

2006 Chevrolet HHR LT

2006 HVAC Heating, Ventilation & Air Conditioning - HHR

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SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Fastener Tightening Specifications

Application	Specification	
	Metric	English
A/C Refrigerant Pressure Sensor	5 N.m	44 lb in
Blower Motor Mounting Screws	1.8 N.m	16 lb in
Blower Motor Nuts	2.4 N.m	21 lb in
Blower Resister Mounting Screws	1.8 N.m	16 lb in
Center Air Distribution Duct Retaining Screws	2.5 N.m	22 lb in
Compressor Clutch Drive Plate Bolt	12 N.m	106 lb in
Compressor Drain Plug	16 N.m	12 lb ft
Compressor Hose to Compressor Bolt	20 N.m	15 lb ft
Compressor Hose to Condenser Bolt	20 N.m	15 lb ft
Compressor Hose to Evaporator Hose Nut	20 N.m	15 lb ft
Compressor Mounting Bolts	25 N.m	18 lb ft
Compressor Pressure Relief Valve	7 N.m	62 lb in
Condenser Mounting Bolts	20 N.m	15 lb ft
Defroster Duct Retaining Screws	2.5 N.m	22 lb in
Evaporator Inlet Line Clamp Nut	10 N.m	88 lb in
Evaporator Inlet Line to Condenser Bolt	20 N.m	15 lb ft
Evaporator Outlet Line to TXV Nut	20 N.m	15 lb ft
Heater Core Cover Screws	1.8 N.m	16 lb in
HVAC Module Actuator Screws	1.8 N.m	16 lb in
HVAC Module Case Screws	1.8 N.m	16 lb in
HVAC Module to Cross Vehicle Beam Mounting Bolts	10 N.m	88 lb in
HVAC Module to Dash Panel Nuts	10 N.m	88 lb in
Instrument Panel (I/P) Carrier Bolts	25 N.m	18 lb ft
Outer Air Outlet Duct Retaining Screws	2.5 N.m	22 lb in
Service Port Valve Core	2.5 N.m	22 lb in
Side Window Duct Retaining Screws	2.5 N.m	22 lb in
TXV to Evaporator Core Mounting Bolts	7 N.m	62 lb in

REFRIGERANT SYSTEM CAPACITIES

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Refrigerant System Capacities

Application	Specification	
	Metric	English
PAG Oil GM P/N 12378526 for United States PAG Oil GM P/N 88900060 for Canada		
Abrupt Refrigerant Loss	60 ml ¹	2.0 oz ¹
Compressor Replacement	74 ml ²	2.5 oz ²
Condenser Replacement	22 ml ²	0.75 oz ²
Evaporator Replacement	22 ml ²	0.75 oz ²
• Total System PAG Oil Capacity	148 ml	5.00 oz
R-134a		
• Refrigerant Charge	0.41 kg	0.9 lb
¹ Abrupt refrigerant loss due to large leak, hose rupture, collision, or pressure relief valve opening. Conditions that allow the refrigerant to seep or bleed off over time do not cause this oil loss. Upon replacement of a component that caused a large refrigerant loss, also add the required amount of oil for the particular component. ² If more than the specified amount of PAG oil was drained from a component, add the equal amount of oil drained.		

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC STARTING POINT - HEATING, VENTILATION AND AIR CONDITIONING

The heating, ventilation and air conditioning (HVAC) system is divided into 2 sections. The first Heating, Ventilation and Air Conditioning has all procedures that pertain to an HVAC component or function that are not specifically associated with an automatic or manual control system. The 2nd HVAC Systems - Manual has all procedures specific to the manual control system.

For systems with DTCs, begin the system diagnosis with the following procedure:

Refer to **Diagnostic System Check - Vehicle** .

The Diagnostic System Check will provide the following information:

- The identification of the control modules which command the system.
- The ability of the control modules to communicate through the class 2 or GM LAN serial data circuit.

The use of the Diagnostic System Check will identify and lead the technician to the correct diagnostic procedure.

Review the Description and Operation information to help you determine the correct symptom diagnostic procedure when a malfunction exists. Reviewing the Description and Operation information will also help you determine if the condition described by the customer is normal operation. The HVAC Description and Operation information is divided into:

- **Air Delivery Description and Operation**
- **Air Temperature Description and Operation**

The Air Delivery Description and Operation contains the following topics:

- HVAC Control Components
- Air Speed
- Air Distribution
- Recirculation Operation

The Air Temperature Description and Operation contains the following topics:

- HVAC Control Components
- Heating and A/C Operation
- Engine Coolant
- A/C Cycle

LEAK TESTING

Tools Required

- **J 39400-A** Halogen Leak Detector
- **J 41447** R-134A A/C Tracer Dye-Box of 24. See **Special Tools**.
- **J 42220** Universal 12V Leak Detection Lamp. See **Special Tools**.
- **J 43872** Fluorescent Dye Cleaner. See **Special Tools**.
- **J 46297** A/C Dye Injector Kit. See **Special Tools**.
- **J 46297-12** Replacement Dye Cartridges. See **Special Tools**.

Refrigerant Leak Testing

IMPORTANT: General Motors vehicles are now manufactured with fluorescent dye installed directly into the air conditioning (A/C) system.

The fluorescent dye mixes and flows with the polyalkylene glycol (PAG) oil throughout the refrigerant system.

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Verifying some passive leaks may require using the **J 39400-A** , even though the A/C system contains fluorescent dye.

The only time that adding additional fluorescent dye is required is after flushing the A/C system.

Fluorescent Leak Detector

Fluorescent dye will assist in locating any leaks in the A/C system.

IMPORTANT: PAG oil is water soluble.

- Condensation on the evaporator core or the refrigerant lines may wash the PAG oil and fluorescent dye away from the actual leak. Condensation may also carry dye through the HVAC module drain.
- Leaks in the A/C system will be indicated in a light green or yellow color when using the leak detection lamp.

Use the leak detection lamp in the following areas:

- All fittings or connections that use seal washers or O-rings
- All of the A/C components
- The A/C compressor shaft seal
- The A/C hoses and pressure switches
- The HVAC module drain tube, if the evaporator core is suspected of leaking
- The service port sealing caps

The sealing cap is the primary seal for the service ports.

- Follow the instructions supplied with the **J 42220** . See **Special Tools**.
- To prevent false diagnosis in the future, thoroughly clean the residual dye from any area where leaks were found. Use a rag and the approved **J 43872** . See **Special Tools**.

Fluorescent Dye Injection

IMPORTANT: Use only fluorescent dye approved by General Motors.

- **J 41447** can be poured directly into a removed A/C component. See **Special Tools**.
- **J 46297-12** is injected into the low side port using **J 46297** . See **Special Tools**.

- Not all of the fluorescent dyes are compatible with PAG oil. Some types of dye decrease the oil viscosity or may chemically react with the oil.
- R-134A leak detection dye requires time to work. Depending upon the leak rate, a leak may not become visible for between 15 minutes and 7 days.

IMPORTANT: Do NOT overcharge the A/C system with dye. Use only one 7.39 ml (0.25 oz) charge.

- To prevent false diagnosis, thoroughly clean any residual dye from the service port with a rag and the approved fluorescent dye cleaner **J 43872** . See **Special Tools**.

Halogen Leak Detector

CAUTION: Do not operate the detector in a combustible atmosphere since its sensor operates at high temperatures or personal injury and/or damage to the equipment may result.

Ensure that the vehicle has at least 0.45 kg (1 lb) of refrigerant in the A/C refrigeration system in order to perform a leak test. Refer to **Refrigerant Recovery and Recharging** for recharging the A/C system.

IMPORTANT: Halogen leak detectors are sensitive to the following items:

- Windshield washing solutions
- Many solvents and cleaners
- Some adhesives used in the vehicle

Clean and dry all surfaces in order to prevent a false warning. Liquids will damage the detector.

IMPORTANT: Follow a continuous path in order to ensure that you will not miss any possible leaks. Test all areas of the system for leaks.

Follow the instructions supplied with the **J 39400-A** .

AIR CONDITIONING (A/C) SYSTEM PERFORMANCE TEST

This test measures the operating efficiency of the A/C system under the following conditions:

- The current ambient air temperature
- The current relative humidity

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- 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

Test Description

The numbers below refer to the step numbers on the diagnostic table.

1: This step determines if the A/C system has at least the minimum refrigerant charge required to operate the system without damage.

2: This step measures the performance of the A/C system.

3: This step is to allow for vehicle variations as well as high ambient temperatures.

Air Conditioning (A/C) System Performance Test

Step	Action	Values	Yes	No
IMPORTANT: • The ambient air temperature must be at least 16°C (60°F). • 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	1. Park the vehicle inside or in the shade. 2. Open the windows in order to ventilate the interior of the vehicle. 3. If the A/C system was operating, allow the A/C system to equalize for about 2 minutes. 4. Turn OFF the ignition. 5. Install the J 43600 ACR 2000 Air Conditioning Service Center. See Special Tools. 6. Record the ambient air temperature displayed on the J 43600 . See Special Tools. 7. Record the low and high side STATIC pressure readings. Are both the low side and high side pressures within the specified value?	More than 16°C (60° F) - 345 kPa (50 psi) More than 24°C (75° F) - 483 kPa (70 psi) More than 33°C (90° F) - 690 kPa (100 psi)	Go to Step 2	Go to Leak Testing
IMPORTANT:				

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

1. Close the vehicle doors and windows.
2. Open the drivers door window 12.7-15.2 cm (5-6 in).
3. Select the following HVAC control settings:
 - The A/C is ON.
 - The coldest temperature setting
 - The maximum blower speed
 - Recirculation mode
 - The instrument panel (I/P) panel outlet mode
 - All I/P panel outlets are OPEN.
4. Install the temperature probes of the **J 43600** in the left and right center panel air outlets. See **Special Tools**.
5. Apply the parking brake.
6. Place the transaxle/transmission in one of the following positions:
 - PARK (Automatic)
 - NEUTRAL (Manual)
7. Start the engine and warm to operating temperature.
8. Operate the A/C system for 5 minutes.
9. Inspect A/C components for the following conditions:
 - Abnormal frost areas
 - Unusual noises

IMPORTANT:

Press the RESET button, before using the print function of the J 43600 . See Special Tools.

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	10. Print the following information: • The panel outlet air temperatures • The low-side pressure • The high-side pressure 11. Compare the low and high side pressures and the panel output temperatures to the A/C Performance Table below. Does all the data recorded fall within the specified ranges of the A/C Performance Table below?			
3	If the pressures and temperatures recorded do not fall within the specified ranges: 1. Continue to operate the A/C system for an additional 5 minutes. 2. RESET the J 43600 and record the pressures and temperatures again. See Special Tools. 3. Compare the low and high side pressures and the panel output temperature to the table below. Does all the data recorded fall within the specified ranges of the table below?	-	Go to Step 8	Go to Step 3
4	Do the high and low side pressures fall within the specified ranges, but the panel outlet temperatures do not?	-	Go to Air Conditioning (A/C) Diagnostics - Pressure Zone A	Go to Step 5
5	Is the low side pressure greater than the specified range, but the high side pressure within or less than the specified range?	-	Go to Air Conditioning (A/C) Diagnostics - Pressure	

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			Zone B	Go to Step 6
6	Are the low and high side pressures both greater than the specified ranges?	-	Go to Air Conditioning (A/C) Diagnostics - Pressure Zone C	Go to Step 7
7	Is the high side pressure greater than the specified range, but the low side pressure is within or less than the specified range?	-	Go to Air Conditioning (A/C) Diagnostics - Pressure Zone D	Go to Step 8
8	Operate the system in order to verify the test results. Did you find the same results?	-	System OK	Go to Symptoms - HVAC Systems - Manual

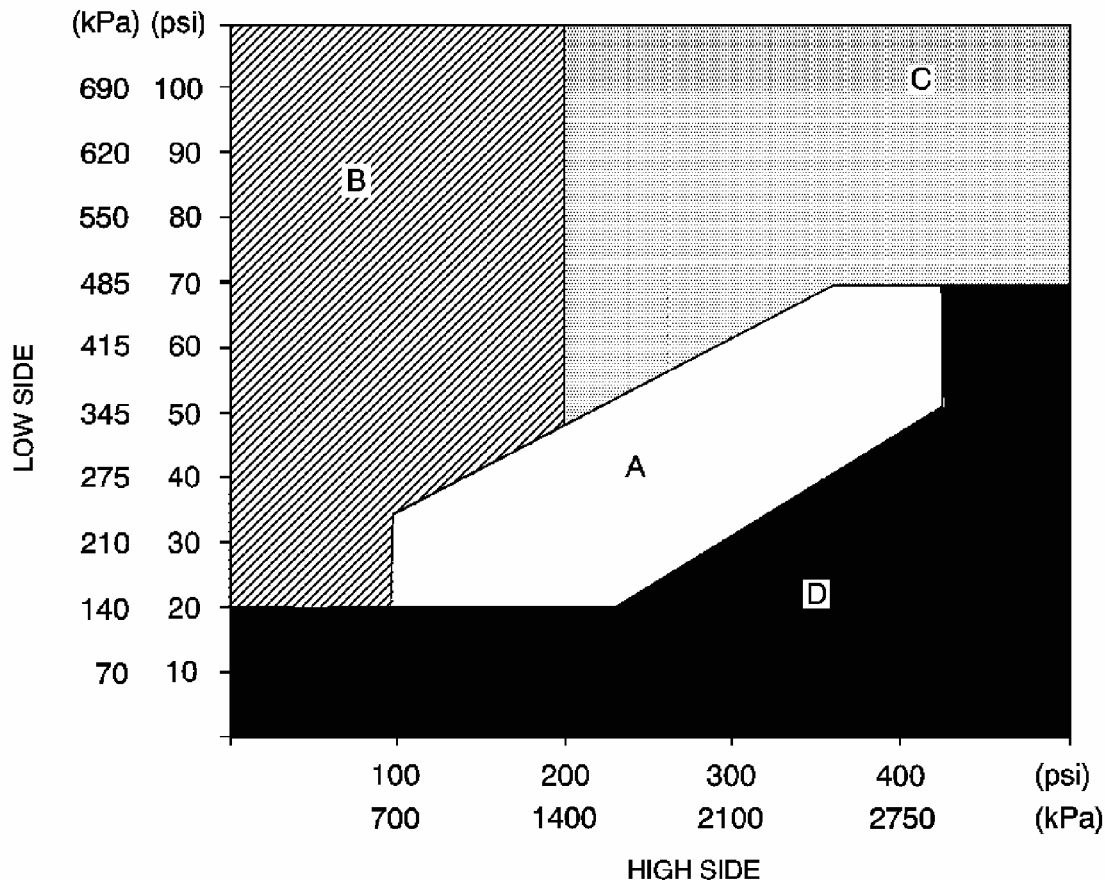


Fig. 1: A/C System Pressure - Zone Classification

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Courtesy of GENERAL MOTORS CORP.

A/C Performance Table

Ambient Temperature	Relative Humidity	Low Side Service Port Pressure	High Side Service Port Pressure	Maximum Left Center Discharge Air Temperature
13-18°C (55-65°F)	0-100%	151-234 kPa (22-34 psi)	709-1123 kPa (103-163 psi)	12°C (52°F)
19-24°C (66-75°F)	Below 40%	151-241 kPa (22-35 psi)	930-1378 kPa (135-200 psi)	12°C (52°F)
	Above 40%	158-282 kPa (23-41 psi)	978-1446 kPa (142-210 psi)	14°C (57°F)
25-29°C (76-85°F)	Below 35%	172-268 kPa (25-39 psi)	1260-1639 kPa (183-238 psi)	13°C (55°F)
	35-50%	172-282 kPa (25-41 psi)	1240-1667 kPa (180-242 psi)	15°C (59°F)
	Above 50%	206-310 kPa (30-45 psi)	1322-1729 kPa (192-251 psi)	18°C (63°F)
30-35°C (86-95°F)	Below 30%	206-310 kPa (30-45 psi)	1522-1942 kPa (221-282 psi)	18°C (63°F)
	30-50%	227-323 kPa (33-47 psi)	1550-1991 kPa (225-289 psi)	18°C (63°F)
	Above 50%	241-351 kPa (35-51 psi)	1591-2060 kPa (231-299 psi)	22°C (55°F)
36-41°C (96-105°F)	Below 20%	248-344 kPa (36-50 psi)	1818-2239 kPa (264-325 psi)	19°C (66°F)
	20-40%	261-358 kPa (38-52 psi)	1839-2287 kPa (267-332 psi)	22°C (70°F)
	Above 40%	275-385 kPa (40-56 psi)	1887-2342 kPa (274-340 psi)	23°C (73°F)
42-46°C (106-115°F)	Below 20%	296-378 kPa (43-55 psi)	1887-2342 kPa (274-340 psi)	23°C (73°F)
	Above 20%	303-392 kPa (44-57 psi)	2129-2501 kPa (309-363 psi)	23°C (72°F)
47-49°C (116-120°F)	Below 30%	337-420 kPa (49-61 psi)	2418-2790 kPa (351-405 psi)	27°C (79°F)

AIR CONDITIONING (A/C) DIAGNOSTICS - PRESSURE ZONE A

Air Conditioning (A/C) Diagnostics - Pressure Zone A

Step	Action	Value	Yes	No
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DEFINITION: The high and low side pressures may be normal or slightly less than normal.

- Air Delivery Concern
- Slight Refrigerant Under Charge
- Refrigerant Contamination

1	Were you sent here from the A/C System Performance Test?	-	Go to Step 2	Go to Air Conditioning (A/C) System Performance Test
2	Refer to the panel air outlet temperatures recorded during the A/C system performance test. Does the discharge air temperature between the right and left center panel outlets vary by more than 4°C (5°F)?	-	Go to Step 7	Go to Step 3
3	Did the customer mention that the A/C system output temperatures are good at first, but then turn warm during extended drives?	-	Go to Step 4	Go to Step 5
4	Increase engine speed to 2,000 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 expansion device and the evaporator?	-	Go to Air Conditioning (A/C) Diagnostics - Pressure Zone D	Go to Step 5
5	Refer to the pressures recorded during the A/C system performance test. Inspect for the following conditions: CAUTION: Refer to Moving Parts and Hot Surfaces Caution in Cautions and Notices. • The high side pressure is slightly greater than the specified pressure ranges but still within Zone A on the A/C	-		

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	Pressure-Zone Classification Chart in the A/C System Performance Test. Refer to <u>Air Conditioning (A/C) System Performance Test</u>. • The discharge line is hot. • The suction line is cool.			
	Do the listed conditions exist?		Go to Step 7	Go to Step 6
6	Refer to the pressures recorded during the A/C system performance test. Inspect for the following conditions: • The low side pressure is 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. Refer to <u>Air Conditioning (A/C) System Performance Test</u>. • The discharge line is warm-to-hot. • The suction line is cool-to-warm.	-		Go to <u>Too Hot in Vehicle</u> in HVAC Systems - Manual
	Do the listed conditions exist?		Go to Step 8	
7	The A/C system may be undercharged. 1. Leak test the A/C system. Refer to <u>Leak Testing</u>. 2. Recharge the A/C system to specifications. Refer to <u>Refrigerant Recovery and Recharging</u>.	-		-
	Is the repair complete?		Go to Step 13	

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8	The A/C system may be contaminated. View the J 43600 ACR 2000 Air Conditioning Service Center information screen for detection of foreign gases in the A/C system. See Special Tools. Do foreign gases exist?	-	Go to Step 9	Go to Step 10
9	1. Evacuate the A/C system to a scavenging tank. Refer to Refrigerant Recovery and Recharging. 2. Recharge the A/C system to specifications. Is the repair complete?	-	Go to Step 13	-
10	The A/C system may contain too much moisture or air. 1. Evacuate and recharge the A/C system to specifications. Refer to Refrigerant Recovery and Recharging. 2. Operate the A/C system and inspect the panel outlet air temperatures. Refer to Air Conditioning (A/C) System Performance Test. Are the panel outlet temperatures within the specified ranges of the A/C Performance Test Table?	-	Go to Step 14	Go to Step 11
11	IMPORTANT: Review the vehicles A/C repair history. If the vehicle history shows multiple A/C repairs and is suspected of improper polyalkylene glycol (PAG) oil balancing in the previous repairs, perform the following procedure: 1. Drain all of the PAG oil drain bottle on the J 43600 . See Special Tools. 2. Flush the A/C system. Refer to Flushing.	148 ml (5 oz)		

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	Was more than the total system capacity of refrigerant oil recovered from the J 43600 oil drain bottle? See Special Tools .		Go to Step 12	Go to Step 12
12	1. Add the specified amount of refrigerant oil. Refer to Refrigerant System Capacities. 2. Recharge the A/C system. Refer to Refrigerant Recovery and Recharging. Are the actions complete?	-	Go to Step 13	-
13	1. Record the low and high side pressures and the instrument panel (I/P) outlet air temperature. 2. Compare the panel outlet temperatures to those listed in the A/C System Performance Chart. Refer to Air Conditioning (A/C) System Performance Test. Are the high and low side pressures and I/P outlet temperatures within specifications?	-	Go to Step 14	Go to Air Conditioning (A/C) System Performance Test
14	Operate the system in order to verify the repair. Did you find and correct the condition?	-	System OK	Go to Symptoms - HVAC Systems - Manual

AIR CONDITIONING (A/C) DIAGNOSTICS - PRESSURE ZONE B

Air Conditioning (A/C) Diagnostics - Pressure Zone B

Step	Action	Yes	No
DEFINITION: The low side pressure is higher than normal and the high side pressure is lower than normal. • Malfunctioning A/C Compressor • Refrigerant Under Charge			

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1	Were you sent here from the A/C System Performance Test?	Go to Step 2	Go to Air Conditioning (A/C) System Performance Test
2	After continued operation of the A/C system, do the low and the high side pressures equalize or become static?	Go to Step 5	Go to Step 3
3	Refer to the pressures recorded during the A/C System Performance Test. Inspect for the following conditions: CAUTION: Refer to Moving Parts and Hot Surfaces Caution in Cautions and Notices. • The low side pressure is equal to or greater than the specified pressure range of the A/C Performance Table. Refer to Air Conditioning (A/C) System Performance Test. • The high side pressure is less than the specified pressure range of the A/C Performance Table. Refer to Air Conditioning (A/C) System Performance Test. • 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?	Go to Step 5	Go to Step 4
	Refer to the pressures recorded during the A/C System Performance Test. Inspect for the following conditions: CAUTION: Refer to Moving Parts and Hot Surfaces Caution in Cautions and Notices. • The low side pressure is greater than the specified pressure range of the A/C Performance Table. Refer to Air		

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4	<u>Conditioning (A/C) System Performance Test.</u> • The high side pressure is less than the specified pressure range of the A/C Performance Table. Refer to <u>Air Conditioning (A/C) System Performance Test.</u> • 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?	Go to Step 5	Go to <u>Air Conditioning (A/C) System Performance Test</u>
5	The A/C system has a low refrigerant charge. Evacuate and recharge the A/C system. Refer to <u>Refrigerant Recovery and Recharging.</u> Is the procedure complete?	Go to Step 6	-
6	1. Record the low and the high side pressures as well as the instrument panel (I/P) outlet air temperature after you perform the repairs. 2. Compare the pressures and the panel outlet temperature to those listed in the A/C Performance Chart. Refer to <u>Air Conditioning (A/C) System Performance Test.</u> Are the readings within the specified ranges found on the A/C Performance Chart?	Go to Step 13	Go to Step 7
7	The A/C compressor is malfunctioning. Remove the expansion device and inspect for contamination. Refer to <u>Thermal Expansion Valve Replacement.</u> Did you find metal flakes on the expansion device?	Go to Step 9	Go to Step 8
8	Inspect the expansion device for a brown, powdery residue indicating desiccant in the A/C system. Is a brown, powdery residue present?	Go to Step 11	Go to Step 12

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9	1. Remove the compressor hose from the compressor. Refer to <u>Compressor Hose Assembly Replacement</u>. 2. Inspect for metal flake contamination at the line connections and the compressor ports. Is metal flake contamination present?	Go to Step 10	Go to Step 12
10	1. Replace the A/C compressor. Refer to <u>Compressor Replacement</u>. 2. Replace the A/C refrigerant filter. Refer to <u>Air Conditioning (A/C) Refrigerant Filter Replacement</u>. 3. Replace the thermal expansion valve. Refer to <u>Thermal Expansion Valve Replacement</u>. 4. Evacuate and recharge the A/C system. Refer to <u>Refrigerant Recovery and Recharging</u>. Is the repair complete?	Go to Step 13	-
11	1. Flush the A/C system. Refer to <u>Flushing</u>. 2. Replace the thermal expansion valve. Refer to <u>Thermal Expansion Valve Replacement</u>. 3. Replace the A/C refrigerant filter. Refer to <u>Air Conditioning (A/C) Refrigerant Filter Replacement</u>. 4. Replace the A/C compressor. Refer to <u>Compressor Replacement</u>. 5. Evacuate and recharge the A/C system. Refer to <u>Refrigerant Recovery and Recharging</u>. Is the repair complete?	Go to Step 13	-
12	1. Replace the A/C compressor. Refer to <u>Compressor Replacement</u>. 2. Evacuate and recharge the A/C system. Refer to <u>Refrigerant Recovery and</u>		-

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	<u>Recharging.</u>		
	Is the repair complete?	Go to Step 13	
13	Operate the system in order to verify the repair Did you find and correct the condition?	System OK	Go to <u>Symptoms - HVAC Systems - Manual</u>

AIR CONDITIONING (A/C) DIAGNOSTICS - PRESSURE ZONE C**Air Conditioning (A/C) Diagnostics - Pressure Zone C**

Step	Action	Yes	No
DEFINITION: The low and the high side pressures are both higher than normal. • Restricted Condenser Air Flow • Cooling Fan Malfunction • Expansion Device Malfunction			
1	Were you sent here from the A/C System Performance Test?	Go to Step 2	Go to <u>Air Conditioning (A/C) System Performance Test</u>
2	1. Start the engine. 2. Turn ON the A/C. 3. Inspect for proper cooling fan operation. Refer to <u>Cooling System Description and Operation</u> in Engine Cooling. Are the cooling fans ON and operating properly?	Go to Step 3	Go to Step 5
3	Visually inspect for the following conditions: • Damaged condenser cooling fins • Missing or misaligned air baffles • Restricted air flow Do any of these conditions exist?	Go to Step 4	Go to Step 6
4	Repair the air flow restriction. Is the repair complete?	Go to Step 9	-

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5	Repair the fault to the cooling fan operation. Refer to Cooling Fan Inoperative in Engine Cooling. Is the repair complete?	Go to Step 9	-
6	CAUTION: Refer to Moving Parts and Hot Surfaces Caution in Cautions and Notices. Feel the liquid line on both sides of the expansion device. Are the temperatures on both sides of the expansion device similar?	Go to Step 7	Go to Step 8
7	Replace the damaged or faulty thermal expansion valve. Refer to Thermal Expansion Valve Replacement . Is the repair complete?	Go to Step 9	-
8	Air is in the refrigerant system, or the system is overcharged. Refer to the view screen on the J 43600 ACR 2000 Air Conditioning Service Center for foreign gas content in the refrigerant. See Special Tools . Recover and recharge the A/C system. Refer to Refrigerant Recovery and Recharging . Is the repair complete?	Go to Step 9	-
9	1. Record the low and high side pressures and the instrument panel (I/P) outlet air temperature after you have performed the repairs. 2. Compare the pressures and the panel outlet temperature to those listed in the A/C Performance Chart. Refer to Air Conditioning (A/C) System Performance Test . Are the readings within the specified ranges listed in the A/C Performance Chart?	Go to Step 10	Go to Air Conditioning (A/C) System Performance Test
10	Operate the system in order to verify the repair. Did you find and correct the condition?	System OK	Go to Symptoms - HVAC Systems - Manual

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Air Conditioning (A/C) Diagnostics - Pressure Zone D

Step	Action	Yes	No
DEFINITION: The low side pressure is lower than normal and the high side pressure is higher than normal. • A restriction in the A/C system. • Debris in the system.			
1	Were you sent here from the A/C System Performance Test?	Go to Step 2	Go to Air Conditioning (A/C) System Performance Test
2	CAUTION: Refer to <u>Moving Parts and Hot Surfaces Caution</u> . Feel the liquid line before the expansion device. Is the liquid line cold before the expansion device?	Go to Step 3	Go to Step 8
3	Feel along the surfaces of the following high side components: • The compressor discharge hose • The condenser • The liquid line between the condenser and the expansion device Did you detect an abrupt drop in temperature along the surfaces of any of the listed components?	Go to Step 7	Go to Step 4
4	1. Feel the liquid line at the expansion device location for extreme cold, possibly accompanied by heavy frost. 2. Feel along the liquid line beyond the expansion device location for warm temperature. Is the liquid line extremely cold at the expansion device location and warm beyond the expansion device location?	Go to Step 11	Go to Step 5
	Feel along the surfaces of the following low		

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5	side components: • The evaporator outlet tube between the evaporator core and the compressor suction hose • The compressor suction hose Did you feel an abrupt temperature change along the surfaces of any of the listed components?	Go to Step 7	Go to Step 6
6	Feel along the surfaces of the low and the high side components: • The evaporator outlet tube between the evaporator core and the compressor • The compressor suction hose • The compressor discharge hose • The condenser • The evaporator inlet tube between the condenser and the expansion device Are the temperatures of these components only mildly warm?	Go to Step 14	Go to Step 8
7	1. Recover the refrigerant. Refer to <u>Refrigerant Recovery and Recharging</u>. 2. Remove the restriction from the component, or replace the component which produced an abrupt temperature drop. Is the repair complete?	Go to Step 9	-
8	1. Recover the refrigerant and evacuate the system. Refer to <u>Refrigerant Recovery and Recharging</u>. 2. Record the weight of the recovered refrigerant. 3. Compare the weight of the recovered refrigerant with the system capacity.		

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	Refer to <u>Refrigerant System Capacities</u> .		
	Is the weight of the recovered refrigerant charge greater than 75 percent of the total system capacity?	Go to Step 9	Go to Step 10
9	Recharge the A/C system. Refer to <u>Refrigerant Recovery and Recharging</u> . Is the cooling performance improved?	Go to Step 21	Go to Step 10
10	1. Leak test the system. Refer to <u>Leak Testing</u> . 2. Repair any leaks. Is the repair complete?	Go to Step 21	-
11	The A/C refrigerant filter or expansion device is restricted. 1. Replace the A/C refrigerant filter. Refer to <u>Air Conditioning (A/C) Refrigerant Filter Replacement</u> . 2. Replace the expansion device. Refer to <u>Thermal Expansion Valve Replacement</u> . Are metal flakes present?	Go to Step 12	Go to Step 13
12	1. Remove the compressor hose assembly from the vehicle. Refer to <u>Compressor Hose Assembly Replacement</u> . 2. Inspect the hose for debris by blowing shop air through one end of the hose while covering the other end with a shop towel. 3. Observe the amount of debris collected in the shop towel. Did a large amount of debris collect in the shop towel?	Go to Step 18	Go to Step 20
	If the expansion device was restricted with a brown or black residue, perform the following procedure:		

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13	1. Replace the condenser. Refer to <u>Condenser Replacement</u>. 2. Flush the A/C system. Refer to <u>Flushing</u>. Are the repairs complete?	Go to Step 21	-
14	1. Recover the refrigerant. Refer to <u>Refrigerant Recovery and Recharging</u>. 2. Disconnect the compressor hose from the compressor. Refer to <u>Compressor Hose Assembly Replacement</u>. 3. Inspect for the presence of debris in the compressor suction port. Is debris present in the compressor suction port?	Go to Step 15	Go to Step 19
15	1. Remove the debris from the suction port. 2. Inspect the A/C refrigerant filter for damage or debris. Refer to <u>Air Conditioning (A/C) Refrigerant Filter Replacement</u>. 3. Inspect the expansion device for damage or debris. Refer to <u>Thermal Expansion Valve Replacement</u>. Did you find evidence of damage or debris?	Go to Step 17	Go to Step 16
16	If the A/C refrigerant filter or expansion device does not show any signs of damage or debris, perform the following procedure: 1. Remove the compressor hose assembly from the vehicle. Refer to <u>Compressor Hose Assembly Replacement</u>. 2. Inspect the hose for debris by blowing shop air through one end of the hose while covering the other end with a shop towel. 3. Observe the amount of debris collected		

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	in the shop towel.		
	Did a large amount of debris collect in the shop towel?	Go to Step 18	Go to Step 19
17	1. Replace the A/C refrigerant filter. Refer to <u>Air Conditioning (A/C) Refrigerant Filter Replacement</u>. 2. Replace the expansion device. Refer to <u>Thermal Expansion Valve Replacement</u>. 3. If the A/C refrigerant filter or expansion device was restricted, observe the type of debris present. Are metal flakes present?	Go to Step 12	Go to Step 13
18	If a large amount of debris was collected in the shop towel from the suction hose, perform the following procedure: 1. Replace the condenser. Refer to <u>Condenser Replacement</u>. 2. Install a suction screen. Refer to <u>Suction Screen Installation</u>. Is the repair complete?	Go to Step 19	-
19	1. Install the compressor hose assembly. Refer to <u>Compressor Hose Assembly Replacement</u>. 2. Recharge the A/C system. Refer to <u>Refrigerant Recovery and Recharging</u>. Are the repairs complete?	Go to Step 21	-
20	1. Install the compressor hose assembly. Refer to <u>Compressor Hose Assembly Replacement</u>. 2. Recharge the A/C system. Refer to <u>Refrigerant Recovery and Recharging</u>.		

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	Are the repairs complete?	Go to Step 21	-
21	- Record the low and the high side pressures and the panel outlet air temperature after you perform the repairs. - Compare the pressures and the panel outlet temperature to those listed in the A/C Performance Chart. Refer to <u>Air Conditioning (A/C) System Performance Test</u>. Are the readings within the specified ranges as shown on the A/C Performance Chart?	Go to Step 22	Go to <u>Air Conditioning (A/C) System Performance Test</u>
22	Operate the system in order to verify the repair. Did you find and correct the condition?	System OK	Go to <u>Symptoms - HVAC Systems - Manual</u>

HEATING PERFORMANCE DIAGNOSTIC

Heating Performance Diagnostic

Step	Action	Yes	No
DEFINITION: Heating system performance.			
1	Were you sent here from Symptoms or another diagnostic table?	Go to Step 2	Go to <u>Symptoms - HVAC Systems - Manual</u> in HVAC Systems - Manual
2	- Start the engine. - Allow the engine to idle. Does the engine reach a normal operating temperature?	Go to Step 3	Go to Step 9
3	- Allow the engine to idle. - Select the FLOOR mode. - Select the minimum blower speed. - Select the warmest temperature setting. - Feel the temperature of the inlet and outlet heater hoses at the heater core.		

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	Does the inlet heater hose feel warmer than the outlet heater hose?	Go to Step 7	Go to Step 4
4	1. Install a thermometer into the center instrument panel (I/P) PANEL air outlet. 2. Secure a thermometer to the heater core outlet hose. 3. Select the PANEL mode. 4. Select the maximum blower speed. 5. Select the warmest temperature setting. 6. Record the temperature at the following locations: • The center I/P PANEL air outlet • The heater core outlet hose 7. Compare the recorded temperatures. Are the two temperature readings about equal?	Go to Step 5	Go to Step 6
5	1. Inspect and repair the following areas of the vehicle for cold air leaks: • The cowl • The recirculation door • The HVAC module case 2. Perform the necessary repairs. Are the repairs complete?	Go to Step 10	-
6	1. Inspect the temperature door operation. Refer to Diagnostic System Check - Vehicle in Vehicle DTC Information. 2. Perform any necessary repairs. Are the repairs complete?	Go to Step 10	-
7	1. Turn OFF the engine. 2. Backflush the heater core. 3. Start the engine. 4. Select the FLOOR mode. 5. Select the minimum blower speed. 6. Select the warmest temperature setting.		

