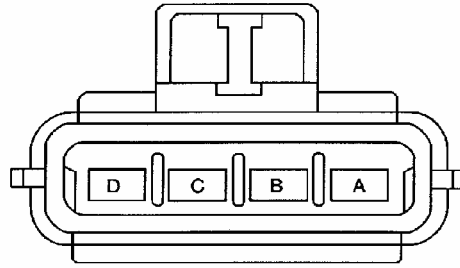
Connector Part Information		<ul style="list-style-type: none">• 12065286• 3-Way F Metri-Pack 150 Series (GRY)	
Pin	Wire Color	Circuit No.	Function
A	BLK	407	Low Reference
B	GRY	474	5 Volt Reference
C	RED/BLK	380	A/C Refrigerant Pressure Sensor Signal

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Fig. 104: Identifying A/C Refrigerant Pressure Sensor Harness Connector Terminal
Courtesy of GENERAL MOTORS CORP.

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette



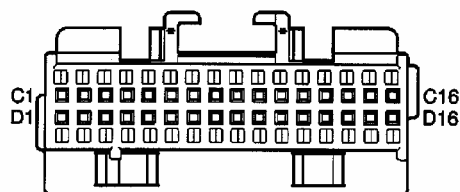
Connector Part Information		<ul style="list-style-type: none">• 12129566• 4-Way F Metri-Pack 280 Series (GRY)	
Pin	Wire Color	Circuit No.	Function
A	BLK	150	Ground
B	RED	1342	Battery Positive Voltage
C	TAN	63	Blower Motor Speed Control
D	--	--	Not Used

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Fig. 105: Identifying Blower Motor Control Processor Harness Connector Terminal
Courtesy of GENERAL MOTORS CORP.

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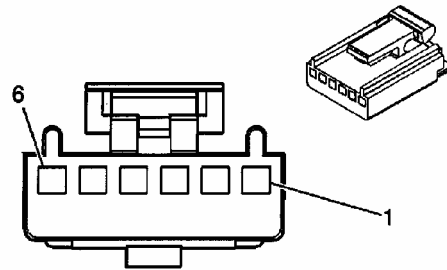
Connector Part Information		<ul style="list-style-type: none"> • 12045470 • 32-Way F Micro-Pack 100 Series (NAT) 	
Pin	Wire Color	Circuit No.	Function
C1	BLK	150	Ground
C2	LT BLU/BLK	590	Driver Solar Sensor Signal
C3	DK BLU	1646	Air Temperature Door Position Signal-Auxiliary
C4	--	--	Not Used
C5	BRN	41	Ignition 3 Voltage
C6	WHT/BLK	1236	Air Temperature Door Control-Auxiliary
C7	DK BLU	1199	Air Temperature Door Control
C8	LT BLU	733	Air Temperature Door Position Signal
C9	--	--	Not Used
C10	YEL	1791	5 Volt Reference
C11	TAN	63	Blower Motor Speed Control
C12	ORN	540	Battery Positive Voltage
C13-C15	--	--	Not Used
C16	YEL	390	Instrument Panel Lamp Supply Voltage - 3
D1	GRY/BLK	1798	Ground
D2	DK GRN	734	Inside Air Temperature Sensor Signal
D3	LT GRN/BLK	735	Outside Air Temperature Sensor Signal
D4-D7	--	--	Not Used
D8	DK GRN	1394	Recirculation Mode Valve Solenoid Control
D9	LT GRN	66	Mix-Blend Mode Valve Solenoid Control
D10	PPL	1397	Lower Mode Valve Solenoid Control
D11	LT GRN	1395	Upper Mode Valve Solenoid Control
D12	WHT	1038	HVAC Class 2 Serial Data
D13	PNK	1396	Defrost Mode Valve Solenoid Control
D14-D16	--	--	Not Used

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Fig. 106: Identifying HVAC Control Module Harness Connector Terminal
Courtesy of GENERAL MOTORS CORP.

2002 Chevrolet Corvette

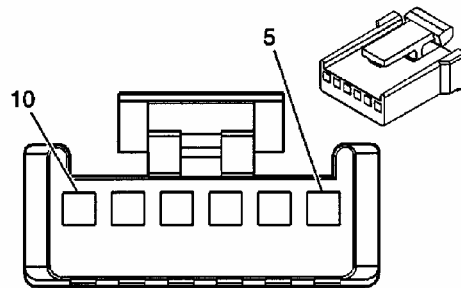
2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette



Connector Part Information		<ul style="list-style-type: none"> 12064978 6-Way F Micro-Pack 100 Series (GRY) 	
Pin	Wire Color	Circuit No.	Function
1	LT GRN	1395	Upper Mode Valve Solenoid Control
2	PPL	1397	Lower Mode Valve Solenoid Control
3	LT GRN	66	Mix-Blend Mode Valve Solenoid Control
4	DK GRN	1394	Recirculation Mode Valve Solenoid Control
5	PNK	1396	Defrost Mode Valve Solenoid Control
6	BRN	41	Ignition 3 Voltage

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Fig. 107: Identifying Vacuum Control Assembly Harness Connector Terminal
Courtesy of GENERAL MOTORS CORP.