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	7. Feel the temperature of the inlet and outlet heater hoses at the heater core. Does the inlet heater hose feel warmer than the outlet heater hose?	Go to Step 8	Go to Step 10
8	Replace the heater core. Refer to Heater Core Replacement . Is the repair complete?	Go to Step 10	-
9	Repair the low engine temperature concern. Refer to Engine Fails To Reach Normal Operating Temperature in Engine Cooling. Is the repair complete?	Go to Step 10	-
10	Operate the system in order to verify the repair. Did you find and correct the condition?	System OK	Go to Step 2

DEFROSTING INSUFFICIENT

Defrosting Insufficient

Step	Action	Yes	No
DEFINITION: Time required to defrost the windshield is longer than usual.			
1	Were you sent here from Symptoms or another diagnostic table?	Go to Step 2	Go to Symptoms - HVAC Systems - Manual in HVAC Systems - Manual
2	1. Start the engine. 2. Select the DEFROST mode. 3. Select the maximum blower speed. Does sufficient air flow from the defroster outlets?	Go to Step 3	Go to Step 11
3	Measure the engine operating temperature. Does engine reach normal operating temperature?	Go to Step 4	Go to Step 9
4	1. Select the minimum blower speed. 2. Select the warmest temperature setting. 3. Feel the temperature of the inlet and outlet hoses at the heater core.		

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	Does the inlet heater hose feel warmer than the outlet heater hose?	Go to Step 12	Go to Step 5
5	Is the vehicle equipped with A/C?	Go to Step 6	Go to Step 14
6	Test the operation of the A/C compressor clutch. Does the A/C compressor clutch engage?	Go to Step 8	Go to Step 7
7	Repair the A/C compressor clutch. Refer to <u>HVAC Compressor Clutch Does Not Engage</u> in HVAC Systems - Manual. Is the repair complete?	Go to Step 15	-
8	Perform the A/C system performance test. Refer to <u>Air Conditioning (A/C) System Performance Test</u> . Is the A/C system operating within the specifications?	Go to Step 10	Go to Step 13
9	Repair the low engine temperature concern. Refer to <u>Engine Fails To Reach Normal Operating Temperature</u> in Engine Cooling. Is the repair complete?	Go to Step 15	Go to Step 14
10	Inspect for correct operation of the recirculation door. Is the recirculation door operating correctly?	Go to Step 15	
11	Repair the air delivery concern. Refer to <u>Air Delivery Improper</u> in HVAC Systems - Manual. Is the repair complete?	Go to Step 15	-
12	Repair the heating concern. Refer to <u>Heating Performance Diagnostic</u> . Is the repair complete?	Go to Step 15	-
13	Repair the A/C performance concern. Refer to <u>Air Conditioning (A/C) System Performance Test</u> . Is the repair complete?	Go to Step 15	-
14	Repair the recirculation door concern. Refer to <u>Air Recirculation Malfunction</u> in HVAC Systems - Manual. Is the repair complete?	Go to Step 15	-
15	Operate the system in order to verify the repair. Did you find and correct the condition?	System OK	Go to Step 2

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NOISE DIAGNOSIS - BLOWER MOTOR**Noise Diagnosis - Blower Motor**

Step	Action	Yes	No
DEFINITION: Noise originating from the blower motor.			
1	Were you sent here from Symptoms or another diagnostic table?	Go to Step 2	Go to Symptoms - HVAC Systems - Manual
2	Inspect the air inlet grille for debris. Is debris present?	Go to Step 8	Go to Step 3
3	1. Sit inside the vehicle. 2. Close the vehicle doors and windows. 3. Turn ON the ignition, with the engine OFF. 4. Cycle the blower motor through all of the speeds and modes in order to determine where and when the noise occurs. Is a noise evident during the blower operation?	Go to Step 4	Go to Step 11
4	Inspect for excessive vibration at each blower motor speed by feeling the blower case. Is excess vibration present?	Go to Step 6	Go to Step 5
5	Listen to the blower motor at each speed. Is the blower motor making a squeaking or chirping noise?	Go to Step 9	Go to Step 11
6	1. Remove the blower motor. Refer to Blower Motor Replacement . 2. Inspect the blower motor impeller for deposits of foreign material. 3. Inspect the blower motor for deposits of foreign material. Did you find any foreign material on the blower motor or blower motor impeller?	Go to Step 8	Go to Step 7
	Inspect the blower motor for the following conditions:		

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7	• Cracked blades • A loose impeller retainer • Improper impeller alignment		
	Did you find any of these conditions?	Go to Step 9	Go to Step 10
8	Remove the foreign material. Is the action complete?	Go to Step 10	-
9	Replace the blower motor. Refer to Blower Motor Replacement . Is the repair complete?	Go to Step 11	-
10	Install the blower motor. Refer to Blower Motor Replacement . Is the action complete?	Go to Step 11	-
11	Operate the system in order to verify the repair. Did you find and correct the condition?	System OK	Go to Step 2

NOISE DIAGNOSIS - AIR CONDITIONING (A/C) SYSTEM**Noise Diagnosis - Air Conditioning (A/C) System**

Step	Action	Yes	No
DEFINITION: Noise originating from the A/C compressor, drive belt, or the A/C lines.			
1	Were you sent here from Symptoms or another diagnostic table?	Go to Step 2	Go to Symptoms - HVAC Systems - Manual in HVAC Systems - Manual
2	A/C system noises can be generally categorized into 3 areas: • Screeching, squealing, chirping noises • Moaning noises • Vibration/rattle noises 1. Start the engine. 2. Ensure that the A/C is ON. Is a screeching, squealing noise heard when		

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	the A/C is engaged?	Go to Step 3	Go to Step 9
3	With the engine OFF, inspect the drive belt for excessive wear. Refer to Drive Belt Excessive Wear Diagnosis for the 2.2L engine and Drive Belt Excessive Wear Diagnosis for the 2.4L engine. Is the drive belt excessively worn?	Go to Step 18	Go to Step 4
4	Inspect the drive belt tension. Refer to Drive Belt Tensioner Diagnosis for the 2.2L engine and Drive Belt Tensioner Diagnosis for the 2.4L engine. Is the drive belt tension correct?	Go to Step 5	Go to Step 19
5	Inspect the drive belt for excessive oil coverage. Is the drive belt covered with oil?	Go to Step 17	Go to Step 6
6	1. Start the engine. 2. Ensure that the A/C is ON. 3. Inspect the compressor and the clutch. Is the A/C compressor locked up?	Go to Step 24	Go to Step 7
7	Is the A/C compressor clutch slipping?	Go to Step 23	Go to Step 8
8	CAUTION: Refer to Moving Parts and Hot Surfaces Caution . Using a stethoscope, listen to the A/C compressor for any abnormal noises. Is the compressor causing an abnormal noise?	Go to Step 15	Go to Step 10
9	Does a moaning noise exist when the A/C clutch is engaged?	Go to Step 10	Go to Step 12
10	Listen to the A/C compressor components and mounting for noise concerns using a stethoscope. Are any of these components loose, damaged, or excessively worn?	Go to Step 20	Go to Step 11
11	1. Idle the engine. 2. Engage the A/C compressor clutch. 3. Using a stethoscope, move around the entire refrigerant plumbing system. Listening for any abnormal noises caused by a component of the A/C		

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	system touching another component. Are any of the A/C components grounding out and causing a vibration noise?	Go to Step 22	Go to Step 13
12	Does a vibration or rattle noise exist when the A/C clutch is engaged?	Go to Step 13	Go to Step 14
13	Does the noise stop when the A/C clutch is disengaged?	Go to Step 15	Go to Step 25
14	1. Idle the engine in PARK with the A/C compressor clutch engaged. 2. Using a stethoscope, move around the entire A/C system testing for any abnormal noises caused by a component. Do any of the A/C components cause an abnormal noise?	Go to Step 21	Go to Step 25
15	Verify that the A/C system is properly charged. Refer to Refrigerant System Capacities . Is the A/C system properly charged?	Go to Step 26	Go to Step 16
16	Recharge the A/C system to specification. Refer to Refrigerant Recovery and Recharging . Is the abnormal compressor noise still present?	Go to Step 24	Go to Step 26
17	Repair the oil leak. Refer to Oil Leak Diagnosis for the 2.2L engine and Oil Leak Diagnosis for the 2.4L engine. Is the repair complete?	Go to Step 26	-
18	Replace the drive belt. Refer to Drive Belt Replacement for the 2.2L engine and Drive Belt Replacement for the 2.4L engine. Is the repair complete?	Go to Step 26	-
19	Replace the drive belt tensioner. Refer to Drive Belt Tensioner Replacement for the 2.2L engine and Drive Belt Tensioner Replacement for the 2.4L engine. Is the repair complete?	Go to Step 26	-
20	Repair or replace the A/C compressor mounting component. Is the repair complete?	Go to Step 26	-

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21	Repair or replace the component which is causing the moaning concern as needed. Is the repair complete?	Go to Step 26	-
22	Correctly route or insulate the A/C component. Is the repair complete?	Go to Step 26	-
23	Replace the A/C compressor clutch. Refer to <u>Compressor Clutch Assembly Replacement</u> . Is the repair complete?	Go to Step 26	-
24	Replace the A/C compressor. Refer to <u>Compressor Replacement</u> . Is the repair complete?	Go to Step 26	-
25	The concern may be caused by an engine related component. Refer to <u>Vibration Analysis - Engine</u> in Vibration Diagnosis and Correction. Did you find and correct the condition?	Go to Step 26	-
26	Operate the system in order to verify the repair. Did you find and correct the condition?	System OK	Go to Step 2

NOISE DIAGNOSIS - HVAC MODULE

Noise Diagnosis - HVAC Module

Step	Action	Yes	No
DEFINITION: Noise originating from the HVAC module.			
1	Were you sent here from Symptoms or another diagnostic table?	Go to Step 2	Go to <u>Symptoms - HVAC Systems - Manual</u>
2	- Start the engine. - Cycle through all of the following: - Blower motor speeds - HVAC modes - Temperature control settings - Determine the type of noise: - Scrape, pop - Tick/click, chirp, or groaning - Air rush/whistle		

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	Is a scrape or pop noise evident when selecting modes or temperature settings?	Go to Step 6	Go to Step 3
3	Is a tick/click, chirping, groaning, or scraping noise present, but decreases as blower motor speed is decreased?	Go to Noise Diagnosis - Blower Motor	Go to Step 4
4	Is an air rush/whistle noise evident in all modes but not all temperature settings?	Go to Step 6	Go to Step 5
5	Is an air rush/whistle noise evident only in defrost or floor mode?	Go to Step 6	Go to Step 6
6	Remove the center air outlet duct. Refer to Air Outlet Duct Replacement - Center . Is the action complete?	Go to Step 7	-
7	1. Inspect the air flow doors for proper operation. 2. Inspect the ducts for obstructions or foreign materials. Were any of these conditions found?	Go to Step 10	Go to Step 8
8	Inspect the mode and temperature doors and seals for warping or cracking. Are the doors in normal condition?	Go to Step 10	Go to Step 9
9	Replace the appropriate door and/or seals. Is the repair complete?	Go to Step 10	-
10	1. Remove any obstructions or foreign material found. 2. Install any components that were removed. Is the action complete?	Go to Step 11	-
11	1. Install the center air outlet duct. 2. Install the instrument panel (I/P) accessory trim panel. Refer to Trim Plate Replacement - Instrument Panel (I/P) Accessory. Is the action complete?	Go to Step 12	-
12	Operate the system to verify the repair. Did you find and correct the condition?	System OK	Go to Step 2

REPAIR INSTRUCTIONS

ODOR CORRECTION

Eliminating Air Conditioning Odor

Odors may be emitted from the air conditioning system primarily at start up in hot, humid climates. The following conditions may cause the odor:

- Debris is present in the HVAC module.
- Microbial growth on the evaporator core

When the blower motor fan is turned on, the microbial growth may release an unpleasant musty odor into the passenger compartment. To remove odors of this type, the microbial growth must be eliminated. Perform the following procedure:

Deodorize the evaporator core using Deodorizing Aerosol Kit.

Perform the following steps in order to deodorize the A/C system:

1. Ensure that the plenum which draws outside air into the HVAC module is clear of debris.
2. Disable the A/C compressor clutch operation by disconnecting the clutch coil electrical connector.
3. Dry the evaporator core by performing the following steps:
 1. Start the engine.
 2. Select the warmest temperature setting.
 3. Select the recirculation mode.
 4. Run the blower motor on high for 10 minutes.
4. Locate an area in the HVAC module case between the blower motor and the evaporator core downstream of the blower motor.
5. Drill a 3.175 mm (0.125 in) hole where the hole will not interfere with or damage the following components:
 - The blower motor
 - The evaporator core
 - Any other operating part of the system
6. Wear safety goggles and latex gloves in order to perform the following actions:
 1. Select the maximum blower speed.
 2. Insert the deodorizer extension tube into the hole to the mark on the extension tube.
 3. Use short spray bursts and vary the direction of spray for a 2-3 minute period of time.
7. Shut the engine OFF. Allow the vehicle to sit for 3-5 minutes.

8. Seal the 3.175 mm (0.125 in) hole with body sealer or RTV gasket compound.
9. Start the engine.
10. Operate the blower motor on high for 15-20 minutes to dry.
11. Reconnect the A/C compressor clutch coil electrical connector.
12. Verify proper clutch operation.

REFRIGERANT RECOVERY AND RECHARGING

Tools Required

- **J 43600** ACR 2000 Air Conditioning Service Center. See Special Tools.
- **J 45037** A/C Oil Injector. See Special Tools.

CAUTION: Avoid breathing the A/C Refrigerant 134a (R-134a) and the lubricant vapor or the mist. Exposure may irritate the eyes, nose, and throat. Work in a well ventilated area. In order to remove R-134a from the A/C system, use service equipment that is certified to meet the requirements of SAE J 2210 (R-134a recycling equipment). If an accidental system discharge occurs, ventilate the work area before continuing service. Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

CAUTION: For personal protection, goggles and gloves should be worn and a clean cloth wrapped around fittings, valves, and connections when doing work that includes opening the refrigerant system. If R-134a comes in contact with any part of the body severe frostbite and personal injury can result. The exposed area should be flushed immediately with cold water and prompt medical help should be obtained.

NOTE: R-134a is the only approved refrigerant for use in this vehicle. The use of any other refrigerant may result in poor system performance or component failure.

NOTE: To avoid system damage use only R-134a dedicated tools when servicing the A/C system.

NOTE: Use only Polyalkylene Glycol Synthetic Refrigerant Oil (PAG) for internal circulation through the R-134a A/C system and only 525 viscosity mineral oil on fitting threads and O-rings. If lubricants other than those specified are used, compressor failure and/or

fitting seizure may result.

NOTE: R-12 refrigerant and R-134a refrigerant must never be mixed, even in the smallest of amounts, as they are incompatible with each other. If the refrigerants are mixed, compressor failure is likely to occur. Refer to the manufacturer instructions included with the service equipment before servicing.

The **J 43600** is a complete air conditioning service center for R-134a. See **Special Tools**. The ACR 2000 recovers, recycles, evacuates and recharges A/C refrigerant quickly, accurately and automatically. The unit has a display screen that contains the function controls and displays prompts that will lead the technician through the recover, recycle, evacuate and recharge operations. R-134a is recovered into and charged out of an internal storage vessel. The ACR 2000 automatically replenishes this vessel from an external source tank in order to maintain a constant 5.45-6.82 kg (12-15 lbs) of A/C refrigerant.

The ACR 2000 has a built in A/C refrigerant identifier that will test for contamination, prior to recovery and will notify the technician if there are foreign gases present in the A/C system. If foreign gases are present, the ACR 2000 will not recover the refrigerant from the A/C system.

The ACR 2000 also features automatic air purge, single pass recycling and an automatic oil drain.

Refer to the **J 43600** ACR 2000 manual for operation and setup instruction. See **Special Tools**. Always recharge the A/C System with the proper amount of R-134a. Refer to **Refrigerant System Capacities** for the correct amount.

A/C Refrigerant System Oil Charge Replenishing

If oil was removed from the A/C system during the recovery process or due to component replacement, the oil must be replenished. Oil can be injected into a charged system using **J 45037**. See **Special Tools**. For the proper quantities of oil to add to the A/C refrigerant system, refer to **Refrigerant System Capacities**.

FLUSHING

Tools Required

- **J 41447** R-134a - Leak Detection Dye. See **Special Tools**.
- **J 42220** Universal 12V Leak Detection Lamp. See **Special Tools**.
- **J 43600** ACR 2000 Air Conditioning Service Center. See **Special Tools**.
- **J 45268** A/C Flush Adapter Kit. See **Special Tools**.

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IMPORTANT: Flushing with the J 43600 is not intended to remove metal from the A/C system. See Special Tools.

Flushing is intended to remove the following:

- Contaminated polyalkylene glycol (PAG) oil
- Desiccant, following a desiccant bag failure
- Overcharge of PAG oil
- Refrigerant contamination

Forward Flushing Setup

- IMPORTANT:**
- Forward flow refrigerant flushing is recommended for contaminated refrigerant or PAG oil.
 - Inspect and lubricate the sealing washers J 45268 . See Special Tools. Refer to Sealing Washer Replacement.

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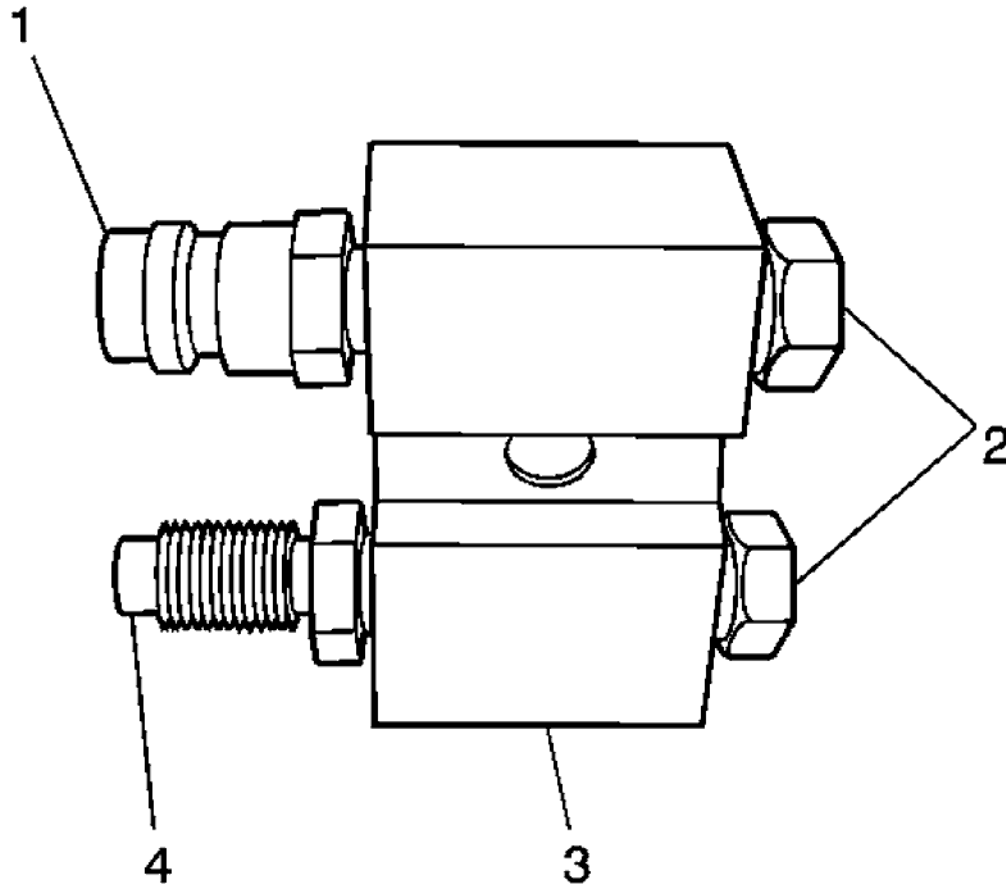


Fig. 2: Identifying J 45268-2 (3), J 45268-7 (1), J 45268-8 (4), & J 45268-9 (2)
Courtesy of GENERAL MOTORS CORP.

1. Install both J 45268-9 (2) onto the J 45268-10 (3).
2. Install the J 45268-7 (4) onto the suction side of the J 45268-10 (3).
3. Install the J 45268-8 (1) onto the discharge side of the J 45268-10 (3).

Reverse Flushing Setup

IMPORTANT:

- Reverse flow refrigerant flush is recommended for desiccant bag failure. Replace the condenser/receiver dehydrator assembly when the A/C flush is complete and perform the following procedure:
- Inspect and lubricate the J 45268 sealing washers. See Special Tools. Refer to Sealing Washer Replacement.

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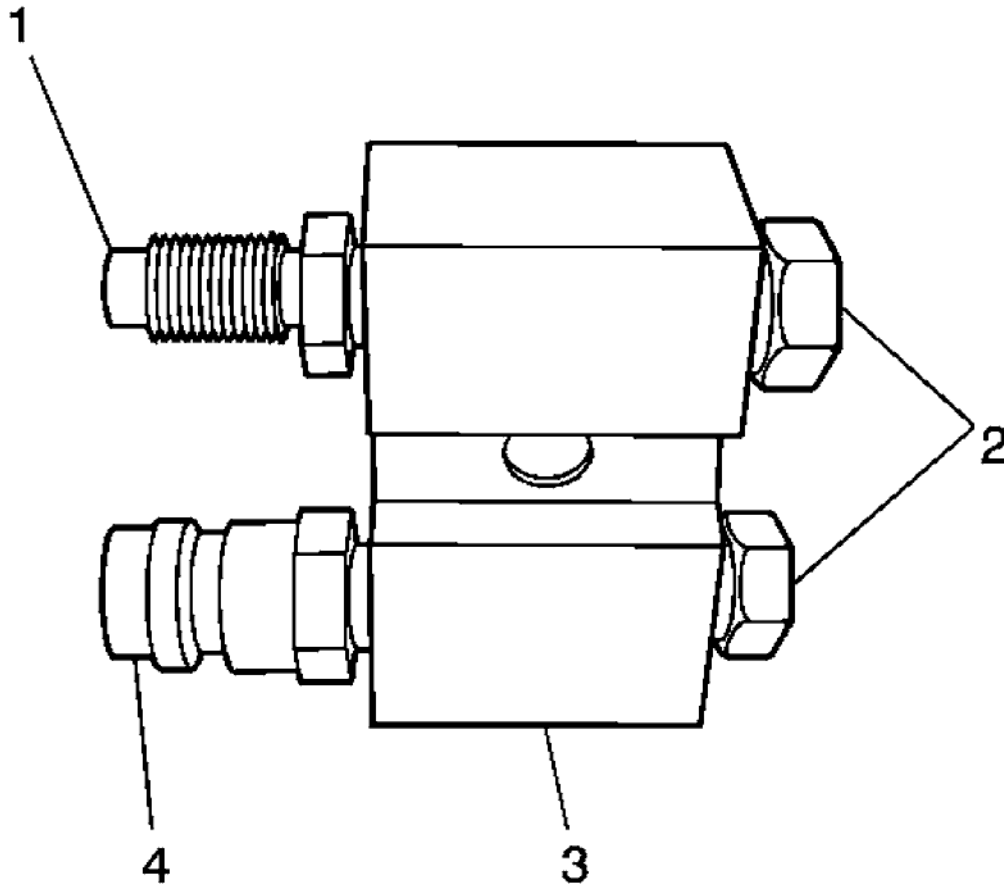


Fig. 3: Using J45268-9, J45268-8, J 45268-7, & J 45268-2
Courtesy of GENERAL MOTORS CORP.

1. Install both J 45268-9 (2) onto the J 45268-10 (3).
2. Install the J 45268-8 (1) onto the suction side of the J 45268-10 (3).
3. Install the J 45268-7 (4) onto the discharge side of the J 45268-10 (3).

Flush Procedure

IMPORTANT: Warmer engine or ambient temperatures decreases the refrigerant recovery time during the A/C flush procedure.

1. Recover the refrigerant. Refer to Refrigerant Recovery and Recharging.
2. Remove the thermal expansion valve (TXV). Refer to Thermal Expansion Valve Replacement.

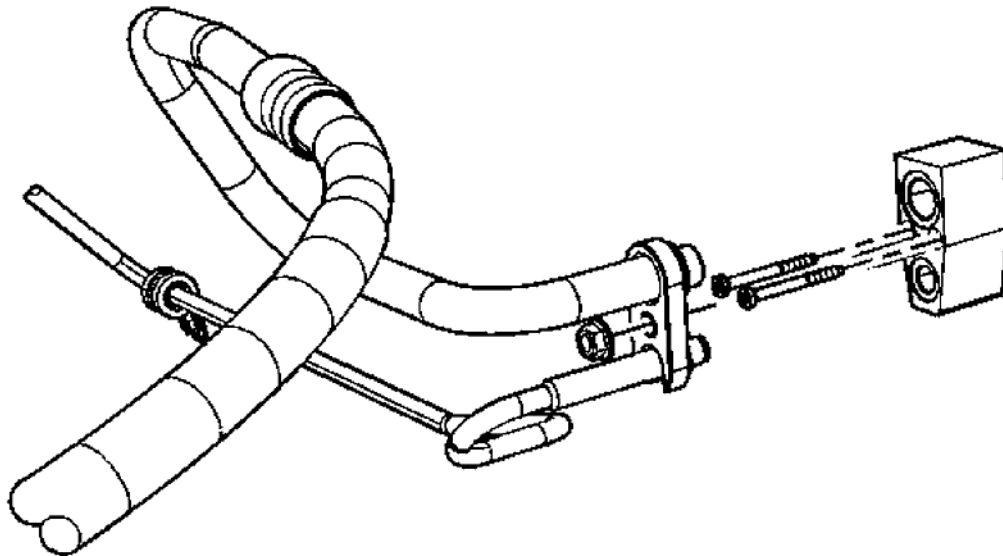


Fig. 4: Thermal Expansion Valve
Courtesy of GENERAL MOTORS CORP.

3. Install the stud onto the J 45268-115.
4. Install new sealing washers onto the evaporator core. Refer to **Sealing Washer Replacement**.
5. Install J 45268-115 in place of the TXV.

NOTE: Refer to **Fastener Notice** .

6. Install TXV mounting bolts.

Tighten: Tighten the bolts to 7 N.m (62 lb in).

7. Install new washers onto the condenser tube and evaporator hose. Refer to **Sealing Washer Replacement**.
8. Connect the condenser tube and evaporator hose to the J 45268-115.
9. Install the TXV block fitting nut.

Tighten: Tighten the nut to 20 N.m (15 lb ft).

10. Remove the A/C compressor. Refer to **Compressor Replacement**.

11. Remove the A/C refrigerant filter. Refer to **Air Conditioning (A/C) Refrigerant Filter Replacement**.

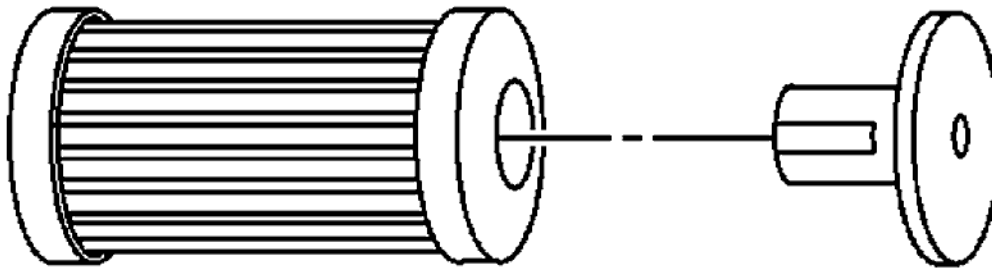


Fig. 5: View Of A/C Filter And Check Valve
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: The filter inside J 45268-1 is serviceable. Remove and discard the check valve from the filter.

12. Service the filter with AC Delco P/N GF 470, before each flush.

IMPORTANT: Install new sealing washers onto the compressor hose assembly. Refer to **Sealing Washer Replacement**.
Assure that the suction and discharge ports on the J 45268-10 correspond to the suction and discharge ports on the compressor hose assembly.

13. Install the J 45268-10 to the compressor hose assembly.
14. Connect the J 45268-1 flush filter to the J 45268-7 flush adapter.

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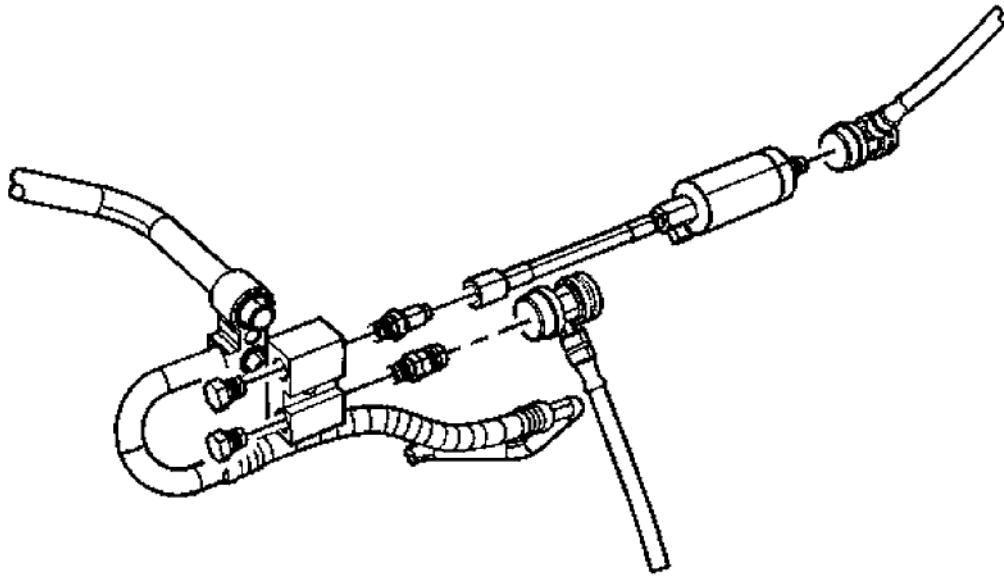


Fig. 6: Flush Filter Adapter
Courtesy of GENERAL MOTORS CORP.

15. Connect the blue hose from the **J 43600** to J 45268-1 flush filter adapter. See **Special Tools**.
16. Connect the red hose from the **J 43600** to J 45268-8 flush adapter. See **Special Tools**.

IMPORTANT: Close the valve on the external refrigerant tank, before starting the flush process.

17. Flush the A/C system. Follow the instructions supplied with the **J 43600** . See **Special Tools**.
18. Disconnect the red hose from the **J 43600** to J 45268-8 flush adapter. See **Special Tools**.
19. Disconnect the blue hose from the **J 43600** to J 45268-1 flush filter adapter. See **Special Tools**.
20. Disconnect the J 45268-1 flush filter from the J 45268-10 flush adapter.
21. Remove the J 45268-10 from the compressor hose assembly.

IMPORTANT: Flushing will remove all the PAG oil from the A/C system. The A/C system must be replenished with the correct amount of PAG oil.

22. If you will reinstall the removed A/C compressor, perform the following procedure:

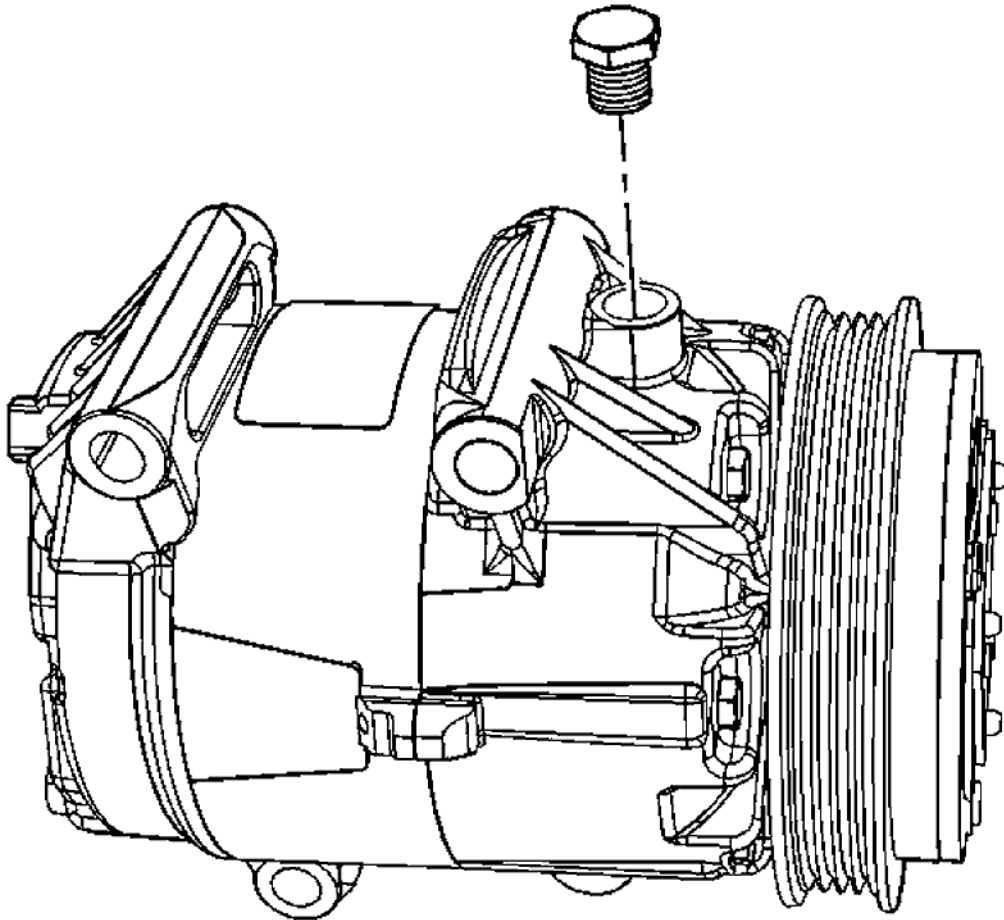


Fig. 7: A/C Compressor Drain Plug
Courtesy of GENERAL MOTORS CORP.

1. Remove the A/C compressor drain plug.
2. Drain the PAG oil from the A/C compressor. Rotate the compressor input shaft to assist in draining the PAG oil from the compressor.
3. Add the total system capacity of PAG oil to the crankcase of the A/C compressor. Refer to **Refrigerant System Capacities**.

IMPORTANT: Flushing will remove the fluorescent leak detection dye from the A/C system.

4. Add one bottle of J 41447 directly into the A/C compressor. See **Special Tools**.

5. Install the A/C compressor drain plug.

Tighten: Tighten the drain plug to 15 N.m (11 lb ft).

IMPORTANT: A new service compressor is shipped with a partial charge of PAG oil. Refer to Refrigerant System Capacities.

23. Install the A/C compressor. Refer to Compressor Replacement.
24. Install the A/C refrigerant filter. Refer to Air Conditioning (A/C) Refrigerant Filter Replacement.
25. Remove the TXV block fitting nut.
26. Disconnect the condenser tube and evaporator hose from the J45268-115.

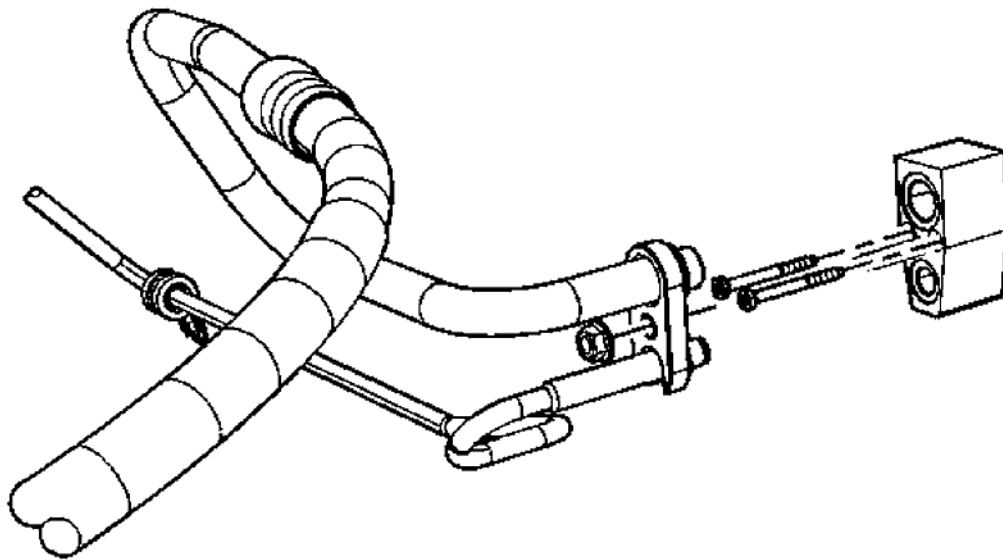


Fig. 8: Thermal Expansion Valve
Courtesy of GENERAL MOTORS CORP.

27. Remove the TXV bolts retaining the J 45268-115.
28. Remove the J 45268-115.
29. Inspect the TXV for debris. Clean or replace as needed.
30. Install the TXV. Refer to Thermal Expansion Valve Replacement.
31. Evacuate and recharge the A/C system. Refer to Refrigerant Recovery and Recharging.

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32. Leak test the fittings using **J 42220** . See Special Tools.

COMPRESSOR OIL BALANCING

Draining Procedure

IMPORTANT: Drain and measure as much of the refrigerant oil as possible from the removed compressor.

1. Remove the compressor crankcase oil drain plug and drain the crankcase into a clean, graduated container.

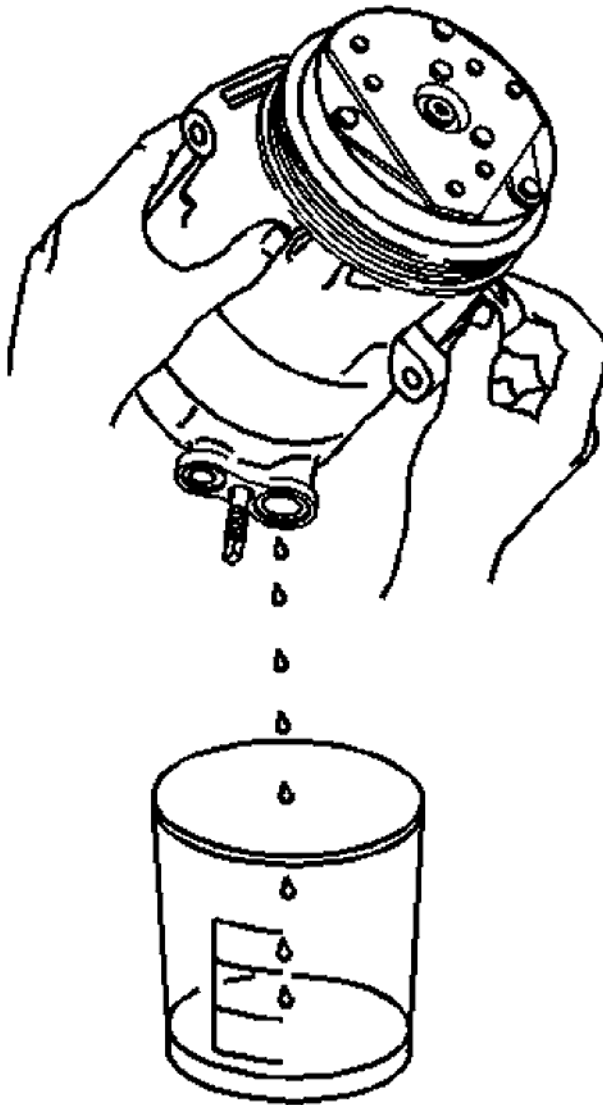


Fig. 9: Draining A/C Refrigerant Oil From Compressor
Courtesy of GENERAL MOTORS CORP.

2. Drain the oil from both the suction and discharge ports of the removed compressor into the same container.

Rotate the compressor shaft to assist in draining the compressor.

3. Measure and record the amount of oil drained from the removed compressor.

This measurement will be used during installation of the replacement compressor.

4. Properly discard the used refrigerant oil.

Balancing Procedure

IMPORTANT: The refrigerant oil in the A/C system must be balanced during compressor replacement.

1. The replacement compressor is shipped with 74 ml (2.5 oz) of refrigerant oil.

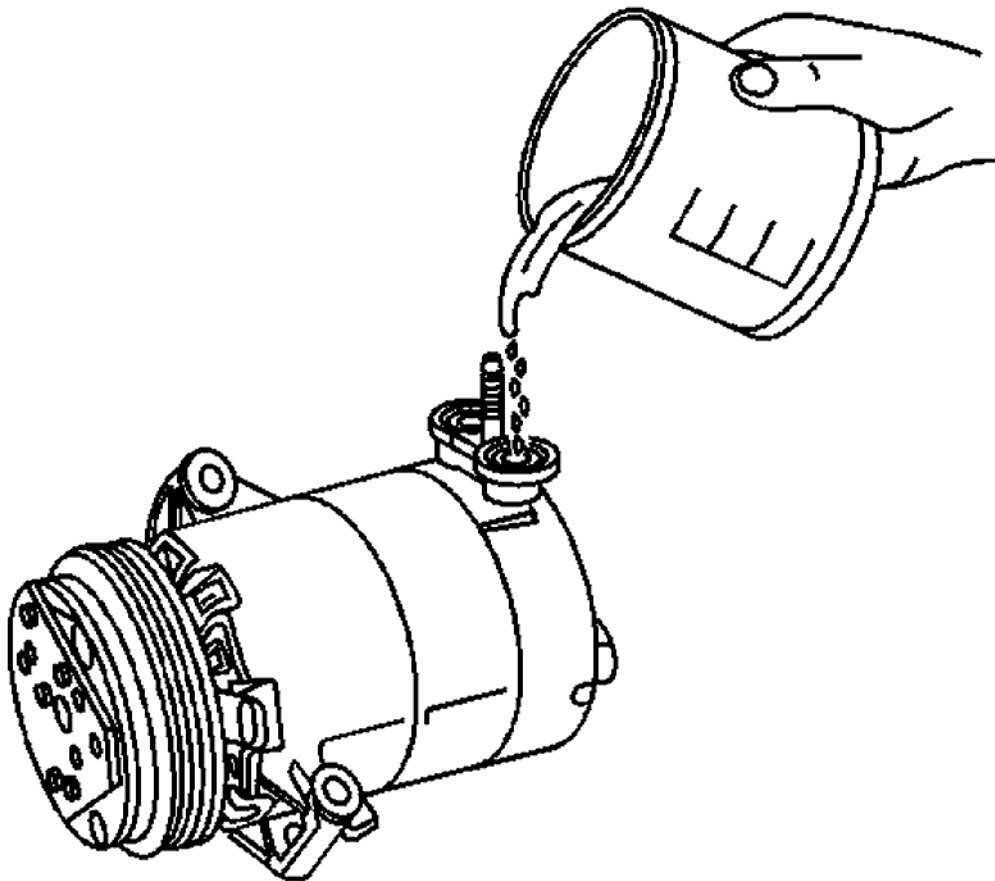


Fig. 10: Replacing Measured Compressor Oil
Courtesy of GENERAL MOTORS CORP.

2. Compare the amount of refrigerant oil recorded during compressor removal to the amount of refrigerant oil shipped in the replacement compressor.

If the amount of refrigerant oil drained and recorded from the removed compressor is:

- Less than 74 ml (2.5 oz)

Leave the 74 ml (2.5 oz) in the replacement compressor.

- More than 74 ml (2.5 oz)

Add to the compressor the difference between the 74 ml (2.5 oz) and the amount drained.

COMPRESSOR REPLACEMENT

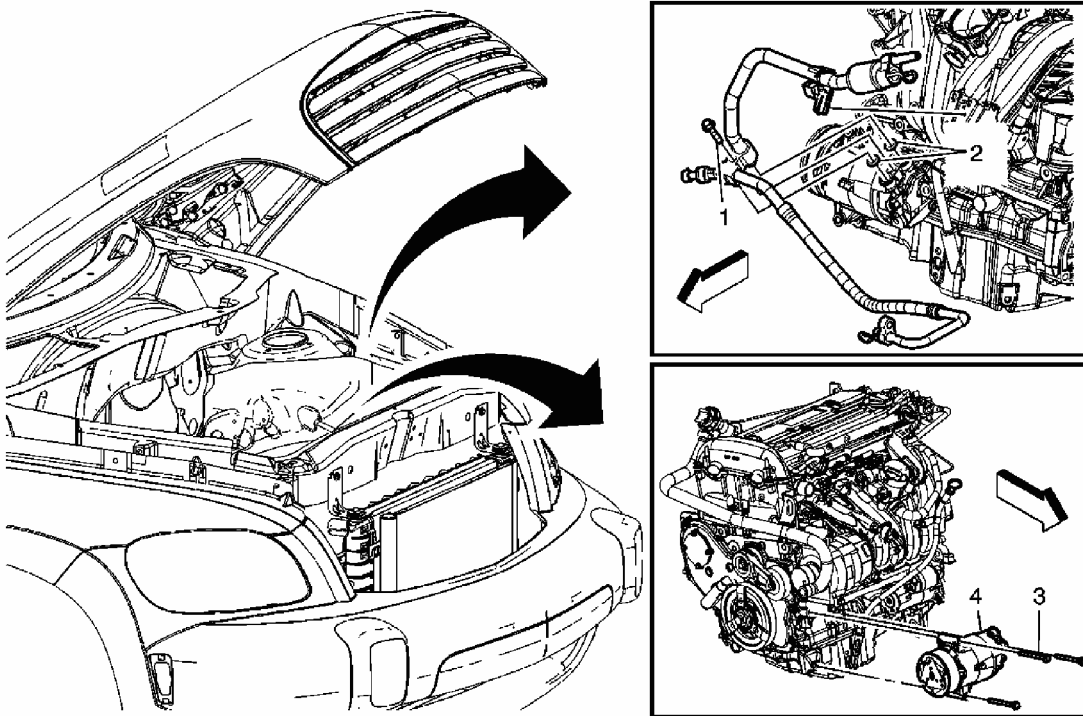


Fig. 11: Compressor Replacement
Courtesy of GENERAL MOTORS CORP.

Compressor Replacement

Callout	Component Name
NOTE: Refer to <u>Fastener Notice</u> . Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u>. Preliminary Procedure	

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1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging**.
2. Remove the drive belt. Refer to **Drive Belt Replacement** for the 2.2L engine or **Drive Belt Replacement** for the 2.4L engine.
3. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle**.
4. Disconnect the A/C compressor electrical connector.

1	A/C Compressor Hose Bolt Tip: Remove the A/C compressor hose from the A/C compressor and cap hose. Tighten: 20 N.m (15 lb ft)
2	Sealing Washer Remove and discard sealing washers. Refer to Sealing Washer Replacement .
3	A/C Compressor Bolt Tighten: 22 N.m (16 lb ft)
4	A/C Compressor Assembly Tip: • Use a low viscosity, poly-alkylene glycol (PAG) oil. Use of the incorrect oil can result in compressor failure. • When replacing the A/C compressor, balance the compressor. Refer to Compressor Oil Balancing.

COMPRESSOR CLUTCH ASSEMBLY REPLACEMENT

Tools Required

- **J 37872** Universal Spanner Wrench. See **Special Tools**.
- **J 6083** Snap Ring Pliers. See **Special Tools**.

Removal Procedure

1. Remove the compressor. Refer to **Compressor Replacement**.

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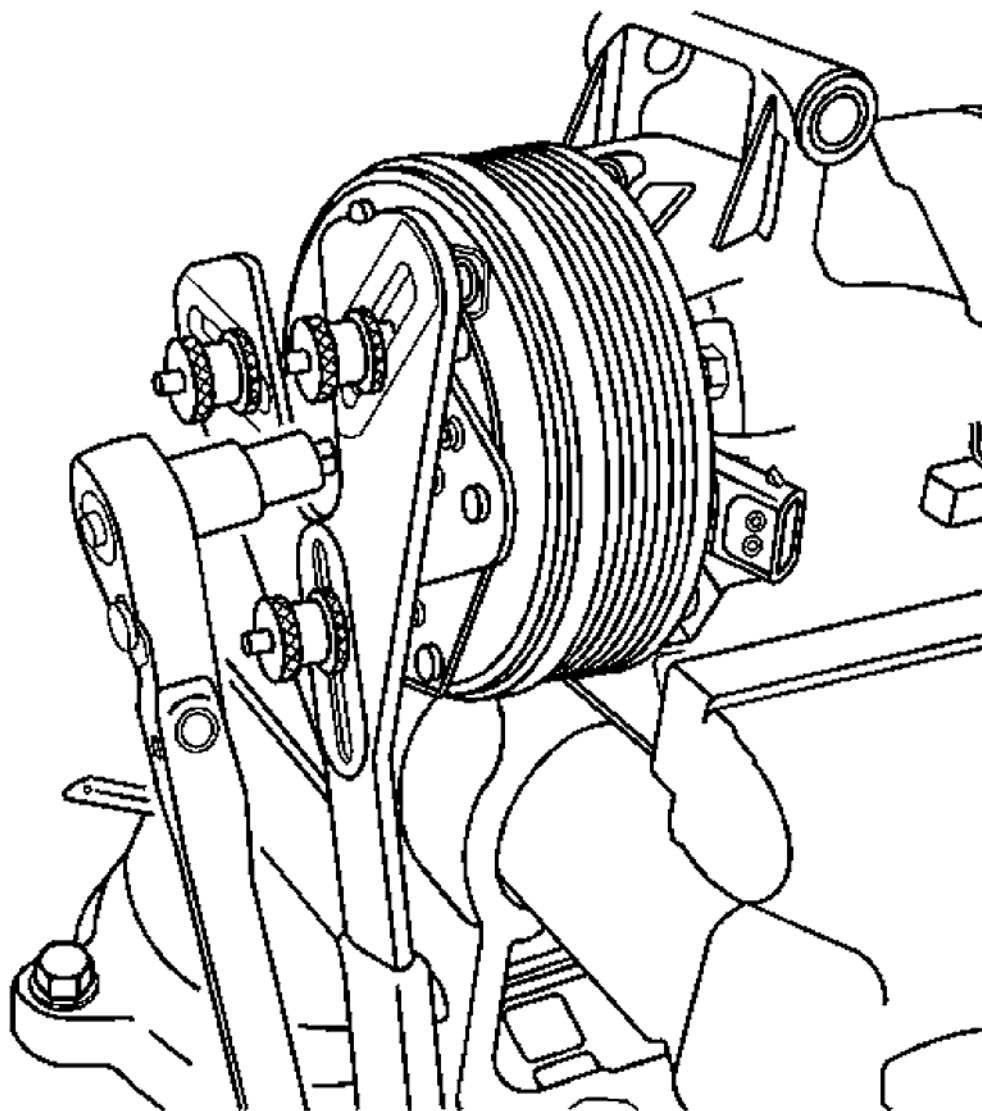


Fig. 12: Identifying Compressor Clutch Plate Bolt
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Remove the three adjustable dowels from the J 37872 Universal Spanner Wrench. See Special Tools.
Install three 5/16 x 1 inch bolts in place of the dowels.

2. Remove and discard the compressor clutch plate bolt.

Use the J 37872 to hold the compressor clutch plate from turning. See Special Tools.

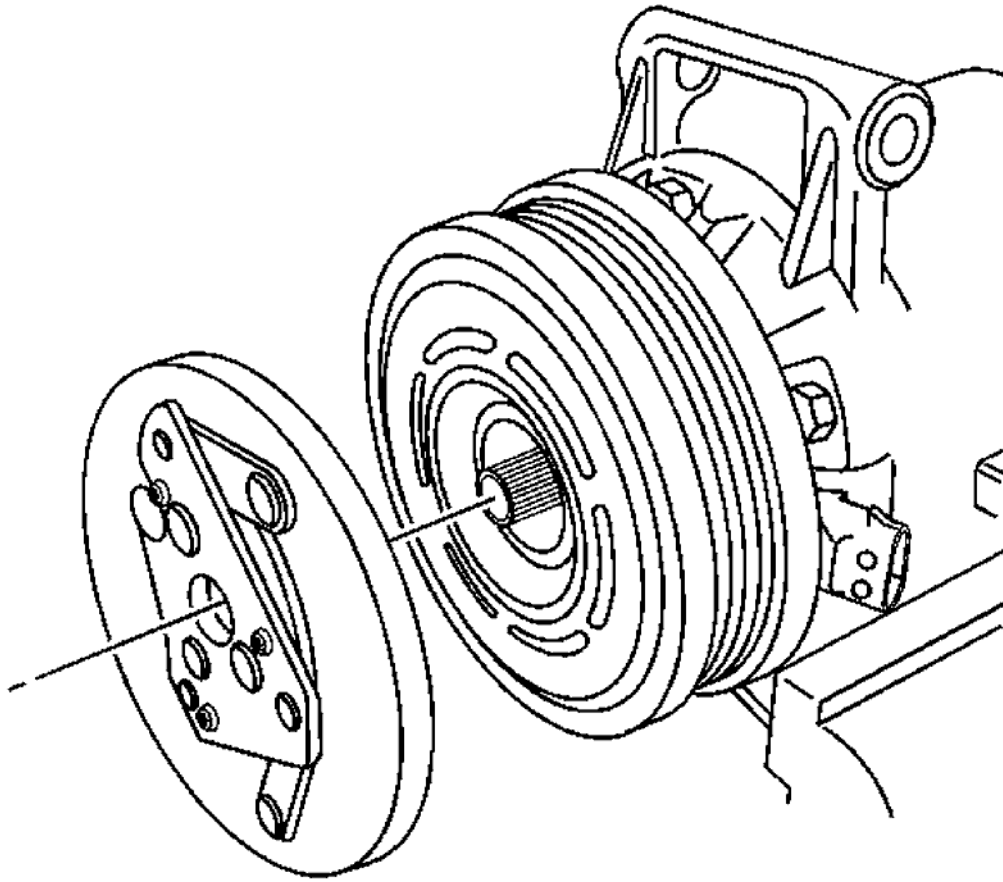


Fig. 13: Identifying Compressor Clutch Plate
Courtesy of GENERAL MOTORS CORP.

3. Remove the compressor clutch plate from the compressor.

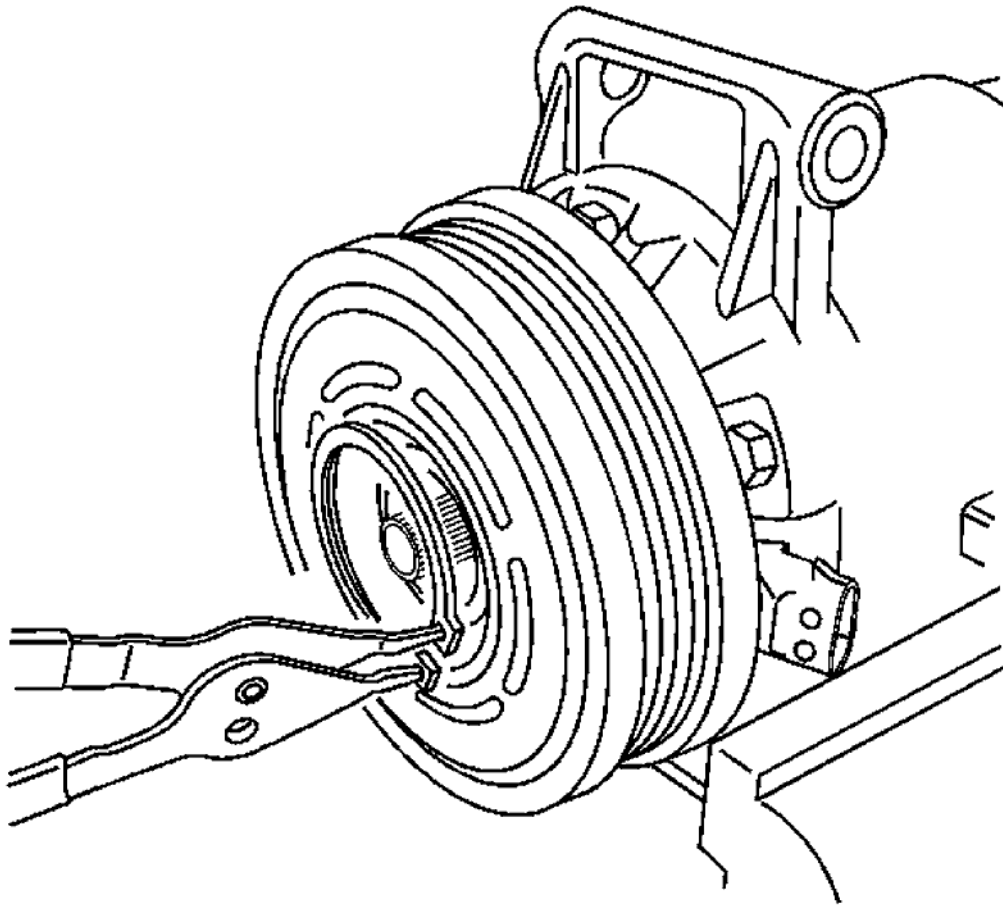


Fig. 14: View Of Compressor Pulley Snap Ring
Courtesy of GENERAL MOTORS CORP.

4. Remove the compressor pulley snap ring using the **J 6083** . See **Special Tools**.

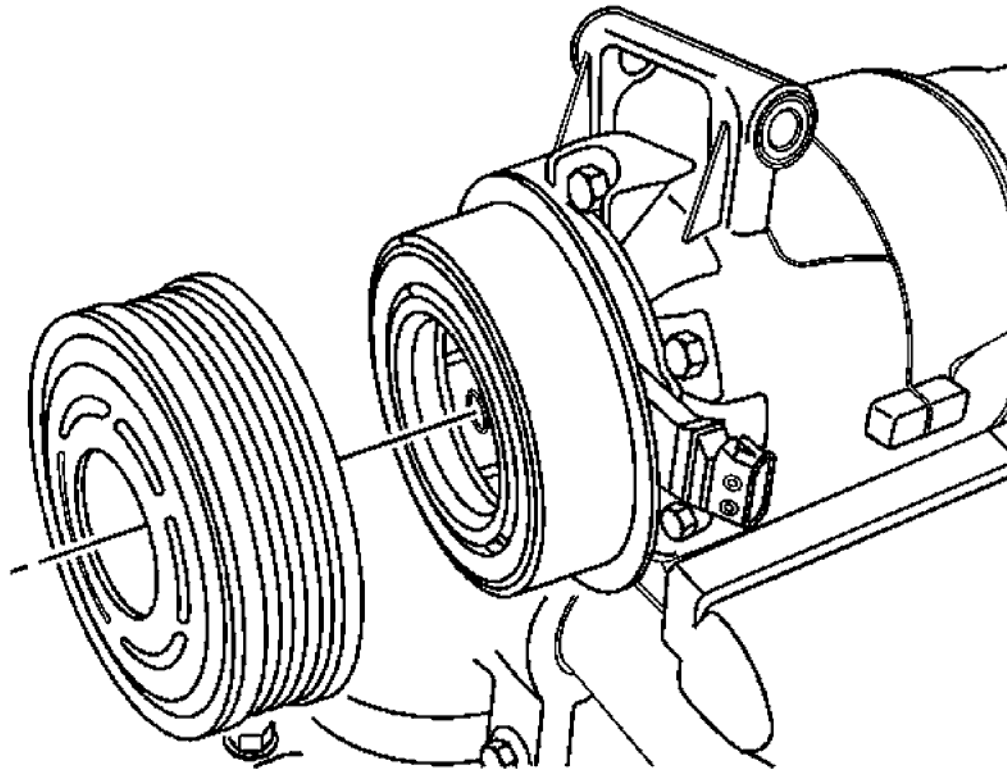


Fig. 15: Identifying Compressor Pulley
Courtesy of GENERAL MOTORS CORP.

5. Remove the compressor pulley from the compressor.

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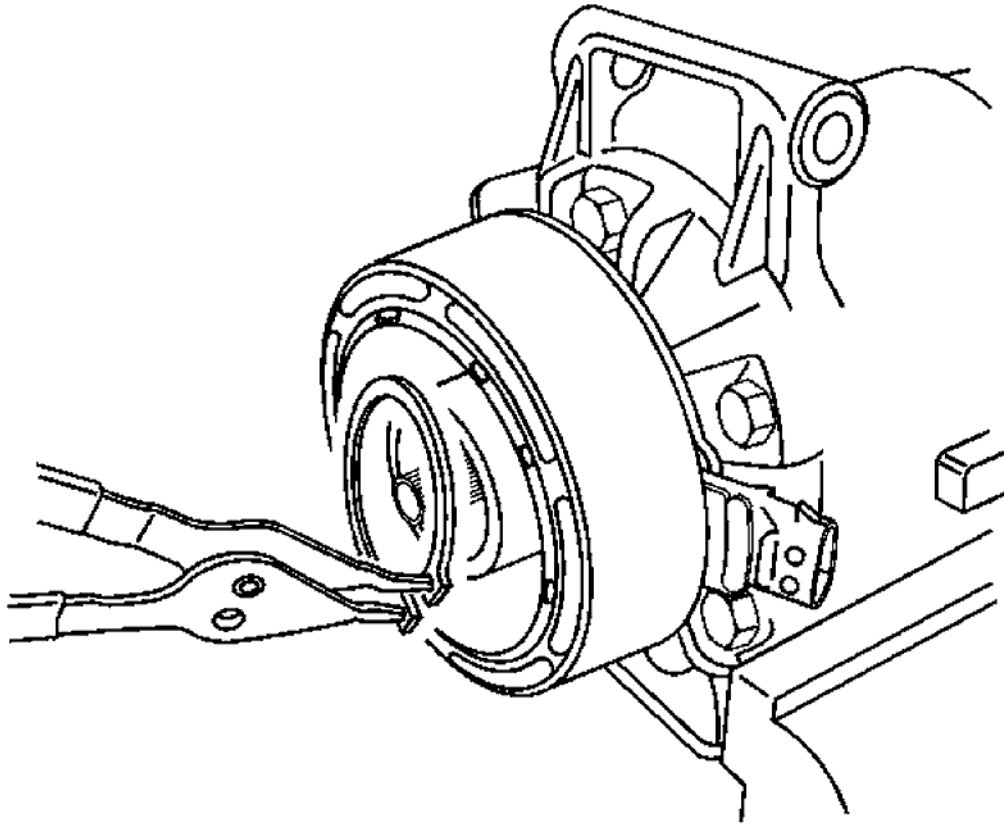


Fig. 16: Identifying Compressor Clutch Coil And Snap Ring
Courtesy of GENERAL MOTORS CORP.

6. Remove the compressor clutch coil snap ring using the **J 6083** . See **Special Tools**.

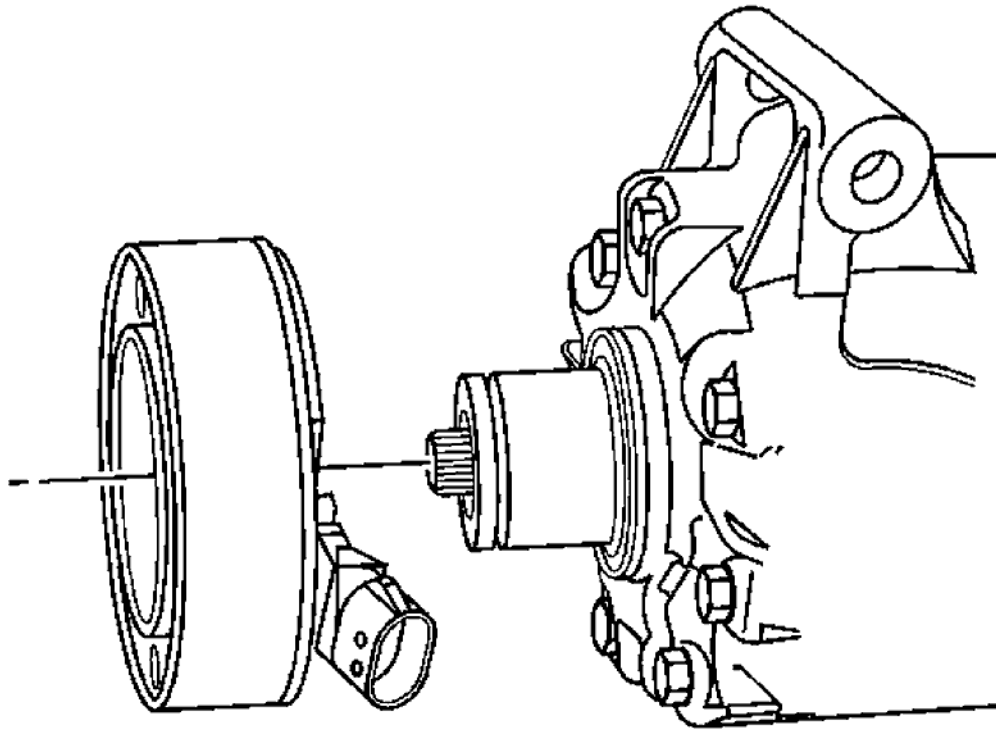


Fig. 17: Identifying Compressor Clutch Coil To Compressor
Courtesy of GENERAL MOTORS CORP.

7. Remove the compressor clutch coil from the compressor.

Installation Procedure

1. Carefully clean the clutch plate bolt threads with a M6x1.0 tap. Carefully blow out debris with compressed air.

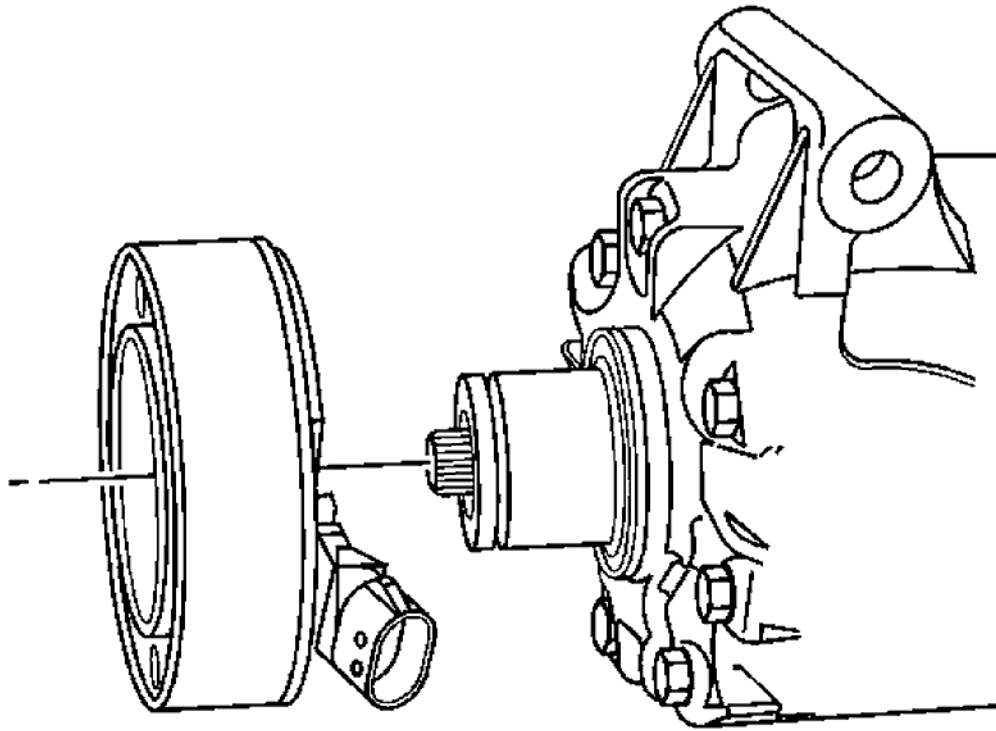


Fig. 18: Identifying Compressor Clutch Coil To Compressor
Courtesy of GENERAL MOTORS CORP.

2. Install the compressor clutch coil to the compressor.

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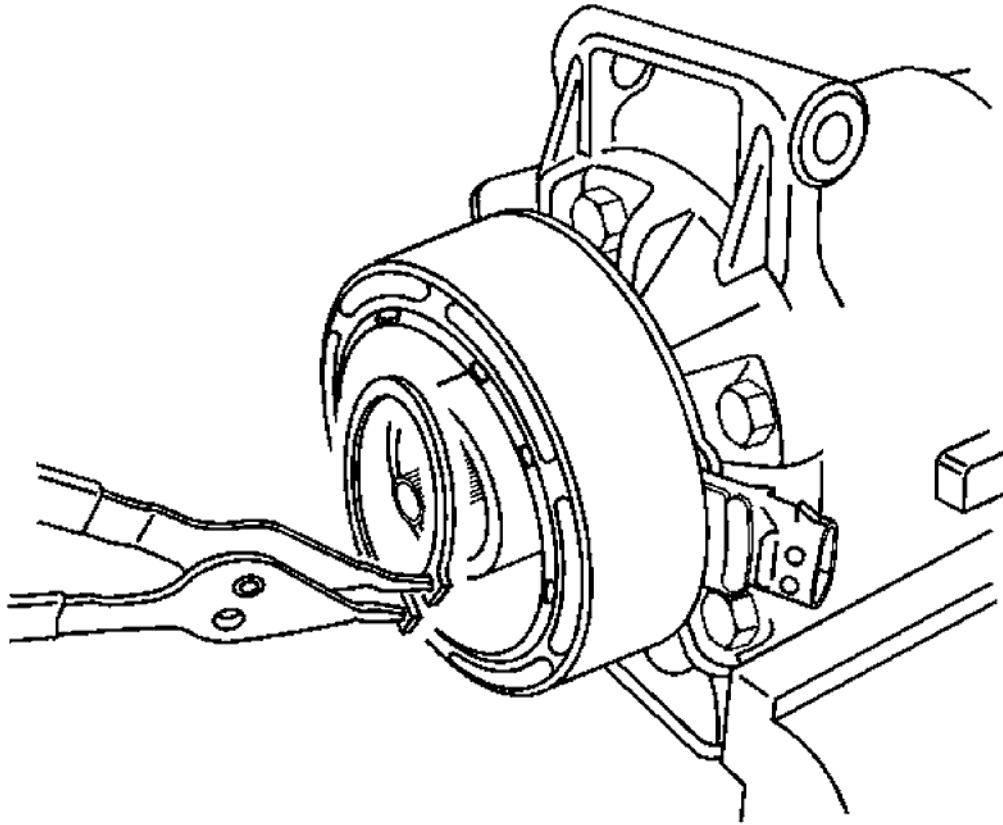


Fig. 19: Identifying Compressor Clutch Coil And Snap Ring
Courtesy of GENERAL MOTORS CORP.