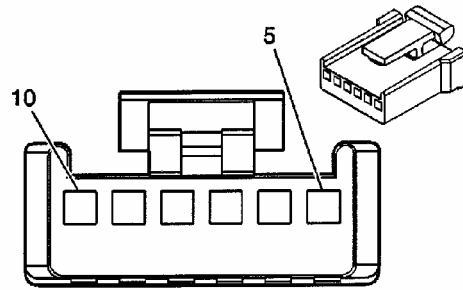
Connector Part Information		<ul style="list-style-type: none"> 12040953 6-Way F Micro-Pack 100 Series (BLK) 	
Pin	Wire Color	Circuit No.	Function
5	BRN	41	Ignition 3 Voltage
6	DK BLU	1199	Air Temperature Door Control
7	GRY/BLK	1798	Ground
8	--	--	Not Used
9	LT BLU	733	Air Temperature Door Position Signal
10	YEL	1791	5 Volt Reference

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Fig. 108: Identifying Left Air Temperature Actuator Harness Connector Terminal
Courtesy of GENERAL MOTORS CORP.

2002 Chevrolet Corvette

2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

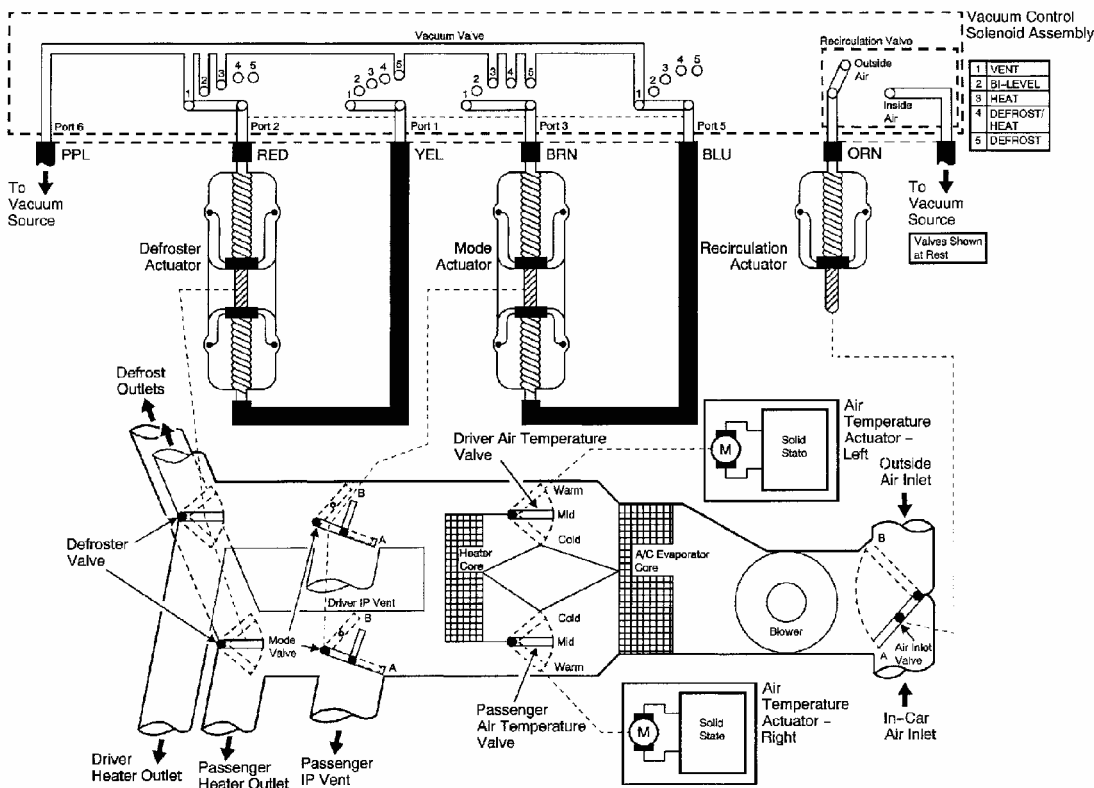


Connector Part Information		<ul style="list-style-type: none"> 12040953 6-Way F Micro-Pack 100 Series (BLK) 	
Pin	Wire Color	Circuit No.	Function
5	BRN	41	Ignition 3 Voltage
6	WHT/BLK	1236	Air Temperature Door Control-Auxiliary
7	GRY/BLK	1798	Ground
8	--	--	Not Used
9	DK BLU	1646	Air Temperature Door Position Signal-Auxiliary
10	YEL	1791	5 Volt Reference

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Fig. 109: Identifying Right Air Temperature Actuator Harness Connector Terminal
Courtesy of GENERAL MOTORS CORP.

VACUUM DIAGRAMS



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2002 Chevrolet Corvette
2002 AUTOMATIC A/C-HEATER SYSTEMS Corvette

Fig. 110: Automatic A/C-Heater System Vacuum Diagram (Corvette)
Courtesy of GENERAL MOTORS CORP.

WIRING DIAGRAMS

See **AIR CONDITIONING** in SYSTEM WIRING DIAGRAMS article in WIRING DIAGRAMS.