3. Install the compressor clutch coil snap ring using the **J 6083** . See **Special Tools**.

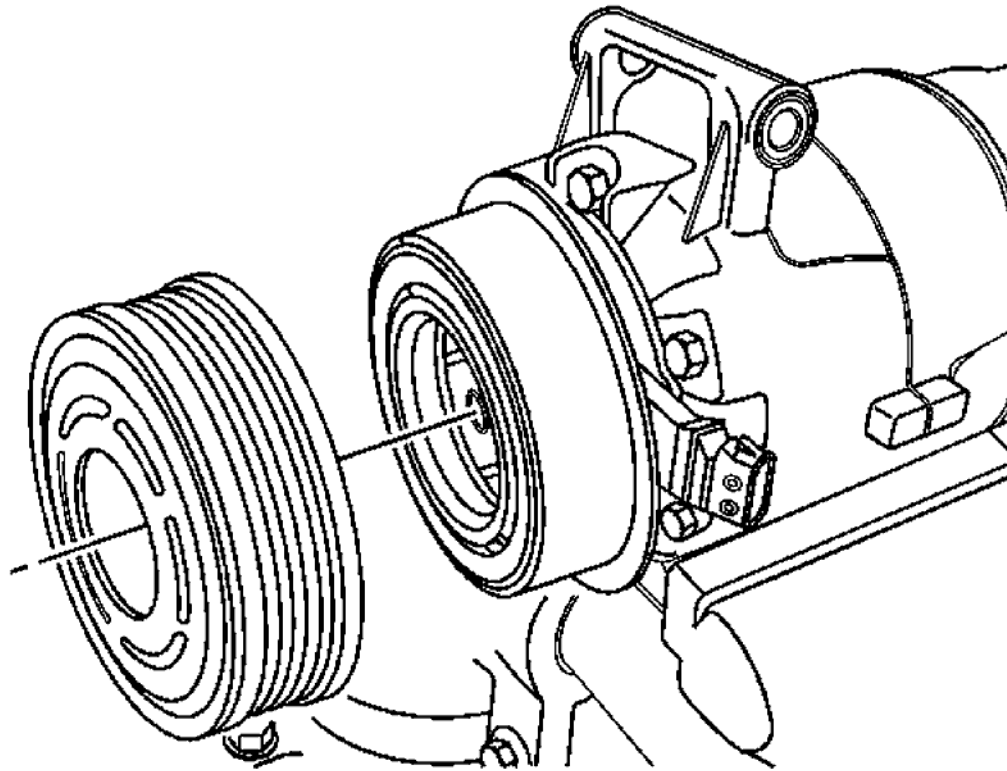


Fig. 20: Identifying Compressor Pulley
Courtesy of GENERAL MOTORS CORP.

4. Install the compressor pulley to the compressor.

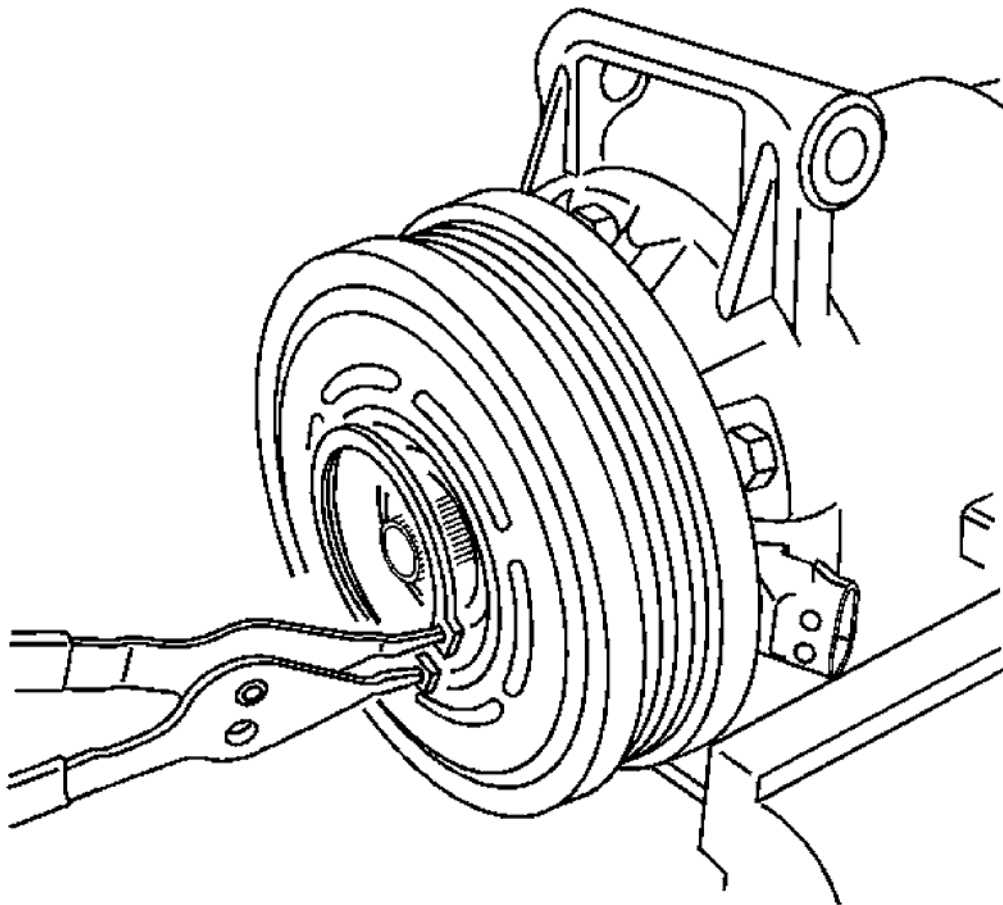


Fig. 21: View Of Compressor Pulley Snap Ring
Courtesy of GENERAL MOTORS CORP.

5. Install the compressor pulley snap ring using the **J 6083** . See **Special Tools**.
6. Place a small amount of oil on the 0.4 mm (0.016 in) air gap shim and place inside the clutch drive plate.

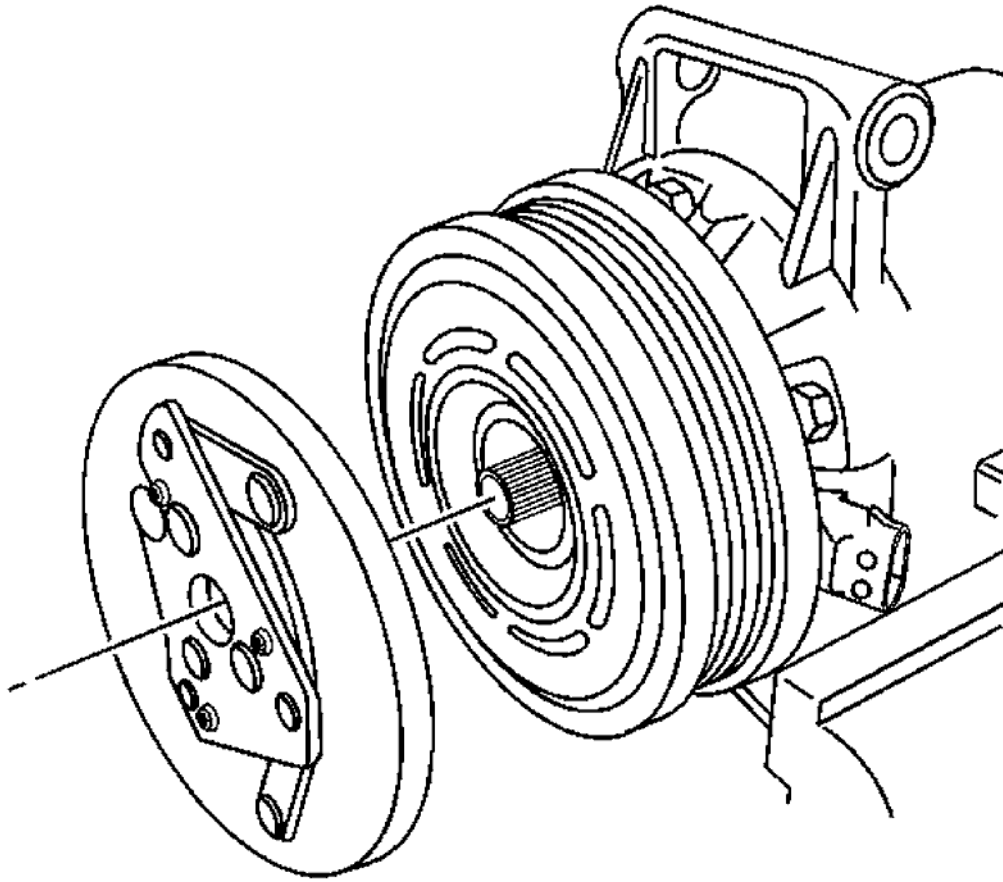


Fig. 22: Identifying Compressor Clutch Plate
Courtesy of GENERAL MOTORS CORP.

7. Install the compressor clutch plate to the compressor.

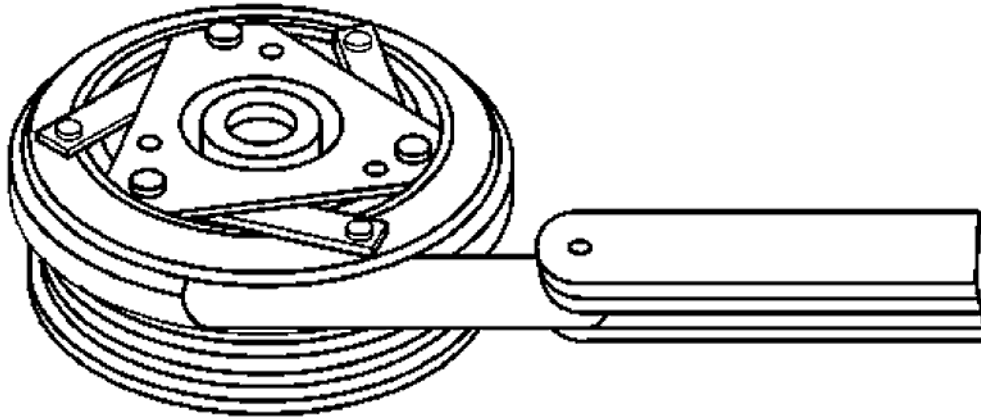


Fig. 23: View Of Air Gap Between Pulley And Drive Plate
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Make certain that the drive plate does not drag against the pulley when the pulley is rotated.

8. Measure the air gap between the pulley and the drive plate. Adjust the shims to achieve a 0.3-0.6 mm (0.012-0.024 in) air gap.

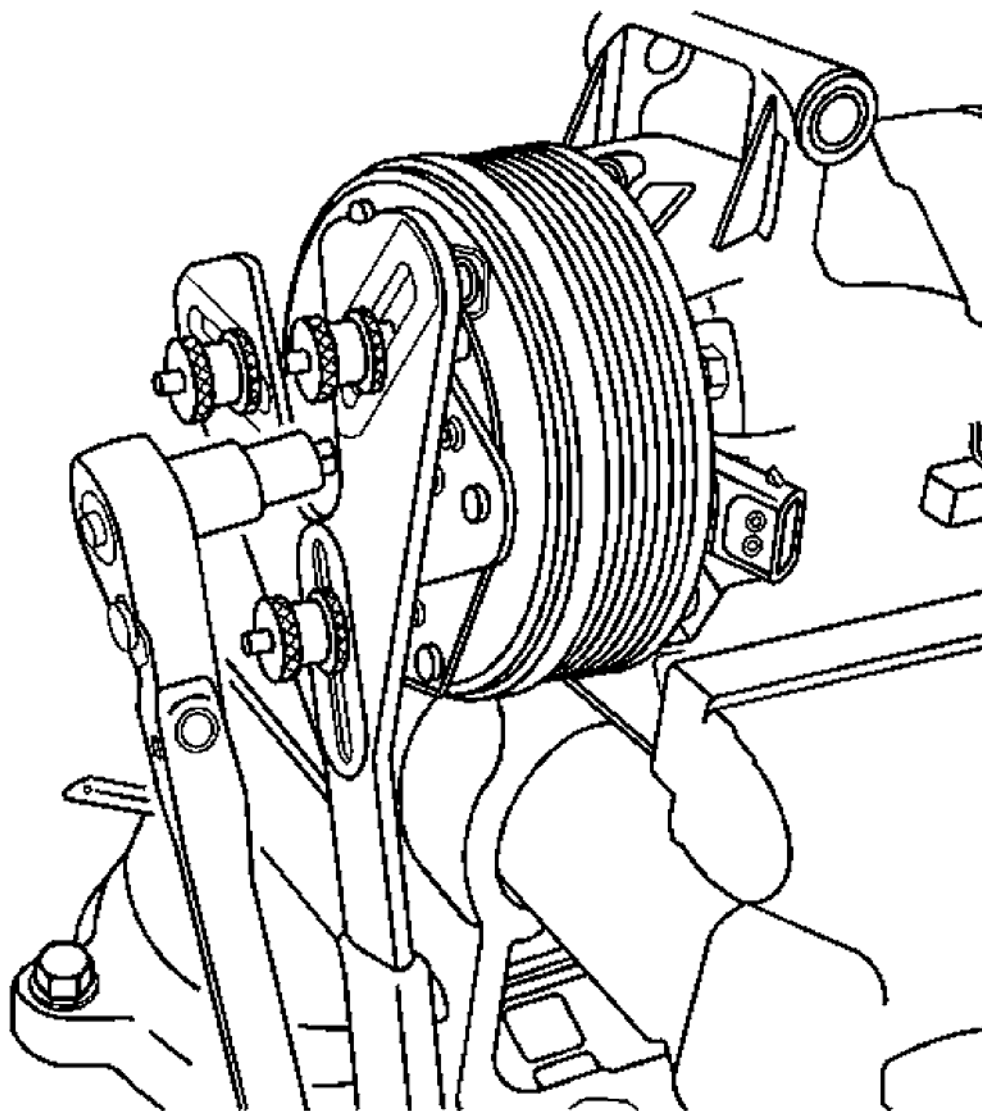


Fig. 24: Identifying Compressor Clutch Plate Bolt
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Make certain that the new drive plate bolt has colored adhesive on at least 5 threads.

9. Install the clutch drive plate bolt.

NOTE: Refer to Fastener Notice in Cautions and Notices.

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10. Tighten the compressor clutch drive plate bolt.

Use the **J 37872** to hold the compressor clutch plate from turning. See **Special Tools**.

Tighten: Tighten the bolt to 12 N.m (9 lb ft).

11. Install the compressor. Refer to **Compressor Replacement**.
12. Leak test the fittings using the **J 39400-A**.

COMPRESSOR PRESSURE RELIEF VALVE REPLACEMENT

Tools Required

J 39400-A Halogen Leak Detector

Removal Procedure

1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging**.
2. Raise the vehicle. Refer to **Lifting and Jacking the Vehicle** in General Information.

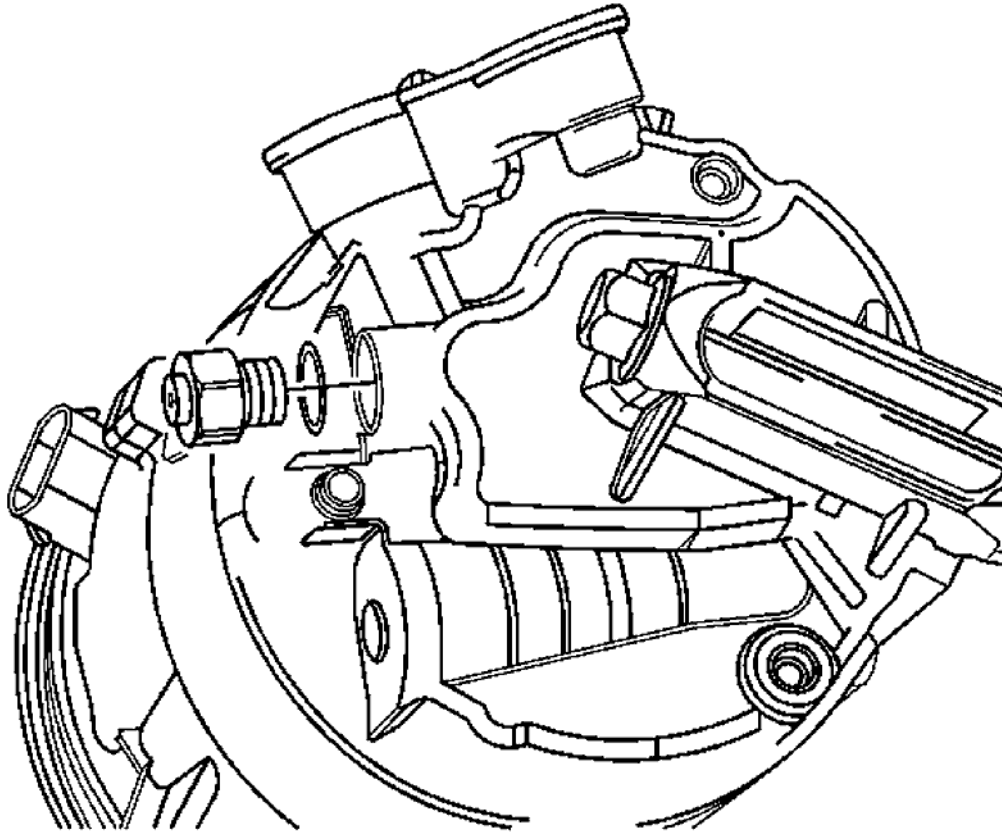


Fig. 25: View Of Compressor Pressure Relief Valve
Courtesy of GENERAL MOTORS CORP.

3. Remove the pressure relief valve from the compressor.

Installation Procedure

NOTE: Refer to Fastener Notice in Cautions and Notices.

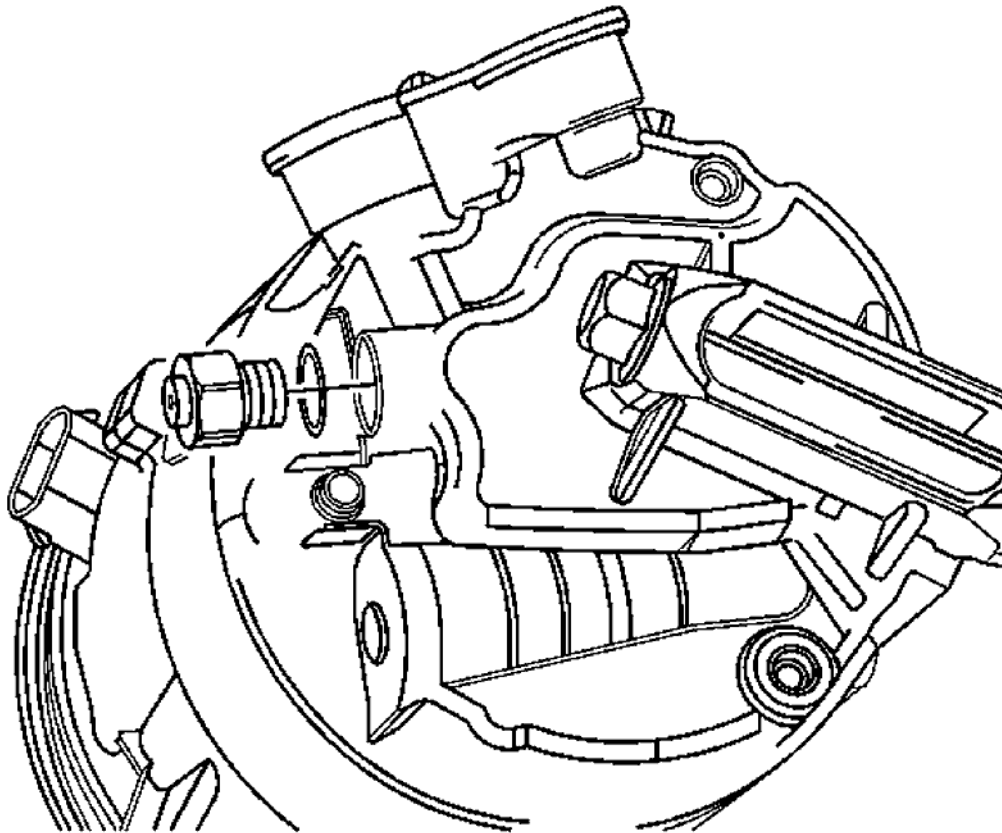


Fig. 26: View Of Compressor Pressure Relief Valve
Courtesy of GENERAL MOTORS CORP.

1. Install the pressure relief valve and seal to the compressor.

Tighten: Tighten the compressor pressure relief valve to 7 N.m (62 lb in).

2. Lower the vehicle.
3. Evacuate and charge the refrigerant system. Refer to **Refrigerant Recovery and Recharging**.
4. Leak test the fittings using the **J 39400-A**.

SEALING WASHER REPLACEMENT

Removal Procedure

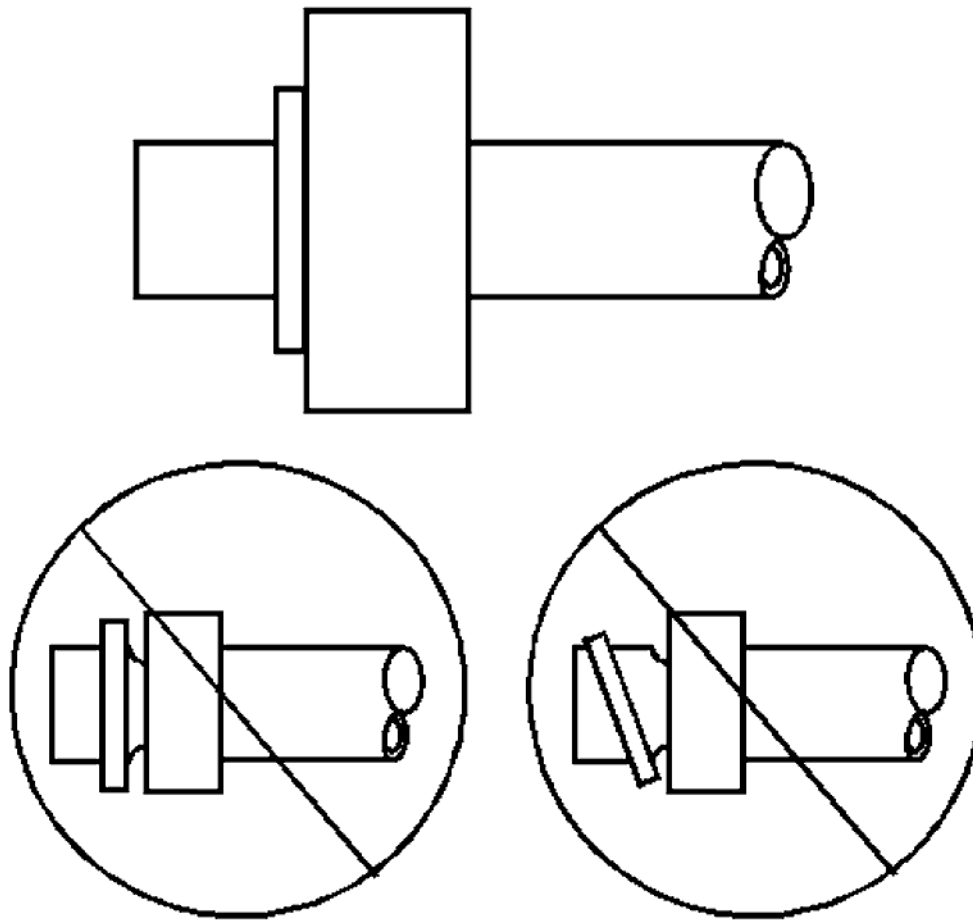


Fig. 27: Identifying Good And Bad Sealing Washer Positions
Courtesy of GENERAL MOTORS CORP.

1. Remove the seal washer from the A/C refrigerant component.

IMPORTANT: Cap or tape the open A/C refrigerant components immediately to prevent system contamination.

2. Inspect the seal washer for signs of damage to help determine the root cause of the failure.
3. Inspect the A/C refrigerant components for damage or burrs. Repair if necessary.

IMPORTANT: DO NOT reuse the sealing washer.

4. Discard the sealing washer.

Installation Procedure

IMPORTANT: Flat washer type seals do not require lubrication.

1. Inspect the new seal washer for any signs of cracks, cuts, or damage.

Do not use a damaged seal washer.

2. Remove the cap or tape from the A/C refrigerant components.

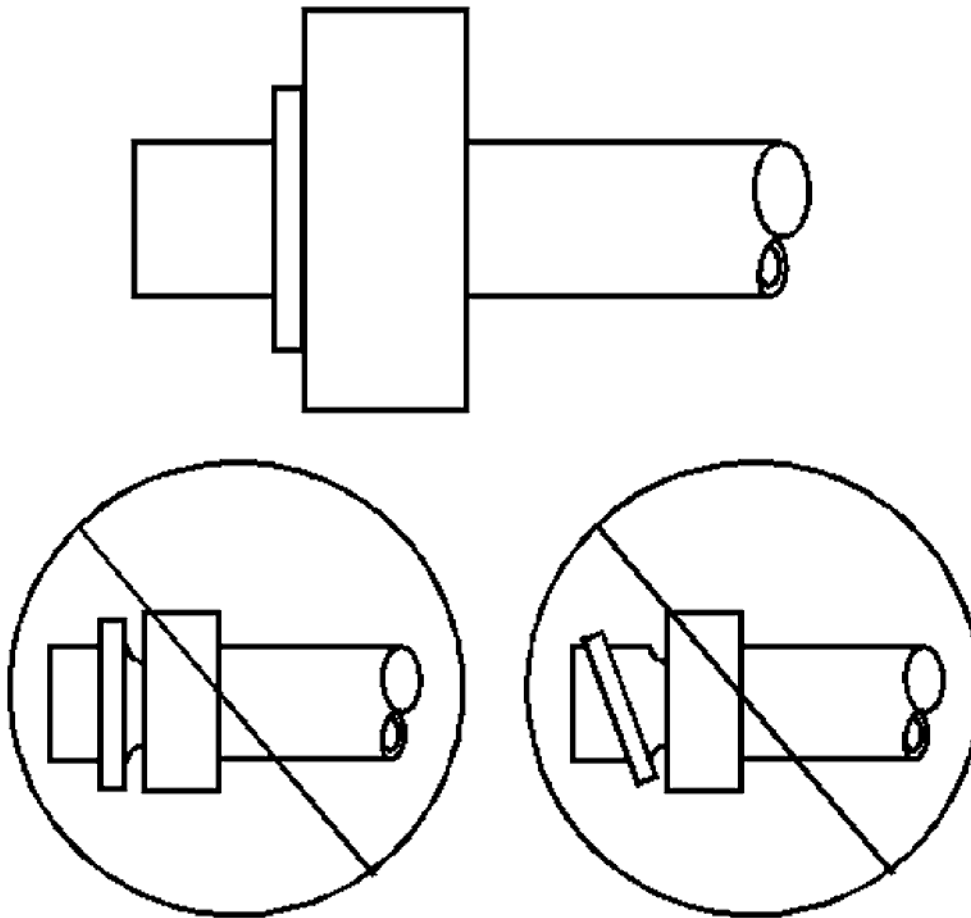


Fig. 28: Identifying Good And Bad Sealing Washer Positions
Courtesy of GENERAL MOTORS CORP.

3. Using a lint-free clean, dry cloth, clean the sealing surfaces of the A/C refrigerant components.
4. Carefully install the new seal washer onto the A/C refrigerant component.

The washer must completely bottom against the surface of the fitting.

IMPORTANT: After tightening the A/C components, there should be a slight sealing washer gap of approximately 1.2 mm (3/64 in) between the A/C line and the A/C component.

5. Assemble the remaining A/C refrigerant components. Refer to the appropriate repair procedure.

COMPRESSOR HOSE ASSEMBLY REPLACEMENT

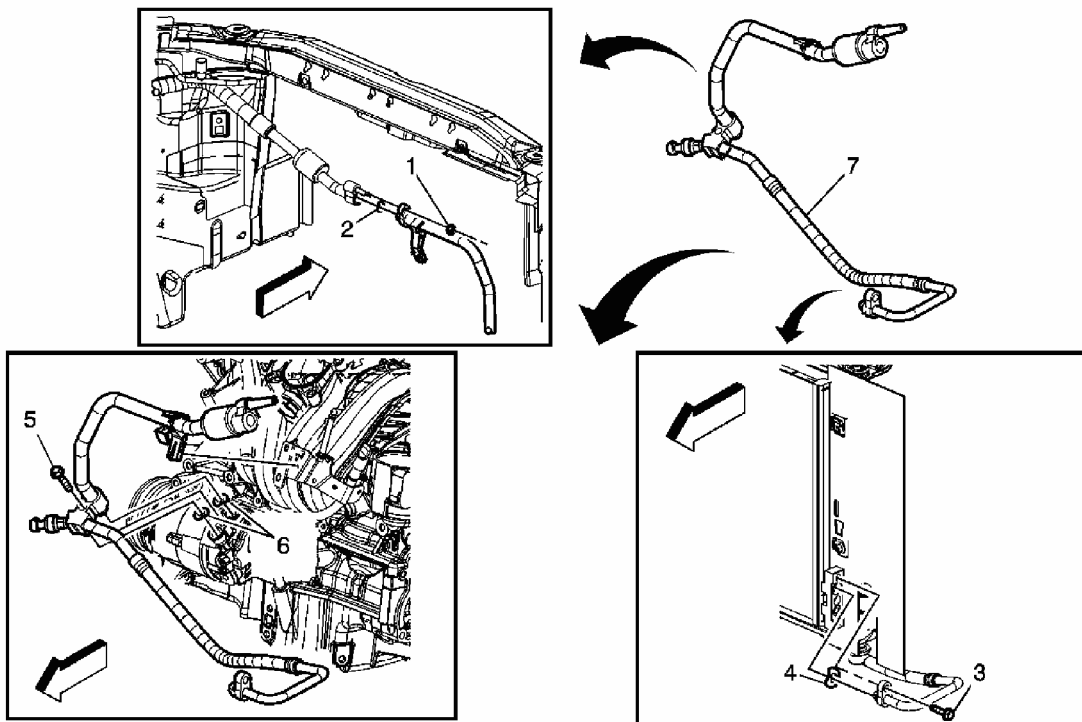


Fig. 29: Compressor Hose Assembly
Courtesy of GENERAL MOTORS CORP.

Compressor Hose Assembly Replacement

Callout	Component Name
NOTE: Refer to <u>Fastener Notice</u> .	

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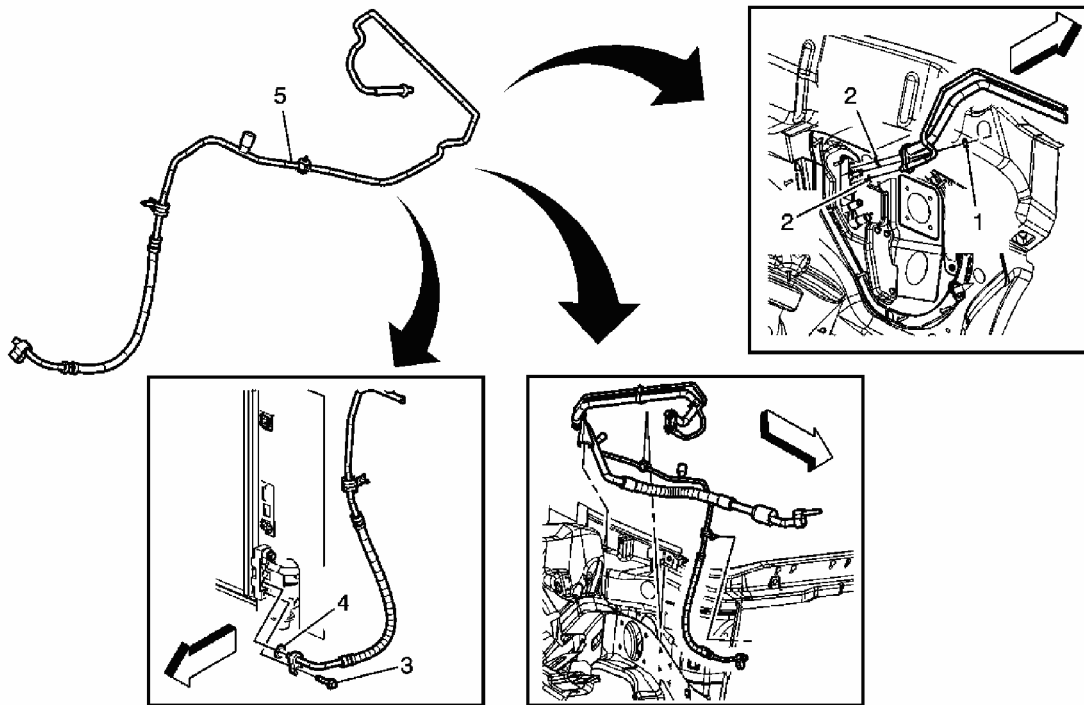
Fastener Tightening Specifications: Refer to **Fastener Tightening Specifications**.

Preliminary Procedure

1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging**.
2. Remove the air cleaner assembly. Refer to **Air Cleaner Assembly Replacement** for the 2.2L engine or **Air Cleaner Assembly Replacement** for the 2.4L engine.
3. Disconnect the A/C compressor pressure relief valve electrical connector.

1	Nut, A/C Compressor and TXV Hose Tighten: 20 N.m (15 lb ft)
2	Washer, Sealing Remove and discard sealing washers. Refer to Sealing Washer Replacement .
3	Nut, A/C Compressor and Condenser Tighten: 20 N.m (15 lb ft)
4	Washer, Sealing Remove and discard sealing washers. Refer to Sealing Washer Replacement .
5	Bolt, A/C Compressor Hose Tighten: 20 N.m (15 lb ft)
6	Washer, Sealing Remove and discard sealing washers. Refer to Sealing Washer Replacement .
7	Hose Assembly, A/C Compressor

CONDENSER TUBE REPLACEMENT

**Fig. 30: Condenser Tube**

Courtesy of GENERAL MOTORS CORP.

Condenser Tube Replacement

Callout	Component Name
NOTE: Refer to Fastener Notice . Fastener Tightening Specifications: Refer to Fastener Tightening Specifications . Preliminary Procedure 1. Recover the refrigerant. Refer to Refrigerant Recovery and Recharging . 2. Remove the air cleaner assembly. Refer to Air Cleaner Assembly Replacement for the 2.2L engine or Air Cleaner Assembly Replacement for the 2.4L engine.	
1	Nut, A/C Evaporator and Condenser Hose Assembly Tighten: 20 N.m (15 lb ft)
2	Washer, Sealing Remove and discard sealing washers. Refer to Sealing Washer Replacement .
3	Bolt, A/C Condenser Tube Assembly Tighten: 20 N.m (15 lb ft)

4	Washer, Sealing Remove and discard sealing washers. Refer to Sealing Washer Replacement .
5	Tube Assembly, A/C Condenser Tip: Remove the condenser tube from the clips connecting the condenser tube to the evaporator hose.

EVAPORATOR HOSE ASSEMBLY REPLACEMENT

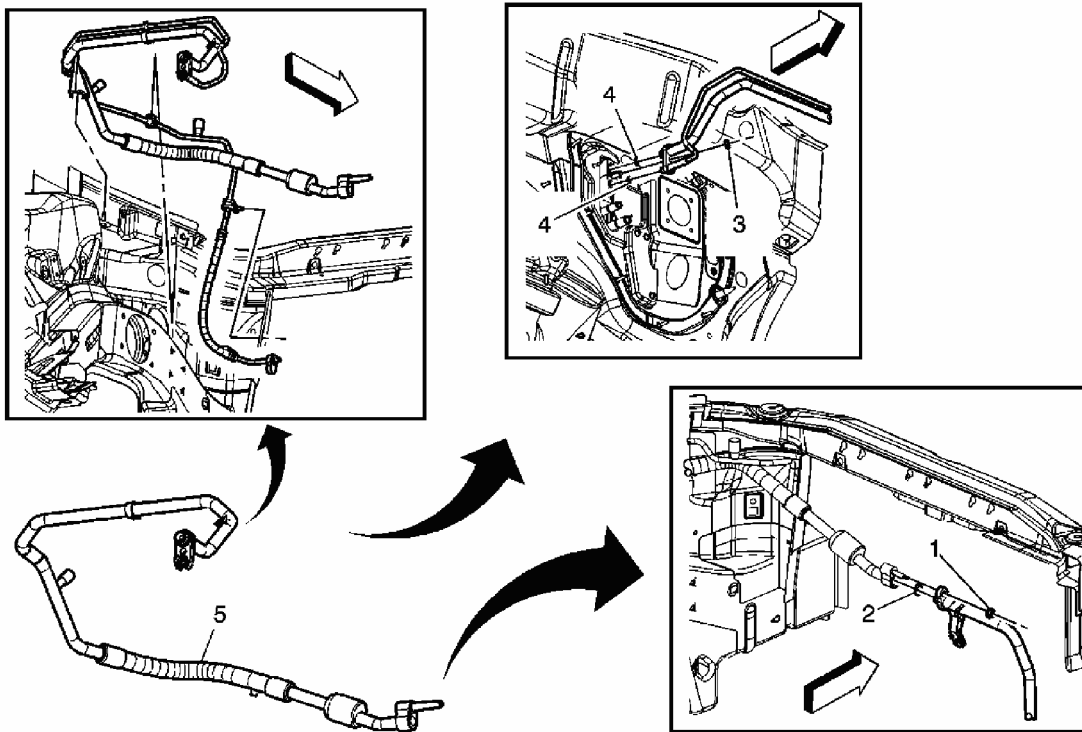


Fig. 31: Evaporator Hose Assembly
Courtesy of GENERAL MOTORS CORP.

Evaporator Hose Assembly Replacement

Callout	Component Name
NOTE: Refer to Fastener Notice. Fastener Tightening Specifications: Refer to Fastener Tightening Specifications. Preliminary Procedure 1. Recover the refrigerant. Refer to Refrigerant Recovery and Recharging. 2. Remove the air cleaner assembly. Refer to Air Cleaner Assembly Replacement	

for the 2.2L engine or **Air Cleaner Assembly Replacement** for the 2.4L engine.

1	Nut, A/C Compressor and Evaporator Hose Assembly Tighten: 20 N.m (15 lb ft)
2	Washer, Sealing Remove and discard sealing washers. Refer to Sealing Washer Replacement .
3	Nut, A/C Evaporator and Condenser Hose Assembly Tighten: 20 N.m (15 lb ft)
4	Washer, Sealing Remove and discard sealing washers. Refer to Sealing Washer Replacement .
5	Hose Assembly, A/C Evaporator

AIR CONDITIONING (A/C) REFRIGERANT FILTER REPLACEMENT

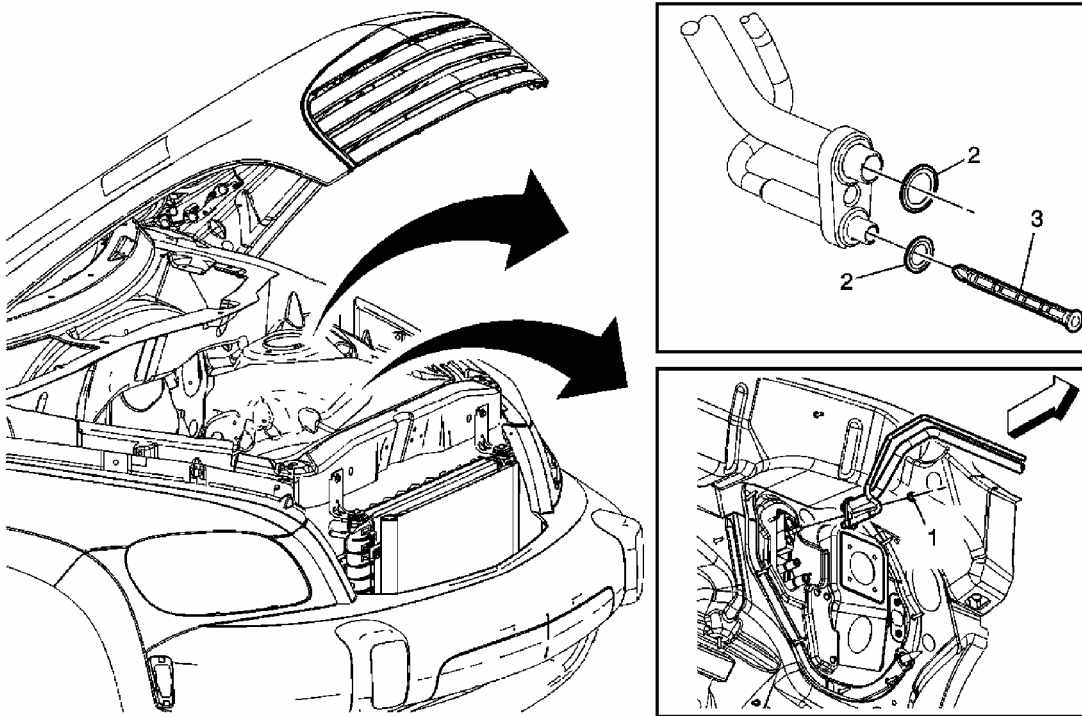


Fig. 32: A/C Refrigerant Filter
Courtesy of GENERAL MOTORS CORP.

Air Conditioning (A/C) Refrigerant Filter Replacement

Callout	Component Name
NOTE: Refer to Fastener	

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Notice .

Fastener Tightening Specifications: Refer to **Fastener Tightening Specifications**.

Preliminary Procedure

1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging**.
2. Remove the air cleaner assembly. Refer to **Air Cleaner Assembly Replacement** for the 2.2L engine or **Air Cleaner Assembly Replacement** for the 2.4L engine.

1	Nut, A/C Evaporator and Condenser Hose Assembly Tighten: 20 N.m (15 lb ft)
2	Washer, Sealing Remove and discard sealing washers. Refer to <u>Sealing Washer Replacement</u> .
3	Filter, A/C Refrigerant

SUCTION SCREEN INSTALLATION

Tools Required

J 44551 Suction Screen Kit. See **Special Tools**.

IMPORTANT: Suction screens are intended to be installed in the suction hose after a major compressor failure.

The suction screens are available in 3 different sizes.

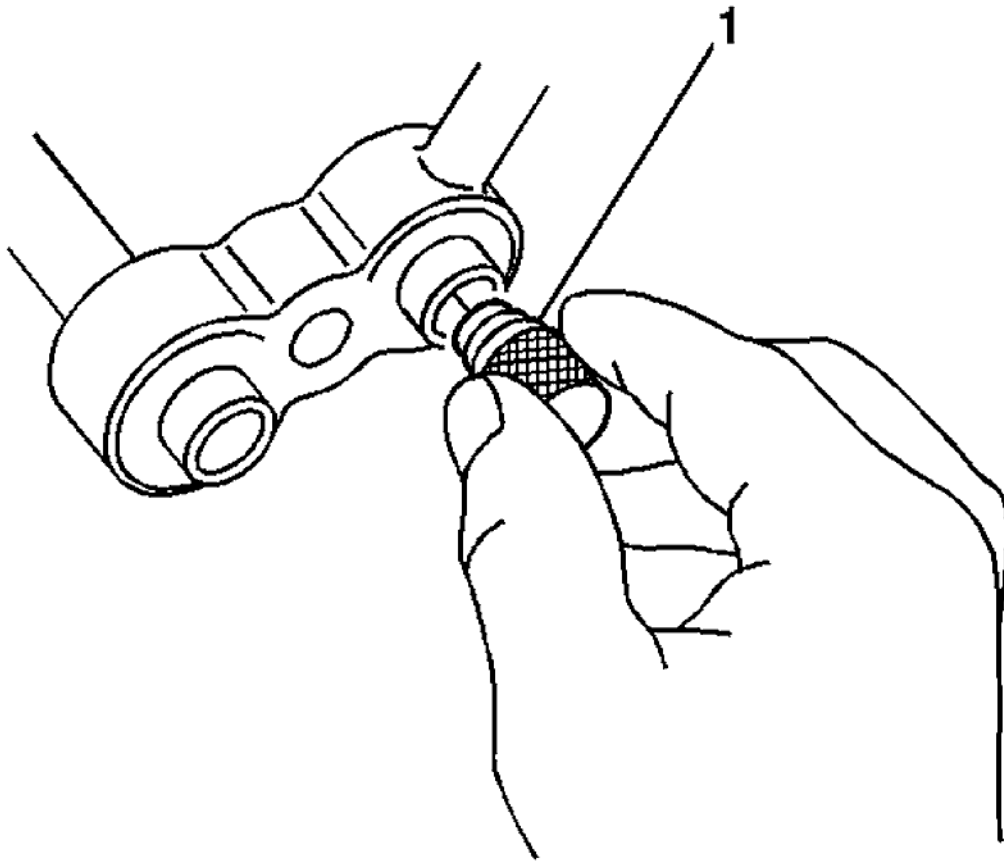


Fig. 33: View Of J 44551-6

Courtesy of GENERAL MOTORS CORP.

1. Insert the J 44551-6 Sizing Tool (1) into the suction hose to select the correct size suction screen.
2. Insert the suction screen into the compressor end of the suction hose.

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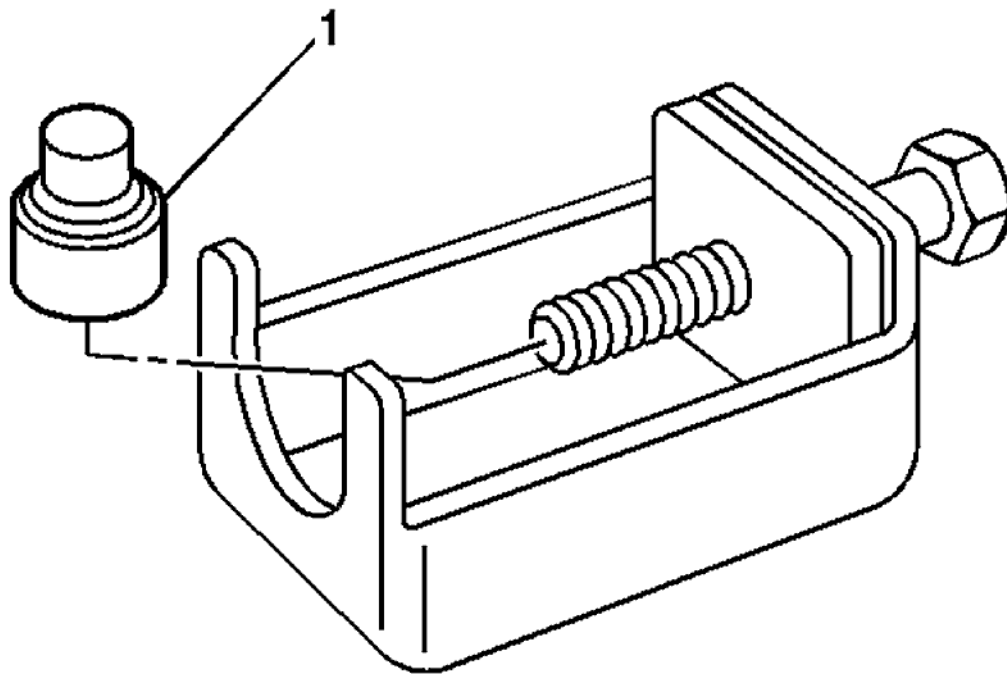


Fig. 34: Installing Mandrel To J 44551-5
Courtesy of GENERAL MOTORS CORP.

3. Install the correct mandrel (1) to the J 44551-5 Screen Installation Tool.

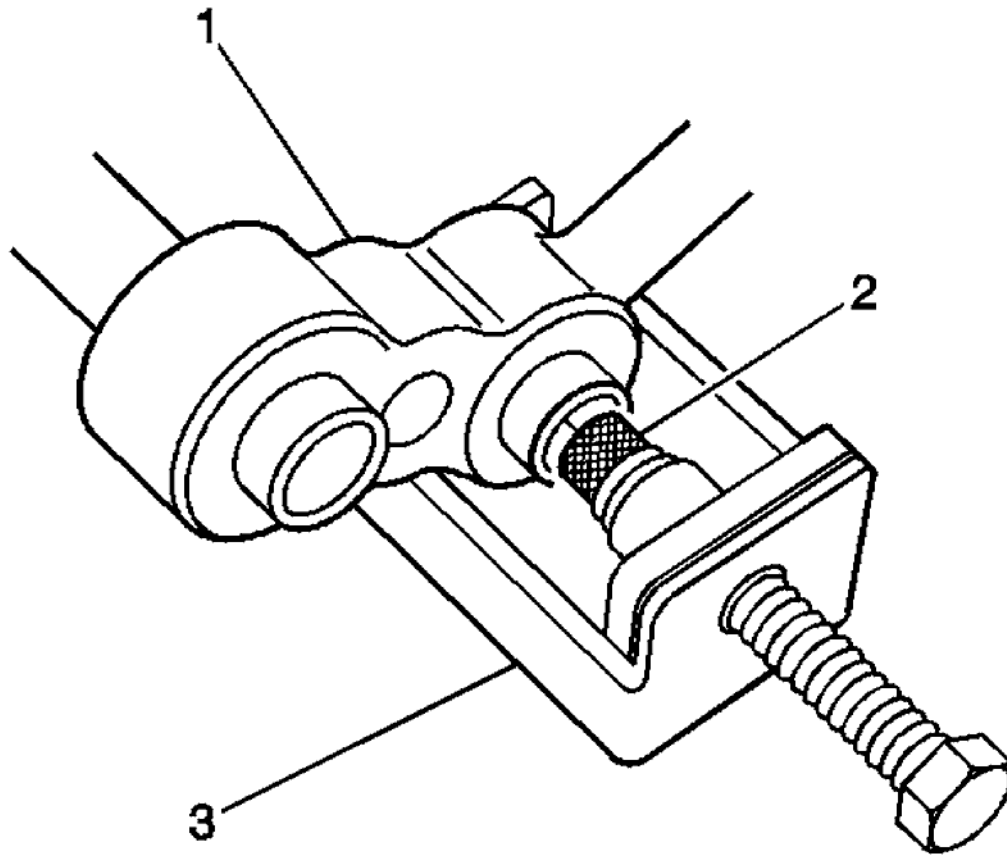


Fig. 35: Proper Placement Of J 44551-5
Courtesy of GENERAL MOTORS CORP.

4. Install the J 44551-5 (3) over the end of the suction hose and the suction screen (2).

IMPORTANT: Correct placement of the J 44551-5 is critical.

5. Tighten the forcing screw of the J 44551-5.

The suction screen is fully installed when the screen is flush with the end of the suction hose fitting.

6. Remove the J 44551-5 from the suction hose.
7. Install the J 44551-1 Suction Screen Notification Label.

Tools Required

- **J 39400-A** Halogen Leak Detector
- **J 46246** Valve Core Tool. See **Special Tools**.

Removal Procedure

1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging**.

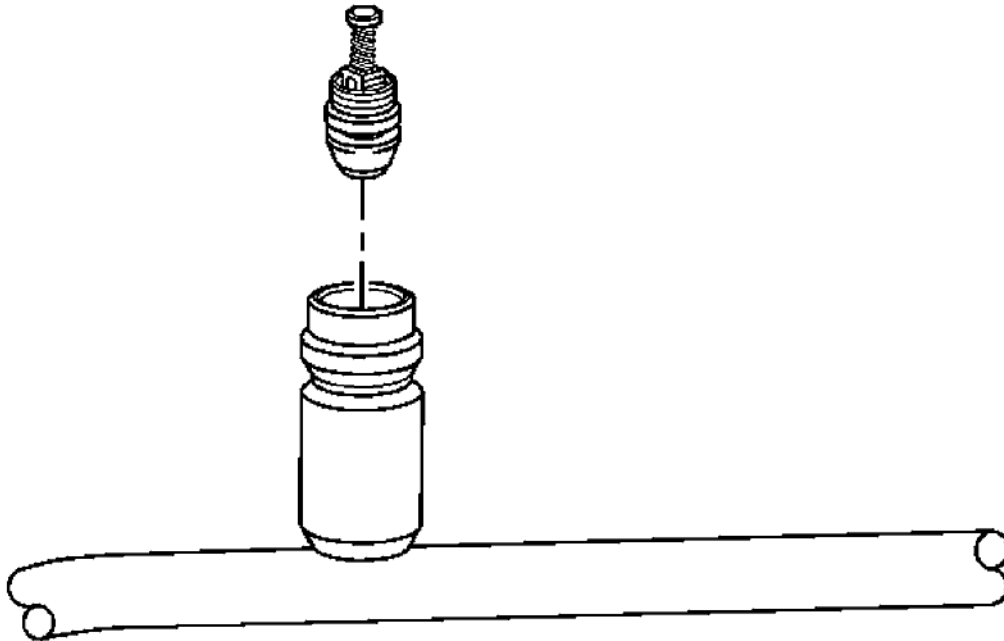


Fig. 36: View Of Service Port Valve Core
Courtesy of GENERAL MOTORS CORP.

2. Remove the service port valve core using **J 46246** or equivalent. See **Special Tools**.

Installation Procedure

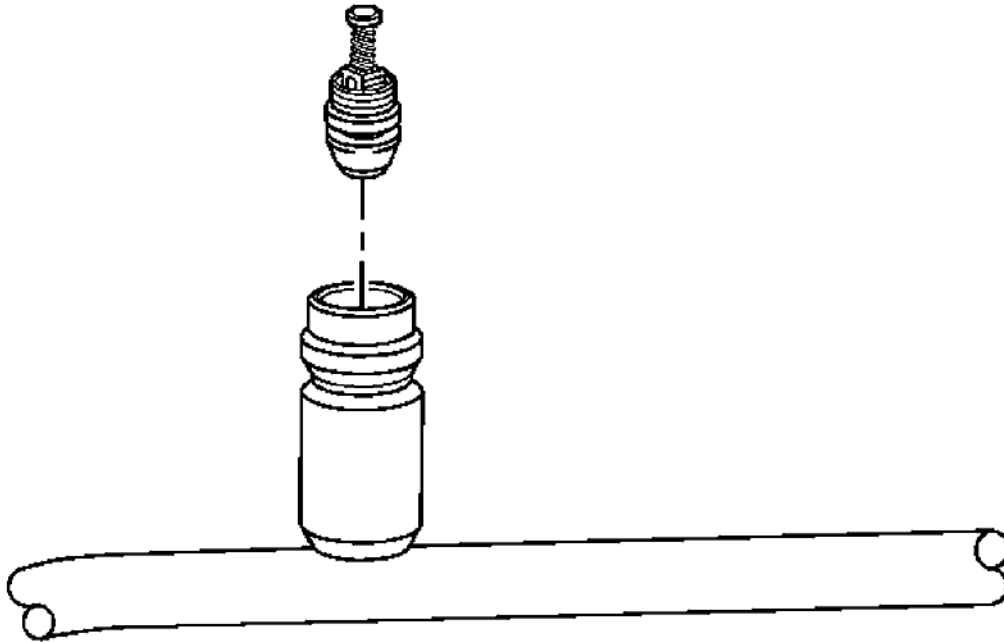


Fig. 37: View Of Service Port Valve Core
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice in Cautions and Notices.

1. Install the service port valve core using **J 46246** or equivalent. See Special Tools.
- Tighten:** Tighten the service port valve core to 2.5 N.m (22 lb in).
2. Evacuate and charge the refrigerant system. Refer to Refrigerant Recovery and Recharging.
3. Leak test the fittings using the **J 39400-A**.

THERMAL EXPANSION VALVE REPLACEMENT

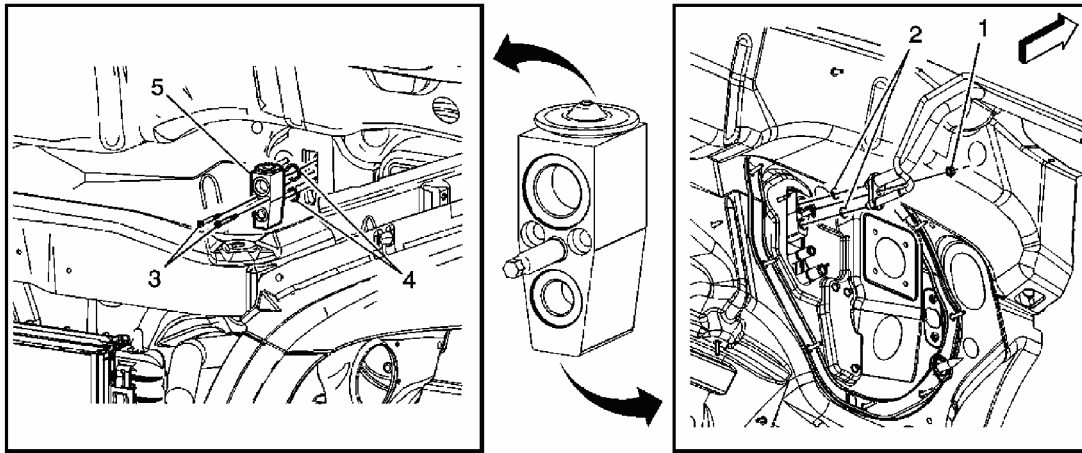


Fig. 38: Thermal Expansion Valve
 Courtesy of GENERAL MOTORS CORP.

Thermal Expansion Valve Replacement

Callout	Component Name
NOTE: Refer to Fastener Notice . Fastener Tightening Specifications: Refer to Fastener Tightening Specifications.Preliminary Procedure: Recover the refrigerant. Refer to Refrigerant Recovery and Recharging .	
1	Nut, A/C Evaporator and Condenser Hose
2	Washer, Sealing Remove and discard sealing washers. Refer to Sealing Washer Replacement .
3	Bolt, Thermal Expansion Valve (Qty: 2) Tighten: 7 N.m (62 lb in)
4	Washer, Sealing Remove and discard sealing washers. Refer to Sealing Washer Replacement .
5	Valve, Thermal Expansion

AIR CONDITIONING (A/C) REFRIGERANT PRESSURE SENSOR REPLACEMENT

Tools Required

J 39400-A Halogen Leak Detector

Removal Procedure

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1. Raise the vehicle. Refer to **Lifting and Jacking the Vehicle** in General Information.

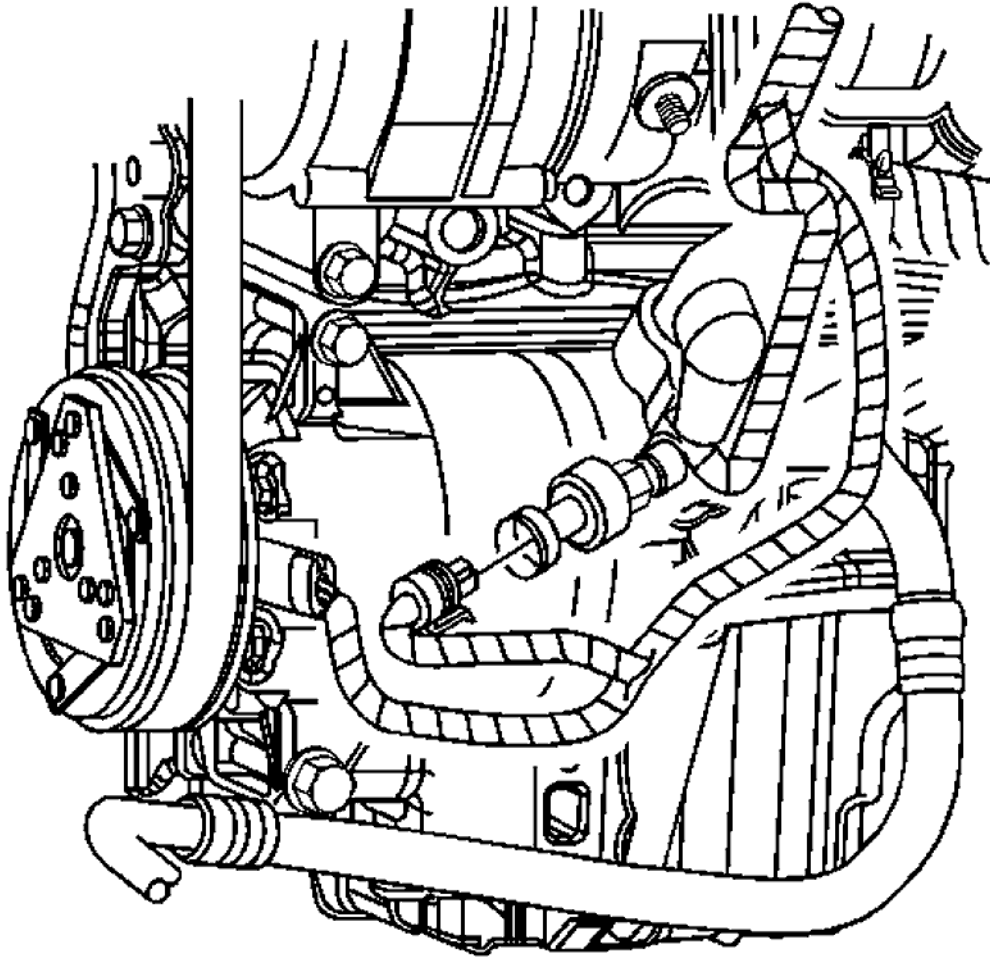


Fig. 39: View Of Pressure Transducer Electrical Connector
Courtesy of GENERAL MOTORS CORP.

2. Disconnect the electrical connector from the pressure sensor.

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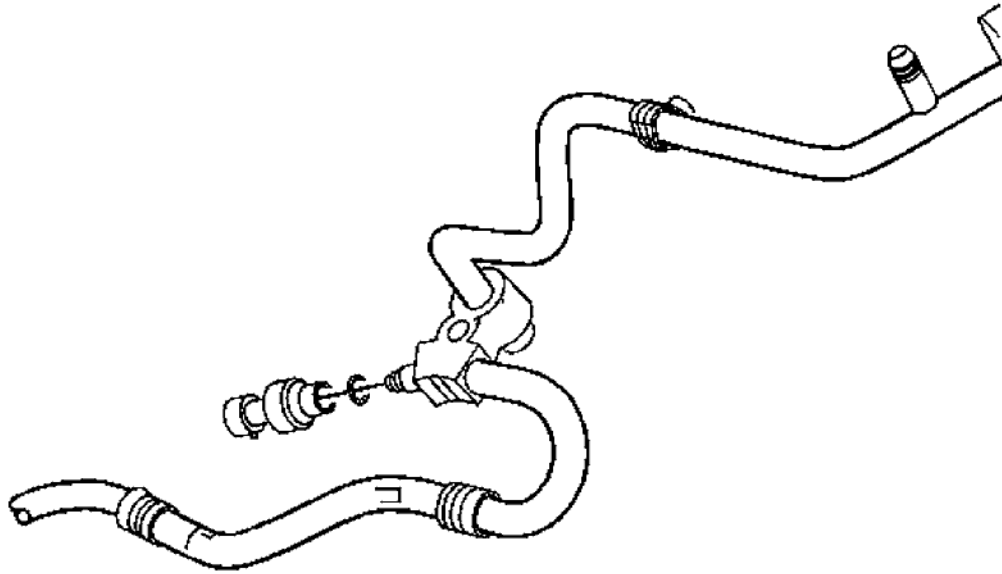


Fig. 40: View Of A/C Refrigerant Pressure Sensor
Courtesy of GENERAL MOTORS CORP.

3. Remove the pressure sensor from the compressor hose.
4. Remove and discard the seal.

Installation Procedure

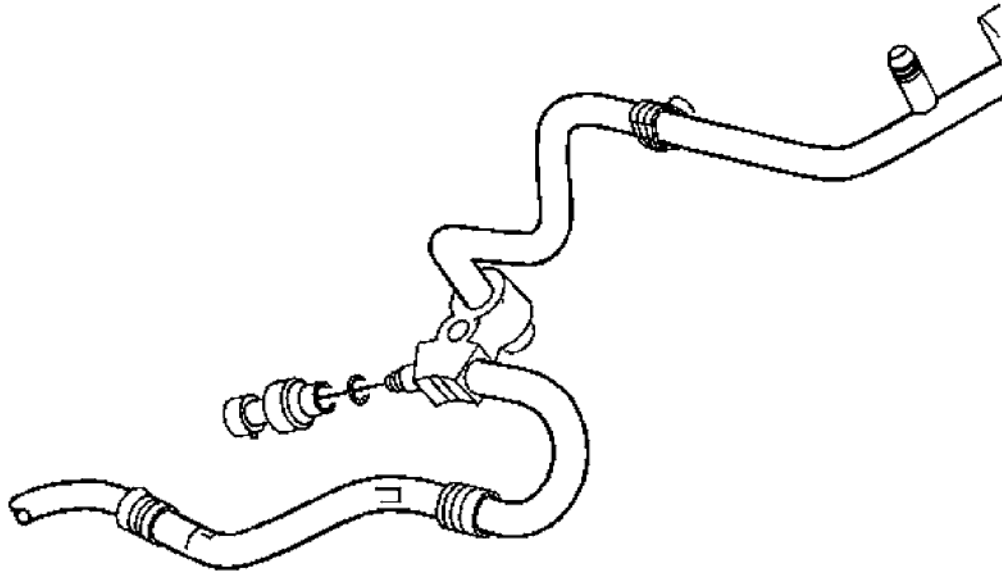


Fig. 41: View Of A/C Refrigerant Pressure Sensor
Courtesy of GENERAL MOTORS CORP.

1. Install a new seal in the pressure sensor.

NOTE: Refer to Fastener Notice .

2. Install the pressure sensor to the compressor hose.

Tighten: Tighten the pressure sensor to 5 N.m (44 lb in).

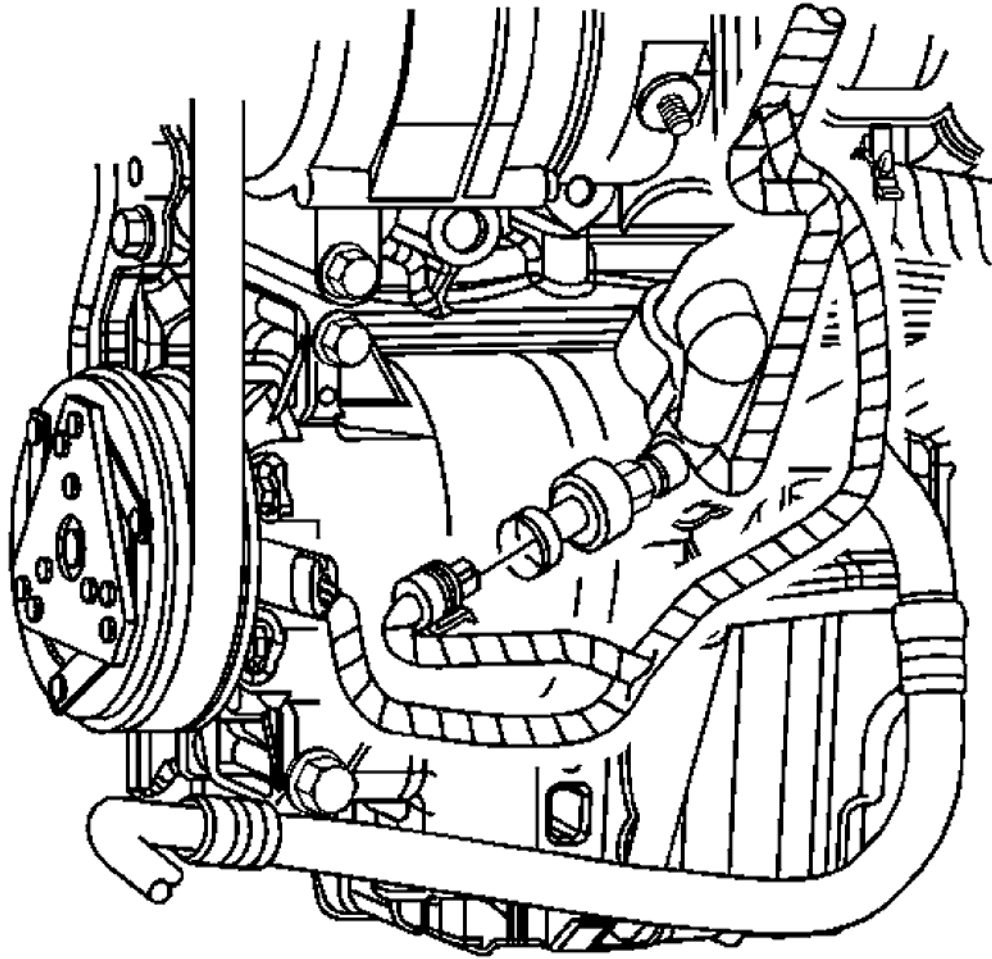


Fig. 42: View Of Pressure Transducer Electrical Connector
Courtesy of GENERAL MOTORS CORP.

3. Connect the pressure sensor electrical connector.
4. Lower the vehicle.
5. Leak test the fittings using the J 39400-A .

CONDENSER REPLACEMENT

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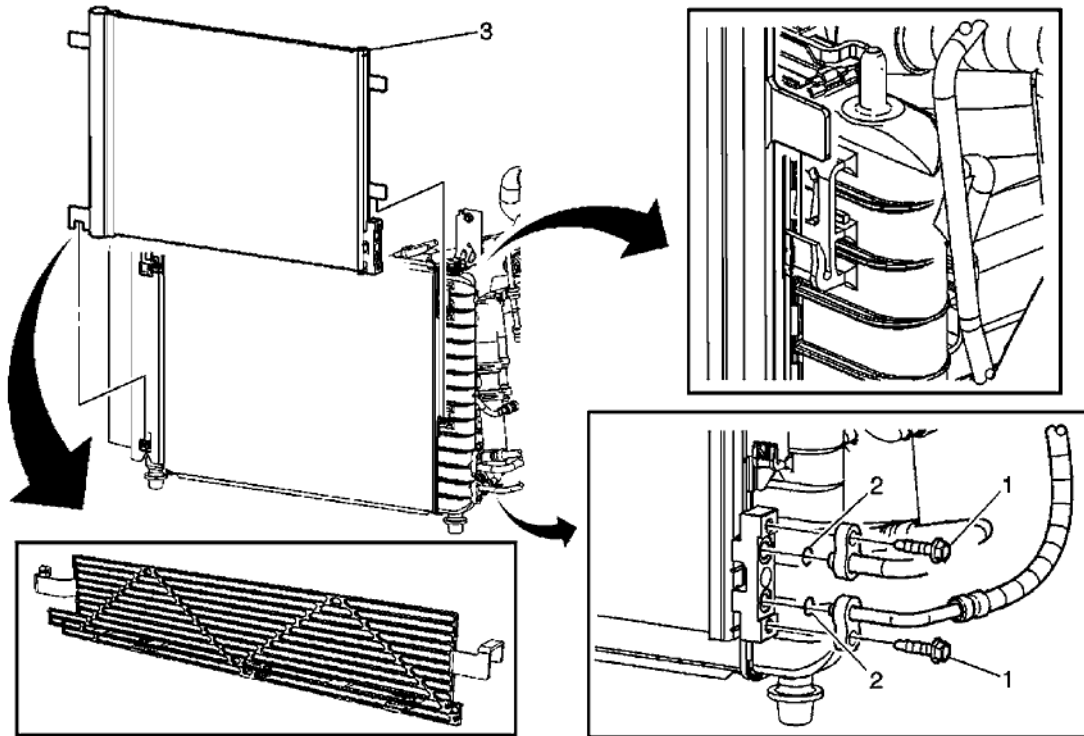


Fig. 43: Condenser Replacement
Courtesy of GENERAL MOTORS CORP.

Condenser Replacement

Callout	Component Name
NOTE: Refer to <u>Fastener Notice</u> .	
Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u> . Preliminary Procedure: Recover the refrigerant. Refer to <u>Refrigerant Recovery and Recharging</u> .	
1	Bolt, A/C Condenser Hose (Qty: 2) Tighten: 20 N.m (15 lb in)
2	Sealing Washer Remove and discard sealing washers. Refer to <u>Sealing Washer Replacement</u> .
3	Condenser Assembly Tip: Release the condenser from the radiator by squeezing the tabs on the radiator holding the condenser.

AIR CONDITIONING (A/C) EVAPORATOR CASE ASSEMBLY REPLACEMENT

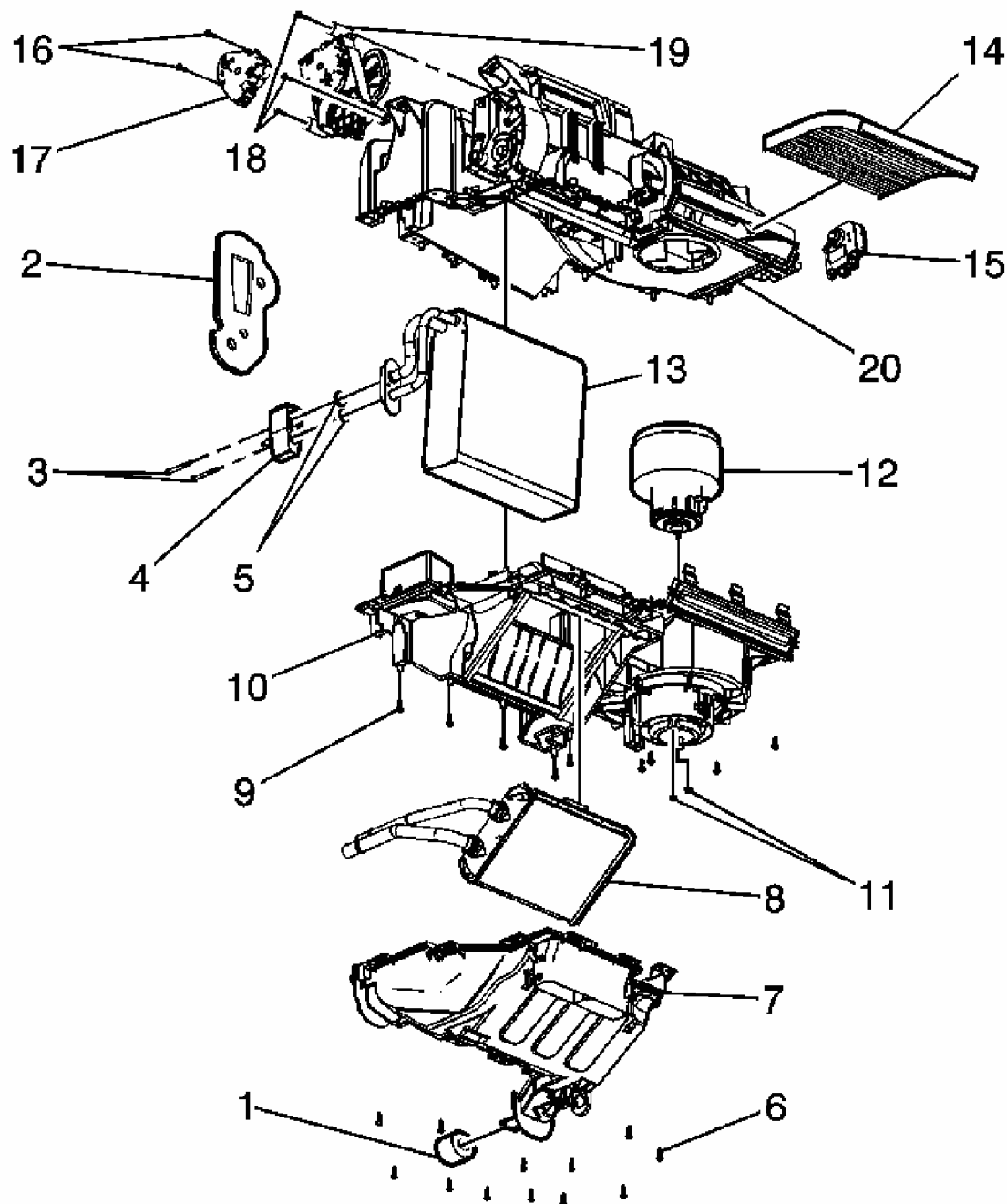


Fig. 44: A/C Evaporator Case Assembly Replacement
 Courtesy of GENERAL MOTORS CORP.

Air Conditioning (A/C) Evaporator Case Assembly Replacement

Callout	Component Name
NOTE: Refer to Fastener Notice . Fastener Tightening Specifications: Refer to Fastener Tightening Specifications.	

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Preliminary Procedure

1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging**.
2. Remove the HVAC module. Refer to **HVAC Module Assembly Replacement**
3. Remove the HVAC module wiring harness from the HVAC module.

1	Heater and A/C Evaporator and Blower Module Drain Tube Seal
2	Heater and A/C Evaporator Tube Seal
3	A/C Evaporator Thermal Expansion Valve (TXV) Bolts (Qty: 2) Tighten: 7 N.m (62 lb in)
4	A/C Evaporator Thermal Expansion Valve Assembly
5	Sealing Washer Remove and discard sealing washers. Refer to Sealing Washer Replacement .
6	Cover Assembly Screw - Heater (Qty: 12) Tighten: 1.5 N.m (13 lb in)
7	Heater Cover Assembly Tip: Remove the heater core cover heat stakes using a small chisel.
8	Heater Core Assembly
9	Case Assembly Screws - A/C Evaporator and Blower Lower (Qty: 9) Tighten: 1.5 N.m (13 lb in)
10	A/C Evaporator and Blower Case - Lower
11	Blower Motor Nuts (Qty: 2) Tighten: 2.4 N.m (21 lb in)
12	Blower Motor Assembly
13	A/C Evaporator Assembly Tip: Remove the heater core cover heat stakes using a small chisel.
14	Passenger Compartment Air Filter
15	Air Inlet Valve Actuator Assembly Tip: Unsnap the actuator assembly from the A/C evaporator and blower case - upper.
16	Actuator Assembly Screws - Temperature Valve (Qty: 2) Tighten: 1.5 N.m (13 lb in)
17	Temperature Valve Actuator Assembly
18	Cam Assembly Screws - Mode (Qty: 3) Tighten: 1.5 N.m (13 lb in)

19	Mode Cam Assembly
20	A/C Evaporator and Blower Case - Upper

HVAC MODULE ASSEMBLY REPLACEMENT

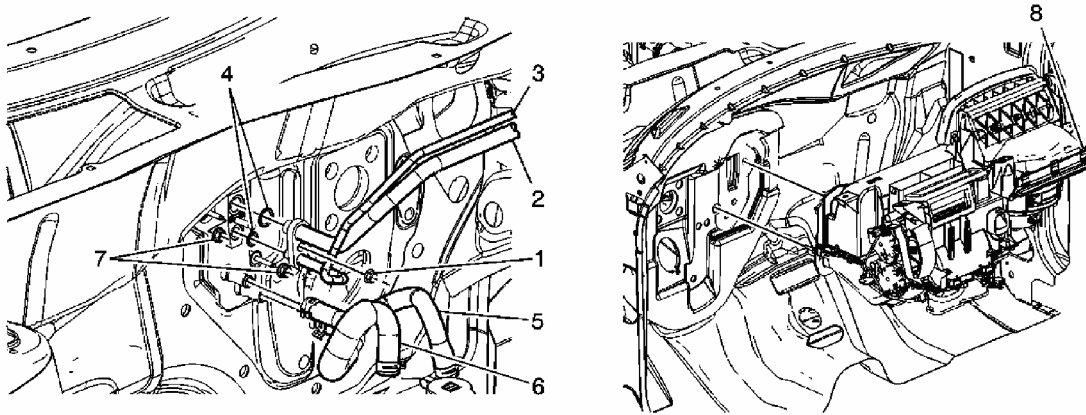


Fig. 45: HVAC Module Assembly Replacement
 Courtesy of GENERAL MOTORS CORP.

HVAC Module Assembly Replacement

Callout	Component Name
NOTE: Refer to Fastener Notice . Fastener Tightening Specifications: Refer to Fastener Tightening Specifications . Preliminary Procedure 1. Recover the refrigerant. Refer to Refrigerant Recovery and Recharging . 2. Partially drain the cooling system. Refer to Draining and Filling Cooling System (Static Fill) or Draining and Filling Cooling System (GE 47716 Fill) .	
1	A/C Evaporator and Condenser Hose Assembly Nut Tighten: 7 N.m (62 lb in)
2	A/C Evaporator Hose Assembly
3	A/C Condenser Tube Assembly
4	Sealing Washer Tip: Remove and discard sealing washers. Refer to Sealing Washer Replacement .
5	Heater Outlet Hose Tip: Use J 38185 to reposition clamp on the heater outlet hose from the

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	heater core.
6	Heater Inlet Hose Tip: Use J 38185 to reposition clamp on the heater inlet hose from the heater core.
7	HVAC Module Assembly Nut (Qty: 2) Tighten: 10 N.m (89 lb in)
8	HVAC Module Assembly

EVAPORATOR CORE REPLACEMENT

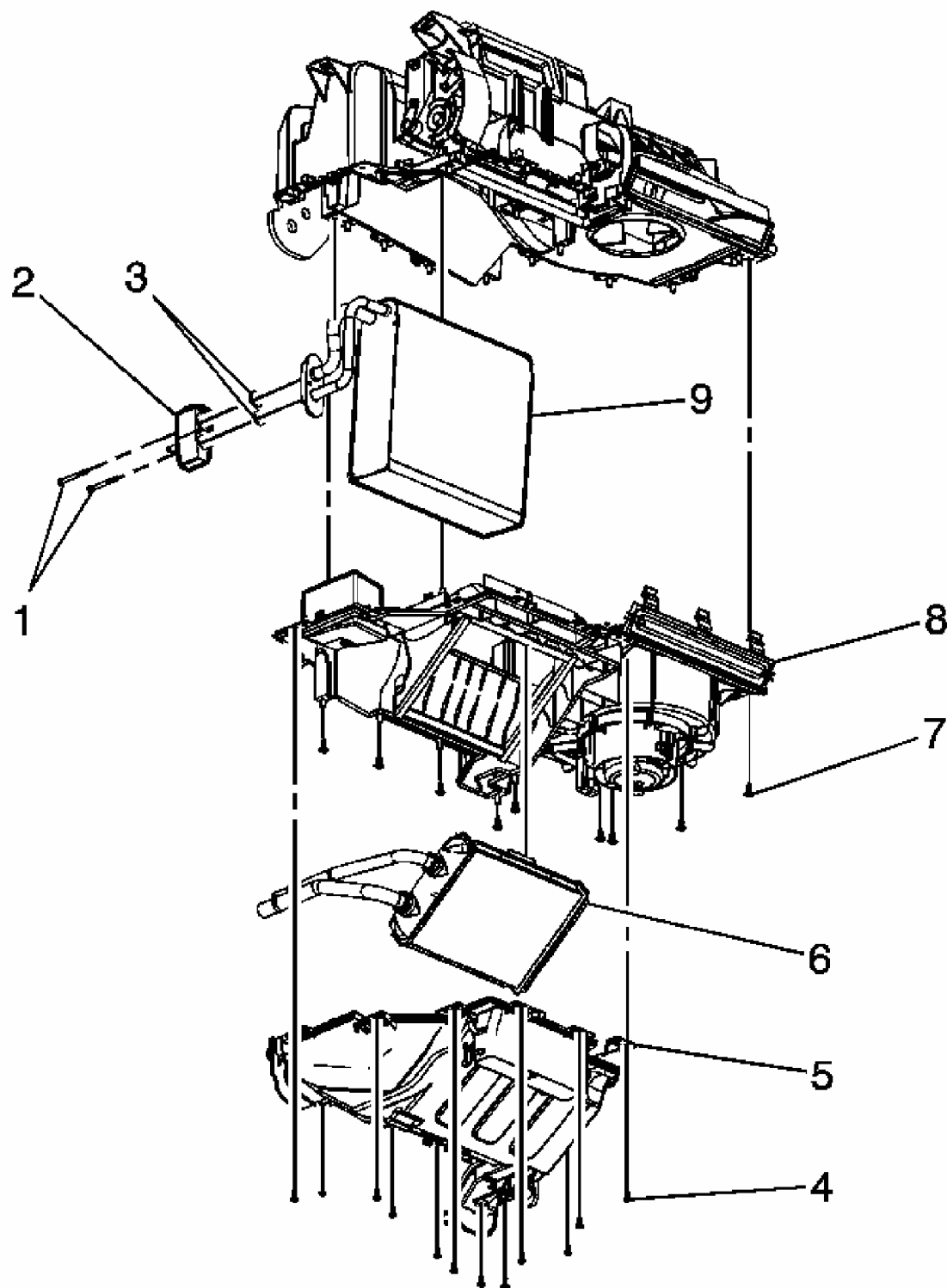


Fig. 46: Evaporator Core Replacement
 Courtesy of GENERAL MOTORS CORP.

Evaporator Core Replacement

Callout	Component Name

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NOTE:

Refer to **Fastener Notice** .

Fastener Tightening Specifications: Refer to **Fastener Tightening Specifications**.

Preliminary Procedure

1. Recover the refrigerant. Refer to **Refrigerant Recovery and Recharging**.
2. Remove the HVAC module. Refer to **HVAC Module Assembly Replacement**
3. Remove the HVAC module wiring harness from the HVAC module.

1	A/C Evaporator Thermal Expansion Valve (TXV) Bolts (Qty: 2) Tighten: 7 N.m (62 lb in)
2	A/C Evaporator Thermal Expansion Valve Assembly
3	Sealing Washer Remove and discard sealing washers. Refer to Sealing Washer Replacement .
4	Cover Assembly - Heater Screws (Qty: 12) Tighten: 1.5 N.m (13 lb in)
5	Heater Cover Assembly Tip: Remove the heater core cover heat stakes using a small chisel.
6	Heater Core Assembly
7	Case Assembly Screws - A/C Evaporator and Blower Lower (Qty: 9) Tighten: 1.5 N.m (13 lb in)
8	A/C Evaporator and Blower Case - Lower
9	A/C Evaporator Assembly Tip: Remove the heater core cover heat stakes using a small chisel.

HEATER HOSE REPLACEMENT - INLET

Tools Required

J 38185 Hose Clamp Pliers

Removal Procedure

1. Drain the coolant. Refer to **Draining and Filling Cooling System (Static Fill)** or **Draining and Filling Cooling System (GE 47716 Fill)** .
2. Remove the surge tank from the surge tank bracket.
3. Reposition the heater inlet hose clamp at the heater core using the **J 38185** .

4. Reposition the heater inlet hose clamp at the engine using the **J 38185** .

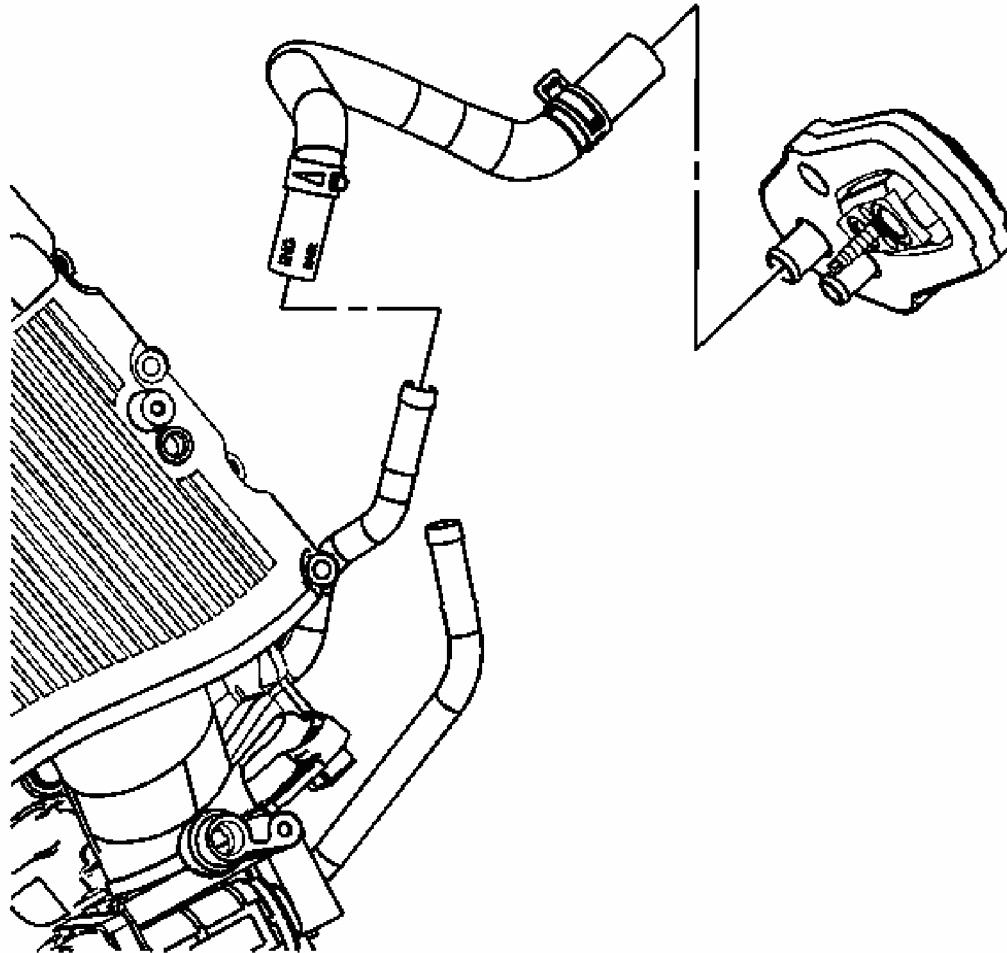


Fig. 47: Removing Heater Inlet Hose From Heater Core
Courtesy of GENERAL MOTORS CORP.

5. Remove the heater inlet hose from the heater core.
6. Remove the heater inlet hose from the engine.
7. Remove both heater inlet hose clamps from the heater inlet hose.

Installation Procedure

1. Install both heater inlet hose clamps to the heater inlet hose.

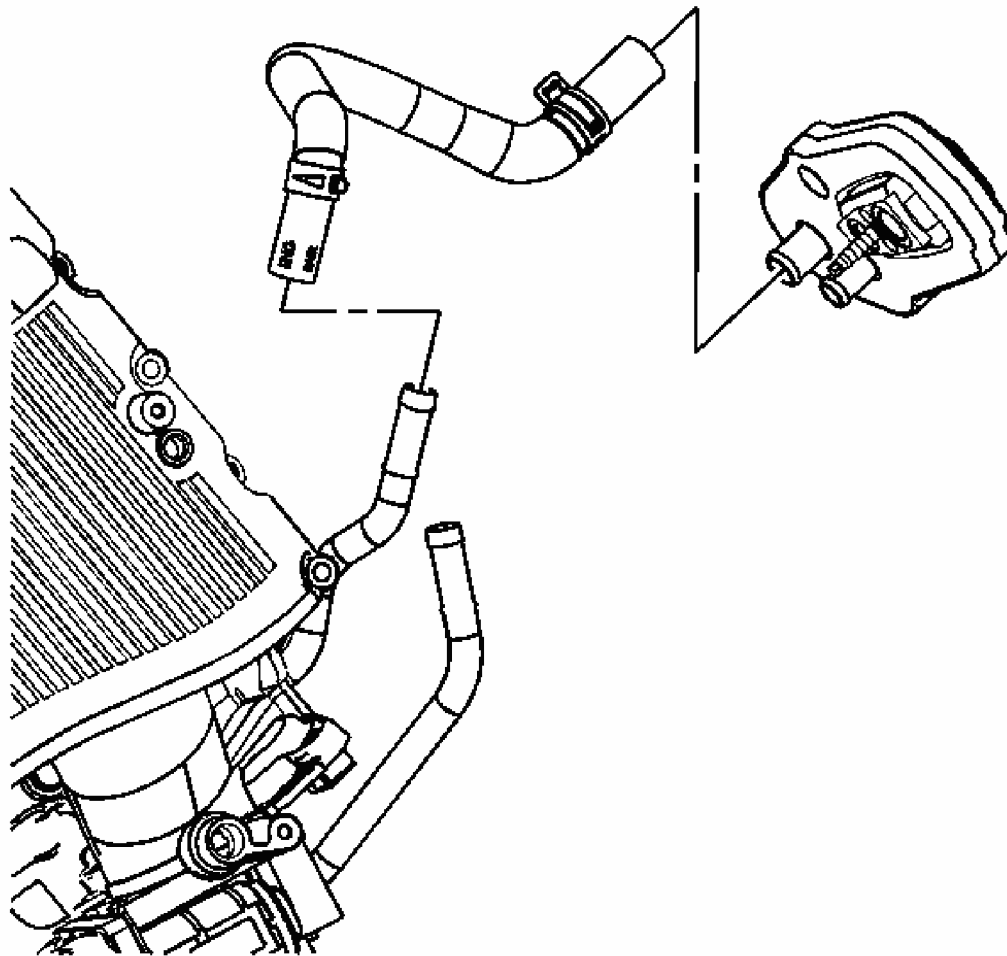


Fig. 48: Removing Heater Inlet Hose From Heater Core
Courtesy of GENERAL MOTORS CORP.

2. Install the heater inlet hose to the engine.
3. Install the heater inlet hose to the heater core.
4. Reposition the heater inlet hose clamp at the engine using the **J 38185** .
5. Reposition the heater inlet hose clamp at the heater core using the **J 38185** .
6. Install the surge tank to the surge tank bracket.
7. Fill the coolant. Refer to **Draining and Filling Cooling System (Static Fill)** or **Draining and Filling Cooling System (GE 47716 Fill)** .

HEATER HOSE REPLACEMENT - OUTLET

Tools Required

J 38185 Hose Clamp Pliers**Removal Procedure**

1. Drain the coolant. Refer to **Draining and Filling Cooling System (Static Fill)** or **Draining and Filling Cooling System (GE 47716 Fill)** .
2. Remove the surge tank from the surge tank bracket.
3. Reposition the heater outlet hose clamp at the heater core using the **J 38185** .
4. Reposition the heater outlet hose clamp at the engine using the **J 38185** .

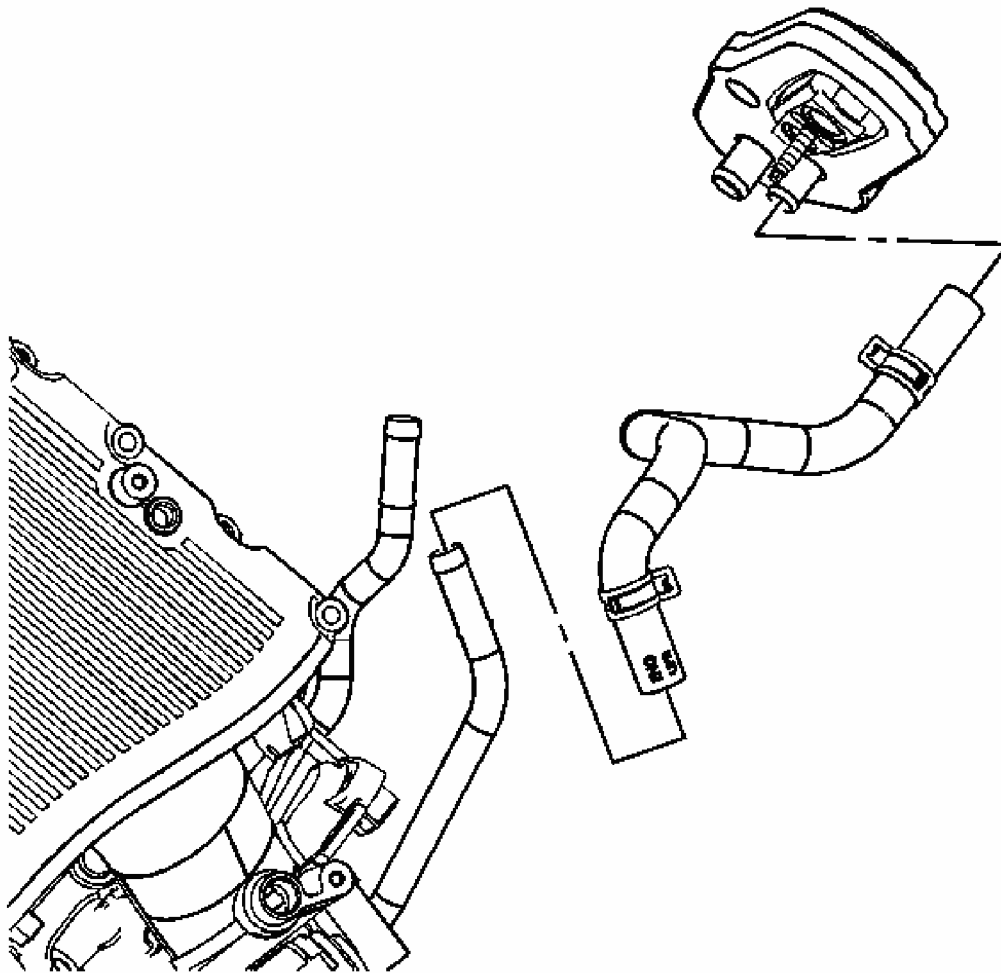


Fig. 49: Removing Heater Outlet Hose From Heater Core
Courtesy of GENERAL MOTORS CORP.

5. Remove the heater outlet hose from the heater core.

6. Remove the heater outlet hose from the engine.
7. Remove both heater outlet hose clamps from the heater outlet hose.

Installation Procedure

1. Install both heater outlet hose clamps to the heater outlet hose.

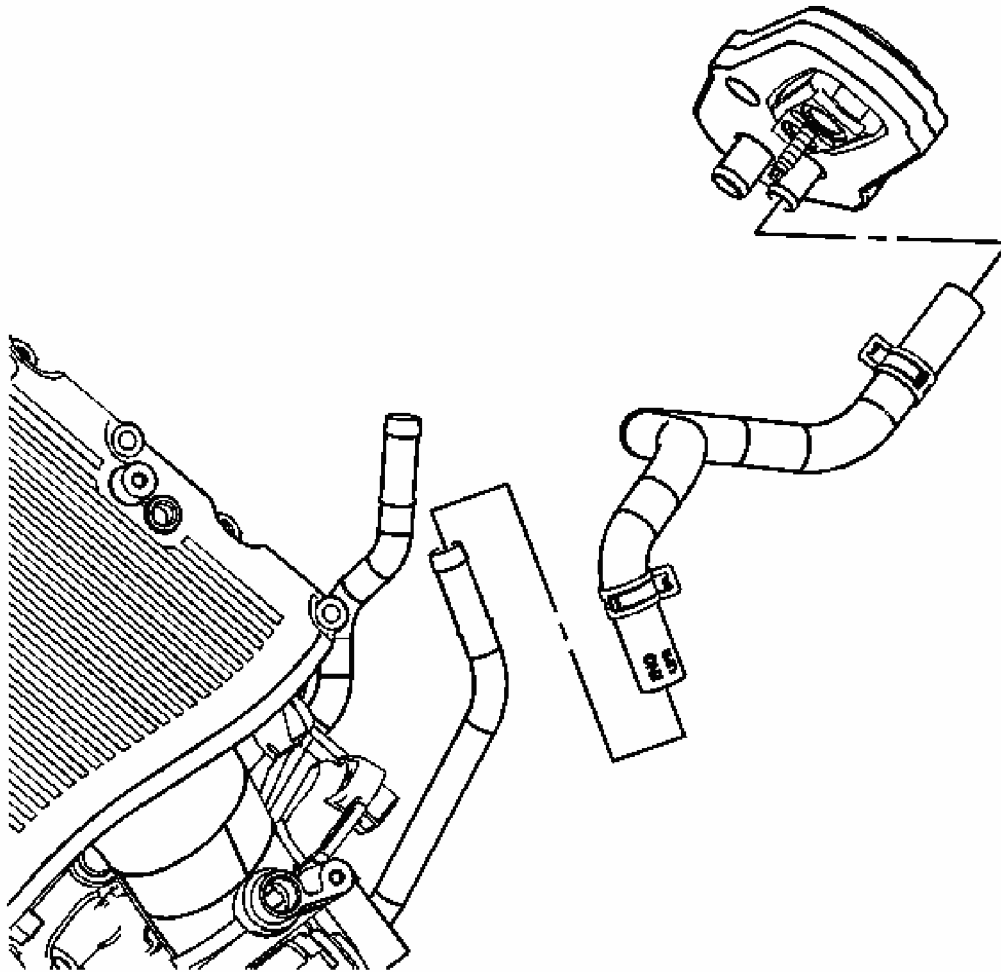


Fig. 50: Removing Heater Outlet Hose From Heater Core
Courtesy of GENERAL MOTORS CORP.

2. Install the heater outlet hose to the engine.
3. Install the heater outlet hose to the heater core.
4. Reposition the heater outlet hose clamp at the engine using the **J 38185**.
5. Reposition the heater outlet hose clamp at the heater core using the **J 38185**.

6. Install the surge tank to the surge tank bracket.
7. Fill the coolant. Refer to **Draining and Filling Cooling System (Static Fill)** or **Draining and Filling Cooling System (GE 47716 Fill)** .

PASSENGER COMPARTMENT AIR FILTER REPLACEMENT

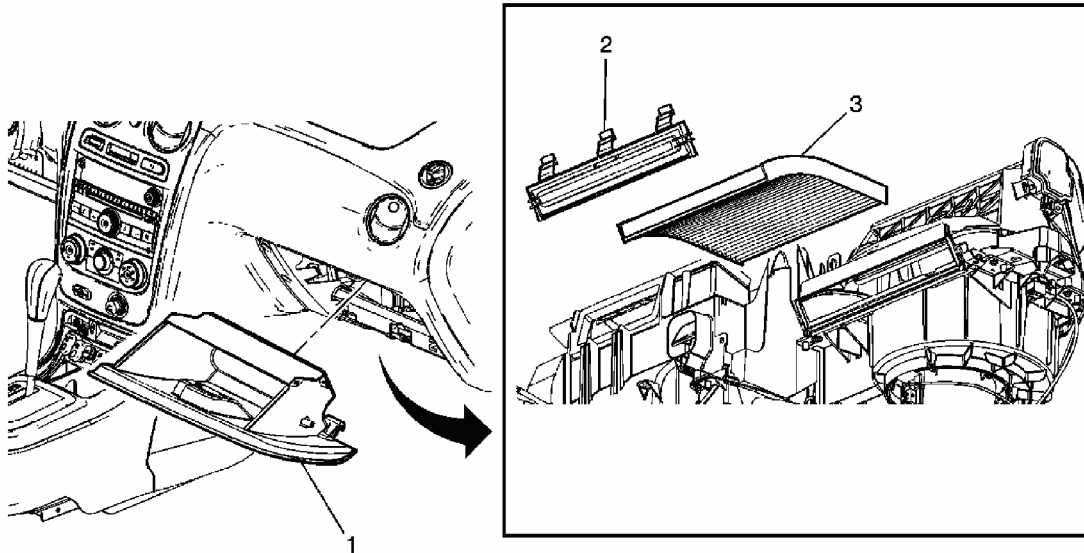


Fig. 51: Passenger Compartment Air Filter Replacement
 Courtesy of GENERAL MOTORS CORP.

Passenger Compartment Air Filter Replacement

Callout	Component Name
Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u>.	
1	Instrument Panel Compartment Remove the instrument panel (I/P) compartment. Refer to <u>Compartment Replacement - Instrument Panel (I/P)</u> .
2	Passenger Compartment Air Filter Cover
3	Passenger Compartment Air Filter

BLOWER MOTOR RESISTOR REPLACEMENT

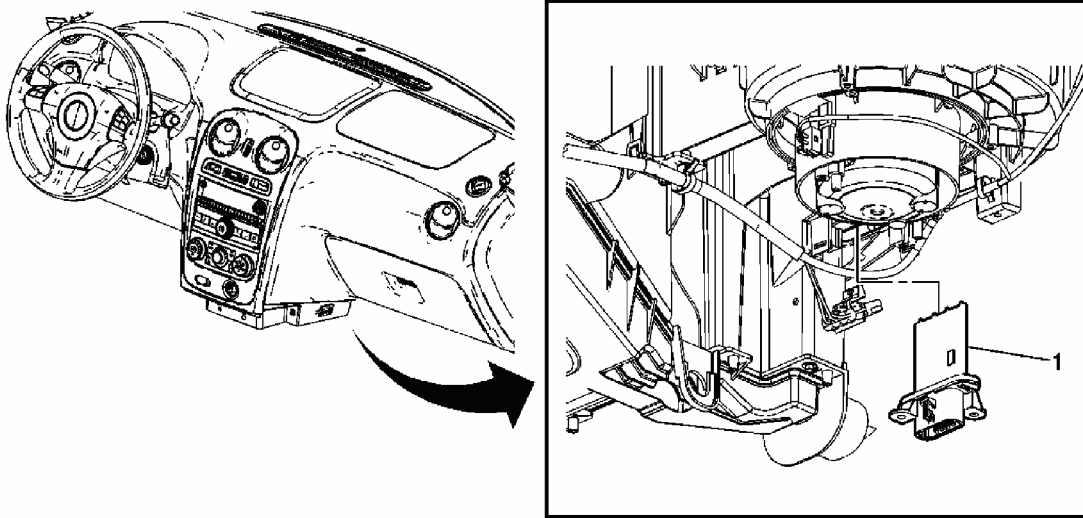


Fig. 52: Blower Motor Resistor Replacement
Courtesy of GENERAL MOTORS CORP.

Blower Motor Resistor Replacement

Callout	Component Name
Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u> .	
Preliminary Procedure	
1. Remove the right insulator panel. Refer to <u>Insulator Replacement - Instrument Panel (I/P)</u> .	
2. Disconnect the blower motor resistor electrical connector.	
1	Resistor Assembly, Blower Motor Tip: Unsnap the blower motor resistor from the HVAC module and remove.

BLOWER MOTOR REPLACEMENT

Removal Procedure

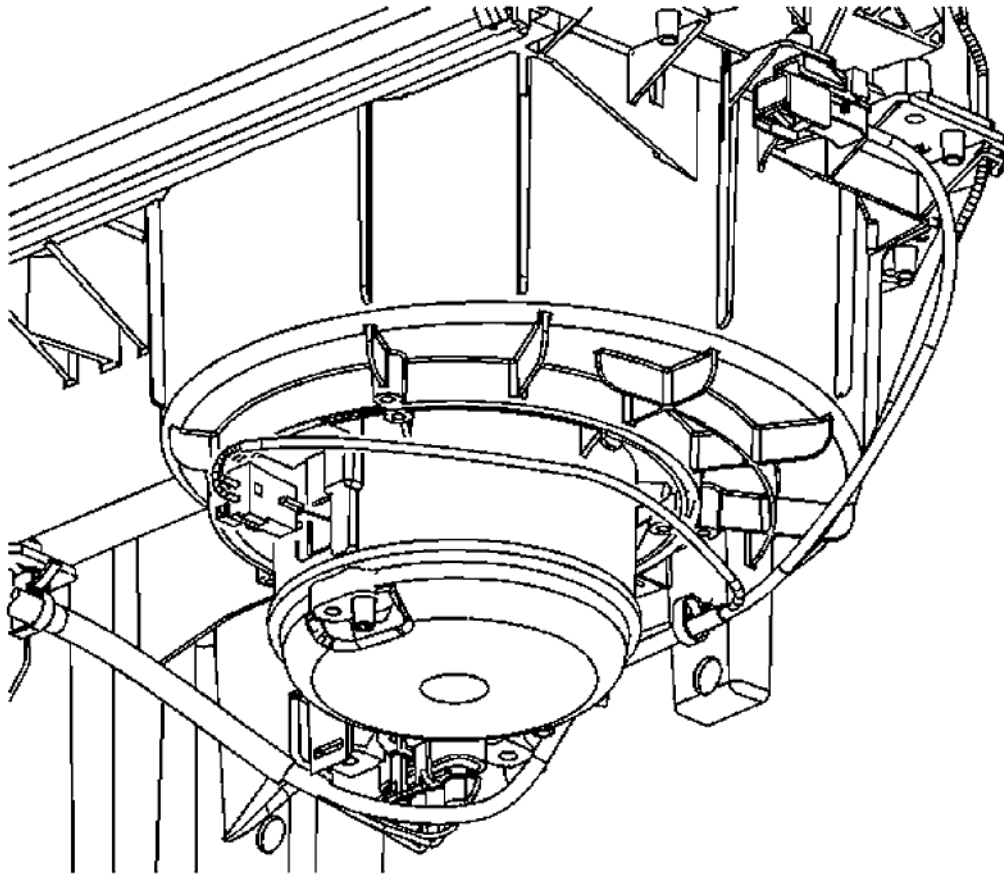


Fig. 53: View Of Blower Motor Electrical Connector
Courtesy of GENERAL MOTORS CORP.

1. Disconnect the blower motor electrical connector.

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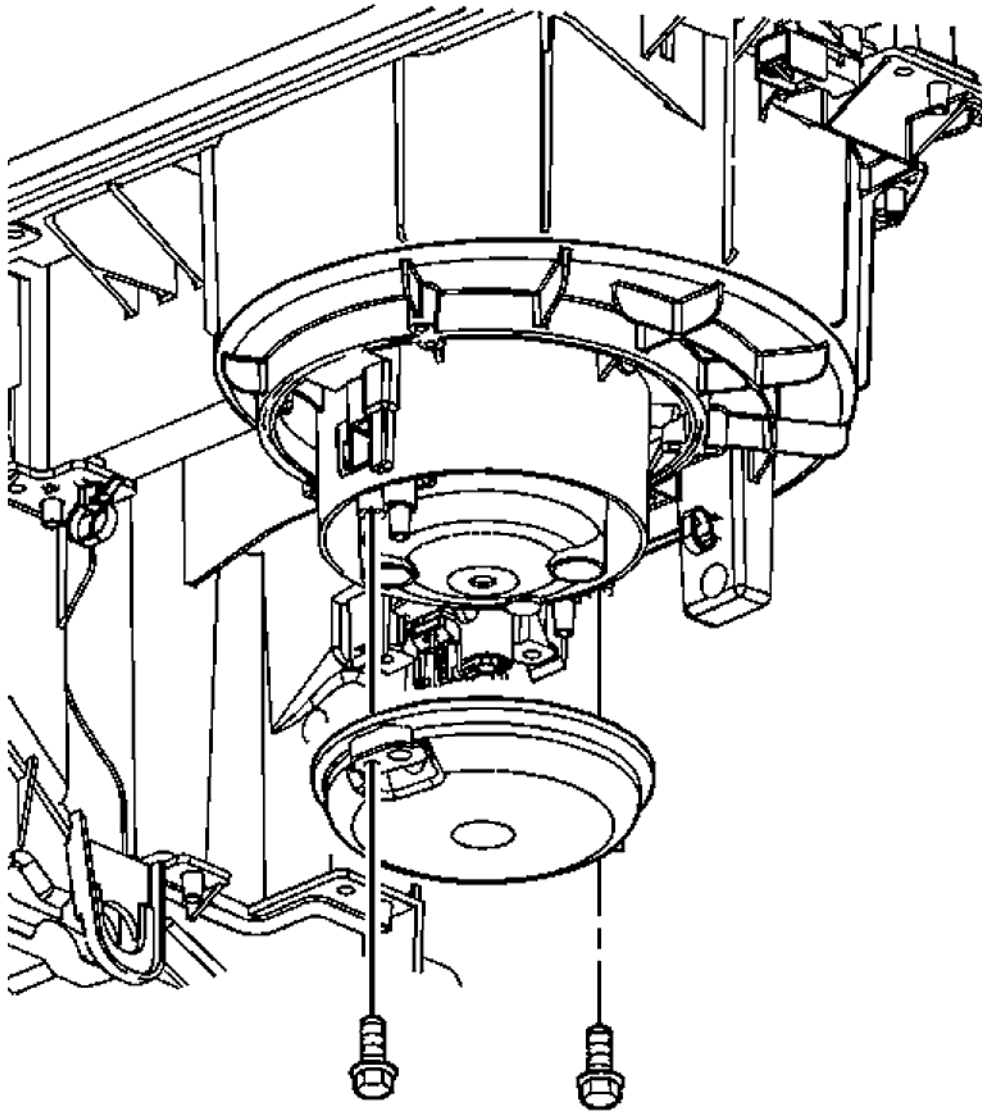


Fig. 54: Identifying Lower Motor Cover
Courtesy of GENERAL MOTORS CORP.

2. Remove the lower blower motor cover retaining screws.
3. Remove the lower blower motor cover.

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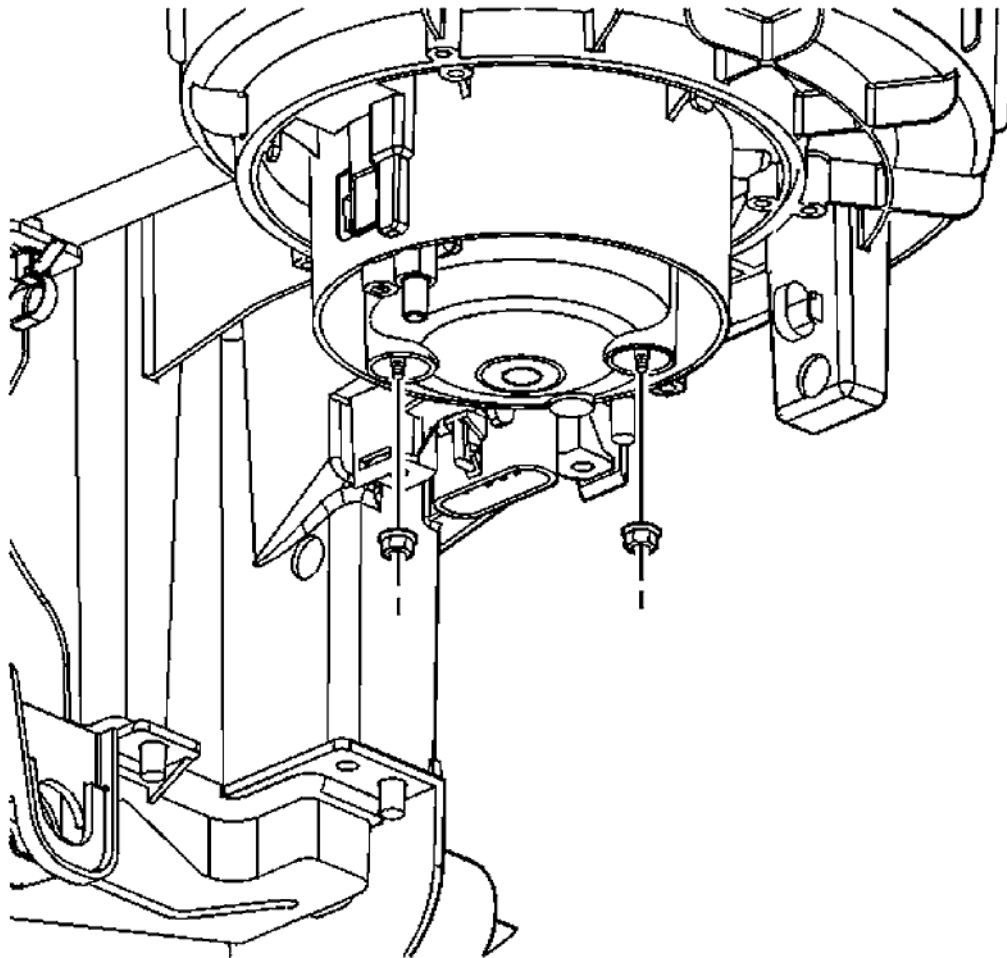


Fig. 55: Identifying Blower Motor Nuts
Courtesy of GENERAL MOTORS CORP.

4. Remove the blower motor nuts.

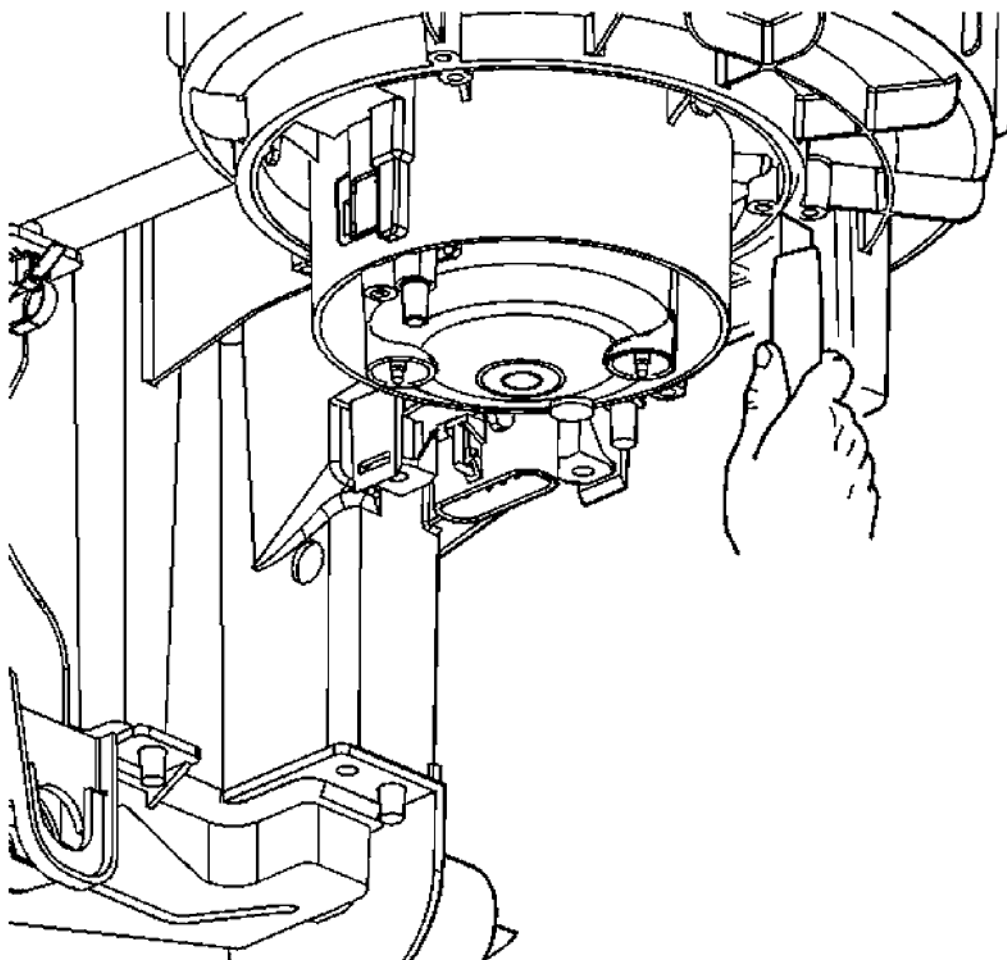


Fig. 56: Cutting Through Case
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Cut through the case as straight as possible because the motor cup must be replaced. In order to prevent damage to the component, do not cut any deeper than necessary to remove the motor cup.

5. Remove the blower motor and cup from the lower case by cutting through the case between the circular ribs around the motor with a sharp utility knife.

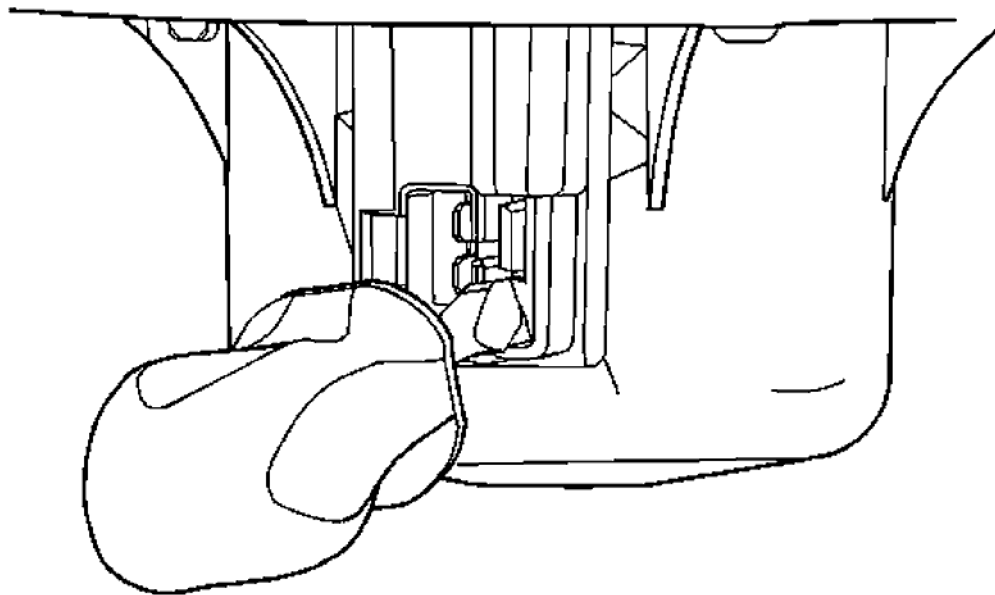


Fig. 57: Releasing Blower Motor Retaining Tab
Courtesy of GENERAL MOTORS CORP.

6. Release the blower motor retaining tab and remove the motor from the cup.

Installation Procedure

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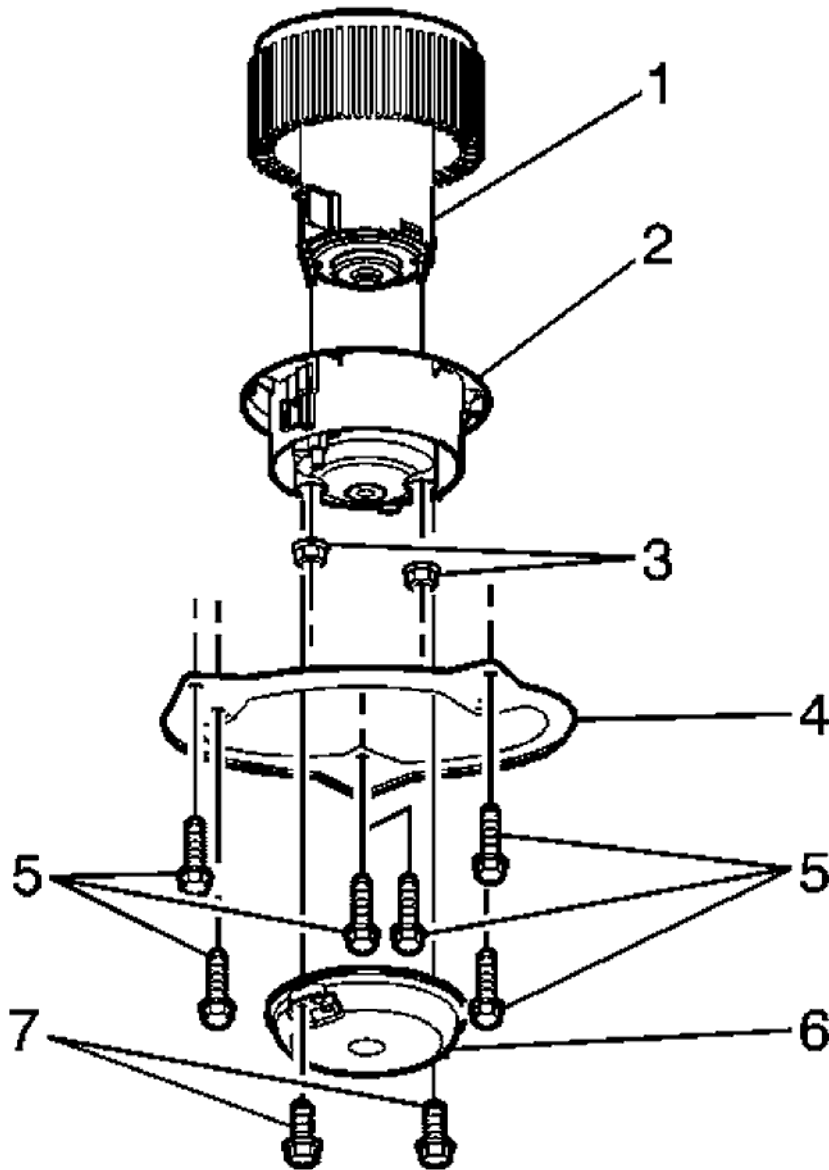


Fig. 58: Identifying Blower Motor & Motor Cup
Courtesy of GENERAL MOTORS CORP.

1. Install the blower motor (1) into the motor cup (2) that was cut out of the lower case.

NOTE: Refer to Fastener Notice .

2. Install the blower motor nuts (3)

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Tighten: Tighten the nuts to 2.4 N.m (21 lb in).

3. Attach the service ring (4) to the motor cup (2) with the screws (5) included in the kit.

Tighten: Tighten the screws to 1.8 N.m (15 lb in).

4. Install the blower motor and service ring into the HVAC module using the screws (5) included in the kit. Make certain the blower motor electrical connector is pointing rearward in the vehicle.

Tighten: Tighten the screws to 1.8 N.m (15 lb in).

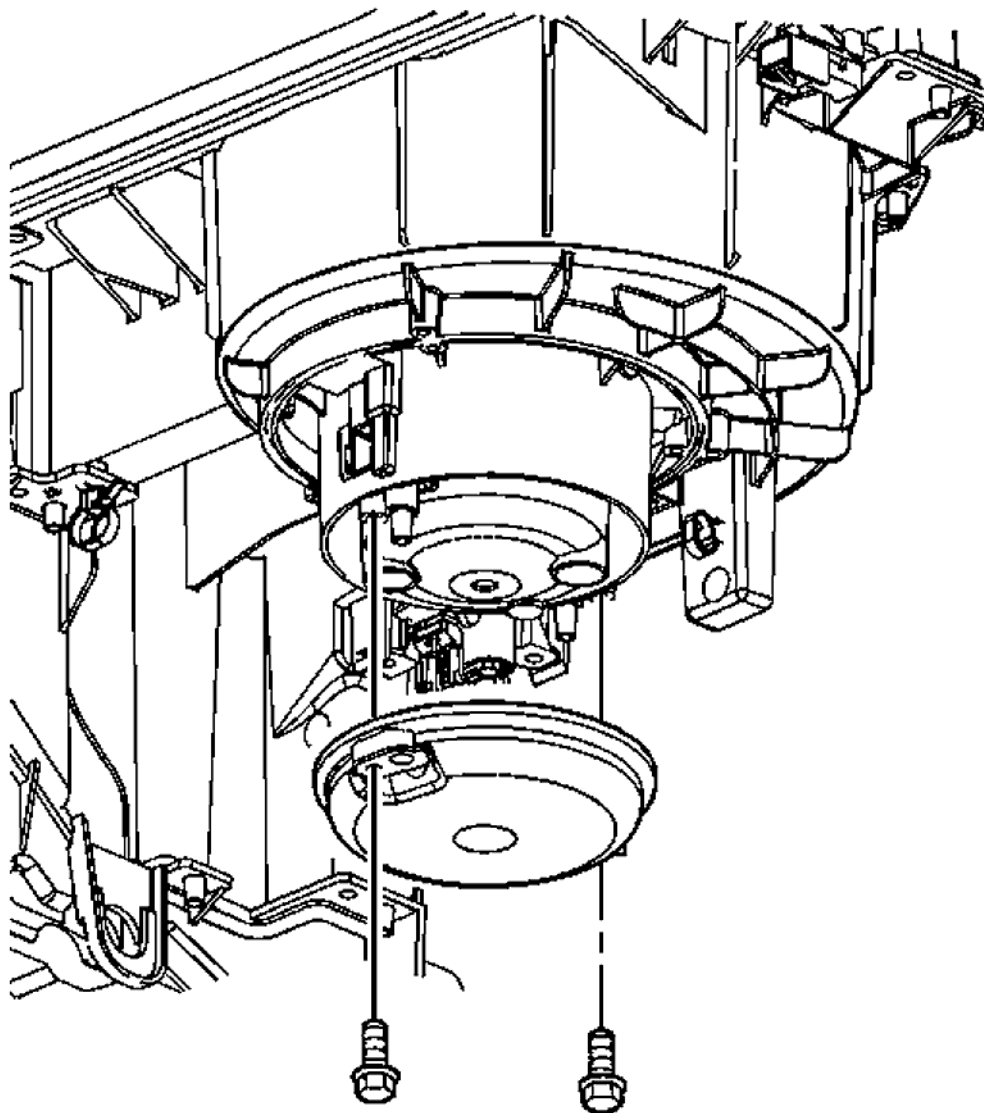


Fig. 59: Identifying Lower Motor Cover
Courtesy of GENERAL MOTORS CORP.

5. Install the lower blower motor cover.
6. Install the lower blower motor cover retaining screws.

Tighten: Tighten the screws to 1.8 N.m (15 lb in).

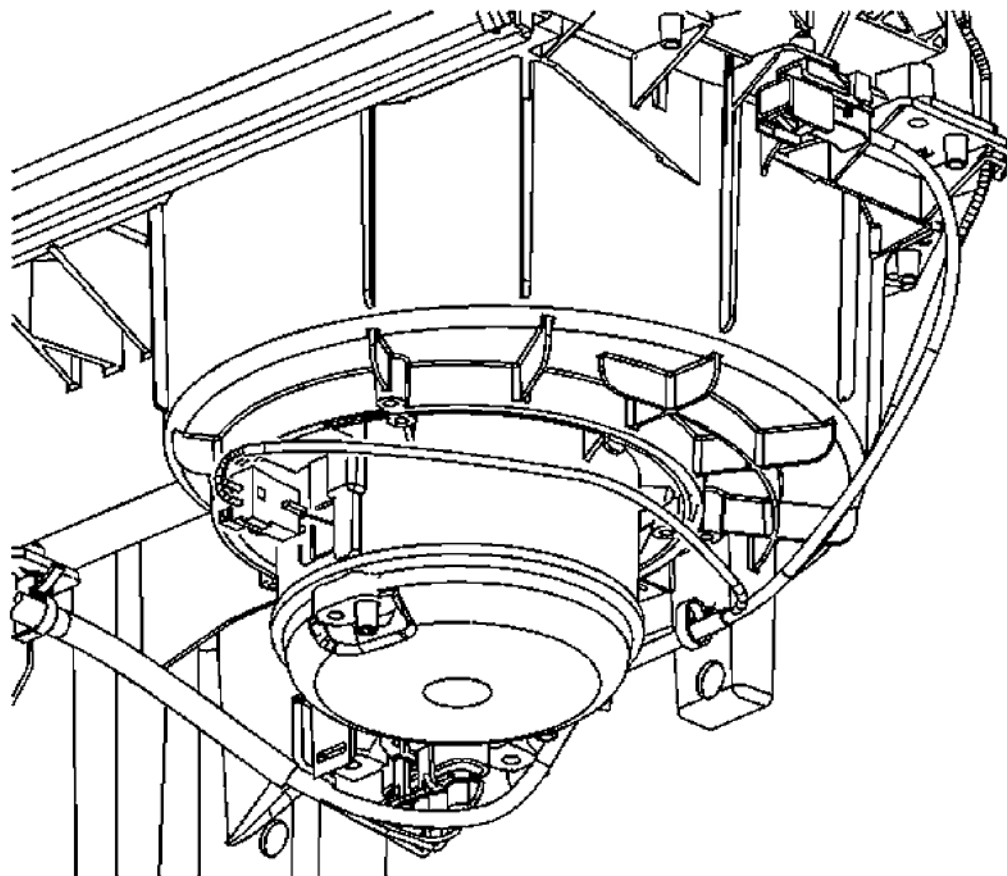


Fig. 60: View Of Blower Motor Electrical Connector
Courtesy of GENERAL MOTORS CORP.

7. Connect the blower motor electrical connector.

AIR OUTLET REPLACEMENT - INSTRUMENT PANEL - LEFT

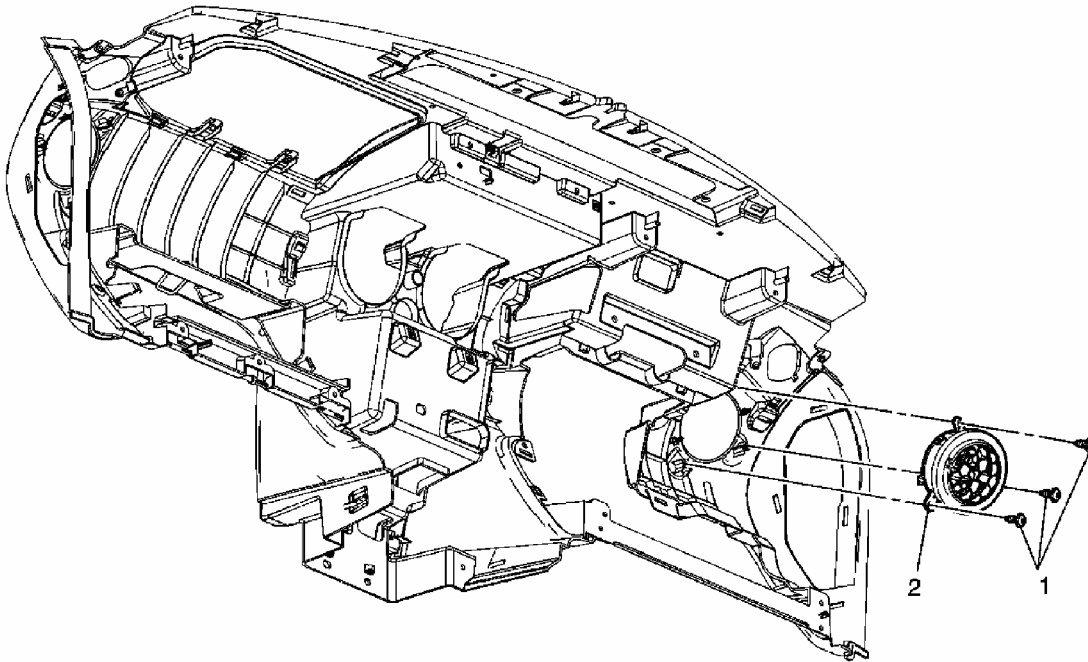


Fig. 61: Left Air Outlet Replacement - Instrument Panel
 Courtesy of GENERAL MOTORS CORP.

Air Outlet Replacement - Instrument Panel - Left

Callout	Component Name
NOTE: Refer to <u>Fastener Notice</u> . Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u> . Preliminary Procedure: Remove the lower instrument panel (I/P) retainer. Refer to <u>Instrument Panel (I/P) Retainer Replacement</u> .	
1	Screw, Left Air Outlet Assembly (Qty: 3) Tighten: 1.5 N.m (13 lb in)
2	Left Air Outlet Assembly Tip: Remove the air outlet from the back side of the I/P retainer.

AIR OUTLET REPLACEMENT - INSTRUMENT PANEL - CENTER

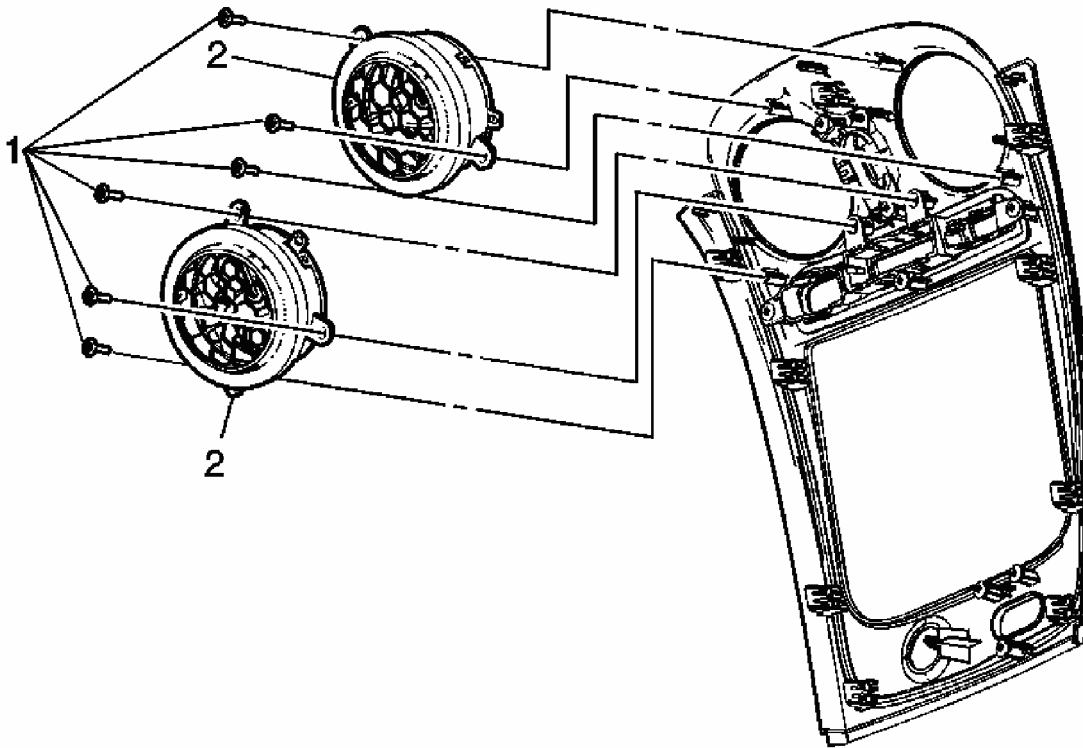


Fig. 62: Center Air Outlet Replacement - Instrument Panel
 Courtesy of GENERAL MOTORS CORP.

Air Outlet Replacement - Instrument Panel - Center

Callout	Component Name
NOTE: Refer to <u>Fastener Notice</u> . Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u> . Preliminary Procedure: Remove the instrument panel (I/P) accessory trim plate. Refer to <u>Trim Plate Replacement - Instrument Panel (I/P) Accessory</u> .	
1	Screw, Center Air Outlet Assembly (Qty: 3) Tighten: 1.5 N.m (13 lb in)
2	Center Air Outlet Assembly Tip: Remove the air outlet from the back side of the accessory trim plate.

AIR OUTLET REPLACEMENT - INSTRUMENT PANEL - RIGHT

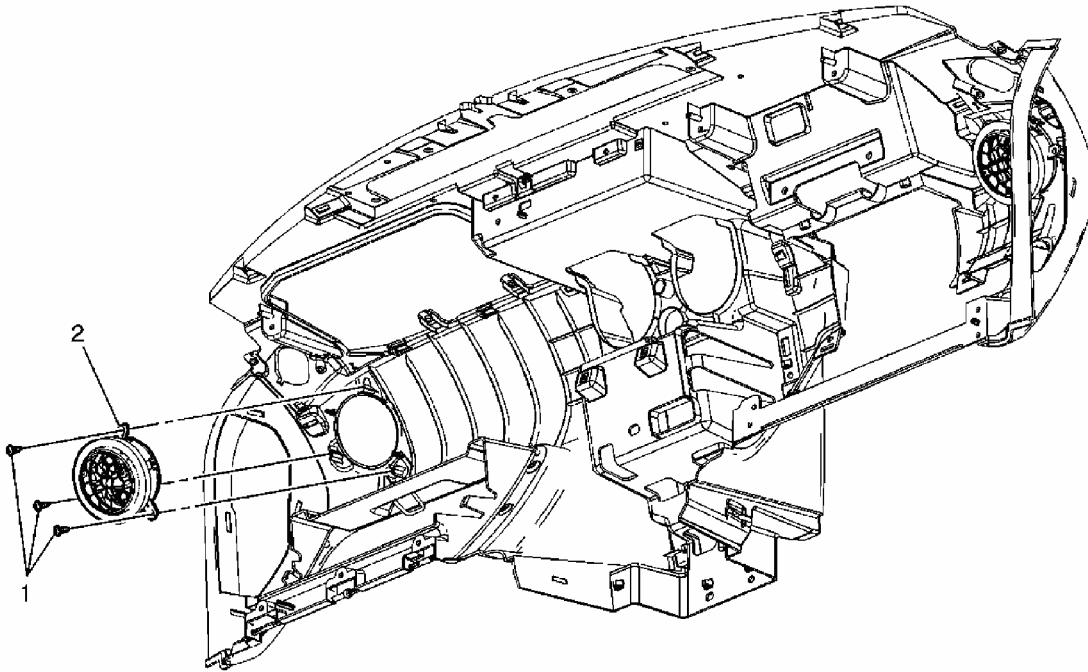


Fig. 63: Right Air Outlet Replacement - Instrument Panel
Courtesy of GENERAL MOTORS CORP.

Air Outlet Replacement - Instrument Panel - Right

Callout	Component Name
NOTE: Refer to Fastener Notice .	
Fastener Tightening Specifications: Refer to Fastener Tightening Specifications . Preliminary Procedure: Remove the lower instrument panel (I/P) retainer. Refer to Instrument Panel (I/P) Retainer Replacement .	
1	Screw, Right Air Outlet Assembly (Qty: 3) Tighten: 1.5 N.m (13 lb in)
2	Right Air Outlet Assembly Tip: Remove the air outlet from the back side of the I/P retainer.

AIR OUTLET DUCT REPLACEMENT - CENTER FLOOR

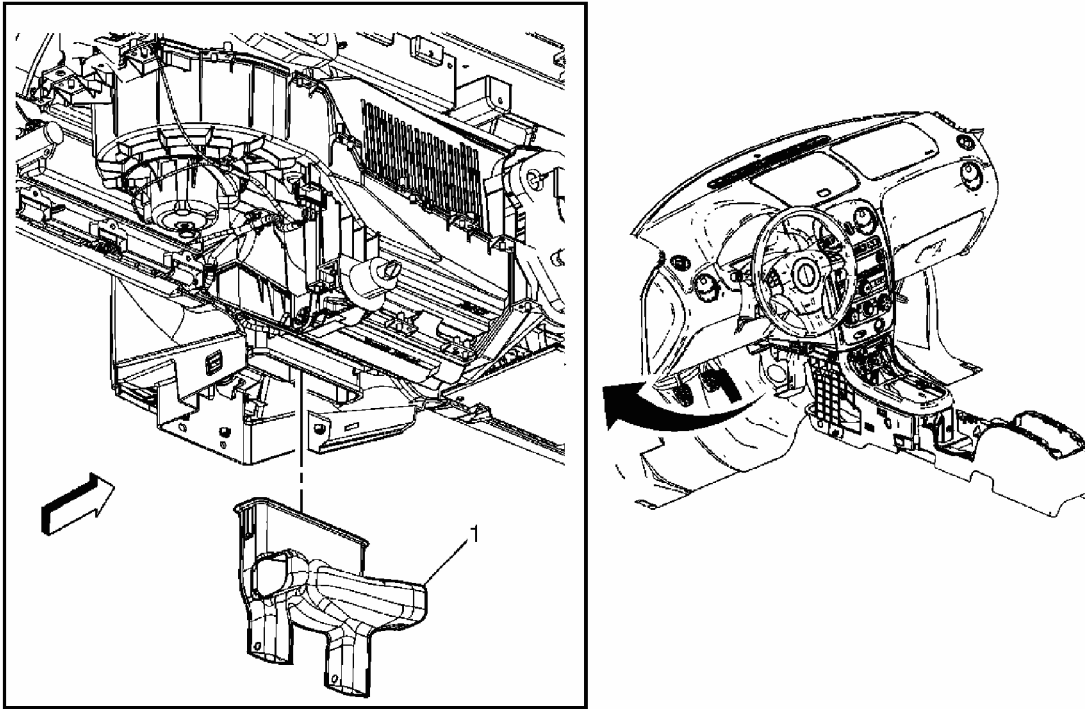


Fig. 64: Air Outlet Duct Replacement - Center Floor
Courtesy of GENERAL MOTORS CORP.

Air Outlet Duct Replacement - Center Floor

Callout	Component Name
NOTE: Refer to Fastener Notice .	
Fastener Tightening Specifications: Refer to Fastener Tightening Specifications . Preliminary Procedure: Remove the center front floor console extension. Refer to Extension Replacement - Floor Console - Center .	
1	Rear Floor Air Duct Tip: Lift up on the rear floor air duct and push the bottom of the duct toward the front of the vehicle to remove from the HVAC module.

AIR OUTLET DUCT REPLACEMENT - CENTER

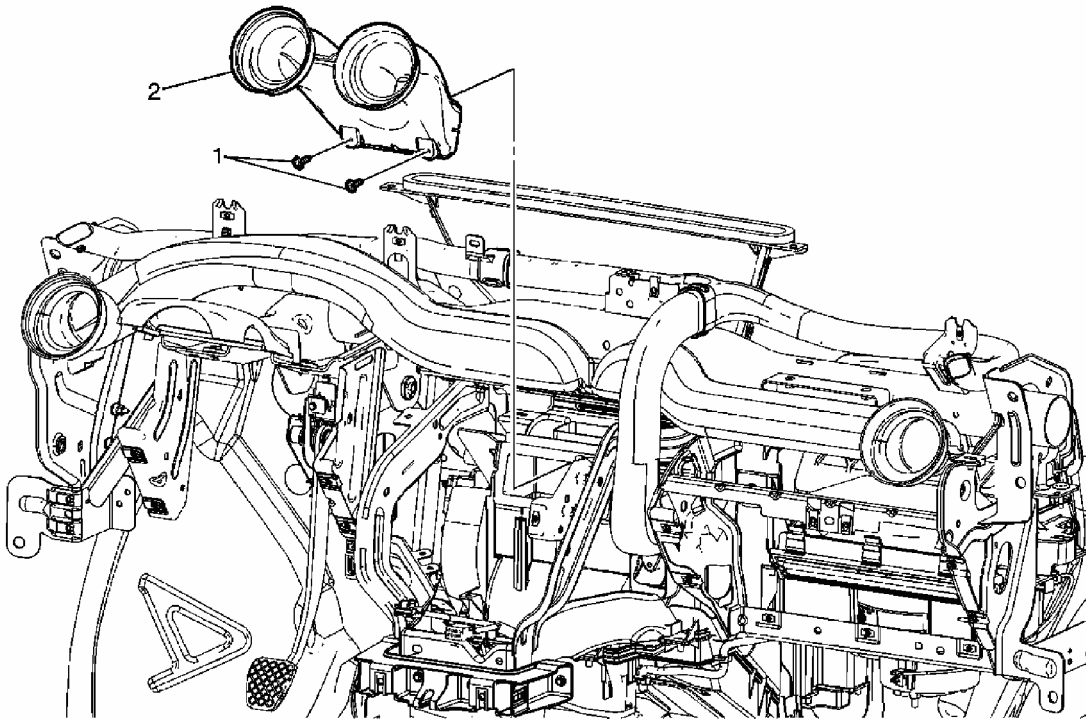


Fig. 65: Air Outlet Duct Replacement - Center
Courtesy of GENERAL MOTORS CORP.

Air Outlet Duct Replacement - Center

Callout	Component Name
Fastener Tightening Specifications: Refer to Fastener Tightening Specifications .	
Preliminary Procedure: Remove the lower instrument panel (I/P) retainer. Refer to Instrument Panel (I/P) Retainer Replacement .	
1	I/P Center Air Outlet Duct Assembly

DEFROSTER DUCT REPLACEMENT - WINDSHIELD

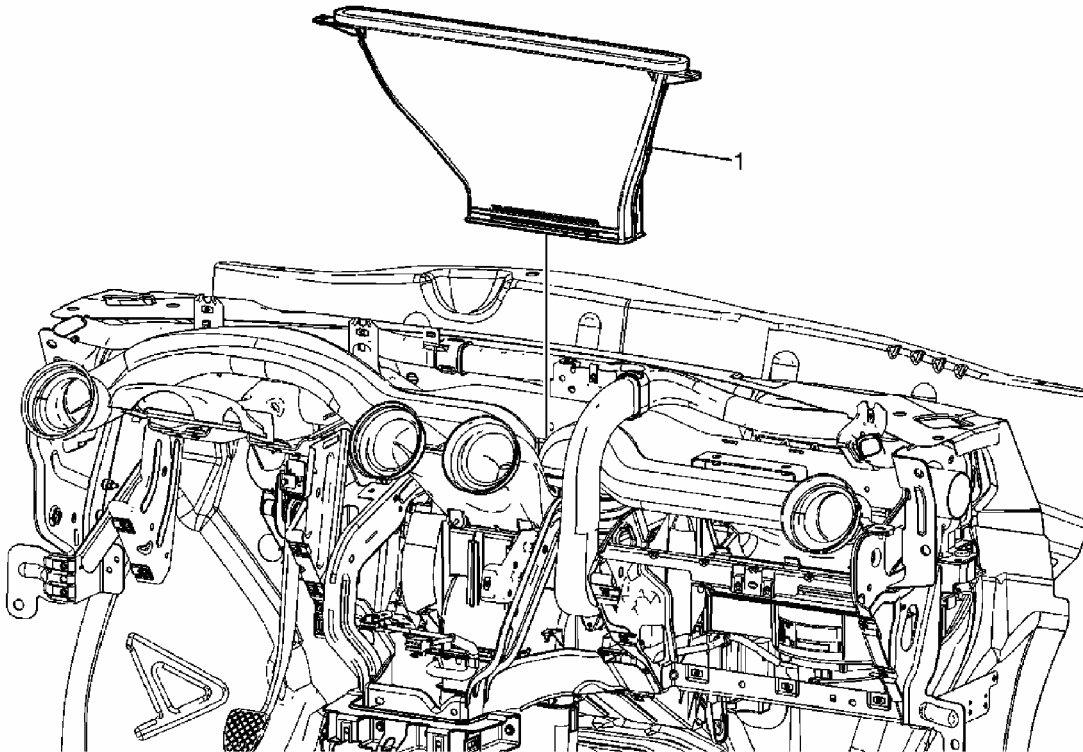


Fig. 66: Defroster Duct Replacement - Windshield
Courtesy of GENERAL MOTORS CORP.

Defroster Duct Replacement - Windshield

Callout	Component Name
Fastener Tightening Specifications: Refer to Fastener Tightening Specifications .	
Preliminary Procedure: Remove the lower instrument panel (I/P) retainer. Refer to Instrument Panel (I/P) Retainer Replacement .	
1	Windshield Defroster Nozzle Duct Assembly Tip: Retaining clips holding the windshield defroster nozzle duct assembly will come out with the lower I/P retainer.

AIR DISTRIBUTION DUCT REPLACEMENT

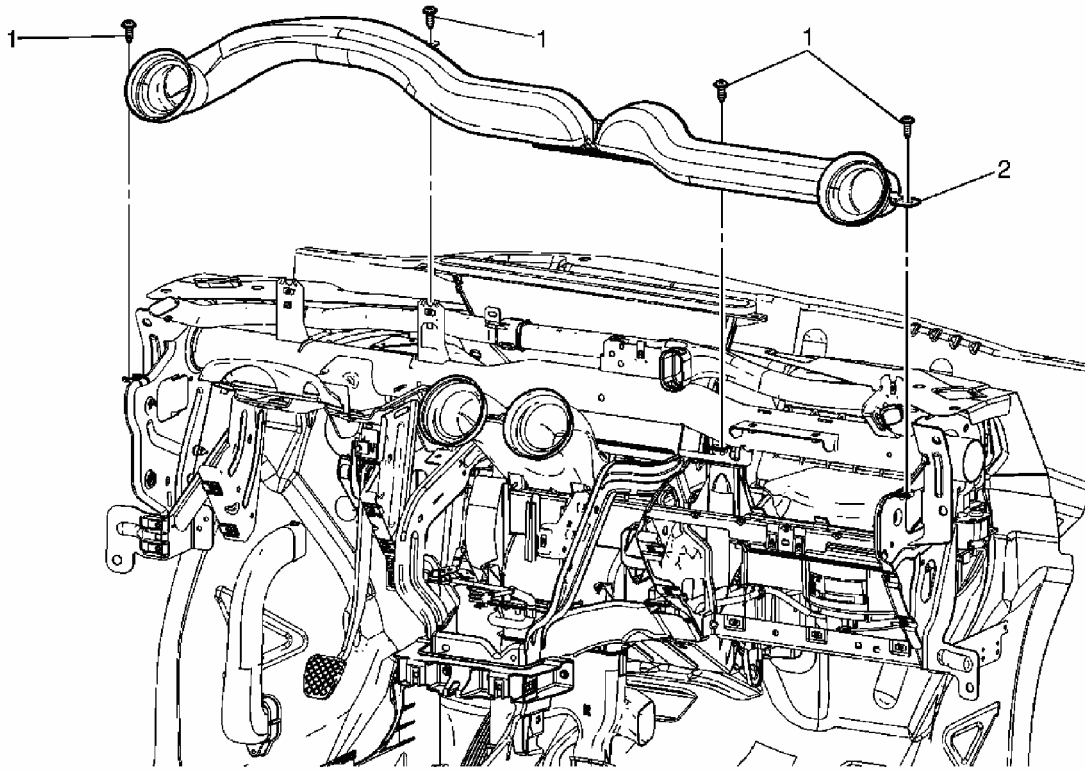


Fig. 67: Air Distribution Duct Replacement
 Courtesy of GENERAL MOTORS CORP.

Air Distribution Duct Replacement

Callout	Component Name
Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u> .	
Preliminary Procedure	
1. Remove the lower instrument panel (I/P) retainer. Refer to <u>Instrument Panel (I/P) Retainer Replacement</u> . 2. Remove the side window defogger duct. Refer to <u>Defogger Outlet Duct Replacement - Side Window</u> .	
1	Screw, Air Distribution Duct Assembly (Qty: 4) Tighten: 1.5 N.m (13 lb in)
2	Air Distribution Duct Assembly

DEFOGGER OUTLET DUCT REPLACEMENT - SIDE WINDOW, LH

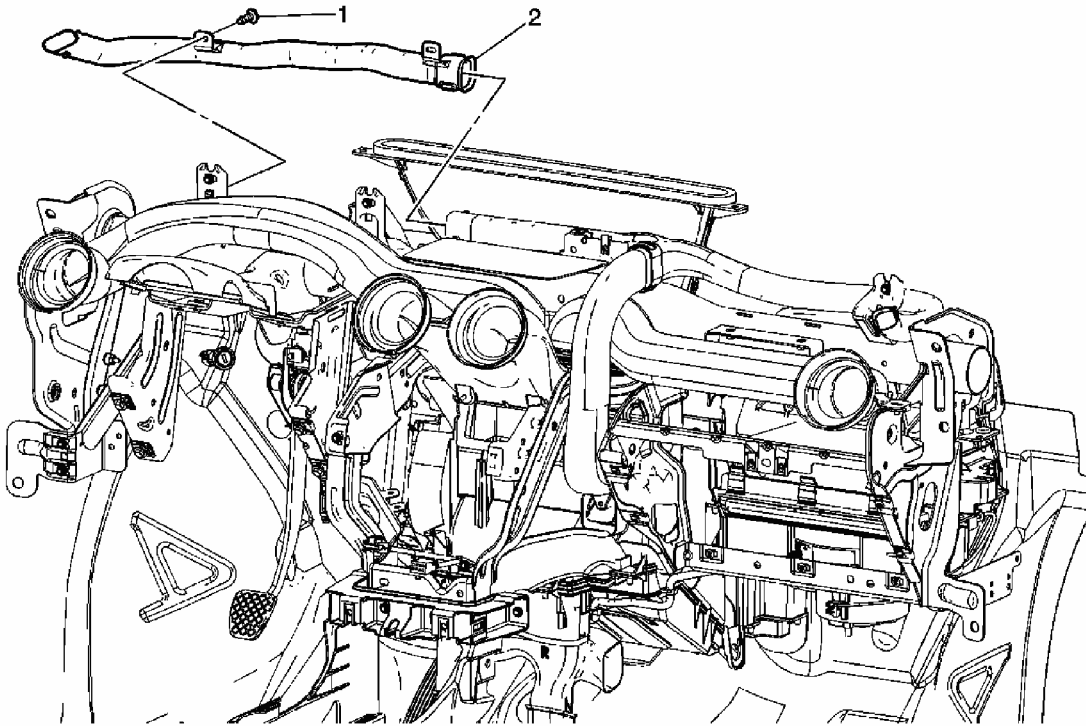


Fig. 68: Defogger Outlet Duct Replacement - Side Window, LH
Courtesy of GENERAL MOTORS CORP.

Defogger Outlet Duct Replacement - Side Window, LH

Callout	Component Name
Fastener Tightening Specifications: Refer to Fastener Tightening Specifications .	
Preliminary Procedure: Remove the lower instrument panel (I/P) retainer. Refer to Instrument Panel (I/P) Retainer Replacement .	
1	Screw, Side Window Defogger Outlet Duct Assembly - Left Hand Side Tighten: 1.5 N.m (13 lb in)
2	Side Window Defogger Outlet Duct Assembly - Left Hand Side

DEFOGGER OUTLET DUCT REPLACEMENT - SIDE WINDOW, RH

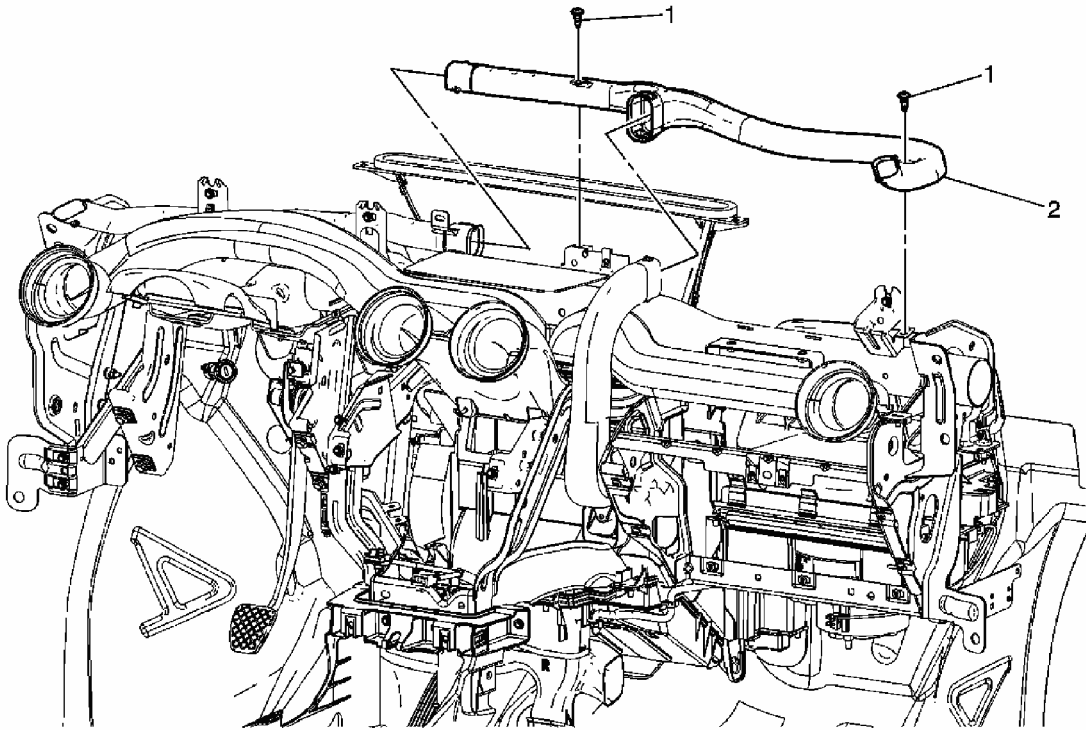


Fig. 69: Defogger Outlet Duct Replacement - Side Window, RH
 Courtesy of GENERAL MOTORS CORP.

Defogger Outlet Duct Replacement - Side Window, RH

Callout	Component Name
Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u> . Preliminary Procedure: Remove the lower instrument panel (I/P) retainer. Refer to <u>Instrument Panel (I/P) Retainer Replacement</u> .	
1	Screw, Side Window Defogger Outlet Duct Assembly - Right Hand Side (Qty: 2) Tighten: 1.5 N.m (13 lb in)
2	Side Window Defogger Outlet Duct Assembly - Right Hand Side

DEFOGGER OUTLET DUCT REPLACEMENT - SIDE WINDOW

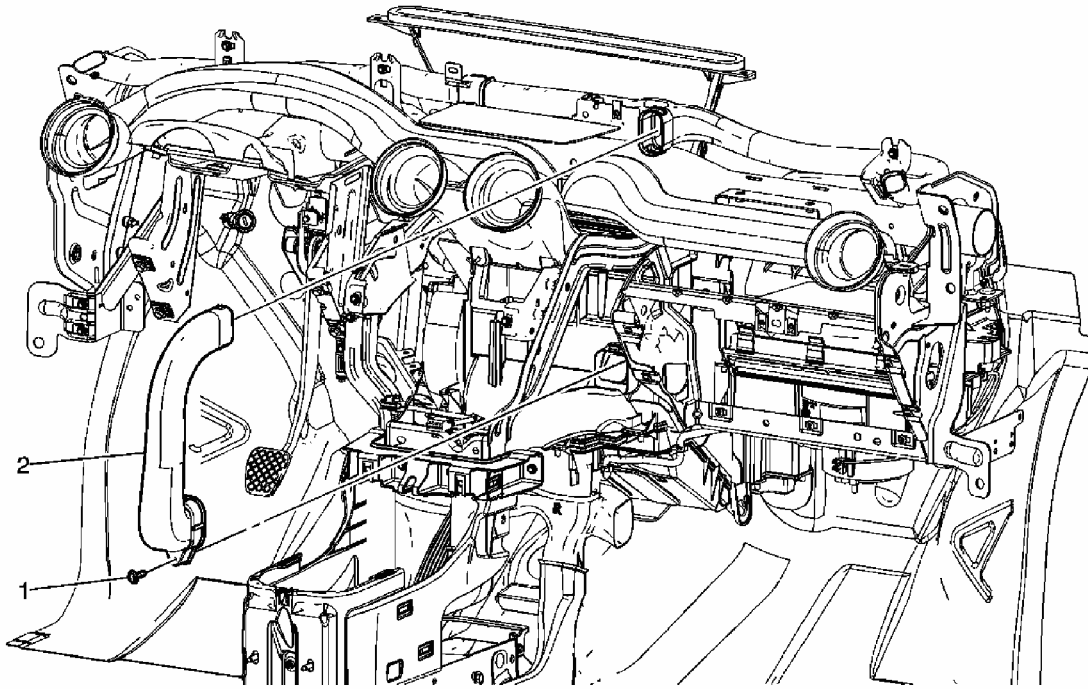


Fig. 70: Defogger Outlet Duct Replacement - Side Window
Courtesy of GENERAL MOTORS CORP.

Defogger Outlet Duct Replacement - Side Window

Callout	Component Name
Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u> .	
Preliminary Procedure: Remove the lower instrument panel (I/P) retainer. Refer to <u>Instrument Panel (I/P) Retainer Replacement</u> .	
1	Side Window Defogger Outlet Duct Assembly

AIR OUTLET DUCT REPLACEMENT - FLOOR, LH

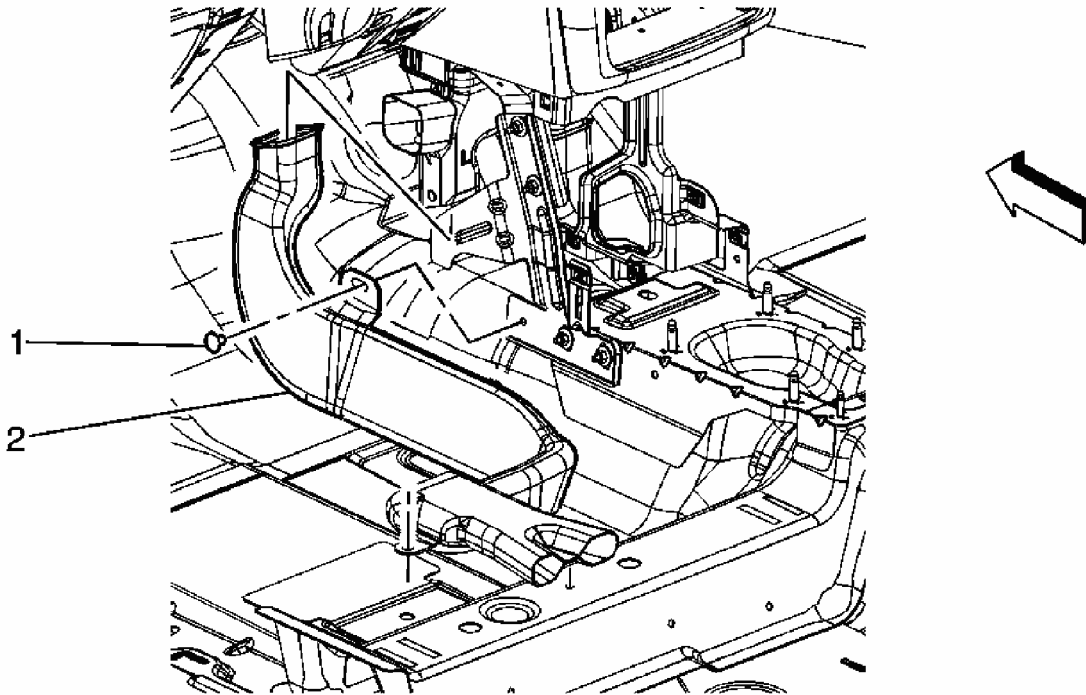


Fig. 71: Air Outlet Duct Replacement - Floor, LH
 Courtesy of GENERAL MOTORS CORP.

Air Outlet Duct Replacement - Floor, LH

Callout	Component Name
Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u> .	
Preliminary Procedure	
1. Remove the left front seat. Refer to <u>Seat Replacement - Front Bucket</u> .	
2. Remove the front center floor console extension. Refer to <u>Extension Replacement - Floor Console - Center</u> .	
3. Remove the left front sill plate. Refer to <u>Door Sill Plate Replacement - Front</u> .	
1	Push Pin
2	Rear Floor Air Duct Assembly - Left Hand Side Tip: Pull the carpet up to access the floor duct.

AIR OUTLET DUCT REPLACEMENT - FLOOR, RH

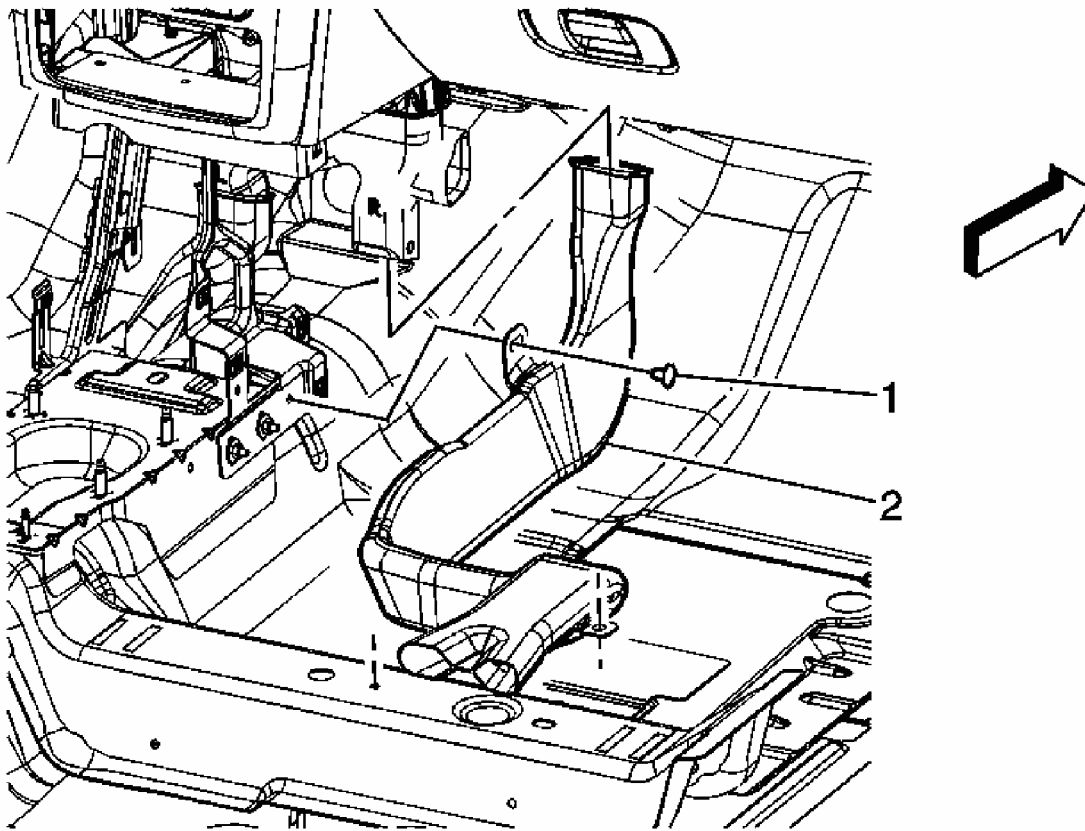


Fig. 72: Air Outlet Duct Replacement - Floor, RH
 Courtesy of GENERAL MOTORS CORP.

Air Outlet Duct Replacement - Floor, RH

Callout	Component Name
Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u> .	
Preliminary Procedure	
1. Remove the right front seat. Refer to <u>Seat Replacement - Front Bucket</u> .	
2. Remove the right side floor console extension. Refer to <u>Extension Replacement - Floor Console - Side</u> .	
3. Remove the right front sill plate. Refer to <u>Door Sill Plate Replacement - Front</u> .	
1	Push Pin
2	Rear Floor Air Duct Assembly - Right Hand Side Tip: Pull the carpet up to access the floor duct.

HEATER CORE COVER REPLACEMENT

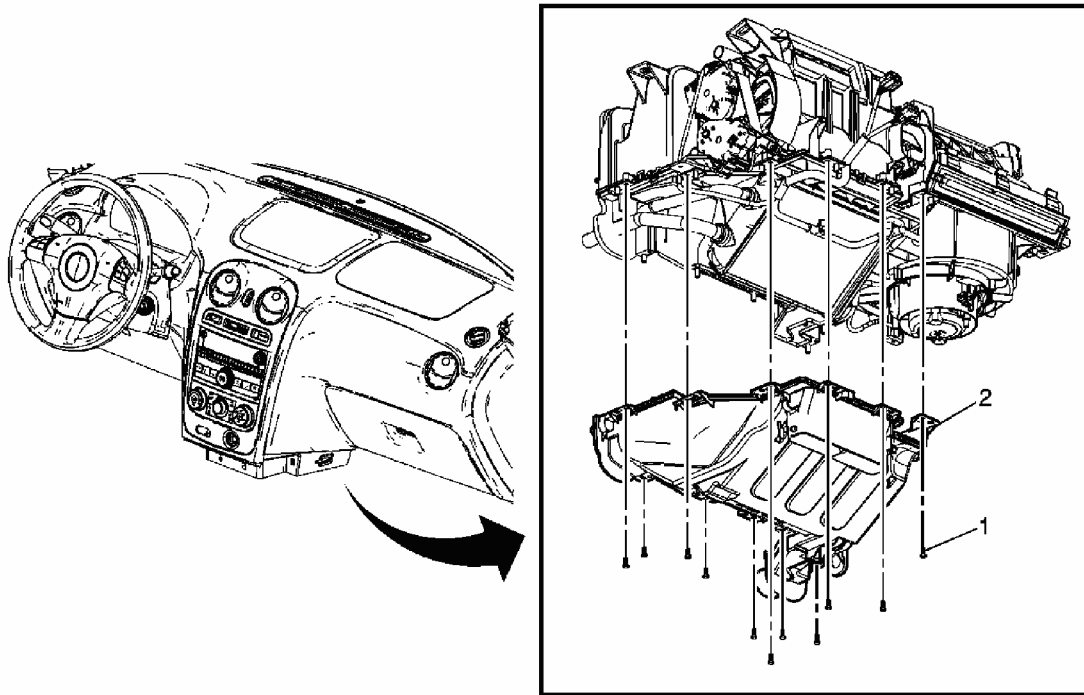


Fig. 73: Heater Core Cover Replacement
 Courtesy of GENERAL MOTORS CORP.

Heater Core Cover Replacement

Callout	Component Name
Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u> .	
Preliminary Procedure	
1. Remove the right insulator panel. Refer to <u>Refrigerant Recovery and Recharging</u> . 2. Remove the center support bracket. Refer to <u>Bracket Replacement - Instrument Panel (I/P) Center Support</u> .	
1	Screw, Cover Assembly - Heater (Qty: 12) Tip: Remove the heater core cover heat stakes using a small chisel. Tighten: 1.5 N.m (13 lb in)
2	Cover Assembly, Heater

HEATER CORE REPLACEMENT

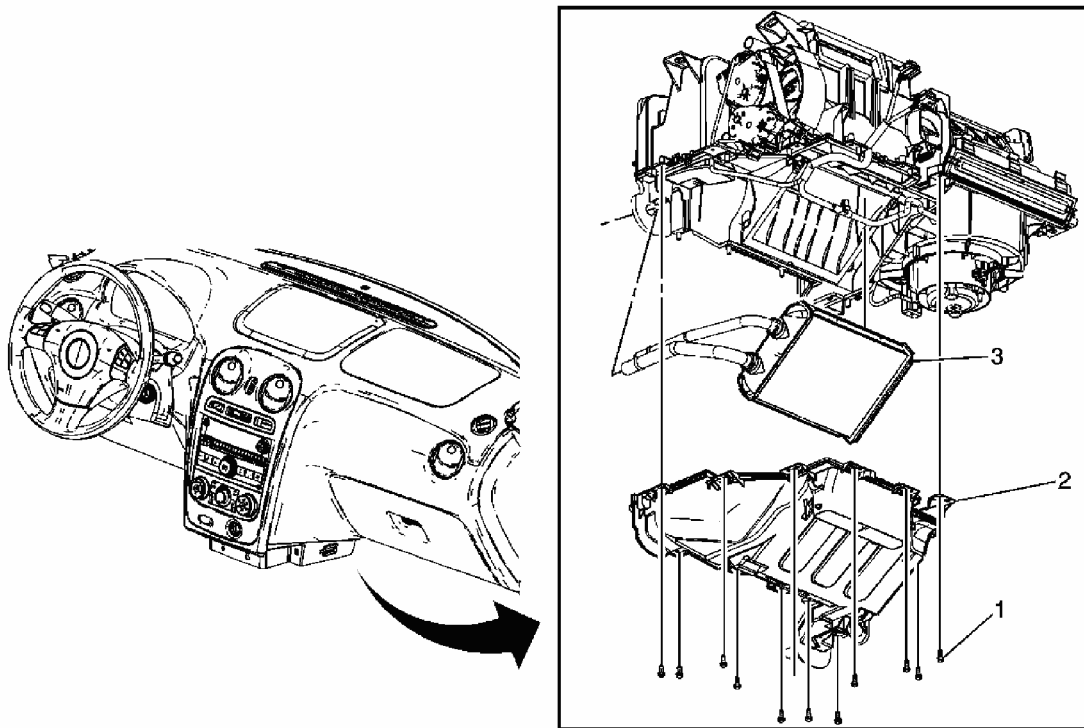


Fig. 74: Heater Core Replacement
 Courtesy of GENERAL MOTORS CORP.

Heater Core Replacement

Callout	Component Name
Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u> .	
Preliminary Procedure	
1. Remove the heater inlet hose from the heater core. Refer to <u>Heater Hose Replacement - Inlet</u>. 2. Remove the heater outlet hose from the heater core. Refer to <u>Heater Hose Replacement - Outlet</u>. 3. Remove the right insulator panel. Refer to <u>Refrigerant Recovery and Recharging</u>. 4. Remove the center support bracket. Refer to <u>Bracket Replacement - Instrument Panel (I/P) Center Support</u>.	
1	Screw, Cover Assembly - Heater (Qty: 12) Tip: Remove the heater core cover heat stakes using a small chisel. Tighten: 1.5 N.m (13 lb in)
2	Cover Assembly, Heater
3	Core Assembly, Heater

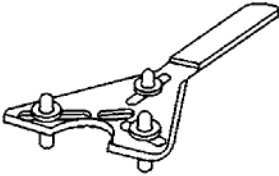
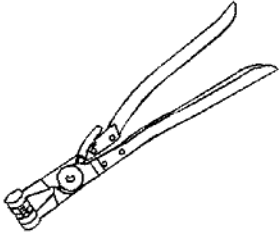
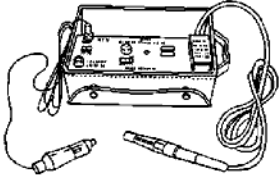
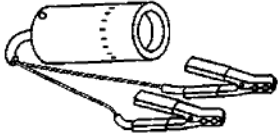
2006 Chevrolet HHR LT

2006 HVAC Heating, Ventilation & Air Conditioning - HHR

SPECIAL TOOLS AND EQUIPMENT

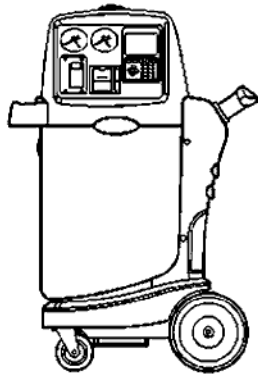
SPECIAL TOOLS

Special Tools

Illustration	Tool Number/Description
	J 37872 Universal Spanner Wrench
	J 38185 Hose Clamp Pliers
	J 39400-A Halogen Leak Detector
	J 41447 R-134A A/C Tracer Dye-Box of 24
	J 42220 Universal 12V Leak Detection Lamp

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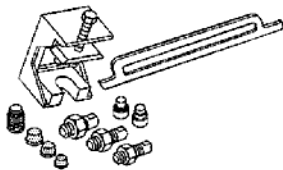
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J 43600
ACR 2000 Air Conditioning Service
Center



J 43872
Fluorescent Dye Cleaner

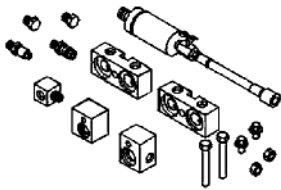
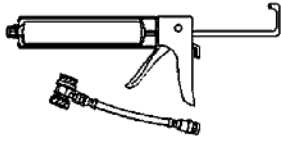


J 44551
Suction Screen Kit

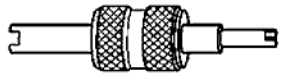
J 45037
A/C Oil Injector

2006 Chevrolet HHR LT

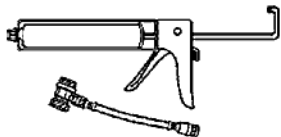
2006 HVAC Heating, Ventilation & Air Conditioning - HHR



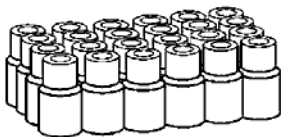
J 45268
A/C Flushing Adapter Kit



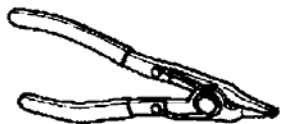
J 46246
Valve Core Tool



J-46297
R-134A A/C Tracer Dye Injector



J-46297-12
Replacement Dye Cartridges



J 6083
Snap Ring Pliers